USERN™
| Universal Scientific Education &
Research Network |
| usern.org |

The 6th International

USERN Congress

and Prize Awarding Festival

November 6th-13th, 2021
Istanbul, Turkey

Organized by:

USERN™
| Universal Scientific Education &
Research Network |
| usern.org |

Hosted by:

MARMARA
U N I V E R S I T Y

MARMARA UNIVERSITY
1883

Co-Hosted by:

TEHRAN UNIVERSITY OF MEDICAL SCIENCES

AVICENNA International College

UNIVERSITÀ DI PAVIA

Kharkiv National Medical University

Sponsored by:

TURKISH SOCIETY OF ALLERGY AND CLINICAL IMMUNOLOGY

Islamic Republic of Iran
Ministry of Health and Medical Education
Office of Persian Medicine

jm Jeffrey Modell Foundation

ROUGINE PHARMED

sanostol for all
ســانســتـول بـرای همـه

majan
Today's Nutrition, Tomorrow's Health

Supported by:

دانشگاه علوم پزشکی و خدمات بهداشتی، درمانی ایران

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی استان زنجان

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی آبادان

دانشگاه علــوم پزشکی و خدمات بهداشتی درمانی

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی کرمانشاه

Universal Scientific Education and Research Network (USERN)

The 6-year Progress of a New Initiation

And

The 6th International USERN Congress and Prize Awarding Festival
November 6ᵗʰ–13ᵗʰ, 2021
Istanbul, Turkey

The 6th International USERN Congress and Prize Awarding Festival

USERN Congress Chair

Nima Rezaei

Co-Chairs

Ahmet Özen
Sevgi Keleş

IBB Executive Committee

Veli Sipahi
Elif Karakoç Aydiner
Safa Baris
V. Dilşad Mungan
A. Füsun Kalpaklıoğlu
Demet Can
Emine Dibek Mısırlıoğlu
Aslı Gelincik
Özge Uysal Soyer
Sevgi Bilgiç Eltan

Co-Hosts

Avicenna International College, Hungary

Shahrokh MirzaHosseini
László Rosivall
Arash Mirzahosseini
Andonis Theodokopoulos
Trisztán Varga
Reza Faramarzi
Mehdy Arbaby

University of Pavia, Italy

Giulia Grancini

Kharkiv National Medical University, Ukraine

Valeriy Kapystnuk
Iryna Leshchyna
Valeriy Myasoyedov
Anzhela Stashchak
Daria Shliakhova

USERN Congress Invited Lecturers and Guests

Nobel Laureate Lecturer

Jean-Marie Lehn (France) [Nobel Laureate, Chemistry, 1987]

International Experts

Mohammad Abdollahi
Hassan Abolhassani
Marc D. Abrams
Farshad Allameh
Armin Arbab-Zadeh
Moslem Bahadori
Francisco J. Barba
Safa Baris
Juan Carlos Aldave Becerra
Federico Bella
Thomas C. G. Bosch
Carson Bruns
Wenju Cai
Carlos Arturo Camargo
Brian Cantor
Massimo Capaccioli
Rossella Castagna
Jean-Marc Cavaillon
Ernest Chua Kian Jon
Valentina Cianfanelli
Elisabetta Comini
Antonio Condino-Neto
Umberto Crisanti
Sara De Biasi
Tommaso Dorigo
Majid Ebrahimi Warkiani
Julia Espinosa
Albert C. Fahrenbach
Mehdi Farokhnia
Rafael Franco
Leah C. Georges
Vivette Glover
Orlando Manuel da Costa Gomes
Kim Gorgens
Ekaterini Goudouris
Giulia Grancini
Igor Grossmann
Zurab Guguchia
Manoj Gupta

Amine Harbi
Mohammad Mahdi Hasani
Nikos Hatziargyriou
Steven C. Hayes
Ivan Hung
Daniel King
Kenneth Kosik
Chi-Ming Lam
Alexander Leemans
Lisa A. Levin
Brian Lighthill
Vittorio Limongelli
Zong-Hong Lin
Brian Little
Salvatore Lorusso
Fabien Lotte
Kewin Lowe
Livio Luongo
Christopher Ryan Maboloc
Amir Hossein Mahvi
Reza Malekzadeh
Alireza Mani
Miloš Milošević
Mehdi Mirsaeidi
Bahram Mobasher
Seyed Moein Moghimi
Shirin Moossavi
Ashkan Mowla
Paul Myles
Mohammad Hossein Nekoofar
Kotohiro Nomura
Jan Nouwen
Hans Ochs
Francesco Pasqualini
George Perry
Surapati Pramanik
Matin Qaim
Vicentiu Radulescu
Juan C. Sáez
Delfin Ortega Sanchez
Serena Sanseviero
Barry Schwartz
Frank Sellke
Jill Seubert
Alireza Shamshirsaz
Natalya Shelkovaya
Wayne Slater
Sławomir Sztajer
Amirhossein Takian
Sabu Thomas
Clara Vasconcelos

Hassan Vatandoost
Ricardo Vinuesa
Indre Viskontas
Frans von der Dunk
Matthias Von Herrath
Christopher Wlezien
Dongrui Wu
Anne Wyllie

Minghao Yu

USERN Congress Meet the Experts

Abass Alavi
Armin Arbab-Zadeh
Bahram Mobasher
Hans Ochs
Nima Rezaei
Alireza Shamshirsaz

USERN Congress Workshop Instructors

Kiarash Aramesh
Serge Brand
Ivani Nadir Carlotto
Mauro Da Lio
Tommaso Dorigo
Cornelius Ewuoso
Marshall Feterl
Farin Kamangar
Arutha Kulasinghe
Alexander Leemans
Shirin Moossavi
Farshid Noorbakhsh
George Perry
Habib Sadeghirad
Farhana Amy Sarker
Dina Siniora
Amirhossein Takian
Pietro Vischia
Christoph Weniger

USERN Congress Executive Board

Congress Executive Managers
Heliya Ziaei
Niloufar Yazdanpanah
Amir Hossein Loghman

Simin Seyedpour
Negar Azami
Milad Akbarzadehmoallemkolaei
Alireza Sarkar Lotfabadi

Executive Committee
Maede Abroon
Zahra Sadat Aghamir
Amir Hossein Ahmadi
Rashin Alizadeh Azar
Setayesh Arabshahi
Arman Asgharpoor
Alireza Bagheri
Farbod Bahreini
Sara Bakhshi
Sadra Behrouzieh
Shayan Dasdar
Saeed Davari
Azin Eslami
Reza Farzam
Hananeh Ghasemi
Morteza Ghasemi
Fatemeh Hajialiasgari
Ehsan Hijaee
Ali Jafari
Negin Jarrah
Mohammad Javad Kamali Ashtiani
Somayeh Kazemi
Ehsan Keramati Niaragh
Mahsa Keshavarz-Fathi
Fahimeh Khedmatkon
Behzad Khodaei
Sara Khoshlesan
Nika Kianfar
Sajad Kolahchi
Zahra Kolahchi
Mona Mirbeyk
Pegahsadat Mirshafiekhozani
Mohammadreza Mirzaee Goodarzi
Sara Momtazmanesh
Mahshad Naserpour
Kasra Pirahesh
Marzieh Pirzadeh
Ramtin Pourahmad
Ali Pourebrahimi
Puria Qadirian
Shayan Rahmani
Arshia Rastgar
Sepideh Razi
Fatemeh Rostami
Samane Sabzi
Zohreh Sadeghi
Saba Sajadi Tabar

Marzieh Sanatkhani
Mojdeh Sarzaeim
Fatemeh Sodeifian
Fateme Taghavi
Mohammad Ali Tahmasbi Nejad
Amir Erfan Yahyaeian
Mohammad Zamiri Bidary
Kosar Zolfaghari

U-Debate

Manager

Kawthar Mohamed

Group Mentors
Fereshteh Ghiasvand (Infectious Diseases)
Alipasha Meysamie (Epidemiology)
Hamidreza Namazi (Philosophy and Ethics)
Amir-Hassan Zarnani (Immunology)

Executives
Amirreza Beirami
Ghazaleh Ghaffaripour Jahromi
Qodsiye Hosseinifakhr
Melika Mashhadi
Parham Mortazavi
Ali Parouhan

Debate Workshop Instructor
Azim Mirzazadeh

Juries

Mohammad Abdollahi
Sara Abolghasemi
Ali Afshari
Sara Ahmadi Badi
Samira Alesaeidi
Marzieh Alikhasi
Hosein Alimadadi
Donya Alinejhad
Seyyed Farshad Allameh
Erfan Amini
Shahideh Amini
Mahnaz Arshad

Ali Asadollahi-Amin
Fariba Asghari
Haleh Ashraf
Leila Azadbakht
Kamran Balighi
Alireza Biglari
Mohammad Effatpanah
Hanieh-Sadat Ejtahed
Hamid Emadi Koochak
Solaleh Emamgholipour
Vahid Eslami
Ahmad Esmaillzadeh
Farnoush Faridbod
Akbar Fotouhi
Babak Geraiely
Alireza Ghannadan
Behdad Gharib
Rasoul Ghasemi
Masoumeh Ghasempour Alamdari
Aliakbar Haghdoost
Fateme Haji Ali Asgari
Farzin Halabchi
Mehrdad Hamidi
Amir Ali Hamidieh
Mandana Hasanzad
Behzad Houshmand
Ali Jafarian
Mohammad Jalili
Abdolmohammad Kajbafzadeh
Kourosh Karimi Yarandi
Nasim Khajavirad
Mohammad Reza Khami
Mahnaz Khanavi
Arash Khojasteh
Farzad Kompani
Ali Labaf
Masoud Lotfizadeh
Elaheh Malakan Rad
Arpi Manookian
Mehrzad Mehdizadeh
Bita Mesgarpour
Ali Mir
Seyed Rohollah Miri
Kayvan Mirnia
Niayesh Mohebbi
Nariman Mosaffa
Arfa Moshiri
Seyed Abbas Motevalian
Maryam Nasimi
Mohammad Hossein Nekoofar
Alireza Nikbakht Nasrabadi
Farsad Noorizadeh
Parviz Norouzi

Arash Okazi
Farzad Pakdel
Parvin Pasalar
Mohammad Hossein Pourgharib
Roja Rahimi
Katayoon Razjooyan
Ehsan Rezaei
Hossein Rezaeizadeh
Anahita Sadeghi
Mohammad Hossein Sadeghian
Mohammad Ali Sahraian
Mohammadreza Salehi
Hamidreza Saligheh Rad
Mandana Sattari
Roya Sattarzadeh Badkoubeh
Ehsan Sekhavati Moghadam
Enayat A. Shabani
Ehsan Sharif
Shayan Shekarabi
Reza Shervin Badv
Mandana Shirazi
Seyed Davar Siadat
Alireza Sima
Amir Ali Sohrabpour
Majid Sorouri
Maryam Sotoudeh Anvari
Amirhossein Takian
Seyed Mohammad Tavangar
Shabnam Tehrani
Arghavan Tonkaboni
Marjan Yaghmaie
Hossein Zabihi Mahmoudabadi
Amir Zareb Kohan
Arman Zargaran

Health and Art (HEART) Group

Manager

Zahra Rahimi Pirkoohi

Executives
Fateme Abharian
Fateme Eshaghi
Mohammad Hossein Eslami
Negin Hashemi
Rezvan Hosseinzadeh
Fateme Kamali
Sara Samadzadeh
Tina Shahab
Mahtab Pouraghahossein Lahrodi

HiMed Executive Committee

Arman Zargaran
Hamed Arezaei
Mohammad Hossein Ayati
Shahrzad Irannejad
Gürkan Sert
Hamed Ahansazan

USERN Offices Satellite Events

Manager

Noosha Samieefar

Executives
Narjes Mosavari
Danial Nejadmasoom
Ronak Rashedi

USERN Offices Executives

SBMU Office
Arash Khojasteh
Diba Akbarzadeh
Sima Safiei
Ardeshir Khorsand
Aryan Aarabi
Amirreza Beirami
Sajedeh Abbasi Shanbehbazari

AUMS Office
Sheyda Soltani
Mohammadreza Fadavipour
Mohammad Javad Dehnavi
Shaghayegh Naderi
Amir Hossein Ahmadi Asour
Maryam Shariatizadeh
Fatemeh Movalat

KUMS Office
Zhila Izadi
Farbod Ghobadinezhad

ZUMS Office
Malihe Parsa
Zahra Babaloo
Melika Lotfi

USERN Congress Art Performances

Mehrshad Bajelan
Arian Basati
Arefeh Esfandpour
Arman Farahani
Aryan Farahani

Maryam Jafari
Reihaneh Khalilianfard
Ahmad Reza Khatoonabadi
Mohammad Hossein Mahmoudi
Mozhdeh Mokhtari
Amirali Okhovat
Hesam Rezaie
Naeemeh Sargoli
Sepideh Sargoli

Niloufar Shabani
Zahra Sheikhzadeh

Webinar Moderators

Helia Mojtabavi
Elham Rayzan
Pouria Rouzrokh
Zahra Vahedi

Universal Scientific Education and Research Network
The Structural Scientific and Executive Members

Founder and President of USERN

Nima Rezaei

USERN Policy Making Council

Abass Alavi (Clinical Medicine)

Gevork Babamalek Gharehpetian (Engineering)

Raouf Baoutaba (Computer Science)

Hai Cheng (Geoscience)

Francesco Cucca (Molecular Biology and Genetics)

Farnoush Faridbod (Chemistry)

Saeid Ghavami (Biology and Biochemistry)

Angappa Gunasekaran (Social Sciences)

Seid Mehdi Jafari (Agricultural Science)

Markku Kulmala (Plant)

Morteza Mahmoudi (Material Science)

Amir Hossein Mahvi (Environment/Ecology)

Eric Maskin (Economics and Business)

Bahram Mobasher (Space Sciences)

Juan Jose Nieto (Mathematics)

Shekoufeh Nikfar (Pharmacology)

Matjaz Perc (Physics)

Lucina Qazi Uddin (Neuroscience and Behavior)

Nima Rezaei (Immunology)

Williblad Ruch (Psychiatry/Psychology)

Ewen Caeron David Todd (Microbiology)

USERN Advisory Board Nobel and Abel Laureates

Michael Atiyah [Abel Laureate 2004]

Paul Greengard (USA) [Nobel Laureate, Medicine, 2000]

John Bertrand Gurdon (UK) [Nobel Laureate, Medicine, 2012]

Jules Hoffmann (France) [Nobel Laureate, Medicine, 2011]

Robert Huber (Germany) [Nobel Laureate, Chemistry, 1988]

Martin Karplus (USA) [Nobel Laureate, Chemistry, 2013]

Roger David Kornberg (USA) [Nobel Laureate, Chemistry, 2006]

John Michael Kosterlitz (UK) [Nobel Laureate, Physics, 2016]

Yuan Tseh Lee (Taiwan) [Nobel Laureate, chemistry, 1986]

Anthony James Leggett (UK) [Nobel Laureate, Physics, 2003]

Jean-Marie Lehn (France)
[Nobel Laureate, Chemistry, 1987]

Eric Stark Maskin (USA) [Nobel Laureate, Economics & Business, 2007]

Erwin Neher (Germany) [Nobel Laureate, Medicine, 1991]

Louis Nirenberg (Canada) [Abel Laureate 2015]

Stanley Prusiner (USA) [Nobel Laureate, Medicine, 1997]

Peter John Ratcliffe (UK) [Nobel Laureate, Medicine, 2019]

Akira Suzuki (Japan) [Nobel Laureate, Chemistry, 2010]

Oliver Eaton Williamson (USA) [Nobel Laureate, Economics & Business, 2009]

Kurt Wuthrich (USA) [Nobel Laureate, Chemistry, 2002]

Top 1% Scientists

Marc D. Abrams (USA)
Antonio Abate (Gemany)
Saeid Abbasbandy (Iran)
Mohammad Abdollahi (Iran)
Ajith J. Abraham (USA)
Carlo Adamo (France)
Elias C. Aifantis (USA)
Ravi Agarwal (USA)
Carlo Adamo (France)
Elias C. Aifantis (USA)
Ravi Agarwal (USA)
Elias C. Aifantis (USA)
Ravi Agarwal (USA)
Ashok Agarwal (USA)
Jamshid Aghaei (Iran)
Asghar Aghamohammadi (Iran)

https://userncongress.tums.ac.ir

Philippe Aghion (UK)
Bashir Ahmad (Saudi Arabia)
Mohammadali Ahmadi (Iran)
Mohammad Taghi Ahmadian
(Iran)
Hamid Ahmadieh (Iran)
Mohammad R. Akbari
(Canada)
Abolfazl Akbarzadeh (Iran)
Shahin Akhondzadeh (Iran)
Abbas Alavi (USA)
Amir H.   Alavi (USA)
Imran Ali (India)
Siti Aisyah Alias (Malaysia)
Majid Amidpour (Iran)
Farrokh Aminifar (Iran)
Peter Lawætz Andersen
(Denmark)
Jambrak Anet Režek (Croatia)
Reza Ansari (Iran)
Armin Arbab-Zadeh (USA)
Alireza Ashrafi (Iran)
Pablo Artal (Spain)
Mohsen Asghari (Iran)
Gregory Mark Allen Ashton (Aus-
tralia)
Gordon Asmundson (Canada)
Anthony Atala (USA)
Fateme Atyabi (Iran)
Carlos Augusto Monteiro
(Brazil)
Leila Azadbakht (Iran)
Ali Azadeh (Iran)
Fereydoun Azizi (Iran)
Mohammad Mehdi Azizi
(Iran)
Najmedin Azizi (Iran)
Omar Azzaroni
(Argentina)
Hamid Badali (USA)
Alan Baddeley (UK)
Hasan Bagheri (Iran)
Moslem Bahadori (Iran)
Seema Bahinipati (India)
Mohsen Bahmani-Oskooe
(USA)
John Michael Bailey (USA)
Hamed Bakhshian (Iran)
Arnold Bakker
(The Netherlands)
Stephen John Ball (UK)
Mofid Gorji Bandpy (Iran)
Kaustav   Banerjee (USA)

Francisco Barba (Spain)
Peter J. Barnes (UK)
Andre Bationo (USA)
Micheal Baulac (France)
Mehrdad Behmanesh (Iran)
Federico Bella (Italy)
Jacob D. Biamonte (Russia)
Jafar Biazar (Iran)
Leonard Bickman (USA)
Colin B. Blakemore (Hong Kong)
Dumitru I. Bleanu (Turkey)
Winfried Blum (Austria)
Iván G. Bodis-Wollner (USA)
Saeed Bokaie (Iran)
Diana Boraschi (Italy)
Stephane Bordas
(Luxembourg)
Thomas Bosch (Germany)
Mohammad Hossein
Boskabady (Iran)
Raouf Boutaba (Canada)
Biykem Bozkurt (USA)
Omid Bozorg-Haddad (Iran)
Sergee Brand (Switzerland)
Bernhard Breit (Germany)
David I. Bernstein (USA)
Roderick J. Brodie
(New Zealand)
James B. Brugarolas (USA)
Richard A. Bryant (Australia)
Wojciech Marcin Budzianowski
(Poland)
Paulo Roberto Bueno (Brazil)
Harry Roger Buller
(The Netherlands)
Jerome R. Busemeyer (USA)
Rajkumar Buyya (Australia)
Wenju Cai (Australia)
Alberto   Cabada (Spain)
Carlos Camargo (USA)
Brian Cantor (UK)
Massimo Capaccioli (Italy)
Esra Capanoglu Guven(Turkey)
Emilio Carbone (Italy)
Jean-Laurent Casanova (USA)
Rudy J. Castellani (USA)
Valentina Cauda (Italy)
Jean-Marc Cavaillon (France)
Marcelo Moreira Cavalcanti (Brazil)
Artemi Cerda (Spain)
Pierre Chambon (France)
Ali Chamkha (USA)
Sunita S. Chandel (India)

Anjan Chatterjee (USA)
Chaoji Chen (USA)
Cha`o-Kuang Chen (Taiwan)
Chunying Chen (China)
Guanrong Chen (China)
Hsiao-Hwa Chen (Taiwan)
Jiesheng Chen (China)
Shen-Ming Chen (China)
Wei-Hsin Chen (Taiwan)
Yeguang Chen (China)
Hai Cheng (China)
Hui-Ming Cheng   (China)
Bruce D. David Cheson (USA)
Eric Chevet (France)
Kian Jon Ernest Chua
(Singapore)
James J. Collins (USA)
Elisabetta Comini (Italy)
Nelson Cowan (USA)
José Alexandre De Souza Crippa
(Brazil)
Francesco Cucca (Italy)
Kathleen E. Cullen (USA)
Jack Cuzick (UK)
Minoo Dabiri (Iran)
Liming Dai (USA)
Gary L. Darmstadt (USA)
Lourenco Beirão Da Veiga
(Italy)
Manlio De Domenico (Belgium)
Alfredo   De Massis (Italy)
Ahmadreza Dehpour (Iran)
Hong-Wen Deng (USA)
Liping Di (USA)
Charles A. Dinarello (USA)
Rasoul Dinarvand (Iran)
Feng Ding (USA)
Filip Dochy (Belgium)
Davood Domiri Ganji (Iran)
Tommaso Dorigo (Italy)
Philippe Dubois (Belgium)
Evan Eichler (USA)
Yahia Elhadi M. (Mexico)
Menachem Elimelech (USA)
Zahra Emam-Djomeh (Iran)
Shahriar Emami (Iran)
Mohammad Hossein Enayati (Iran)
Ali Asghar Ensafi (Iran)
Babak Eshrati (Iran)
Ahmad Esmailzadeh (Iran)
Alireza Esteghamati (Iran)
Gian Paolo Fadini (Italy)
Ali Fahim (Iran)

Farnoush Faridbod (Iran)
Omid Farokhzad (USA)
Farshad Farzadfar (Iran)
Seyed Mohammad Taghi Fatemi Ghomi (Iran)
Mohammadhossein Fathi (Iran)
Lisa Feldman Barrett (USA)
Dean Andrew Fennell (UK)
Sahena Ferdosh (Malaysia)
Seyed Mohammad Fereshtehnejad (Canada)
Habib Firouzabadi (Iran)
Markus Fischer (Switzerland)
Dale Andrew Fisher(Singapore)
David N. Fisman (Canada)
Alex Fornito (Australia)
Alireza Foroumadi (Iran)
Mahmoud Fotuhi (Iran)
Claudio Franceschi (Italy)
Rafael Franco (Spain)
Gert Fricker (Germany)
Adrian Furnham (UK)
Ciprian G. Gal (USA)
Charis M. Galanakis (Greece)
Juan Galvis (Colombia)
Amir Gandomi (Australia)
Mohammad Reza Ganjali (Iran)
Harish Garg (India)
Marco Gattorno (Italy)
William C. Gause (USA)
Mark C. Genovese (USA)
Raif S. Geha (USA)
Beatrice Gelder
(The Netherlands)
Erol Gelenbe (Poland)
Mehmorang Ghaedi (Iran)
Gevork Babamalek Gharehpetian (Iran)
Saeid Ghavami (Canada)
Christian Gilissen
(The Netherlands)
Nicolas Gisin (Switzerland)
Martin Giurfa (France)
Vivette Glover (UK)
Robert Glynne-Jones (UK)
Giulia Grancini (Italy)
David J. Greenblatt (USA)
James Griffin (USA)
Igor Grossmann (Canada)
Paulo Roberto Guimarães (Brazil)
Angappa Gunasekaran (USA)
Shaojun Guo (China)
Sudhir Gupta (India)

Manoj Gupta (Singapore)
Vinod Kumar Gupta (Saudi Arabia)
Abdolreza Hajipour (Iran)
Michael R. Hamblin (USA)
Mehrdad Hamidi (Iran)
Lennart Hammarström
(Sweden)
Eddie Harmon-Jones(Australia)
Carl L. Hart (USA)
Nikos Hatziargyriou (Greece)
Steven C. Hayes (USA)
Wallace Hayes (USA)
Ji-Huan He (China)
James J. Heckman (USA)
Agnar Helgason (Iceland)
Mohammad Hemmat Esfe (Iran)
Rene Hen (USA)
Majid Momahed Heravi (Iran)
J. Alfredo Martinez Hernandez
(Spain)
Robert G. Hill (UK)
Stefan G. Hofmann (USA)
Jeff M. Holly (UK)
Jonathan C. Howard (Portugal)
Xiaosong Hu (China)
Ivan Hung (Hong Kong)
David John Hunter (Australia)
Tan Irene (Philippines)
Elena P. Ivanova (Australia)
Rudolf Jaenisch (USA)
Seid Mehdi Jafari (Iran)
Peter Jenni (Switzerland)
Peixue Jiang (China)
Richard J. Johnson (USA)
Olof Johansson-Stenman (Sweden)
Fariborz Jolai (Iran)
Lucas Joppa (USA)
Emmanuelle Jouanguy
(France)
Ghasem Jouyban (Iran)
Junichi Kadokawa (Japan)
Hazem M. Kalaji (Poland)
Farin Kamangar (USA)
Erdal Karapinar (China)
Behrooz Karimi (Iran)
Hassan Karimi-Maleh (Iran)
Fatah Kashanchi (USA)
Koichi Kato (Japan)
Ajeet Kaushik (USA)
Ali Kaveh (Iran)
Salim Kazi (Malaysia)
Roya Kelishadi (Iran)

Alireza Khataee (Iran)
Ali Khademhosseini (USA)
Phan Quoc Khanh (Vietnam)
Nam)
Saadi Khochbin (France)
Mohammad Mehdi Khodaei (Iran)
Adem Kilicman (Malaysia)
Kwang S. Kim (South Korea)
Dongho Kim (South Korea)
Do Kyung Kim (South Korea)
Shinya Kimura (Japan)
Bernard Kippelen (USA)
Toomas Kivisild (UK)
Yuri Kivshar (Australia)
Joerg Kleeff (Germany)
Christoph Klein (Germany)
Robyn S. Klein (USA)
Daniel J. Klionsky (USA)
Takayoshi Kobayashi (Japan)
Kenneth S. Kosik (USA)
Michael R. Kosorok (USA)
Arie W. Kruglanski (USA)
Markku Kulmala (Finland)
Rakesh Kumar (Norway)
Shaji K. Kumar (USA)
Robert Kurzban (USA)
Theodore P. Labuza (USA)
Lucas Lacasa (UK)
Lain-Jong Lance Li (Saudi Arabia)
Greg Landsberg (USA)
Terence G. Langdon (USA)
Lawrence Alfred Lavery (USA)
Alexander Leemans (The Netherlands)
Lisa Ann Levin (USA)
Daniel Levy (USA)
Can Li (China)
He Li (China)
Chao-Jun Li (Canada)
Gholamhossein Liaghat (Iran)
Boqiang Lin (China)
ZongHong Lin (Taiwan)
Oliver B. Linton (UK)
Pierre Louis Lions (France)
Jyh-Ming Liou (Taiwan)
Jia-Ming Liu (China)
Jing Liu (China)
Meilin Liu (USA)
Na Liu (Germany)
Yansui Liu (China)
José López-Barneo (Spain)
Vittorio Loreto (Italy)
Kevin Lowe (Australia)

Andres Lozano (Canada)
Gaoqing Max Lu (UK)
Timothy W. Lyons (USA)
Jun Ma (China)
Colin MacLeod (Australia)
Morteza Mahmoudi (USA)
Reza Mahmudi (Iran)
Amir Hossein Mahvi (Iran)
Reza Majdzadeh (Iran)
Partha Pratim Majumder (India)
Harry L. Malech (USA)
Ali Maleki (Iran)
Reza Malekzadeh (Iran)
Khosrow Maleknejad (Iran)
Shadpour Mallakpour (Iran)
Laszlo Marodi (Hungary)
Massimiliano Mazzone (Italy)
Robert William McCarley (USA)
Roger S. McIntyre (Canada)
Michael Meaney (Canada)
Roxana   Mehran (USA)
Laurent M.J. Meijer (France)
Marjan Mernik (Slovenia)
Geltrude Mingrone (UK)
Seyed Hamed Mirhosseini (Malaysia)
Bahram Mobasher (USA)
Moein Moghimi (UK)
Maedeh Mohammadi (Iran)
Toraj Mohammadi (Iran)
Mojtaba Mohammadi Najafabadi (Iran)
Behnam Mohammadi-Ivatloo (Iran)
Dinesh Mohan (India)
Gian Carlo Montanari (USA)
Ali Montazeri (Iran)
Ali Akbar Moosavi-Movahedi (Iran)
Gisèle Mophou (France)
Maziar Moradi-Lakeh (Iran)
Hamid Moradkhani (USA)
Eugenia Morselli (Chile)
Amir M. Mortazavian (Iran)
Steffen Mortiz (Germany)
Ali Mostafaeipour (Iran)
Xavier Moya (UK)
Thomas Muller (Germany)
Michael D. Mumford (USA)
Paul S. Myles (Australia)
Gholamhassan Najafi (Iran)
Abbas Najafizade (Iran)
Yusuke Nakamura (USA)

Balakrishnan Narayanaswamy (India)
Gus Nathan (Australia)
Mohammad Kahja Nazeeruddin (Korea)
Davood Nematollahi (Iran)
Hossein Nezamabadi-Pour (Iran)
Henry T. Nguyen (USA)
Guangjun Nie (China)
Feiping Nie (China)
Juan J. Nieto (Spain)
Shekoufeh Nikfar (Iran)
Khodabakhsh Niknam (Iran)
Peter J. Nilssen (South Africa)
Luca Nizzetto (Czech Republic)
Kotohiro Nomura (Japan)
Parviz Norouzi (Iran)
Luigi D. Notarangelo (USA)
David John Nutt (UK)
Hans D. Ochs (USA)
Sergei D. Odintsov (Spain)
Artem R. Oganov (Russia)
Shuji Ogino (USA)
Takeo Oku (Japan)
Bolajoko Olubukunola Olusanya (Nigeria)
Jordan Scott Orange (USA)
Seyed Nasser Ostad (Iran)
Saeid Paktinat Mehdiabadi (Iran)
Ioannis Pallikaris (Greece)
Søren Riis Paludan (Denmark)
Gen-Xing Pan (China)
Klaus Pantel (Germany)
Wolfgang Parak (Germany)
Octavio Paredes-Lopez (Mexico)
Crystal L. Park (USA)
Lucilla Parnetti (Italy)
Mohsen Parsa Moghadam (Iran)
Alvaro Pascual-Leone (USA)
Sandip Patel (UK)
Ruby Pawankar (Japan)
John Pawelek (USA)
Lian Mao Peng (China)
Matjaz Perc (Slovenia)
Stephen P. Pereira (UK)
George Perry (USA)
Godefridus J. Peters (Poland)
Sarah Hurst Petrosko (Japan)
Stefano Pluchino (UK)
Alessandro Poggi (Italy)
Alessio Pomponio (Iran)

Claudio E. Ponticelli (Italy)
Mohammad Reza Pourjafar (Iran)
Domenico Pratico (USA)
Jennifer Puck (USA)
Anne Puel (France)
Matin Qaim (Germany)
Vicentiu Radulescu (Romania)
Babak Rahbaran (Austria)
Kazem Rahimi (UK)
Masoud Rahimi (Iran)
Roja Rahimi (Iran)
Vafa Rahimi-Movaghar (USA)
Ashrafur Rahman (Australia)
Nikolaus Rajewsky (Germany)
Mohamed Fawzy Ramadan Hassanien (Saudi Arabia)
Seeram Ramakrishna (India)
Mohammad Ramezani (Iran)
Idupulapati M. Rao (Colombia)
Lingamallu Jaganmohan Rao (India)
Jahanbakhsh Raoof (Iran)
Esmat Rashedi (Iran)
Farhad Ravandi (USA)
Seyed Mohammadali Razavi (Iran)
Seyed Hadi Razavi (Iran)
Keramatollah Rezaei (Iran)
Nima Rezaei (Iran)
Siavash   Riahi (Iran)
Giancarlo C. Righini (Italy)
Ya'acov A. Ritov (USA)
Tadeusz Robak (Poland)
Simon Robson (USA)
Valery Romanovski (Slovenia)
Ute Römling (Sweden)
James Todd Rosenbaum (USA)
Laszlo Rosivall (Hungary)
Ali Rostami (Iran)
Wolff-Michael Roth (Canada)
Carlo Rovelli (France)
Willibald Ruch (Switzerland)
Guy Rutten (The Netherlands)
André Russowsky Brunoni (Brazil)
Janusz K. Rybakowski (Poland)
Ali Akbar Saboury (Iran)
Juan Carlos Saéz (Chile)
Rajesh Sagar (India)
Amirhossein Sahebkar (Iran)
Mohammad Ali Sahraian (Iran)
Upendra Man Sainju (USA)
Masoud Salavati-Niasari (Iran)
Peyman Salehi (Iran)
Per Morten Sandset (Norway)

Lucio Sarno (UK)
Daniel Sauter (Germany)
Saeid Saryazdi (Iran)
Lianne Schamaal (Australia)
Philip Scheltens (The Netherlands)
Lon S. Schneider (USA)
Reinnold E. Schmidt (Germany)
Michael Schreiber (Germany)
Aletta E. Schutte (Australia)
Neil J. Scolding (UK)
Andrea Scozzafava (Italy)
Constantine Sedikides (UK)
Athena Sefat (USA)
Nicolas Segata (Italy)
Joao Seixas (Portugal)
Frank Sellke (USA)
Juan Benigo Seoane-Sepulveda (Spain)
Sadaf Ghajarieh Sepanlou (Iran)
Igor B. Sevostianov (USA)
 John Francis Seymour (Australia)
Reza Shadmehr (USA)
Abbas Shafiee (Iran)
Mohammad Ali Shahbazi (Finland)
Shahram Shahbazpanahi (Canada)
Saeed Shahrokhian (Iran)
Ling Shao (UAE)
Mohsen Sheikholeslami (Iran)
Shengli Victor Sheng (USA)
Hao Shen (China)
Shouri Sheng (China)
Steven C. Sherwood (Australia)
Ramin Shiekhattar (USA)
Mariano Sigman (USA)
Abdolreza Simchi (Iran)
Daniel Simson (Poland)
Vijay Pal Singh (USA)
Ian Sloan (Australia)
Sidney Smith (Australia)
Dalbir Singh Sogi (India)
Abraham Sonenshein (USA)
Armin Sorooshian (USA)
Benjamin Sovacool (Denmark)
Francesco Stellacci (Switzerland)
E. Richard Stiehm (USA)
Emmanuel Stratakis (Greece)
Hendrik Streeck (Germany)
Kathleen Sullivan (USA)
Xiaoming Sun (USA)
Meisam Tabatabaei (Malaysia)
Nicholas J. Talley (Australia)

Ben Zhong Tang (Hong Kong)
Chen Tang (Australia)
Michael Tanzer (Canada)
Xiaoming Tao (Hong Kong)
Reza Tavakkoli-Moghaddam (Iran)
Mohammad Saleh Tavazoei (Iran)
Sabu Thomas (India)
Visith Thongboonkerd (Thailand)
Andre David Tinoco (Switzerland)
Umberto Tirelli (Italy)
Maria Titirici (Germany)
Masakazu Toi (Japan)
Seyed Ali Torabi   (Iran)
Alireza Torabi (Iran)
Pedro Torres (Spain)
Mark S. Tremblay (Canada)
Jan Treur (The Netherlands)
Donald   G. Truhler (USA)
Theodoros A. Tsiftsis (China)
Sergio Tufik (Brazil)
Kjell O. Tullus (UK)
Jaakko Tuomilehto (Finland)
Lucina Qazi Uddin (USA)
Hiroki R. Ueda (Japan)
Rudolf Valenta (Austria)
Jeroen C.J.Mvan van der Bergh (The Netherlands)
Paul A.M. van Lange (The Netherlands)
Zhale Varshowsaz (Iran)
Hassan Vatandoost (Iran)
Nicola Veronese (Italy)
Eric Vivier (France)
C Van Der Vleuten (The Netherlands)
Ladislav Volicer (USA)
Matthias Georg Von Herrath (USA)
 Paul T.Von Hippel (USA)
Aldert Vrij (UK)
Jiu-Yao Wang (Taiwan)
Zhong Lin Wang (USA)
Zhi Jian Wang (Scotland)
Klaus Warnatz (Germany)
Connie M. Weaver (USA)
Elisabete Weiderpass (Sweden)
Ralf Weiskirchen (Germany)
Scott Weiss (USA)
John J. Wiens (USA)
Eske Willerslev (Denmark)
Stephen E. Williams (Australia)

Christopher Wlezien (USA)
Kin-Lu Wong (Taiwan)
Nathan D. Wong (USA)
Dongrui Wu (China)
William K. Wu (Hong Kong)
Mahmoud Yaghoubi (Iran)
Masayoshi Yamaguchi (USA)
Muhhwa Yang (Taiwan)
Otto Orlean Yang (USA)
Peidong Yang (USA)
Guihua Yu (USA)
Jiaguo Yu (China)
Salim Yusuf (Canada)
Jeffrey M. Zacks (USA)
Hassan Ali Zamani (Iran)
Mostafa Zandieh (Iran)
Hamid Reza Zare (Iran)
Mohammad Reza Zarrindast (Iran)
Witold A. Zaton´ski (Poland)
Jianhua Zhang (China)
Chaohui Zhang (China)
Xudong Zhao (China)

Support and Resource Development

Milad Akbarzadehmoallemkolaei
Saboura Ashkevarian
Negar Azami
Mahsa Keshavarz-Fathi
Sajad Kolahchi
Zahra Kolahchi
Mona Mirbeyk
Kawthar Mohamed
Sara Momtazmanesh
Negar Moradian
Zahra Rahimi Pirkoohi
Noosha Samieefar
Mojdeh Sarzaeim
Simin Seyedpour
Niloufar Yazdanpanah
Heliya Ziaei

USERN Junior Ambassadors

Musa Joya (Afghanistan)
Amine Harbi (Algeria)
Luis Boccalatte (Argentina)
Sevan Iritsyan (Armenia)
Araks Ulikhanyan (Armenia)
Fareeda Hashem (Bahrain)

Md Shahidul Islam (Bangladesh)
Otavio Cabral-Marques (Brazil)
Mariya Ivanovska (Bulgaria)
Essouma Mickael (Cameroon)
Niyoosha Yoosefi (Canada)

Chunfeng Xiao (China)
Amanuel Godana Arero (Ethiopia)
Aram Pascal Abu Hejleh (Germany)
Aliyu Jibril Tijani (Ghana)
Orsolya Cseprekal (Hungary)
Mujtaba Shaw (India)
Laila Rahmah (Indonesia)
SILA KAYA (Ireland)
Giulia Grancini (Italy)
Shadrack Oriama   (Kenya)
Lindelwa Mmema (Kingdom of Eswatini)
Ayesha Mushtaq   (Kyrgyzstan)
Sara Makke (Lebanon)
Dalia Sabaliauskiene (Lithuania)
Irene Ling (Malaysia)
Sarah Cuschieri (Malta)
D Bhattarai (Nepal)
Abarikwu (Nigeria)
Amjad Khan (Pakistan)
Maggi Cavalcanti   (Perú)
Leander Marquez (Philippines)
Piotr Rzymski (Poland)
Tiago Ribeiro (Portugal)
Maria-Bianca Gegea (Romania)
Zalina Kudzoeva (Russia)
Faten Attig Bahar (Tunisia)
Halil Ibrahim Ucar (Turkey)
Esra Hazar (Turkey)
Kseniia Minakova (Ukraine)
Eduardo Rodríguez-Romá (Venezuela)
Rangarirai Makuku (Zimbabwe)

USERN Interest Groups

Animal Models Integrated Network (AMIN)
Applications of Cochrane Evidence in Everyday's Life Group (ACEELG)
Association of Nuclear Medicine and Molecular Imaging (ANMMI)
Association of Science and Art (ASA)
Biology & Biochemistry Interest Group (BBIG)
BioMedical Visualization Association (BMVA)
Brain Cancer Research Core (BCRC)
Breast Cancer Association (BrCA)
Cancer Biology Signaling Pathway Interest Group (CBSPIG)
Cancer Immunology Project (CIP)
Clinical Psychology and Psychotherapy Studies (CPPS)
Clinical Reasoning Association (CRA)
Committee of Climate Change and Health (CCCH)
Complementary and Integrative Medicine Interest Group (CIMIG)
Computational Biology and Chemistry Group (CBCG)
Dietitians and Nutrition Experts Team (DiNET)
Digital Health Network (DHN)
Early Childhood Education, Development, and Intervention research group (ECEDI)
Epilepsy, Sleep Disorders, and Brain Electrophysiology Research Network (ESDBERN)
Food Science and Nutrition Group (FSANG)
Fuzzy Logic Lab Interest Group (FLLIG)
Gastrointestinal Pharmacology Interest Group (GPIG)
G-Quadruplexes as INnovative ThERApeutiC Targets (G4_INTER-ACT)
Health and Art (HEART)
History of Medicine Network (HiMedNet)
Immunogenetics Research Network (IgReN)
Immunology Board for Transplantation and Cell-based Therapeutics (Immuno_TACT)
ImmunologyToday, Immunology (ImmunologyToday)
Innovation and Creativity Research Association for Transforming Education (I_CREATE)
Integrated Science Association (ISA)
Integration of Renewable Energy Resources in Smart Grid (IRERSG)
Intelligent Big Data Analysis in Medicine (IBDAM)
Interest Group of CoronaVirus 2019 (IGCV_19)
International Hematology/Oncology of Pediatrics Experts (IHOPE)
International Network for Photo Medicine and Photo Dynamic Therapy (INPMPDT)
International Network of Stem Cell (INSC)
Iranian Association of Magnetic Resonance in Medicine (IAMRM)
Medical Education Development Network (MED_NET)
Medical Genetics Network (Me-GeNe)
Medical Humanities Association (MHA)
MetaCognition Interest Group (MCIG)
Microbial Toxin's Physiology Group (MTPG)
Microbiome and Microbial Ecology Interest Group (MMEIG)
Molecular Immunology Interest Group (MIIG)
Molecular Medicine Interest Group (MMIG)
Nano-encapsulation in the Food, Nutraceutical, and Pharmaceutical Industries Group (NFNPIG)
Nanomedicine Research Association (NRA)
Network of Dermatology Research (NDR)
Network of Empirical, Gustatory and Olfactory Aesthetics (NEGOA)
Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA)
Network of Interdisciplinarity in Neonates and Infants (NINI)
NeuroImaging Network (NIN)
Neuroscience Research Group (NRG)
Non-Ionizing Radiation Group (NIRG)
Nutritional Health Team (NHT)
Pharmaceutical Association for

Research and Manufacturing (PhARMa)

PhytoPharmacology Interest Group (PPIG)

Primary Immunodeficiency Diseases Network (PIDNet)

Primordial Prevention of Non Communicable Disease Group (PPNCDG)

Rayazi Bioinformatics Research Group (RBRG)

Regenerative Medicine Group (REMED)

Scientific Union of Community Health (SUCH)

Smart Asset Condition Evaluation (SACE)

Space Biology and Astrobiology Research Team (SBART)

Systematic Review and Meta-analysis Expert Group (SRMEG)

Systems Artificial Intelligence Network (SAIN)

Tissue Engineering Hub (TEHUB)

Tissues and Biomaterial Research Group (TBRG)

Two Dimensional Materials for Electronics and Optoectronics, Nanoscience and Nanotechnology (TDMfEO_NSNT)

Universal Council of Epidemiology (UCE)

Universal Council of Ophthalmology (UCO)

Universal Council of Radiation Therapy (UCRT)

Universal Network of Interdisciplinary Research in Oral and Maxillofacial Surgery (UNIROMS)

Urology Research Taskforce (URT)

Urticaria Community of Interest and Action (URTICA)

USERN Anthem Vocals

Shayan Shekarabi
Ghazal Mahdavi
Helia Mojtabavi
Melina Sharbati
Ali Sani
Pejman Mansouri
Saina Ahmadi Moghaddam
Arash Barzkar
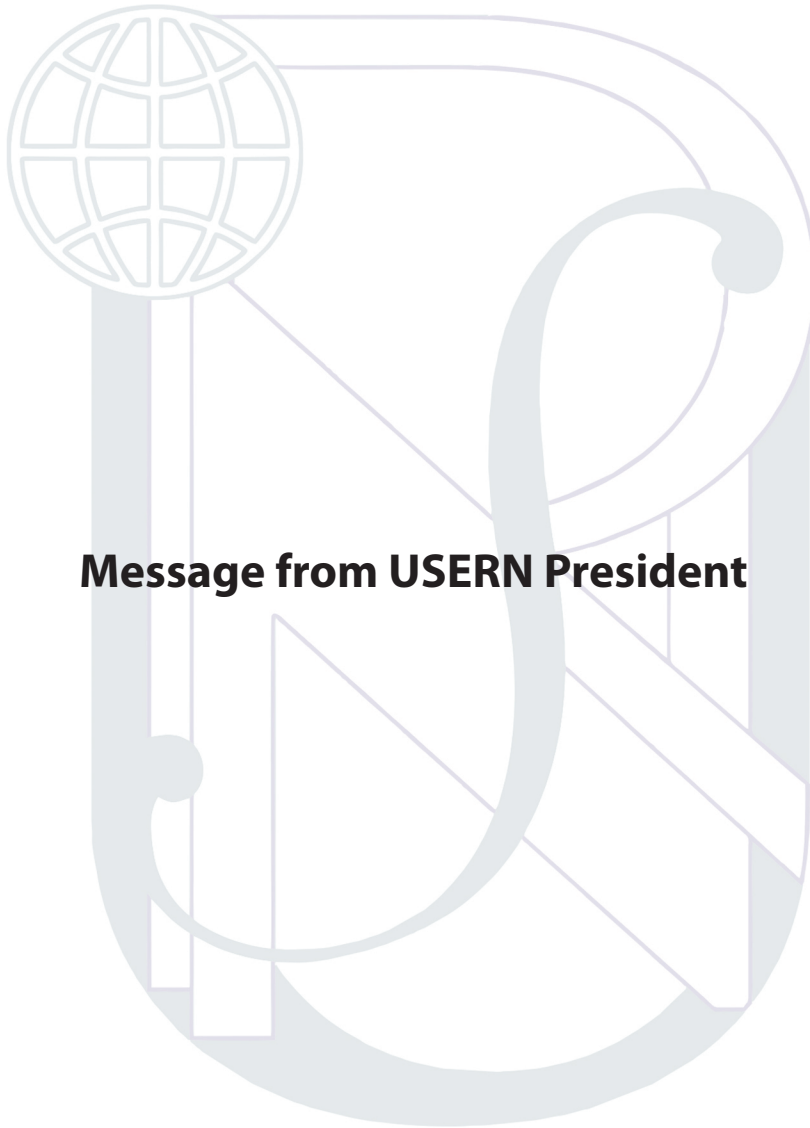Zahra Rahimi Pirkoohi
Ariana Rezaei
Arnika Rezaei

USERN™

[Universal Scientific
Education &
Research Network]

[usern.org]

The 6th International USERN Congress and Prize Awarding Festival

Message from USERN President

Nima Rezaei

Founding President of USERN
Professor of Clinical Immunology, Tehran
University of Medical Sciences, Tehran, Iran

During all these years, starting as a junior medical student and researcher, and then as a faculty member, I often wondered, what makes a perfect researcher, a perfect teacher, a mentor, or a leader? Realizing that none of these would make me a perfect human, was one of the most important discoveries of my life.

As one dives deep into his own scientific field, interacting with his colleagues, and joining educational and research groups, we realize how high we've built the walls around ourselves, and those who share the same interests as us. We learn not to resist invaders into our territories and to think and behave as affiliates of a certain virtue.

Art, Medicine, Plants, Mathematics, and Astronomy, are all parts of the heritage of ancient, true pioneers of knowledge. The enormity of this prodigious legacy can only reach its true potential when these segments, reunite as a whole and into knowledge without borders. It is undeniable that science today, is unintentionally mistaken for a line to draw boundaries with, a weapon to display power, or a rule to rank orders. We believe that the golden key to this reconciliation, is by the hands of the scientist themselves, by the hands of artists, mathematicians, and by the hands of anyone who has an ability to share what they know, for the greater good. USERN has been established with the main purpose of peaceful and humanitarian promotion of education and research, universally. It comprises of top 1% scientists in all scientific fields as the advisory board members who would manage and supervise the educational and research programs in their field of specialty. There are more than 600 top 1% scientists, including 19 Nobel/Abel Laureates, among the advisory board members of USERN. The theme of the Congress this year is "The Elephant in the Dark Room", adapted from the concept of Rumi's poem, emphasizing the important role of interdisciplinary studies to discover the unkowns in science. Therefore, different aspects of science is covered in the scientific program, which would be presented by top scientists worldwide. In the meantime, the gathering of senior and junior scientists in the context of USERN Congress would be a forward step in eliminating the age and level borders of science. Not only the senior scientists, but also junior students/scientists would get the chance to present their experiences in science within USERN Congress in the context of "Junior Talks/Posters". The concept of USERN has been supported by a hundred scientific centers and universities.

Importantly and beyond the noble goal of USERN Congress in scientific promotions, USERN Prize has been also established in order to identify the most talented qualified junior scientists in all areas of science, who have devoted their times to science promotion and performed outstanding scientific projects so far! The bests of bests in each field will be awarded each year to be distinguished to the scientific world and to be acknowledged for their humanitarian efforts. The USERN Prize Awarding Festival will be held annually on November 10th, the Global Day of Science for Peace and Development.

It should be mentioned that as of the global impact of COVID-19 pandemic, our top priority will always be the health and safety of all the delegates. It is from the bottom of our hearts that we wish you safety, health, and peace of mind during these uncertain times.

Now, here as we are standing on the verge of the sixth official international event of this network, the USERN Congress and Prize Awarding Festival 2021, let us express our gratitude to your presence, and together witness the propagation of Science without Borders.

Nima Rezaei, MD, PhD
Founding President of USERN
USERN Congress Chair and Secretary-General of the USERN Prize 2021
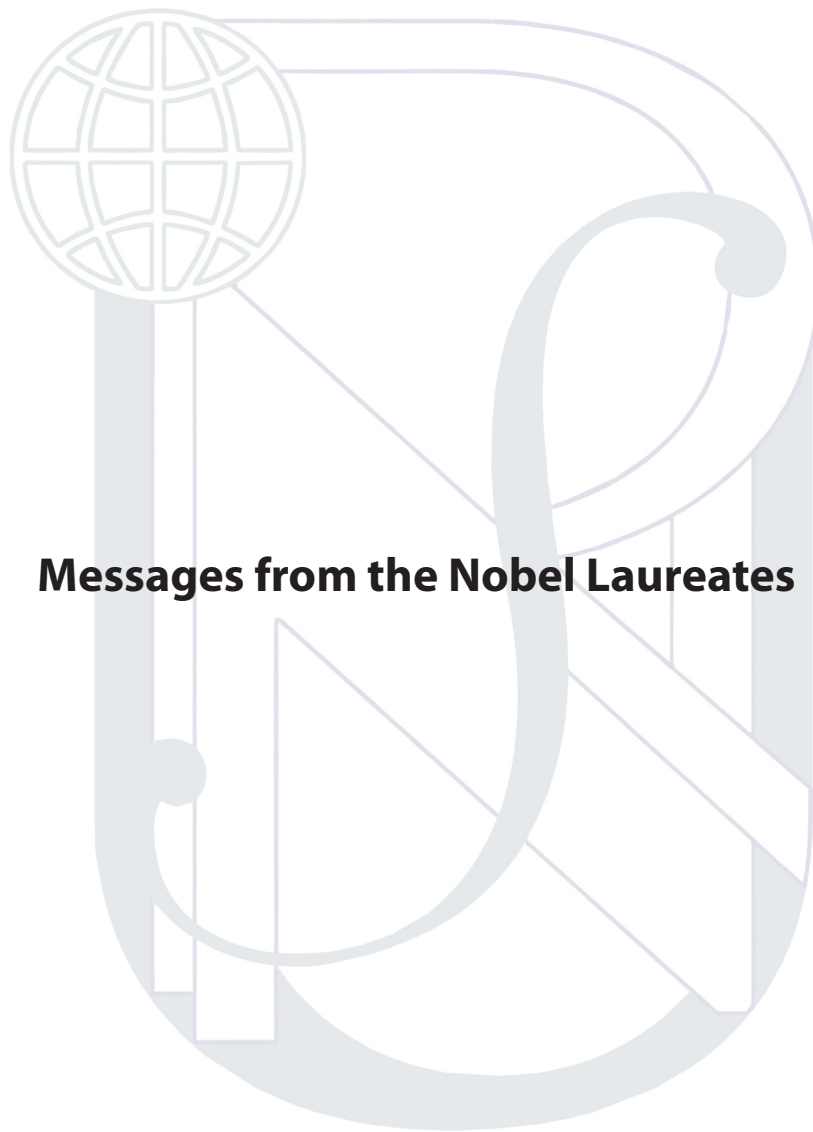
Messages from the Nobel Laureates

"Let me congratulate you on your civilized and far-sighted initiative; USERN. I shall be with you in spirit"

John Charles Polanyi	1986 Nobel Prize in Chemis-

for his research in chemical kinetics

"I am taking the opportunity to wish you fruitful results and much success for this international Scientific Event, and an excellent USERN Festival Wishing you much success for the USERN Congress and the Prize Festival."

Theodor Hänsch	2005 Nobel Prize in Physics

for contributions to the development of laser-based precision spectroscopy

"Wish you the best of luck with your symposium"

Roger Y. Tsien	2008 Nobel Prize in chemistry

for the discovery and development of the green fluorescent protein, GFP

"I whole-heatedly endorse the goals of the meeting you described"

Hugh David Politzer	2004 Nobel Prize in Physics

for discovery of asymptotic freedom in quantum chromodynamics

"The subject of your meeting "sciences without borders" is exactly the topic I mentioned in my dinner speech when I received the Nobel Prize 30 years ago"

Klaus von Klitzing	1985 Nobel Prize in Physics

for discovery of the integer quantum Hall Effect

"I wish you a productive and enjoyable meeting"

Mario Ramberg Capecchi   **2007 Nobel Prize in Physiology or Medicine**

for his research in chemical kinetics
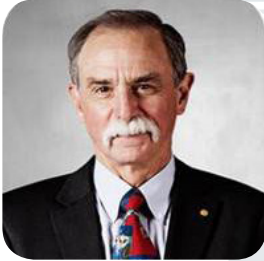
"I would very much enjoy this meeting, in particular meeting with the young scientists . I send my best wishes for a successful meeting"

David J. Wineland   **2012 Nobel Prize in Physics**

for ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems

"USERN is a very worthwhile initiative. I recognize that such a meeting is indeed a very significant contribution to scientific exchange and communication"

Jean-Marie Lehn   **1987 Nobel Prize in Chemis-**

for synthesis of cryptands

"I accept to be a member of the advisory board, but cannot join the USERN congress this year, but I might be able to join your future meetings."

Sir Peter Ratcliffe   **2019 Nobel Prize in Physiology or Medicine**

for their discoveries of how cells sense and adapt to oxygen availability

"Best wishes for the congress."

Albert Fert   **2007 Nobel Prize in Physics**

for the discovery of Giant Magnetoresistance

24

"Thank you for the kind invitation to participate in the USERN congress. Of course I have long loved travelling and interacting with young scientists and students! You are offering both. I wish you a wonderful and inspiring USERN experience this year, especially for the young researchers who will participate."

John Hall	2005 Nobel Prize in Physics

for contributions to the development of laser-based precision spectroscopy

"I wish you much success with this event."

Angus Deaton	2015 Nobel Prize in Economic Sciences

for his analysis of consumption, poverty, and welfare

"Wishing you all the best for a great Festival."

Brian Schmidt	2011 Nobel Prize in Physics

for his discovery of dark energy

"Best wishes and hope your meeting goes well."

Peter Higgs	2013 Nobel Prize in Physics

for the theory of how particles acquire mass

"I wish you a successful gathering."

Dan Shechtman	2011 Nobel Prize in Chemistry

for the discovery of quasicrystals

25

"All the best for your festival."

Stefan W. Hell   **2014 Nobel Prize in Chemistry**

for the development of super-resolved fluorescence microscopy

"Let me congratulate you on your civilized and far-sighted initiative; USERN.I shall be with you in spirit"

Takaaki Kajita   **2015 Nobel Prize in Physics**

for the discovery of neutrino oscillations, which shows that neutrinos have mass

"wish you the best success with the event."

Edmund S. Phelps   **2006 Nobel Prize in Economic Sciences**

for his analysis of intertemporal tradeoffs in macroeconomic policy

"Congratulations on your progress in USERN. I have looked at the program that you have organized for the USERN Congress. It is outstanding and should be a great inspiration for young scientists."

Martin Akarplus   **2013 Nobel Prize in Chemistry**

for the development of multiscale models for complex chemical systems

"I am happy to be a member of the honorary advisory board of USERN and would be delighted to work closely with you."

Stanley B. Prusiner   **1997 Nobel Prize in Physiology or Medicine**

for his discovery of Prions - a new biological principle of infection

"I wish you all the very best with your exciting festival."

Bruce Beutler	2011 Nobel Prize in Physiology or Medicine

For the discoveries concerning the activation of innate immunity

"I wish you good luck with the preparations for this congress."

Ben Feringa	2016 Nobel Prize in Chemistry

for the design and synthesis of molecular machines
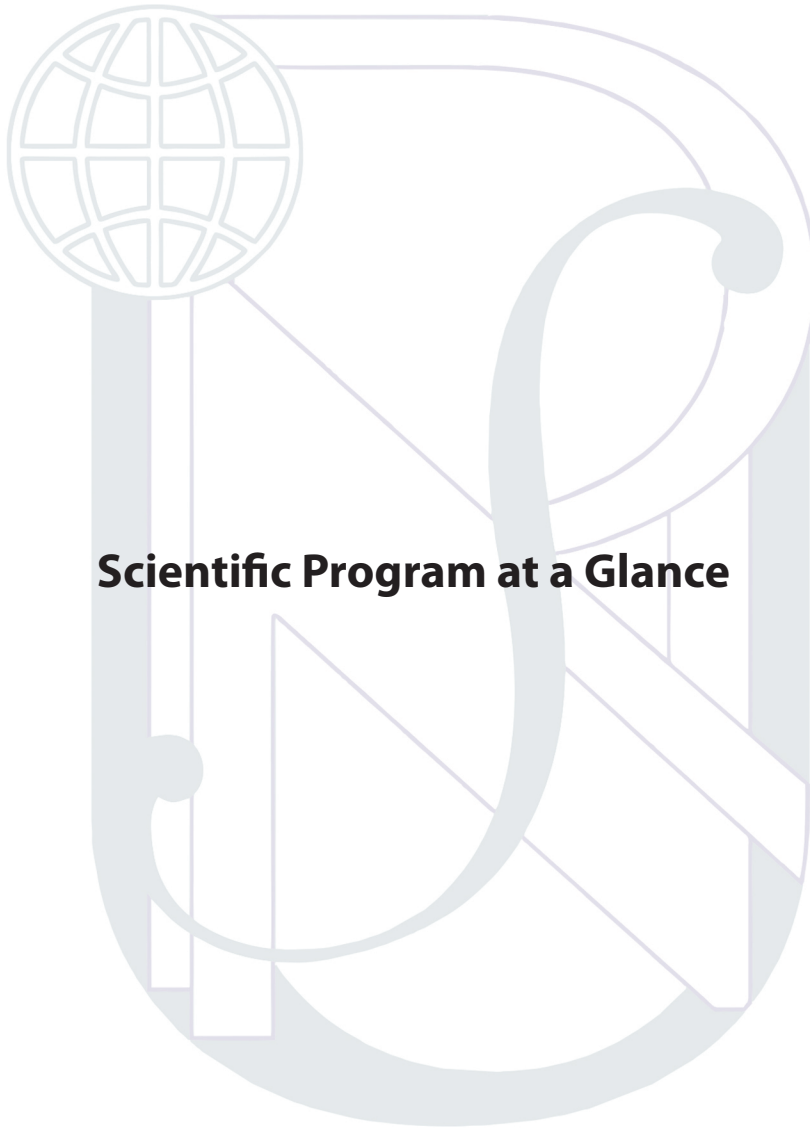
Scientific Program at a Glance

Day 1: November 6, 2021 Tehran, Iran

Opening Session, 05:30 - 07:15 GMT (09:00 - 10:45 Iran Time)

USERN 2021: The Concept of Elephant in the Dark
Prof. Nima Rezaei, Iran

Message from Vice Chancellor of Tehran University of Medical Sciences
Dr. Mohammad Hossein Ayati, Tehran

Converging in Medical Sciences for a Better Performance
Prof. Moslem Bahadori, Iran

Blended Learning: The Missing Piece of the Education Puzzle
Prof. Farshad Allameh, Iran

Critical Appraisal, a Scientific Tool to Touch it in the Dark
Prof. Mohammad Hossein Nekoofar, Iran

Deep Time: Past History and Future story of the Universe, the Earth and Life
Prof. Bahram Mobasher, USA

GMT	Iran Time	Subject
07:45 – 09:30	11:15 – 13:00	Miniature Talk Presentations
09:30 – 10:00	13:00 – 13:30	Nobel Laureate Talk: Step Towards Life: Chemistry *Prof. Jean-Marie Lehn, Nobel Prize Laureate in Chemistry (1987)*
10:30 – 12:30	14:00 – 16:00	Gathering Session With mTalk Winners
13:00 – 17:00	16:30 – 20:30	Webinar Panel: Formal Sciences: Human vs. Artificial Intelligence
17:30 – 19:30	21:00 – 23:00	USERN Workshop: Scientific Publication and Scientific Progress *George Perry, USA*

Day 2: November 7, 2021 Tehran, Iran

GMT	Iran Time	Subject
05:30 – 07:15	09:00 – 10:45	Junior Talk Session (Part I)
07:45 – 09:30	11:15 – 13:00	Junior Talk Session (Part II)
10:30 – 12:30	14:00 – 16:00	Meet The Expert: *Prof. Nima Rezaei, Iran*
13:00 – 17:00	16:30 – 20:30	Webinar Panel: Physical and Chemical Sciences
17:30 – 19:30	21:00 – 23:00	USERN Workshop: Health Pseudoscience and Multidisciplinary Studies *Kiarash Aramesh, USA* *Farin Kamangar, USA* *Cornelius Ewuoso, South Africa* *Ivani Nadir Carlotto, USA* *Dina Siniora, USA*

Day 3: November 8, 2021 Tehran, Iran

GMT	Iran Time	Subject
05:30 – 07:15	09:00 – 10:45	U-Debate Session
07:15 – 07:45	10:45 - 11:15	Coffee Break
07:45 – 08:15	11:15 – 11:45	Inspirational Lecture (Persian): Home may be perilous and destination out of reach But there are no paths without an end, do not grieve *Prof. Bahram Mobasher*
08:15 – 09:30	11:45 – 13:00	The Announcement of U-debate, mTalk and Junior Talks Winners
10:30 - 12:30	14:00 - 16:00	USERN Meet The Experts: *Prof. Bahram Mobasher, USA*
13:00 – 17:00	16:30 – 20:30	Webinar Panel: Biological Sciences: Behind the Scenes
17:30 – 19:30	21:00 – 23:00	USERN Workshop: Introduction To Microbiome Analysis *Shirin Moossavi, Canada*

Day 4: November 9, 2021 Tehran, Iran

GMT	Iran Time	Subject
05:30 – 07:15	09:00 – 10:45	Virtual Poster Presentation (Part I)
07:45 – 09:30	11:15 – 13:00	Virtual Poster Presentation (Part II)
10:30 – 12:30	14:00 – 16:00	USERN Workshop: How to write a Motivation Letter *Amirhossein Takian, Iran*
13:00 – 17:00	16:30 – 20:30	Webinar Panel: Environmental Sciences: Save the Nature
17:30 – 19:30	21:00 – 23:00	USERN Meet The Expert: *Prof. Hans Ochs, USA*

Day 5: November 10, 2021 Istanbul, Turkey

GMT	Turkey Time	Subject
06:00 – 07:30	09:00 – 10:30	Opening Ceremony of IBB And Keynote Lectures
08:00 – 09:30	11:00 – 12:30	6th USERN Prize Awarding Festival
10:30 – 11:30	13:30 – 14:30	Symposium: Perspectives from IEI Patients and The patient organizations and 7th IFPPP prize session
11:30 - 11:55	14:30 - 14:55	Conference
12:00 – 16:00	15:00 – 19:00	USERN/IBB virtual Program and The NIAID-MENAT Immunodeficiency Symposium
GMT	Iran Time	Subject
10:30 – 12:30	14:00 – 16:00	USERN Workshop: System Biology *Farshid Noorbakhsh, Iran*
13:00 – 17:00	16:30 – 20:30	Virtual Lectures: Medical Sciences: Health and Prevention
17:30 – 19:30	21:00 – 23:00	USERN Meet the Expert *Prof. Armin Arbab-Zadeh, USA*

Day 6: November 11, 2021 Istanbul, Turkey

GMT	Turkey Time	Subject
06:00 – 07:30	09:00 – 10:30	IBB Keynote Lecture: Challenges on Immunodeficiencies
08:00 – 09:30	11:00 – 12:30	USERN-IBB Junior Talk (Part I)
10:30 – 12:00	13:30 – 15:00	USERN-IBB Junior Talk (Part II)
14:10 – 15:30	17:10 – 18:30	Virtual Plenary Session (IEIs throughout the lifetime)

GMT	Iran Time	Subject
07:30 – 09:30	11:00 – 13:00	USERN Workshop: Statistics For Dummies *Serge Brand, Switzerland*
10:30 – 12:30	14:00 – 16:00	USERN Workshop: Artificial Intelligence challenges in science and society *Tommaso Dorigo, Italy* *Mauro Da Lio, Italy* *Pietro Vischia, Belgium* *Christoph Weniger, The Netherlands*
13:00 – 17:00	16:30 – 20:30	Virtual Lectures: Psychoneuroimmunological Sciences

Day 7: November 12, 2021 Istanbul, Turkey

GMT	Turkey Time	Subject
06:00 – 07:30	09:00 – 10:30	IBB Keynote Lecture: Clinical Immunology
08:00 – 09:30	11:00 – 12:30	Opening Session of HiMed 2021
10:30 – 12:00	13:30 – 15:00	Closing Ceremony, Junior Scientist Presentations Followed By an IBB/HiMed Prize

GMT	Iran Time	Subject
10:30 – 12:30	14:00 – 16:00	USERN Workshop: Analysing Diffusion MRI Data To Investigate Brain Fiber Pathways *Alexander Leemans, The Netherlands*
13:00 – 17:00	16:30 – 20:30	Virtual Lectures: Social Sciences: Ethics and Moral
17:30 – 19:30	21:00 – 23:00	USERN Meet The Expert: Prof. Abass Alavi, USA

Day 8: November 13, 2021 Tehran, Iran

GMT	Iran Time	Subject
10:30 – 12:30	14:00 - 16:00	USERN Workshop: Introduction to Spatial Transcriptomics *Arutha Kulasinghe , Australia* *Habib Sadeghirad, Australia* *Marshall Feterl, Australia* *Farhana Amy Sarker, Australia*
13:00 – 17:00	16:30 - 20:30	Virtual Lectures: Integrated Sciences: Education and Research
17:30 – 19:30	21:00 - 23:00	USERN Meet The Expert: Prof. Alireza Shamshirsaz, USA
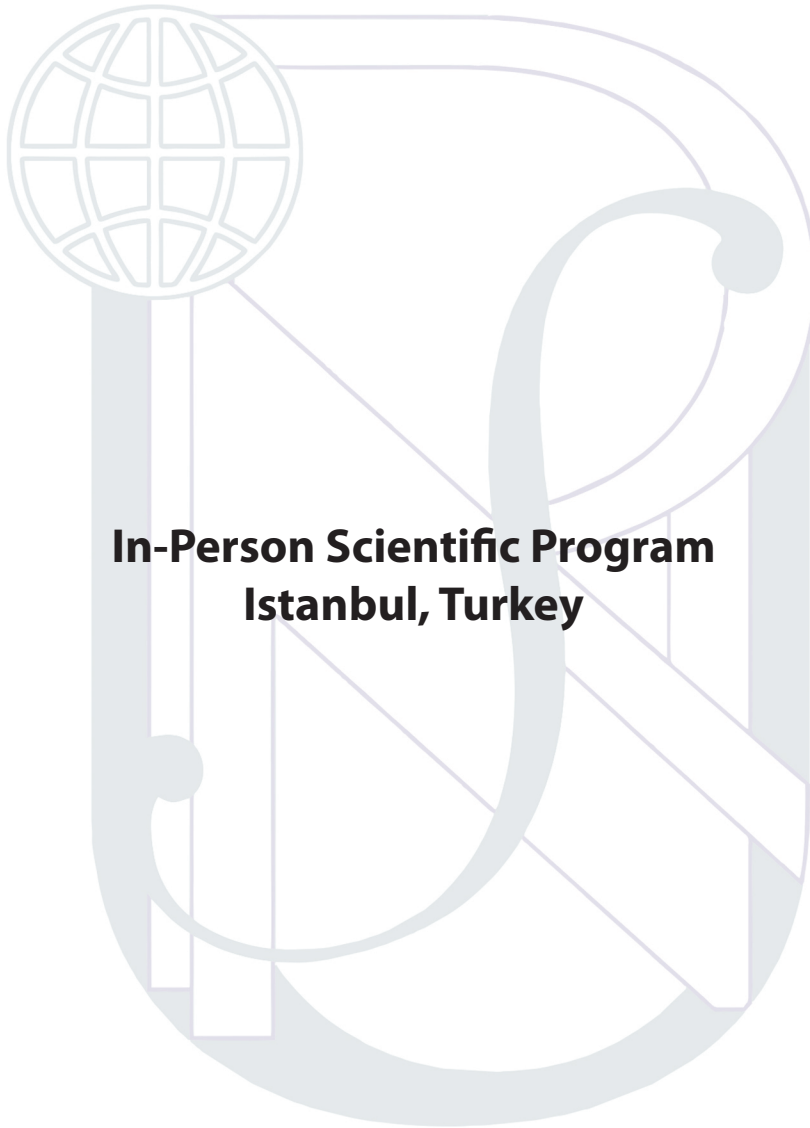
In-Person Scientific Program
Istanbul, Turkey

Day 1: November 10, 2021 Turkey, Istanbul

Opening Session
06:00 – 07:30 GMT (09:00 – 10:30 Turkey Time)

i. Welcome session: A high level administrator of Marmara University
ii. Representative from AID
iii. Representative from USERN
iv. Opening Ceremony of the Işıl Berat Barlan Center for Translational Medicine: cutting the red ribbon

Coffee Break
7:30 – 8:00 GMT (10:30 – 11:00 Turkey Time)

USERN Prize Session
08:00 – 09:30 GMT (11:00 – 12:30 Turkey Time)

USERN Prize Awarding Festival to announce the USERN Laureates 2021 and
short talks by the USERN Laureates Talks and art performances

USERN Laureate in Physical and Chemical Sciences:
Towards High-Power Energy Storage: Materials, Electrochemistry, and Devices

USERN Laureate in Biological Sciences:
Advanced Materials for Potassium Batteries: Chemistry, Materials Science and Engineering

USERN Laureate in Medical Sciences: Integrated Multi-Omics Analysis of Unsolved Immunodeficiencies

Luncheon
09:30 – 10:30 GMT (12:30 – 13:30 Turkey Time)

Symposium: Life with IEI: Perspectives from IEI Patients and the patient organizations
10:30 – 11:30 GMT (13:30 – 14:30 Turkey Time)
Chairs: Elif Karakoç Aydıner & Nima Rezaei

Closing Ceremony of 7th International Festival of Paintings for Pediatric Patients (IFPPP 2021)
Words from patients and Art performances
Awarding Festival of Paintings for Pediatric Patients
Words from patient Society representatives
Ömer İren: IMYED; Turkish Patient Society of Immunodeficiency
IPOPI Representative
Can Sucak Foundation; "A few words from Can": Gülsan Sucak

Conference
11:30 – 11:55 GMT (14:30 – 14:55 Turkey Time)

"Our Journey of Hope, Advocacy and Action",
Vicki and Fred Modell, Co-Founders, Jeffrey Modell Foundation

USERN/IBB virtual Program (Medical Sciences: Health and Prevention)
The NIAID-MENAT Immunodeficiency Symposium

Part 1 Frontiers in Inborn Errors of Immunity
Chairs: Mohamed H. Sayegh & Ahmet Ozen
12:00 – 16:00 GMT (15:00 – 19:00 Turkey Time)

Collaborative research in MENAT Region
Mohamed H. Sayegh, Lebanon

Dissecting the mechanisms of immune dysregulation in autoimmune diseases using IEI models
Michael Lenardo, USA

Exploring the nodes of immune regulation in allergic disorders: what do I learn from IEIs
Talal Chatila, USA

NIAID/NIH Funding opportunities for Inborn Errors of Immunity
Frosso Voulgaropoulou, USA

Part 2. Frontiers in Inborn Errors of Immunity
Chairs: İlhan Tezcan & Safa Barış
13:45 – 14:45 GMT (16:45 – 17:45 Turkey Time)

Hyper-IgE syndromes: exploring the frontiers between infection and allergy
Ridha Barbouche, Tunisia

Inborn Errors of Immunity Predominantly Affecting the Gut
Ahmet Ozen, Turkey

Prevention of infections in patients with inborn errors of immunity
Ghassan Dbaibo, Lebanon

Abstract Presentations (Virtual)
Chairs: Güzide Aksu & Sara Şebnem Kılıç Gültekin
15:00 – 16:00 GMT (18:00 – 19:00 Turkey Time)

The best of all submissions will be presented

Day 2: November 11, 2021 Turkey, Istanbul

Challenges on Immunodeficiencies: How to manage IEIs?
Chairs: Yıldız Camcıoğlu & Figen Doğu
06:00 – 07:30 GMT (09:00 – 10:30 Turkey Time)

15-min senior talk
Alteration of T cell repertoire in inborn errors of immunity associated with DNA repair and methylation defects
Hassan Abolhassani, Sweden

Opportunities from studying Primary Immunodeficiency Diseases
Michel Massaad, Lebanon

COVID-19 and inborn errors of immunity; Turkish Network
Elif Karakoç Aydıner, Turkey

6-min junior talk
Genetic roots of PFAPA (Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis) syndrome
Kosar Asnaashari, Iran

Expanding the clinical and immunological phenotypes and natural history of MALT1 deficiency
Asena Pınar Sefer, Turkey

HSCT on STK4 deficiency
Vedat Uygun, Turkey

Clinical features and IgRT outcomes of adults with CVID
Tuba Erdoğan, Turkey

Early diagnosis of IEI at Pediatric intensive care unit
Günseli Bozdoğan, Turkey

Two siblings with ARHGEF1 deficiency presenting with diffuse warts and bronchiectasis
Ayça Kıykım, Turkey

Three patients with NBAS deficiency
Şule Haskoloğlu, Turkey

Coffee Break
07:30 – 8:00 GMT (10:30 – 11:00 Turkey Time)

Short Oral presentations on Immunodeficiencies and COVID-19
Chairs: Nima Rezaei & Ahmet Ozen
8:00 – 9:30 GMT (11:00 – 12:30 Turkey Time)

6-min junior talk
Oral Manifestations of Patients with Inherited Defect in Phagocyte Number or Function
Heliya Ziaei, Iran

Congenital neutropenia caused by an autosomal recessive loss of function mutation in SMARCD2
Esra Özek, Turkey

ADA2 deficiency presenting with neutropenia and bone marrow failure
Öner Özdemir, Turkey

NLRP1 deficiency causing an inflammatory skin disease
Hasibe Artaç, Konya Selçuk University, Turkey

Increased radiosensitivity and impaired DNA repair in patients with STAT3-LOF and ZNF341 deficiency
Şükrü Çekiç, Turkey

A rare case report with a combination of ICOS deficiency and wipf1 deficiency with novel mutations
Ozlem Keskin, Turkey

A scientific story from a specialized research center in Turkey: Can Sucak Research Lab for Translational Immunology
Baran Erman, Turkey

Autoimmune Complications of COVID-19
Niloufar Yazdanpanah, Iran

Clinical and Laboratory Pattern of COVID-19 Related Multi-System Inflammatory Syndrome in Children
Parinaz Sedighi, Iran

Epidemiology of asthma in patients with COVID-19 illness: respiratory allergy is not a risk factor for COVID-19 severity
Sara Mostafavi, Iran

SARS-CoV-2-related and COVID-19 vaccine-induced thromboembolic events
Mohammad Barary, Iran

COVID-19 in Iran: Clinical presentations and outcomes in three different surges of COVID-19 infection
Marzieh Pirzadeh, Iran

Luncheon
09:30 – 10:30 GMT (12:30 – 13:30 Turkey Time)

Short Oral presentations on Transdisciplinarity
Chairs: Mutlu Yüksek & Neslihan Karaca Edeer
10:30 – 12:00 GMT (13:30 – 15:00 Turkey Time)

6-min junior talk
Mental health during COVID-19: Behind the front mental battles and how to cope with them
Pegah Niktalab, Iran

Misty Impact of Social Media on Medicine utilization: Case of Selected pharmaceuticals in COVID-19 Pandemic
Amir Reza Mazandarani, Iran

Autoimmune diseases in the era of Artificial Intelligence
Fatemeh Zareian, Iran

No need to swallow GIANT pills anymore as the mucoadhesive patches have been made
Leyli Shadman, Iran

Alterations of BRCA genes in Gliomas
Sepideh Ebrahimi Meimand, Iran

Acitretin and methotrexate combination therapy in psoriasis, results from a cross-sectional study
Simin Seyedpour, Iran

A novel LIG4 variant in DNA ligase IV deficiency: Case report and review of literature
Fatemeh Sodeifian, Iran

Beyond EBM: towards a phenomenological alternative
Azar Ghasemi, Iran

Towards a Business Intelligence System Implementation Framework for the Public Sector: The Case of Oman
Vision 2040 Implementation Follow-Up Unit (OVIFU)
Marwa Al-Habsi, Oman

Novel Xylomannan Coated Iron Oxide Nanocomposite Enhances the In-vitro Maturation Rate in Vitrified Mouse GV Oocytes
Alireza Sarkar Lotfabadi, Iran

Protective effect of oxytocin on Autism Spectrum Disorder model of zebrafish larvae, molecular and behavioral study
Milad Akbarzadehmoallemkolaei, Iran

Virtual Plenary Session (IEIs throughout the lifetime)
Chairs: Uğur Muşabak & Safa Baris
14:10 – 15:30 GMT (17:10 – 18:30 Turkey Time)

Newborn screening into SCID: Turkish Experience
Aydan İkincioğulları, Turkey

Understanding Class switch recombination defects by presenting both classic and atypic cases with CD40 and CD40L. defects
Necil Kütükçüler, Turkey

CD19 deficiency
İsmail Reisli, Turkey

Enigma in immune dysregulatory disorders
Deniz Çağdaş Ayvaz, Turkey

**USERN/IBB virtual Symposium (Psychoneuroimmunological Sciences:
Multidisciplinary Approach)
13:00 – 17:00 GMT (16:00 – 20:00 Turkey Time)**

Can you see the elephant yet? CBT and its candles
Umberto Crisanti, UK

Resorbable Magnesium For Reducing Human Pain
Manoj Gupta, Singapore

Multidisciplinary approach to sport, psychology and creativity studies - a step beyond traditional application
of psychology in sport
Milos Milosevic, Serbia

Endocannabinoid signalling in chronic pain and related co-morbidities
Livio Luongo, Italy

Multidisciplinary studies should reflect multidisciplinary practice: the case of inborn errors of immunity
Ekaterini Goudouris, Brazil

Didactics and teamwork to improve patient care in Immunology
Juan Carlos Aldave Becerra, Peru

The implementation of universal Newborn Screening for Primary Immunodeficiencies in Brazil,
a model for developing countries
Antonio Condino-Neto, Brazil

In Search of a Cure for Alzheimer's Disease
George Perry, USA

How demographic history of drift and founder effects can produce a modern mutational landscape
of neurodegenerative conditions
Kenneth Kosik, USA

What I learned from studying rare disorders of the Immune system, beyond looking for genes and effective therapies
Hans Ochs, USA

Day 3: November 12, 2021 Turkey, Istanbul

Clinical Immunology session: Deeper into the immune system
Chairs: Günnur Deniz & Tunç Akkoç
6:00 – 7:30 GMT (9:00 – 10:30 Turkey Time)

Contrasting Clinical and Immunological findings in STK4 Deficiency versus other forms of Hyper_IgE
Sevgi Keleş, Turkey

Protein Dimerization Choice May Influence the Phenotype of the
Immunodeficiency, Centromeric Instability, and Facial *Anomalies Syndrome Type 2 (ICF2)*
Batu Erman, Turkey

Our adventures in immunogenetics in Qatar
Bernice Lo, Qatar

Development of NK cell-based cancer immunotherapies
Tolga Sütlü, Turkey

Newly diagnosed ADA-SCID case presentation and screening programs - a Kuwait & Global perspective
Waleed Al-Herz, Kuwait

Interdisciplinary Approach to Inborn Errors of Immunity
Nima Rezaei, Iran

Coffee Break
07:30 – 08:00 GMT (10:30 – 11:00 Turkey Time)

Opening session of HiMed 2021
Chair: Şefik Görkey
08:00 – 9:30 GMT (11:00 – 12:30 Turkey Time)

Welcome Message
Şefik Görkey, Koç University

History of Anti-vaccination
Kürşat Epöztürk, Turkey

From Shiraz to Sivas; the scholar in travel: Qutb al-Din Shīrāzī in his medical autobiography
Hamed Arezaei, Iran

Hakim Mohammad, the Persian military surgeon in the courts of the Safavid and Ottoman Empires
Arman Zargaran, Iran

Iran and Turkey along the Silk Road, a historical perspective
Mohammad Hossein Ayati, Iran

Luncheon
09:30 – 10:30 GMT (12:30 – 13:30 Turkey Time)

Oral Presentations on Integrated Science
Chairs: Şükrü Nail Güner & Öner Özdemir
10:30 – 12:00 GMT (13:30 – 15:00 Turkey Time)

10-min junior talk
Inflammation and immune markers in oral cavity of cigarette and e-cigarette smokers
Liudmyla Kryvenko, Ukraine

Oral Health Changes In Tobacco Smoking Orthodontic Patients
Kseniia Lepilina, Ukraine

Nano-Enzyme based biosensor Applications
Saboura Ashkevarian, Iran

Effectiveness of using intravenous ethambutol and isoniazid administration in patients with tuberculosis and HIV co-infection
Dmytro Butov, Ukraine

Effects of GdYVO4:Eu3+ nanoparticles on apoptosis of leukocytes in vitro
Anton Tkachenko, Ukraine

Closing Ceremony of USERN-IBB 2021
Chairs: Nima Rezaei (USERN), Ahmet Ozen (Marmara),
Sevgi Keleş (Necmettin Erbakan University)

Concluding remarks

USERN-IBB 2021 prize for the best young investigator/junior scientist presentations
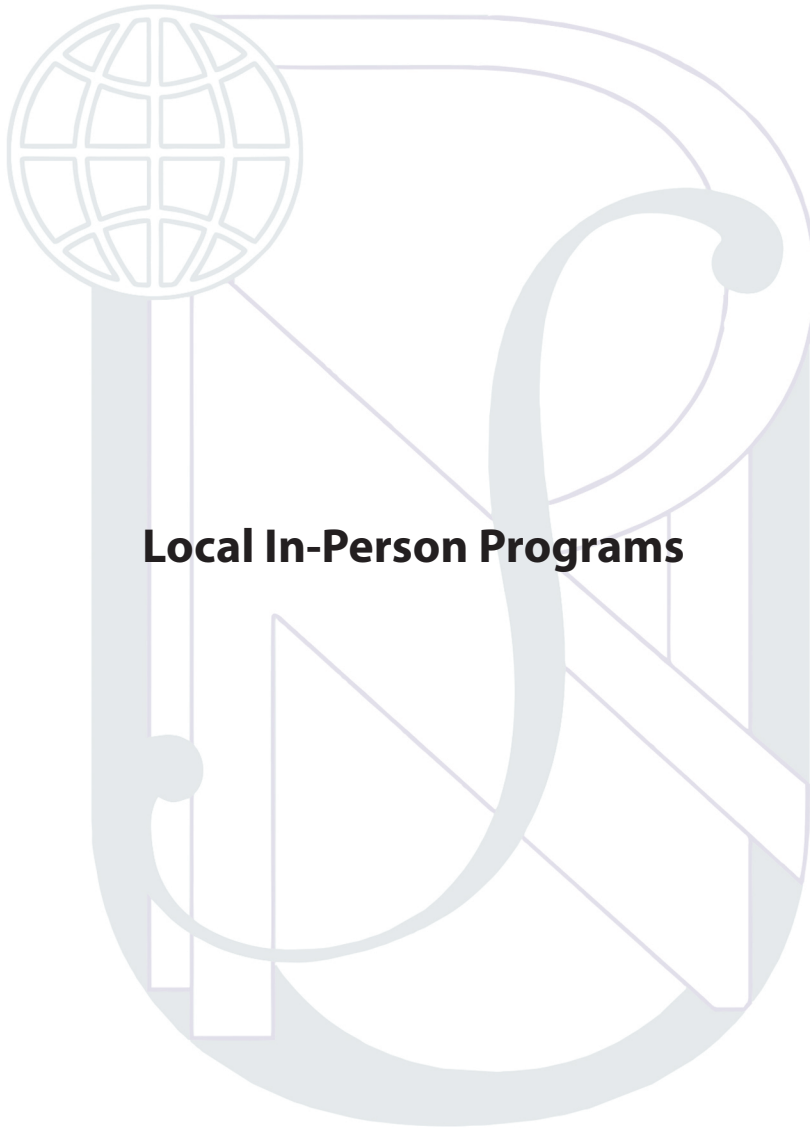
Local In-Person Programs

Kharkiv National Medical University (Ukraine)
SCIENCE SLAM for PhD-Students
10 November, 15:00 Ukrainian Time

Aim
With the help of intellectual humor, speakers talk about their achievements in scientific work

About the event
Science Slam - a project to promote science, where each performance lasts a limited time, usually no more than ten minutes. The presentation of own research should be accessible and interesting to the unprepared audience

The languages
English and Ukrainian

Virtual Programs

November 6, 2021 (Hosted By Iran)
Formal Sciences: Human vs. Artificial Intelligence

GMT	Subject
13:00 – 13:20	Searching in the Dark: Unsupervised Learning Meets Fundamental Science *Tommaso Dorigo, Italy*
13:20 – 13:40	The impact of the Dark Triad on leader selection and performance *Kevin Lowe, Australia*
13:40 – 14:00	Novel insights into the human brain's circuitry with diffusion MRI *Alexander Leemans, The Netherlands*
14:00 – 14:20	Challenges and opportunities in addressing unhealthy digital technology habits *Daniel King, Australia*
14:20 – 14:40	Machine learning in brain-computer interfaces *Dongrui Wu, China*
14:40 – 15:00	Simultaneity of vision and incremental knowledge *Serena Sanseviero, Italy*
15:00 – 15:20	Brain-Computer Interaction: at the crossroad of Machine and Human Learning research *Fabien Lotte, France*
15:20 – 15:40	Why metabolomics provide a myriad of data but not useful knowledge *Rafael Franco, Spain*
15:40 – 16:00	Some mathematical models in applied sciences: singularities, fractals and non-Newtonian fluids *Vicentiu Radulescu, Romania*
16:00 – 16:20	Role of Artificial Intelligence in the Management of Acute Ischemic Stroke *Ashkan Mowla, USA*

November 7, 2021 (Hosted By Avicenna International College (Hungary) and USERN ZUMS Office)
Physical and Chemical Sciences: Transdisciplinarity

GMT	Subject
13:00 – 13:20	Advanced materials impact air-conditioning industry *Ernest Chua Kian Jon, Singapore*
13:20 – 13:40	The Understanding and Application of Triboelectrification *Zong-Hong Lin, Taiwan*
13:40 – 14:00	Bio-based Polymers from Plant Oils for Better Chemical Recycling *Kotohiro Nomura, Japan*
14:00 – 14:20	Utility under the Dark Tetrad *Orlando Manuel da Costa Gomes, Portugal*
14:20 – 14:40	Towards a more decarbonized, digitalized, decentralized, democratized energy system *Nikos Hatziargyriou, Greece*
14:40 – 15:00	Electrochemistry for energy: conversion, storage and integration for a self-powered society *Federico Bella, Italy*
15:00 – 15:20	Understanding and Optimizing Interface Energetics and Processes: an essential step towards efficient and stable perovskite solar cells *Giulia Grancini, Italy*
15:20 – 15:40	Idiosyncratic infusion reactions to nanomedicines: can we predict the unpredictable *Moein Moghimi, UK*
15:40 – 16:00	Multicomponent High-Entropy Cantor alloys for the next generation of new materials *Brian Cantor, UK*
16:00 – 16:20	Metal oxide chemical sensors *Elisabetta Comini, Italy*
16:20 – 16:40	Dante Alighieri and astronomy *Massima Capaccioli, Italy*
16:40 – 17:00	Precision Timing and Autonomous Deep Space Navigation: How Advancements in Atomic Clock Technology Can Influence the Future of Deep Space *Jill Seubert, USA*
17:00 – 17:20	Using Uniaxial Stress to Probe The Relationship Between Competing Superconducting States in A Cuprate With Spin-Stripe Order *Zurab Guguchia, Switzerland*

November 8, 2021 (Hosted By University of Pavia (Italy) and USERN AUMS Office)
Biological Sciences: Behind the Scenes

GMT	Subject
13:00 – 13:20	Novel microengineered for biomedical research *Majid Ebrahimi Warkiani, Australia*
13:20 – 13:40	So far so near: Global Pandemics and the essential need for multidisciplinary approach to policy-making *Amirhossein Takian, Iran*
13:40 – 14:00	Discovering the role of the microbiome in health and disease relies on multidisciplinary studies *Thomas Bosch, Germany*
14:00 – 14:20	CD28 signaling and related Inborn Errors of Immunity *Safa Baris, Turkey*
14:20 – 14:40	Multi-disciplinary microbiome research: when microbiome science meets philosophy and engineering *Shirin Moossavi, Canada*
14:40 – 15:00	Virtual microscopes to reproduce in silico molecular binding processes in realistic conditions *Vittorio Limongelli, Switzerland*
15:00 – 15:20	Artificial Immune Cells: How Close Can We Get? *Mohammad Mahdi Hasani-Sadrabadi, Iran*
15:20 – 15:40	Biomedical Smart Tattoos *Carson Bruns, USA*
15:40 – 16:00	Biohybrid electrospun materials: the role of complex interfaces *Rossella Castagna, Latvia*
16:00 – 16:20	Physical and causal inferences in domestic dogs *Julia Espinosa, Canada*
16:20 – 16:40	Breakthroughs in the coordinates regulation of autophagy and cell proliferation may fuel advances in biomedical medicine *Valentina Cianfanelli, Italy*
16:40 – 17:00	Saliva as a reliable sample type for mass SARS-CoV-2 testing strategies *Anne Wyllie, USA*
17:00 – 17:20	How (not) to build a heart *Francesco Pasqualini, Italy*

November 9, 2021 (Hosted By Kharkiv National Medical University (Ukraine) and USERN SBMU Office)
Environmental Sciences: Save the Nature

GMT	Subject
13:00 – 13:20	The importance of space lawyers *Frans von der Dunk, USA*
13:20 – 13:40	Climate extremes in a warming climate *Wenju Cai, Australia*
13:40 – 14:00	Challenges for Sustainable Global Food Security *Matin Qaim, Germany*
14:00 – 14:20	Green processing as a tool to achieve Sustainable Development Goals *Francisco J. Barba, Spain*
14:20 – 14:40	The Dark Side of Bottled Water *Amir Hossein Mahvi, Iran*
14:40 – 15:00	Indigenous landscapes and the impact of global change on forests in the eastern United States *Marc Abrams, USA*
15:00 – 15:20	AI, computational fluid dynamics and sustainability *Ricardo Vinuesa, Sweden*
15:20 – 15:40	Deep-sea Science for Societal Needs: Sustainability Challenges for the Deep Half of the Planet *Lisa Levin, USA*
15:40 – 16:00	Environmental Toxicants and Epigenetics *Mohammad Abdollahi, Iran*
16:00 – 16:20	Worldwide status of insecticide resistance of Aedes aegypti and Ae. albopictus, vectors of Zika, Dengue, Chikungunya, Yellow fever *Hassan Vatandoost, Iran*
16:20 – 16:40	A Complex Reaction Network for Understanding Early Earth Chemistry *Albert C. Fahrenbach, Australia*
16:40 – 17:00	Pro-Enviromental Attitudes and Behaviours to Respondably Protect Nture *Clara Vasconcelos, Portugal*

https://userncongress.tums.ac.ir

November 10, 2021
Medical Sciences: Health and Prevention

GMT	Subject
13:00 – 13:20	Reverse translation in perioperative clinical research: linking back to the laboratory *Paul Myles, Australia*
13:20 – 13:40	Update on antiviral treatment for Covid19 patients *Ivan Hung, Hong Kong*
13:40 – 14:00	Education during a Pandemic: Time for Virtual Mobility! *Jan Nouwen, The Netherlands*
14:00 – 14:20	Revisiting the work of the polymath Elie Metchnikoff in the light of COVID-19 *Jean-Marc Cavaillon, France*
14:20 – 14:40	Prevention of premature death in LMIC *Reza Malekzadeh, Iran*
14:40 – 15:00	Prenatal stress and the effects on the fetus and the child, together with interventions, emphasising multidisciplinary studies and a global perspective *Vivette Glover, UK*
15:00 – 15:20	Mask off-policy in the shadow of emerging SARS-CoV2 variants *Mehdi Mirsaeidi, USA*
15:20 – 15:40	Heterogeneity of infant bronchiolitis *Carlos Camargo, USA*
15:40 – 16:00	Identification of novel therapeutic targets for addiction: Can we overcome the "valley of death" *Mehdi Farokhnia, USA*
16:00 – 16:20	Surgical vs transcatheter aortic valve replacement: resolving the different perspectives of clinicians *Frank Sellke, USA*
16:20 – 16:40	The Urgency to Pivot Back to Hippocratic Medicine *Armin Arbab-Zadeh, USA*
16:40 – 17:00	Interdisciplinary Approaches in Research *Sabu Thomas, India*
17:00 – 17:20	Multidisciplinary management of placenta accreta spectrum *Alireza Shamshirsaz, USA*

November 11, 2021
Psychoneuroimmunological Sciences: Multidisciplinary Approach

GMT	Subject
13:00 – 13:20	Can you see the elephant yet? CBT and its candles *Umberto Crisanti, UK*
13:20 – 13:40	Resorbable Magnesium For Reducing Human Pain *Manoj Gupta, Singapore*
13:40 – 14:00	Multidisciplinary approach to sport, psychology and creativity studies - a step beyond traditional application of psychology in sport *Milos Milosevic, Serbia*
14:00 – 14:20	Endocannabinoid signalling in chronic pain and related co-morbidities *Livio Luongo, Italy*
14:20 – 14:40	Multidisciplinary studies should reflect multidisciplinary practice: the case of inborn errors of immunity *Ekaterini Goudouris, Brazil*
14:40 – 15:00	Didactics and teamwork to improve patient care in Immunology *Juan Carlos Aldave Becerra, Peru*
15:00 – 15:20	The implementation of universal Newborn Screening for Primary Imunodeficiencies in Brazil, a model for developing countries *Antonio Condino-Neto, Brazil*
15:20 – 15:40	Single cell approaches for T cell monitoring in viral infections and cancer *Sara De Biasi, Italy*
15:40 – 16:00	In Search of a Cure for Alzheimer's Disease *George Perry, USA*
16:00 – 16:20	How demographic history of drift and founder effects can produce a modern mutational landscape of neurodegenerative conditions *Kenneth Kosik, USA*
16:20 – 16:40	What I learned from studying rare disorders of the Immune system, beyond looking for genes and effective therapies *Hans Ochs, USA*

November 12, 2021
Social Sciences: Ethics and Moral

GMT	Subject
13:00 – 13:20	Human Flourishing: Well-Doing and the Sustainable Pursuit of Core Projects *Brian Little, USA*
13:20 – 13:40	Big tech, social media, and technological determinism *Christopher Ryan Maboloc, Philippines*
13:40 – 14:00	On the Nature of Human Evil *Natalya Shelkovaya , Ukraine*
14:00 – 14:20	Multidisciplinarity for the scientific study of religion *Sławomir Sztajer, Poland*
14:20 – 14:40	The Dark Side of Productive Struggle and Productive Persistence *Wayne Slater, USA*
14:40 – 15:00	The Dark History of "Normal": Why Applied Behavioral Science Needs Idionomic Concepts *Steven Hayes, USA*
15:00 – 15:20	How good is experts' judgment of societal change? *Igor Grossmann, Canada*
15:20 – 15:40	Media Coverage and Public Opinion: Which Causes Which? *Christopher Wlezien, USA*
15:40 – 16:00	Freedom, Security, Efficiency, and Resilience: Some lessons from the Covid Pandemic *Barry Schwartz, USA*
16:00 – 16:20	Brain Injury: Disrupting the Revolving Door of the Juvenile Justice System *Kim Gorgens, USA*
16:20 – 16:40	Social Integration Focusing on Mental Wellbeing in Prenatal and Adolescent Stages *Juan Carlos Saez Carreño, Chile*

November 13, 2021
Integrated Sciences: Education and Research

GMT	Subject
13:00 – 13:20	Integrated Education *Brian Lighthill, UK*
13:20 – 13:40	Rationality as an Educational Aim *Chi-Ming Lam, Hong Kong*
13:40 – 14:00	Interdisciplinary research in Network Physiology: Lessons from hypoxia *Alireza Mani, UK*
14:00 – 14:20	Translating the Emir Abdelkader' poetry: being lost in translation *Amine Harbi, Algeria*
14:20 – 14:40	Scientific misconduct: A study *Surapati Pramanik, India*
14:40 – 15:00	Multidisciplinarity, interdisciplinarity, transdisciplinarity and some emblematic examples: the historical-technical journal "conservation science in cultural heritage" - the case of Leonardo's Mona Lisa *Salvatore Lorusso, Italy*
15:00 – 15:20	The winner's curse - or how positivity bias in transmission of scientific knowledge slows the recovery process *Matthias Von Herrath, USA*
15:20 – 15:40	STEAM and social studies education: integrating scientific disciplines to solve social problems *Delfin Ortega Sanchez, Spain*
15:40 – 16:00	The Case For and Against Generations as a Demographic Construct *Leah C. Georges, USA*
16:00 – 16:20	Creativity under Stress *Indre Viskontas, USA*

USERN Congress Meet the Experts Sessions

Meet the Experts Sessions

Date	GMT	Instructor
November 7	10:30 – 12:30	Prof. Nima Rezaei, Iran
November 8	10:30 – 12:30	Prof. Bahram Mobasher, USA
November 9	17:30 – 19:30	Prof. Hans Ochs, USA
November 10	17:30 – 19:30	Prof. Armin Arbab-Zadeh, USA
November 12	17:30 – 19:30	Prof. Abass Alavi, USA
November 13	17:30 – 19:30	Prof. Alireza Shamshirsaz, USA
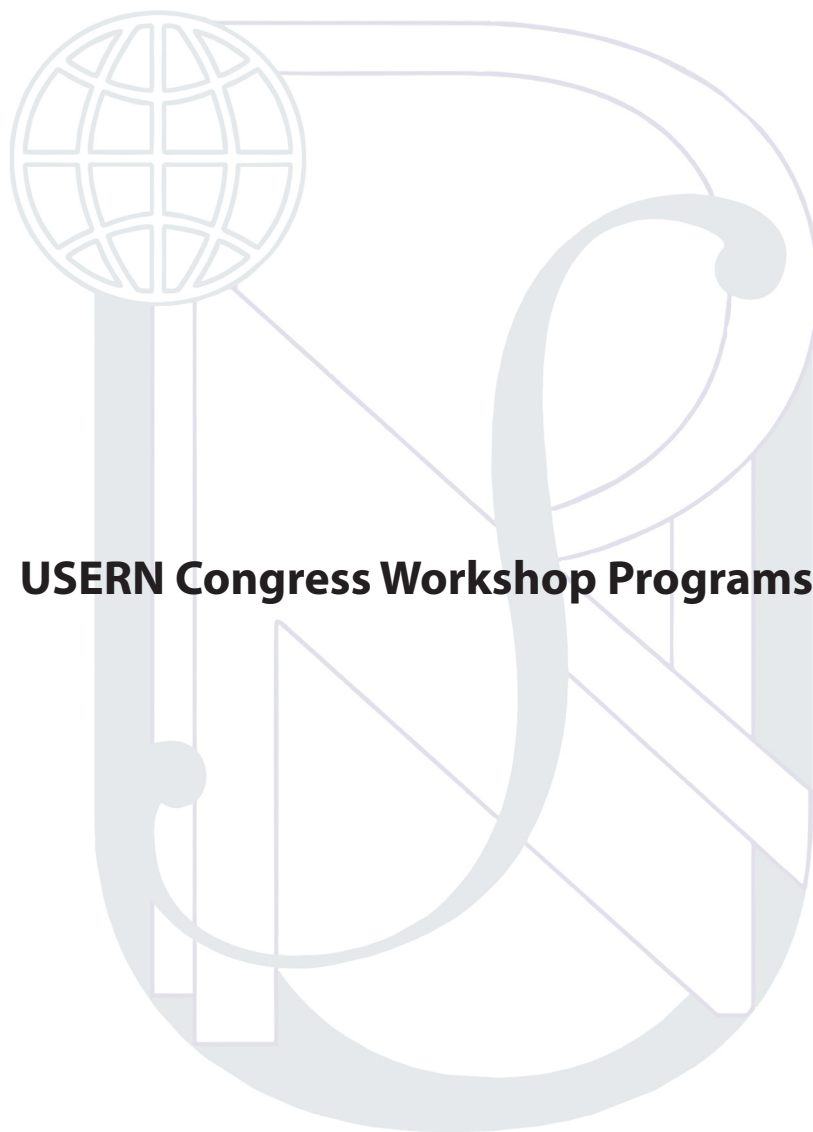
USERN Congress Workshop Programs

USERN Congress Workshops Programs

Date	GMT	Subject
November 6	17:30 – 19:30	Scientific Publication and Scientific Progress *George Perry, USA*
November 7	17:30 – 19:30	Facts and Fiction about the Elephant: Health Pseudoscience and Multidisciplinary Studies *Kiarash Aramesh, USA* *Farin Kamangar, USA* *Cornelius Ewuoso, South Africa* *Ivani Nadir Carlotto, USA* *Dina Siniora, USA*
November 8	17:30 – 19:30	Introduction to microbiome analysis *Shirin Moossavi, Canada*
November 9	10:30 – 12:30	How to write a Motivation Letter *Amirhossein Takian, Iran*
November 10	10:30 – 12:30	System Biology *Farshid Noorbakhsh, Iran*
November 11	07:30 – 09:30	Statistics for dummies: Reporting p-values and effect sizes; how to calculate sample sizes with G*Power *Serge Brand, Switzerland*
November 11	10:30 – 12:30	Artificial Intelligence challenges in science and society *Tommaso Dorigo, Italy* *Mauro Da Lio, Italy* *Pietro Vischia, Belgium* *Christoph Weniger, The Netherlands*
November 12	10:30 – 12:30	How to process/analyze diffusion MRI data for investigating brain fiber pathways? *Alexander Leemans, The Netherlands*
November 13	10:30 – 12:30	Introduction to Spatial Transcriptomics *Arutha Kulasinghe, Australia* *Habib Sadeghirad, Australia* *Marshall Feterl, Australia* *Farhana Amy Sarker, Australia*

USERN Congress Satellite Events

USERN ZUMS Office Satellite Events

Date	Iran Time	Subject
November 10	**09:00 - 13:00**	Electrospun Nanofibers as a Versatile Platform in Biomedical Applications: From Bench to Industry *Kobra Rostamizadeh*
November 10	**09:00 - 13:00**	Real-World Evidence (RWE) for Drug Safety, Toward Pharmacoepidemiology Research and Big Data *Payam Peymani*
November 10	**09:00 - 13:00**	Photoactive Materials: Bridging Novel Cancer Therapy Approaches to Regenerative Medicine *Mohammad Ali Shahbazi*
November 10	**09:00 - 13:00**	Epigenetic Modifications in Cancer: A Short Story for Acute Myeloid Leukemia (AML) *Mitra Khalili*
November 10	**09:00 - 13:00**	Some Aspects of the Important Role of Selenium in Molecular and Clinical Medicine *Alireza Ranjbar*

USERN AUMS Office Satellite Events

Date	Iran Time	Subject
November 10	**17:00 – 19:00**	PCR *Niloufar Neisi*
November 11	**17:00 – 19:00**	Western Blot *Niloufar Neisi*
November 12	**17:00 – 19:00**	Flow cytometry *Niloufar Neisi*
November 13	**17:00 – 19:00**	Chest CT *Reza Jian*
November 14	**17:00 – 19:00**	Hypertension *Samaneh Hashemi*

USERN KUMS Office Satellite Events

Date	Iran Time	Subject
November 15	**14:00 – 17:00**	Paper writing & critical appraisal skills *Mansour Rezaei*
November 15	**17:30 – 19:00**	Build a professional network *Somayeh Soltani*
November 16	**14:00 – 16:00**	Haw to Evaluate the Validity and Reliability of Scales *Mansour Rezaei*
November 16	**16:00 – 20:00**	Build a successful team; what is a team, team dynamics, and ... *Somayeh Soltani*
November 17	**15:00 – 18:00**	Research Methods *Mansour Rezaei*

USERN SBMU Office Satellite Events

Date	Iran Time	Subject
November 12	13:30 – 15:30	Working Memory: a friendly Q&A discussion with Alan Baddeley *Alan Baddeley*
November 12	15:30 – 21:00	Scientific writing *Meisam Akhlaghdoust*
November 14	16:00 – 18:00	Microbiota news in the Neuroscience researches *Seyed Davar Siadat*
November 14	18:00 – 20:00	Research in Neuroscience *Khadijeh Esmaeilpour*
November 15	16:00 – 18:00	Principles and Application of Spirometry in Health and Diseases *Rasoul Ghasemi*
November 15	18:00 – 20:00	An Overview on Microbiota and immunity in COVID-19 *Hanieh-sadat Ejtahed, Sara Ahmadi Badi*
November 16	16:30 – 18:00	Food and drug interactions *Zahra Vahdat Shariatpanahi*
November 17	16:00 – 18:00	Application of stem cells in regenerative medicine *Mahboubeh Bohlouli*
November 19	17:00 – 20:00	Medical Futility (Discussion Panel) *Alireza Bagheri* *Mehran Kouchek* *Mohammad Hossein Sadeghian*
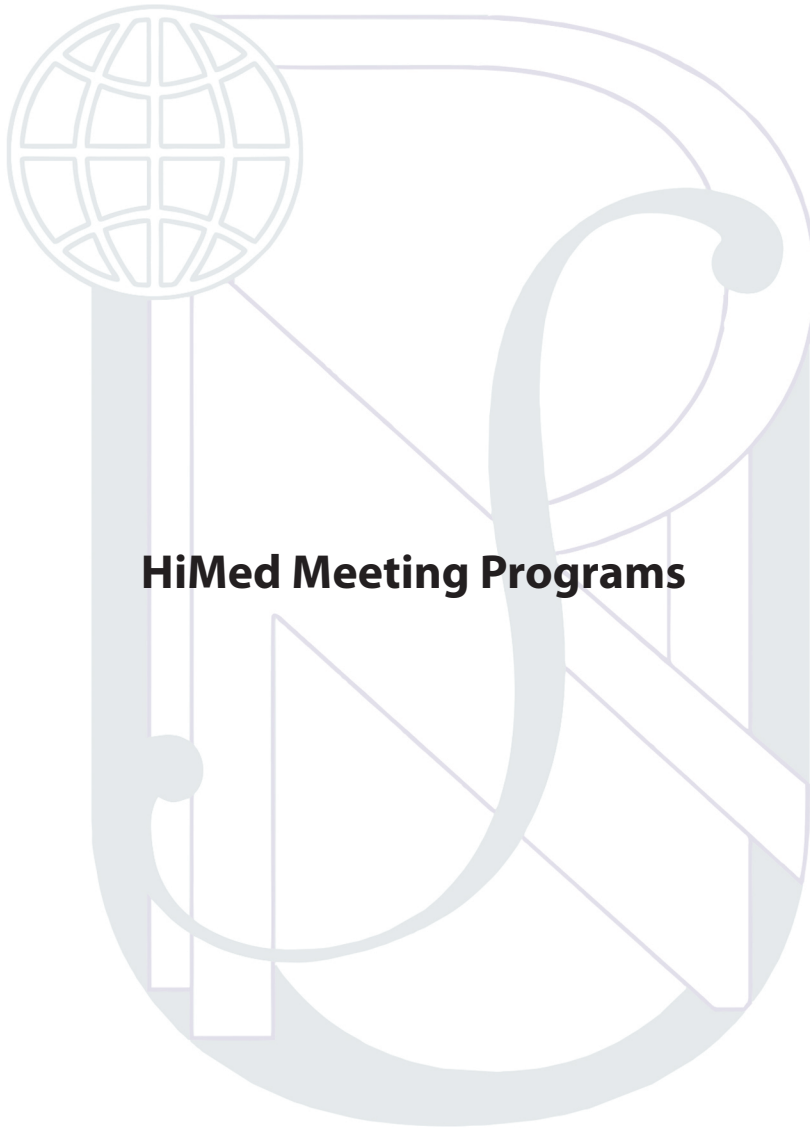
HiMed Meeting Programs

Day 1, November 12th, Hybrid Event/Istanbul, Marmara University
07:00 – 08:30 GMT (10:00 – 11:30 TRT, 10:30 – 12:00 IRST)

Title of Presentation	Lecturer
Welcome Message In-Person/ Online Opening Session of HiMed 2021	*Chair: Şefik Görkey (Koç University)*
History of Anti-vaccination	*Kürşat Epöztürk (Okan University, Faculty of Medicine, Department of Chest Diseases)*
From Shiraz to Sivas; the Scholar in Travel: Qutb al-Din Shirazi in his Medical Autobiography	*Hamed Arezaei (Iran University of Medical Sciences)*
Hakim Mohammad, the Persian military surgeon in the courts of the Safavid and Ottoman Empires	*Arman Zargaran (Tehran University of Medical Sciences)*
Iran and Turkey along the Silk Road, a historical perspective	*Mohammad Hossein Ayati (Tehran University of Medical Sciences)*

Day 2, November 13th, Online Presentations (hosted by TUMS)

07:00 – 08:15 GMT (10:00 – 11:15 TRT, 10:30 – 11:45 IRST)
Session 1, Chair: Hamed Ahansazan (Tehran University of Medical Sciences)

Title of Presentation	Lecturer
Idris Bitlisi and the prevalence of historiography in the Ottoman Empire	Zahra Memariani (Babol University of Medical Sciences)
Ali Ibn al-Tabari and Firdaus al-Hikmah, a historical report on the knowledge of medicine in Iran	Kamran Mahlooji (Iran University of Medical Sciences)
Avicennian experience: Rationalizing the scientific method while approaching the modern method of experiment	Roohollah Fadaei (Tarbiat Modares University)

08:45 – 10:00 GMT (11:45 – 13:00 TRT, 12:15 – 13:30 IRST)
Session 2, Chair: Kamran Mahlooji (Iran University of Medical Sciences)

Title of Presentation	Lecturer
The relation between the eye and the heart in ancient Persian texts	*Mahsima Abdoli (Iran University of Medical Sciences)*
Şerefeddin Sabuncuğlu: The legendary surgeon of the Ottoman empire; a brief review of his surgical practice	*Niusha Esmaealzadeh (Tehran University of Medical Sciences)*
The role of Iran and Ottoman Empires in the establishment of the health organization in France in the year 1920 AD	*Sedigheh Ghasempoor (Shiraz University)*

Day 3, November 14th, Virtual Workshop (hosted by TUMS)
07:00 13:00 GMT (10:00 – 16:00 TRT, 10:30 – 16:30 IRST)

Title of Presentation	Lecturer
Virtual Workshop: Overview of Philology and Codicology for Historians	*Peter J. Starr (Istanbul Technical University)* *Shahrzad Irannejad (Orient-Institut Istanbul)*

Day 4, November 15th, Hybrid Event/Shiraz, Shiraz University of Medical Sciences

07:00 – 09:00 GMT (10:00 – 12:00 TRT, 10:30 – 12:30 IRST)
Session 1, Chair: Arman Zargaran (Tehran University of Medical Sciences)

Title of Presentation	Lecturer
Between the Old and the New: Ottoman Physicians Meet "New Medicine" in the 18th Century	*Kadircan Keskinbora (Bahçeşehir Üniversitesi)*
Four foundation of Islamic Medicine throne: Persian, Yunani, Indian, and Anatolian Medicine	*Alireza Mehdizadeh (Shiraz University of Medical Sciences)*
Examination, treatment and medical education in Seljuk hospitals in Anatolia	*Fuat Ince (Süleyman Demirel University)*
Iranian physicians in the Ottoman Empire	*Hamed Ahansazan (Tehran University of Medical Sciences)*
Reasons for the migration of diseases in the border cities of Iran and Ottoman during the reign of Nasser al-Din Shah Qajar	*Mohammad Hashemimehr (Babol University of Medical Sciences)*

08:45 – 10:00 GMT (11:45 – 13:00 TRT, 12:15 – 13:30 IRST)
Session 2, Chair: Hamed Arezaei (Iran University of Medical Sciences)

Title of Presentation	Lecturer
Qarabadins in Islamic civilization: from the Ottoman Empire to India	*Mehrdad Karimi (Tehran University of Medical Sciences)*
Ibn al-Nafis's Mūjaz al-Qānūn fi al-Tibb and its manuscripts in Turkish libraries	*Fakhriddin Ibragimov (Uzbekistan Academy of Science, Ebû Reyhân Bîrûnî Şarkiyat Enstitüsü) (online)*
The relation between Persian Medicine and national identity	*Masood Kasiri (University of Isfahan)*
The importance of Soleimani's advice book written by Mohammad Hakim bin Mubarak	*Salimeh Afrasiabi (Alzahra University)*
Spanish flu and its role in the fall of the two Ottoman and Qajar governments in the early twentieth century	*Mohammad Ebrahim Zohalinezhad (Shiraz University of Medical Sciences)*

12:15 – 13:00 GMT (15:15 – 16:00 TRT, 15:45 – 16:30 IRST)
Closing Ceremony

Title of Presentation	Lecturer
Cultural relations between Iran and Turkey	*Kavoos Hasanli (Shiraz University)*
Closing Remarks	*Nafiseh Hosseini Yekta (DG of Persian and Complementary Office at Iranian ministry of health and medical education)*
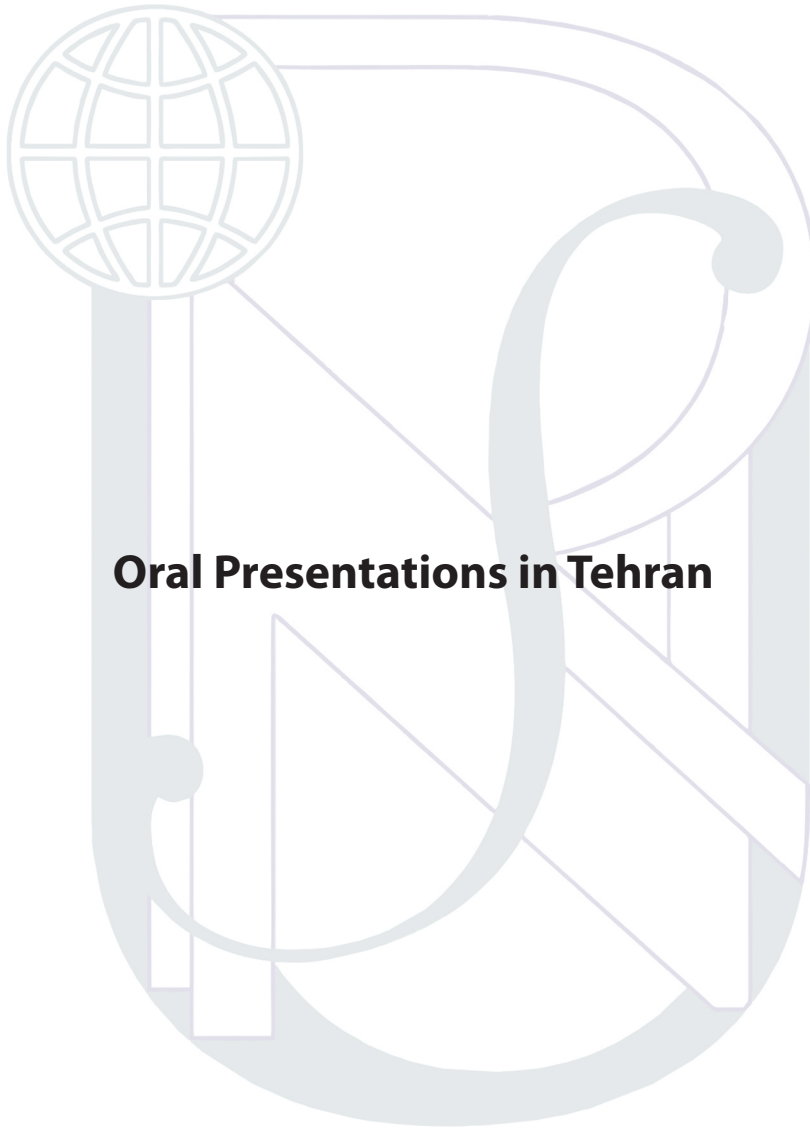
Oral Presentations in Tehran

November 6, 2021 Tehran, Iran

Miniature Talk Presentations, 07:45 – 09:30 GMT (11:15 – 13:00 Iran Time)

Inside our brain (the mystery of consciousness)
Fatemeh Zareian, Iran

Find the reality by solving your maze
Sara Mostafavi, Iran

How are you feeling? Ask my "bacteria": How gut microbium relates to depression and why it matters
Pegah Niktalab, Iran

Beauty and modeling industry
Zohre Rajabpour, Iran

The whole world is a dark room, but who is the elephant? seeing the world through autistic eyes
Leyli Shadman, Iran

Habit or addiction?
Mohammad Khani, Iran

Transgender
Laila Rahmah, Indonesia

Miniature Talk Art Performances

Reihaneh Khalilianfard, Iran
Zahra Sheikhzadeh, Iran
Amirali Okhovat, Iran
Mozhdeh Mokhtari, Iran

November 7, 2021
Junior Talk Presentations; Part I, Medical Sciences

GMT	Iran Time	Subject
05:30 – 05:36	09:00 – 09:06	Methylation Status of the SOCS3 Promoter in Juvenile SystemicLupus Erythematosus *Mahsa Keshavarz-Fathi*
05:36 – 05:42	09:06 – 09:12	Evaluation of the serum IgG-4 level in patients with autoimmune hypothyroidism and its association with Anti-TPO changes *Mina AkbariRad*
05:42 – 05:48	09:12 – 09:18	mRNA vaccines:The future of vaccine *Elham Azarnoosh*
05:48 – 05:54	09:18 – 09:24	Kidney renin-angiotensin system plasticity is affected by age and fasting patterns *Firuzeh Badreh*
05:54 – 06:00	09:24 – 09:30	Oral manifestations of Acquired immunodeficiency syndrome in Children: A Systematic Review *Morteza Banakar*
06:00 – 06:06	09:30 – 09:36	The association between baseline vitamin D level and clinical outcomes in patients with COVID-19: a 7-month follow-up cohort study *Sina Kazemian*
06:06 – 06:12	09:36 – 09:42	Cross-talk between Complex ceRNA Networks in Tumor Cells: The Hidden Players in Angiogenesis *Farzaneh Darbeheshti*
06:12 – 06:18	09:42 – 09:48	Clinical characteristics of 365 hospitalized COVID-19 patients with neurological symptoms: An observational study *Mohammad-Reza Fattahi*
06:18 – 06:24	09:48 – 09:54	Evaluation serum levels of Insulin Growth Factor-1 (IGF-1) and its association with clinical parameters in severe COVID-19 *Parisa Feizollahi*
06:24 – 06:30	09:54 – 10:00	Transcriptome analysis of the notch1 signaling pathway associated-genes in differentiation of human dental pulp stem cells *Amir Esmaeil Sabbaghian*
06:30 – 06:36	10:00 – 10:06	Comparison of high-fat and low-carbohydrate weight loss diet with standard weight loss diet on appetite and anthropometric measurements in overweight and obese children *Mohaddeseh Hasanzadeh*
06:36 – 06:42	10:06 – 10:12	Spectrum of cardiovascular complications in hospitalized patients with COVID-19 *Farbod Hatami*
06:42 – 06:48	10:12 – 10:18	Highly IBD-related colorectal cancer susceptibility associated with the cooperative oncogenic modification of cripto-1 and KRAS gene status as well as a signature composed of three miRNAs (miR-21, miR-148a, and miR-106a) *Somayeh Igder*

https://userncongress.tums.ac.ir

GMT	Iran Time	Subject
06:48 - 06:54	10:18 - 10:24	Virtual Reality Hypnosis; a cognitive intervention for motor function improvement *Danial Nejadmasoom*
06:54 – 07:00	10:24 - 10:30	Junk food consumption and microbiome health with a focus on bacterial vaginosis *Morvarid Noormohammadi*
07:00 – 07:06	10:30 – 10:36	Excess Mortality and COVID-19 Reported Fatality in Iran: Predicted Observed Gap of All-Cause Death during the Pandemic until Spring 2021 *Seyed Amir Ahmad Safavi Naini*
07:06 – 07:12	10:36 – 10:42	Interferon treatment in SARS, MERS, and COVID-19: A systematic review and meta-analysis of clinical evidence *Kiarash Saleki*

November 7, 2021
Junior Talk Presentations; Part II, Medical Sciences

GMT	Iran Time	Subject
07:45 – 07:51	11:15 – 11:21	Investigation of the antidepressant effect of caffeine through NO/cGMP pathway in mice forced swimming test *Reza Shakiba*
07:51 – 07:57	11:21 – 11:27	A randomized clinical trial of the effects of Paleolithic-based low-carbohydrate vs moderate-carbohydrate diet with portion-control and calorie-counting on body composition, adipo/hepatokines and endothelial damage in adults with metabolic syndrome *Farnoosh Shemirani*
07:57 – 08:03	11:27 – 11:33	Comparison of Recombinant Tissue Plasminogen Activator and Dual Antiplatelet Therapy in Treatment of Patients with Ischemic Stroke *Niloufar Valizadeh*
08:03 – 08:09	11:33 – 11:39	Narrative Medicine: A road towards rehumanizing medicine *Saba Mirikermanshahi*

November 7, 2021
Junior Talk Presentations; Part III, non-Medical Sciences

GMT	Iran Time	Subject
08:09 – 08:15	11:39 – 11:45	Autoimmunity immunomodulation by biomaterials *Roshanak Amirian*
08:15 – 08:21	11:45 – 11:51	Artificial intelligence in tissuemef engineering and regenerative medicine *Nima Beheshtizadeh*
08:21 – 08:27	11:51 – 11:57	Application of Biomaterials Engineering in Cell Therapy *Nasrin Kakaei*
08:27 – 08:33	11:57 – 12:03	Effectiveness of psychological first aid training for the students of medical sciences: a controlled study *Elahe Meftah*
08:33 – 08:39	12:03 – 12:09	Applying Computational Methods in Psychiatry: Ruling Out Subjectivity? *Golsa Mesbahi*

GMT	Iran Time	Subject
08:39 – 08:45	12:09 – 12:15	COVID-19 pandemic: Possible Condition for Homecoming *Negin Nouraei*
08:45 – 08:51	12:15 – 12:21	Biomaterials and novel 3D printing and electrospinning strategies could affect human life quality *Mohammadreza Rostami*
08:51 – 08:57	12:21 – 12:27	Photobiomodulation Therapy and Dental-derived Mesenchymal Stem Cells: A Review of Literature *Farshid Vahdatinia*
08:57 – 09:03	12:27 – 12:33	Targeted Star-Shaped Copolymeric Micelles for Hydrophobic Agents Drug Delivery *Mehrdad Sahranavard*
09:03 – 09:09	12:33 – 12:39	The effects of gamification on time perception *Mostafa Abdollahi Sarvi*
09:09 – 09:15	12:39 – 12:45	A meta-analysis assessing safety of immune checkpoint inhibitors in breast cancer *Maryam Balibegloo*
09:15 – 09:21	12:45 – 12:51	Next-generation strategies to improve regulatory T cell-based therapies *Farbod Ghobadinezhad*

Oral Presentations in Turkey

November 11, 2021
Part I, Challenges on Immunodeficiencies: How to manage IEIs?

GMT	Turkey Time	Subject
06:45 – 06:51	09:45 – 09:51	Genetic roots of PFAPA (Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis) syndrome *Kosar Asnaashari, Iran*
06:51 – 06:57	09:51 – 09:57	Expanding the clinical and immunological phenotypes and natural history of MALT1 deficiency *Asena Pınar Sefer, Turkey*
06:57 – 07:03	09:57 – 10:03	*HSCT on STK4 deficiency* *Vedat Uygun, Akdeniz University, Turkey*
07:03 – 07:09	10:03 – 10:09	Clinical features and IgRT outcomes of adults with CVID *Tuba Erdoğan, Başkent University, Turkey*
07:09 – 07:15	10:09 – 10:15	Early diagnosis of IEI at Pediatric intensive care unit *Günseli Bozdoğan, Acıbadem University, Turkey*
07:15 – 07:21	10:15 – 10:21	Two siblings with ARHGEF1 deficiency presenting with diffuse warts and bronchiectasis *Ayça Kıykım, Cerrahpaşa University, Turkey*
07:21 – 07:27	10:21 – 10:27	Three patients with NBAS deficiency *Şule Haskoloğlu, Turkey*

Part II, Immunodeficiencies and COVID-19

GMT	Turkey Time	Subject
08:00 – 08:06	11:00 – 11:06	Oral Manifestations of Patients with Inherited Defect in Phagocyte Number or Function *Heliya Ziaei, Iran*
08:06 – 08:12	11:06 – 11:12	Congenital neutropenia caused by an autosomal recessive loss of function mutation in SMARCD2 *Esra Özek, İstanbul University Istanbul Medical Faculty, Turkey*
08:12 – 08:18	11:12 – 11:18	ADA2 deficiency presenting with neutropenia and bone marrow failure *Öner Özdemir, Sakarya University, Turkey*
08:18 – 08:24	11:18 – 11:24	NLRP1 deficiency causing an inflammatory skin disease *Hasibe Artaç, Konya Selçuk University, Turkey*
08:24 – 08:30	11:24 – 11:30	Increased radiosensitivity and impaired DNA repair in patients with STAT3-LOF and ZNF341 deficiency *Şükrü Çekiç, Uludağ University, Turkey*
08:30 – 08:36	11:30 – 11:36	A rare case report with a combination of ICOS deficiency and wipf1 deficiency with novel mutations *Ozlem Keskin, Gaziantep University, Turkey*
08:36 – 08:42	11:36 – 11:42	A scientific story from a specialized research center in Turkey: Can Sucak Research Lab for Translational Immunology *Baran Erman, Hacettepe University, Turkey*

GMT	Turkey Time	Subject
08:42 – 08:48	11:42 – 11:48	Autoimmune Complications of COVID-19 *Niloufar Yazdanpanah, Iran*
08:48 – 08:52	11:48 – 11:52	Clinical and Laboratory Pattern of COVID-19 Related Multi-System Inflammatory Syndrome in Children *Parinaz Sedighi, Iran*
08:52 – 08:58	11:52 – 11:58	Epidemiology of asthma in patients with COVID-19 illness: respiratory allergy is not a risk factor for COVID-19 severity *Sara Mostafavi, Iran*
08:58 – 09:04	11:58 – 12:04	SARS-CoV-2-related and COVID-19 vaccine-induced thromboembolic events *Mohammad Barary, Iran*
09:04 – 09:10	12:04 – 12:10	COVID-19 in Iran: Clinical presentations and outcomes in three different surges of COVID-19 infection *Marzieh Pirzadeh, Iran*

Part III, Transdisciplinarity

GMT	Turkey Time	Subject
10:30 – 10:36	13:30 – 13:36	Mental health during COVID-19: Behind the front mental battles and how to cope with them *Pegah Niktalab, Iran*
10:36 – 10:42	13:36 – 13:42	Misty Impact of Social Media on Medicine utilization: Case of Selected pharmaceuticals in COVID-19 Pandemic *Amir Reza Mazandarani, Iran*
10:42 – 10:48	13:42 – 13:48	Autoimmune diseases in the era of Artificial Intelligence *Fatemeh Zareian, Iran*
10:48 – 10:54	13:48 – 13:54	No need to swallow GIANT pills anymore as the mucoadhesive patches have been made *Leili Shadman, Iran*
10:54 – 11:00	13:54 – 14:00	Alterations of BRCA genes in Gliomas *Sepideh Ebrahimi Meimand, Iran*
11:00 – 11:06	14:00 – 14:06	Acitretin and methotrexate combination therapy in psoriasis results from a cross-sectional study *Simin Seyedpour, Iran*
11:06 – 11:12	14:06 – 14:12	A novel LIG4 variant in DNA ligase IV deficiency: Case report and review of literature *Fatemeh Sodeifian, Iran*
11:12 – 11:18	14:12 – 14:18	Beyond EBM: towards a phenomenological alternative *Azar Ghasemi, Iran*
11:18 – 11:24	14:18 – 14:24	Towards a Business Intelligence System Implementation Framework for the Public Sector: The Case of Oman Vision 2040 Implementation Follow-Up Unit (OVIFU) *Marwa Al-Habsi, Oman*

GMT	Turkey Time	Subject
11:24 – 11:30	**14:24 – 14:30**	Novel Xylomannan Coated Iron Oxide Nanocomposite Enhances the In-vitro Maturation Rate in Vitrified Mouse GV Oocytes *Alireza Sarkar Lotfabadi, Iran*
11:30 – 11:36	**14:30 – 14:36**	Protective effect of oxytocin on Autism Spectrum Disorder model of zebrafish larvae, molecular and behavioral study *Milad Akbarzadehmoallemkolaei, Iran*

Poster Panel

1st Panel: Social, Biological and Formal Sciences
9:00 – 10:45

The relationship between health literacy and illness belief in patients with heart failure
Parisa Bozorgzad

A comprehensive look at yawning
Danial Farsi

The relationship between health literacy and illness belief in patients with heart failure
Parisa Bozorgzad

Concept analysis of the Four-Season-Symphony of Intellectuality-Spirituality-Ethics-Aesthetics (FSS: I SEA) in nursing research
Golnar Ghane

Clarifying the concept of the four-season symphony (I SEA) in nursing practice: A Wilson's approach to concept analysis
Fatemeh Najafi

Bilateral feedback from speech-language pathologist with primary school teachers to reduce dyslexia in exceptional children
Minoo Shahbazifar

Integrated Medical Education; New Perspectives
Noosha Samieefar

The problem of compatibility of «homo ecological» and «homo digital» in the cultural paradigm
Olga Smolina

Crisis Communication in Social Media Era
Kholoud Ben Said

Critical Approach Towards Empathy in Family Medicine
Helya Bolouki Azari

The use of measuring instruments in the study of painting programs of Orthodox churches
Yuliia Khlystun

Dancing with Death in the Dust of Coronavirus: The Lived Experience of Iranian Nurses
Parvaneh Asgari

The effect of mandala colouring on anxiety in hospitalized COVID-19 patients: A randomized controlled clinical trial
Fateme Khademi

Psychometric evaluation of Life Attitude Profile Scale-Revised in Patients with Cancer
Zahra Fotoukian

The covid related anexiety in parents and children with cancer
Amirreza Allahgholipour Komleh

A Comparison between survival rate and the most mutated genes in the oral squamous cell carcinomas with different primary sites, utilizing genomic datasets
Rojin Adabdokht

Effectiveness of Natural compounds in the prevention and treatment of
Oral Squamous Cell Carcinoma an in vivo review of literature
Mohaddeseh Davari

Synthesis of Silver-Doxycycline Complex Nanoparticles and Their Biological Evaluation on
MCF-7 Cell Line of the Breast Cancer
Zahra Ghanbarinasab

Updates on the use of Solid lipid nanoparticles (SLNs) and nanostructured lipid carriers (NLCs) to enhance brain drug delivery
Mahtab Amiri

Effect of foliar application of chitosan nanoparticles on the relative expression of
Mentofuran synthase gene in peppermint leaves
Saeede Sharifi

Nanoparticle-based MSC Therapy in SLE
Sara Hosseini

Rapid detection of Burkholderia cepacia using colorimetric loop-mediated isothermal amplification
Ahang Taghvamanesh

Atorvastatin is related to GDF-9 and BMP-15 expression and in-vitro maturation of mouse oocytes
Arian Ghannadi Karimi

TIDH1 impact in prognosis and drug resistance of Glioblastoma
Amirhossein Hajialiasgari Najafabadi

Reversing molecular signaling pathways involved in Alzheimer's disease pathogenesis via high physical activity in old age
Fatemeh Hajibabaie

The neuroprotective effects of esculetin on the neurological scores, blood brain –barrier permeability and
brain water content after severe traumatic brain injury in male rat: A behavioral study and biochemistry
Asal Safarbalou

Correction of cytokine misbalance between pro-inflammatory TNF and anti-inflammatory IL-4 in patients
with chronic generalized periodotits
Maryna Khudiakova

Application of the Artificial Intelligence in Breast Cancer Detection: past, present and future
AmirAli Moodi Ghalibaf

Confocal Raman Microscopy and applications in pharmaceutical development
Farnaz Khaleseh

Host-guest chemistry and the self assembly complexities of the calixarene driven by diverse guest molecules
Irene Ling

A Simple Paper-supported Fluorescent Aptasensor for Simultaneous Detection of Water Pollutants
Zahra Khoshbin

Biomimetic artificial PLA nerve conduit containing exosomes promotes peripheral nerve regeneration
Mojde Salehi

Investigation of the secondary structure change of beta-amyloid peptide in the presence of
sodium dodecyl sulfate by molecular dynamics simulation
Hamed Zahraee

Targeted Protein Degradation in Neurodegenerative Diseases
Mehdi Azadi Badrbani

Using data mining to predicting and discovering association relations and important effects
between the characteristics of COVID-19 patients
Seyed Mohammad Saleh Hadavi

2ⁿᵈ Panel: Medical Sciences
11:15 – 13:00

Evaluation of COVID-19 infection and hospitalization rate in people living with multiple sclerosis: A report from Iran
Sina Arabi

SARS-CoV-2 Virus-specific T cells (VSTs) Expansion as a Potential Therapy in COVID-19 Patients
Sasan Ghaffari

A review of the neurological manifestations of SARS-CoV-2
Ahad Jafari Rahbar Alizadeh

Skin manifestations as a prognostic indicator for COVID-19 severity: A systematic review
Parnian Jamshidi

The immune system as a target for therapy of SARS-CoV-2: A systematic T review of the current immunotherapies for COVID-19
Amir Hossein Mansourabadi

Flavonoids and covid-19 antiviral & Immunomodulatory charecteristics, what do we know?
Vida Tajiknia

A Comprehensive Review of cutaneous manifestations of COVID-19 infection
Zahra Yousefsani

The effect of pelvic floor muscle training on the treatment of pregnancy-related urinary
incontinence to improve sexual function: A systematic review
Ayda Ahmadibeni

Effect of weight-loss diet combined with taurine supplementation on fasting levels of FGF19, FGF21 and
beta-klotho co-receptor in obese women: a randomized clinical trial
Maryam Asadi

Diagnostic cues for the prediction of complicated brucellosis
Shayan Dasdar

Evaluation of Antifungal Effect of Ganoderma Gel and Clotrimazole Gel in Patients with Denture Stomatitis
Negin Ghahremani

The effect of sheep ghee on pain, stiffness, physical function and range of motion of the knee joint in
older people with osteoarthritis of the knee in Rafsanjan in 2020
Fatemeh Harandi

Mechanisms linking Iodine deficiency to the risk of dementia
Ali Kalhori

Prognostic significance of GPC3 in patients with hepatocellular carcinoma: a systematic review and meta-analysis
Bita Moudi

Smart co-delivery of 6-mercaptopurine and methotrexate using disulphide-based
PEGylated-nanogels for effective treatment of breast cancer
Parinaz Nezhadmokhtari

Mediterranean dietary pattern and bone mineral density: a systematic review and
dose-response meta-analysis of observational studies
Maryam Noori

Evaluation of surgical treatment of congenital kyphosis deformity with posterior vertebral resection
technique (PVCR) in Imam Khomeini Hospital from 2017 to 2019
Alireza Rahbar

Evaluation of Effectiveness of Aloe Vera Extract in comparison with other drug combinations
for the treatment of Oral Mucosal Diseases: a Systematic Review
Parisa Rahimirad

Biomarkers linking metabolic syndrome and periodontal disease
Asma Rasouli Osalu

Antimicrobial Activity Improvement of Metronidazole in Conjugation with Gold Nanoparticles against Helicobacter pylori
Fatemeh Razavinia

Prognostic role of EGFR in patient with lung adenocarcinoma: A retrospective analysis to resolve the dispute
Farzan Safi Dahaj

Acupressure and management of adverse events in breast cancer fighters and breast cancer survivors
Kimia Taslimi

Rift Valley Fever outbreak in Iran – A need for One Health approach
Amirreza Yaghoubpour

Role of CCL2/CCR2 axis in the immunopathogenesis of rheumatoid arthritis: Latest evidence and therapeutic approaches
Fatemeh Moadab

Insight into the Interaction of vitamin D and selenium: cross-talk of nutrients and inflammatory diseases
Mojtaba Daneshvar

Physical activity modulated molecular signaling pathways in pathomechanism aging women
Navid Abedpoor

Potential caries and oral hygiene risks of vaping in Ukrainian adolescents
Oksana Tishchenko

USERN Keynote Lectures
(UKLs)
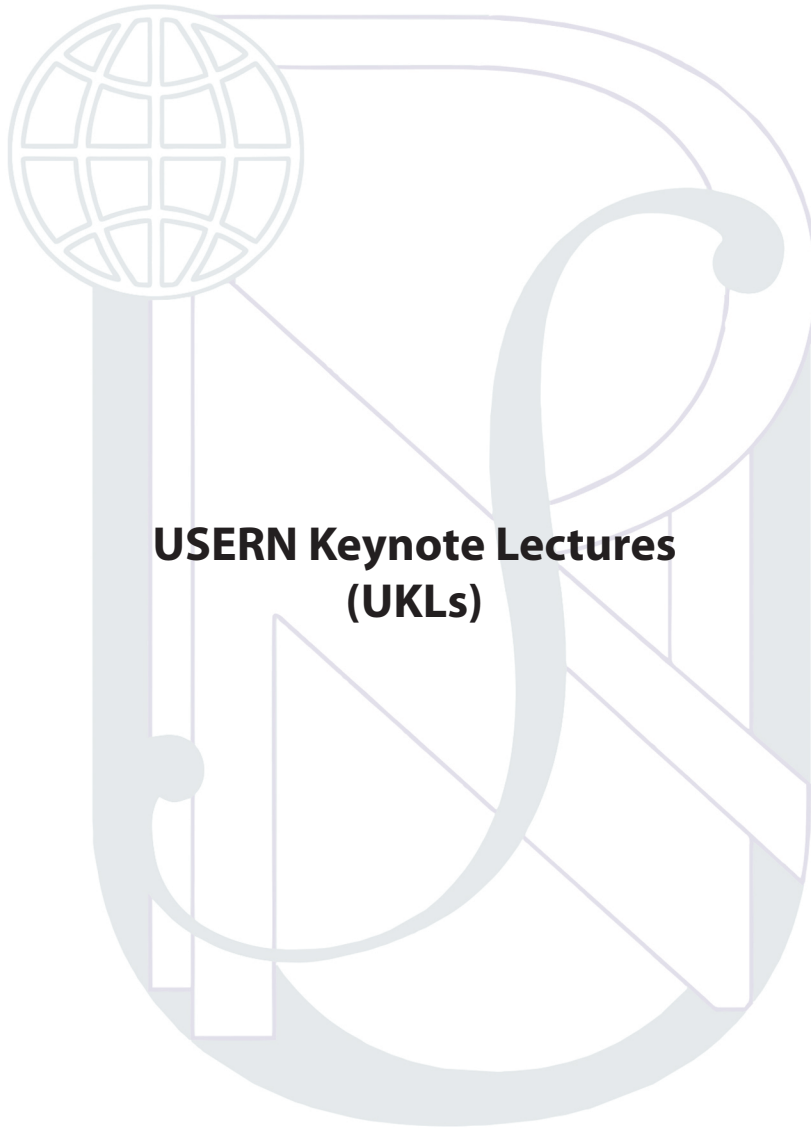
Jean-Marie Lehn

Steps Towards Life: Chemistry

☑ **University of Strasbourg, Strasbourg, France**

☑ **Nobel Laureate, Chemistry, 1987**

Jean-Marie Lehn is Professor at the University of Strasbourg Institute for Advanced Study (USIAS), Emeritus Professor at the University of Strasbourg, and Honorary Professor at the Collège de France in Paris. Professor Lehn founded the Institute of Supramolecular Science and Engineering (ISIS) in Strasbourg in 2002. He is the author of over 1000 scientific publications and two books

In 1968, he achieved the synthesis of cage-like molecules (cryptands) containing a cavity (crypt) into which another entity, molecule or ion of specific nature, can be lodged, forming a cryptate. This work expanded into the investigation of the chemical basis of "molecular recognition" (the way in which a receptor molecule recognises and selectively binds a substrate), which plays a fundamental role in biological processes. Over the years these studies led to the definition of a new field of chemistry, which he called "supramolecular chemistry".

In 1987, Jean-Marie Lehn was awarded the Nobel Prize in Chemistry, together with Donald Cram and Charles J. Pedersen for his synthesis of cryptands.

Alexander Leemans

Novel insights into the human brain's circuitry with diffusion MRI

☑ **Associate Professor of Medical Imaging, PROVIDI Lab, Image Sciences Institute, University Medical Center Utrecht, The Netherlands**

Studying the organization of the complex network of brain connections remains challenging to date, partly because of the strong multi-scale nature of the brain's circuitry and the numerous characteristics available for defining boundaries between brain regions. Combining neuroimaging techniques that capture structural and functional information at different resolutions may overcome this issue and has been widely adopted in "connectomics", the comprehensive study of brain connectivity. With its unique ability to investigate tissue microstructure in vivo, diffusion magnetic resonance imaging (MRI) is the preferred approach for investigating the brain's structural connectivity and will be the main topic of this lecture. After a brief introduction of the key concepts in diffusion MRI, I will present some novel insights about the brain's circuitry with this technique.

Amir Hossein Mahvi

The Dark Side of Bottled Water

☑ **Associate Professor of Environmental Health Engineering, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical sciences, Tehran, Iran**

Today the consumption of bottled water has become widespread around the world. Even in countries where safe and treated drinking water is available through water taps, people are increasingly using bottled water. The global bottled water market was valued at around $238 billion in 2017 and is expected to reach $349 billion in 2021, with growing at a CAGR (compound annual growth rate) of 9.99% during 2017-2021. There is ample evidence out there to show an abundance of harmful chemicals leaching from plastic bottles into bottled water. Leaving bottles in a hot car or in the sun also drastically increases the amount of chemicals leached into your water. Common chemicals found in bottled water include phthalates, and bisphenol-A. Most plastics today are said to leach chemicals such as polyethylene terephthalate (PET or PETE), DEHA, a potential carcinogen, and benzyl butyl phthalate (BBP) which is thought to disrupt the hormone system. These chemical substances have many adverse effect such as reduced sperm counts, testicular atrophy or structural abnormality and liver cancer in infants, young children, pregnant women, the elderly, and people with weak immune systems. Also, ultraviolet rays from the sun or high temperatures will accelerate leaching of the chemicals mentioned from plastic bottle into the water. More than 250 million water bottles are discarded worldwide every day. It takes 200 ml of oil to produce one plastic bottle. It is estimated that 9 out of 10 bottles used worldwide are not recycled, and find their way into landfills around the world. Each year, more than 4 billion pounds of PET plastic bottles end up in landfills or as roadside litter. Also, the production of the bottles requires huge consumption of energy and raw materials and of course gigantic emissions of CO_2. All this facts, have an announcement to take back the tap.

Keywords: Bottled water; Drinking Water, Tap, Health Effect.

Bahram Mobasher

Deep Time: Past History and Future Story of the Universe, the Earth and Life

☑ **Professor of Physics and Astronomy, University of California Riverside, California, USA**

The Universe started 13.6 billion years ago. The Earth was formed around 4.6 billion years ago. The first signs of life appeared on the Earth in the form of Procaryotic cells about 3.2 billion years ago. We have a clear understanding of the processes involved regarding the beginning of the Universe and the Earth. Deciphering the beginning of life is more complicated. Ironically, this is because we know more details about the processes that may have led to life. This is the story of Deep time going to the past. We can now predict, based on our observations and current understanding, the future evolution of the Universe and the Earth. How far in the future we could extrapolate our current knowledge and if we could predict the future of the Earth and life on it, is a big challenge that involves many disciplines. This is Deep Time extending to the future. The encouraging thing is that we are now in a position to study the past and the future through scientific means.

Brian Cantor

Multicomponent High-Entropy Cantor alloys for the next generation of new materials

☑ **Visiting Professor at Department of Materials, University of Oxford Research Professor at Brunel Centre for Advanced Solidification Technology (BCAST), Brunel University**

All human advances have depended on making new materials, and all materials are alloys, i.e. mixtures of several different starting materials or components. So the history of the human race has been the continued invention of new materials by discovering new alloys. Recently a new way of doing this, by manufacturing multicomponent high-entropy alloys, has shown that the total number of possible materials is enormous, even more than the number of atoms in the galaxy, so we have lots of wonderful new materials yet to find. And multicomponent phase space contains a surprisingly large number of extended solid solutions. The first group of these which was discovered are called Cantor alloys, an enormous composition range with a single-phase fcc structure, based loosely on the original equiatomic five-component Cantor alloy CrMnFeCoNi. This talk will discuss the previous history of alloying, the discovery of multicomponent alloys, the structure of multicomponent phase space, the fundamental thermodynamics of multicomponent solid solutions such as the Cantor alloys, the complexity of local atomic and nanoscale configurations in such materials, the effect of this on properties such as atomic diffusion, dislocation slip, and the resulting outstanding mechanical properties and potential applications, in particular in aggressive high-temperature, corrosive and radiative environments, and as resilient materials for recycling and reuse in the circular economy.

Carlos Arturo Camargo

Heterogeneity of Infant Bronchiolitis

☑ **Professor of Emergency Medicine, Medicine, and Epidemiology, Massachusetts General Hospital, Harvard University, Massachusetts, USA**

Bronchiolitis is an acute lower respiratory infection of infants, caused by respiratory viruses; the most common is respiratory syncytial virus (RSV). The condition is a major cause of acute morbidity (e.g., #1 cause of infant hospitalizations in USA) and chronic morbidity (e.g., significantly increased risk of developing childhood asthma). Despite it's clinical and public health importance, treatment remains supportive; specific, effective therapies are not available. We hypothesized that bronchiolitis is a heterogeneous condition and that advances would require a better understanding of this heterogeneity, including mechanisms of disease. In recent years, based on multidisciplinary research, we have identified several distinct and reproducible bronchiolitis profiles, which have important therapeutic and prognostic implications. This research provides a model for how to approach other common "conditions" that may be good candidates for the application of precision medicine.

Christopher Wlezien

Media and Public Opinion: Which Causes Which?

☑ **Hogg Professor of Government, Department of Government, University of Texas at Austin, USA**

There is a pervasive consensus in the social sciences that the media lead the public. Media are seen as influencing public opinion, shaping what people think, at least what they think about, and some even see them as effectively constructing the public. Empirical research usually – indeed, almost always – reflects this assumption of unidirectional flows. But there is reason to think that the media also follow the public. They often are commercial enterprises, with obvious incentives for such representation; where not, they still depend on the support of the policymakers and so the public can matter there too. This paper develops a general model that allows for flows in both directions and then considers three empirical cases in the United States: (1) news coverage of the economy and the public's economic perceptions; (2) news coverage of candidates over an election cycle and the public's vote intentions; and (3) news coverage of policy and public preferences for policy change. The analyses demonstrate that the public influences news coverage in each case and media influence on the public is not always apparent; even where there are media effects, they are less pronounced and reliable. Such patterns may or may not hold in other cases, of course, but the results highlight the need to allow for the possibility of two-way flows between the public and media. That is, scholars should settle the direction of influence based on empirical analysis, not by assumption.

Dongrui Wu

Machine Learning in Brain-Computer Interfaces

☑ **School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China**

A brain-computer interface (BCI) enables a user to communicate with a computer directly using brain signals. Electroencephalograms (EEGs) used in BCIs are weak, easily contaminated by interference and noise, non-stationary for the same subject, and varying across different subjects and sessions. Thus, sophisticated machine learning approaches are needed for accurate and reliable EEG-based BCIs. This talk will introduce the basic concepts of BCIs, review the latest progress, and describe several newly proposed machine learning approaches for BCIs.

Elisabetta Comini

Metal Oxides Chemical Sensors

☑ **Professor of Physics of Matter, SENSOR Laboratory, Department of Information Engineering (DII), University of Brescia, Brescia, Italy**

Day by day environmental monitoring is getting more and more essential due to the continuous rise in human activities especially in the direction of industrial and technological developments. With these developments, the demand of highly efficient sensing device is also rising. In this talk, metal oxides nanostructures (nanowires, nanotubes, surface functionalized nanowires and heterostructures) chemical sensors for environmental monitoring will be presented. To develop these nanostructures, different growth and characterization techniques were used from the vapor and liquid phase. These nanostructures were integrated in chemical sensing devices. Finally, their sensing response was examined under different analytes. Strategies to improve sensitivity and selectivity of metal oxide chemical sensors were investigated. For example, selectivity of ZnO nanowires toward acetone were improved after functionalizing with APTES monolayers.

Ernest Chua Kian Jon

Advanced materials impact air-conditioning industry

☑ **Associate Professor of Mechanical Engineering, Department of Mechanical Engineering, National University of Singapore, Singapore**

In warm and humid climates, the process of removing moisture out of the humid air of air conditioning plant accounts up to 40% of the total cooling load. To promote energy efficiency, one possible solution is to evolve new materials that can conduct effective air dehumidification. This talk focuses on recent material advancements related to new air dehumidification technologies. It further highlights their potential for varying applications, and provides insights on their impacts on global energy efficiency and environmental sustainability.

Federico Bella

Electrochemistry for energy:
conversion, storage and integration for a self-powered society

☑ **Associate Professor of Chemistry, Electrochemistry Group, Department of Applied Science and Technology, Politecnico di Torino, Torino, Italy**

Stability, sustainability and integration of energy devices are critical (and often disregarded) issues, since great focus is often devoted only to the achievement of efficiency records (even if these values rapidly decrease upon time). However, today's research in the energy field must be connected to concepts such as long-term stability, safety and environmental impact.

In this talk, new strategies for materials design, light-induced photopolymerization processes and water-based approaches will be shown for the design and straightforward preparation of polymeric and hybrid components for different energy devices (both storage and conversion).

The lecture will consider the following concepts in the renewable energy field:

• The design of stable cell components for lithium and post-Li batteries;
• The transition towards aqueous photovoltaics.
• The use new materials for allowing the design of integrated conversion/storage systems.
• Solar fuels from emerging conversion technologies.

The importance of considering stability and industrial scalability as main target in the research work will be stressed, along with a real consideration of efficiency results presented in the literature.

Francisco J. Barba

Green processing as a tool to achieve Sustainable Development Goals

☑ **Associate Professor of Nutrition and Bromatology, Department of Preventive Medicine and Public Health, Food Science, Toxicology and Forensic Medicine, Faculty of Pharmacy, Universitat de València, València, Spain**

Taking into account the future challenges that society faces regarding the sustainable management of resources, it is necessary to promote policies that promote the efficient use of clean and sustainable food processing technologies. In this line, it is necessary to know which are the technologies that can be used in a complementary and/or alternative way to the traditional ones as well as their possible applications within the industry. In this presentation, the potential of some of the main innovative non-thermal technologies used nowadays and with a possible application in the coming decades will be evaluated. In this sense, the focus will be on pulsed electric fields, supercritical fluids and ultrasound as some of the most commonly used innovative green processing technologies.

These technologies have a great potential to reach the UN's 2030 Sustainable Development Goals (SDGs) since among the advantages they present compared to conventional technologies, they allow to reduce processing time and cost, simplify handling, give greater purity to the final product obtained, and eliminating wastewater post-treatment, thus consuming less energy and time compared to conventional processes.

In summary, these technologies contribute to achieving sustainable food safety and security objectives, allowing the reduction of pathogenic and contaminant microorganisms and contaminants or causing changes in enzymatic activities. It also promotes environmental sustainability by being able to be used in the wastewater treatment and improving the recovery of nutrients and bioactive compounds from agri-food wastes and by-products, being a useful tool in biomass valorization. Finally, both pulsed electric fields and ultrasound can contribute to economic sustainability by improving freezing and drying processes.

George Perry

Pathology as a Protective Response in Alzheimer's Disease

☑ **Professor of Biology and Chemistry, The University of Texas at San Antonio, San Antonio, USA**

Over a century of research by thousands of talented investigators and billions of dollars of investment have not revealed a cure or even an effective treatment for Alzheimer's disease (AD) patients. The major focus of research has been to remove the pathology of AD, amyloid ß and tau, since they are prominent in AD and genetic mutations linked to both are associated with AD. Association is not causality. Increasingly sophisticated treatments have removed amyloid ß with at best limited benefit, and early efforts to remove tau are also not clinically beneficial.

We have taken an alternative interpretation, that the pathology of AD is compensatory to aging that involves induction of stress responses. Amyloid ß and tau, instead of being the problem, are the brain's response to oxidative stress and mitochondrial dynamics. Addressing AD will require understanding the biology of AD and working with, rather than against, what preserves neurons for decades.

Hans Ochs

What I learned from observing patients with inborn errors of immunity (IEI) – beyond causative genes and effective biologics

☑ **Professor of Pediatrics and Immunology, Department of Pediatrics, University of Washington School of Medicine, and Seattle Children's Research Institute, Seattle, USA**

1) My teachers taught me observe the patients and learn from them and encouraged me to publish what I observed, because "without the rigor of
putting observations on paper and have it peer reviewed, it is like your study was never done
2) Observing the patients:
a) Treating antibody deficient children with the original gamma globulin preparation, 16% Cohn fraction II, reduces the incidence of pneumonia, meningitis and sepsis,
but is painful and traumatic. This led to the design of IVIG, starting in the 1970ies with clinical trials of modified IgG formulations that could be given IV and later
changes in the formulation for subcutaneous infusion that can be given at home by the parents or by the patient.
b) Early IVIG preparations had severe adverse effects but If the freeze-dried preparations were dissolved in 5% glucose instead of normal saline, the infusions were better tolerated, so the formulation was change to add 5% maltose.
c) IVIG in adequate doses does not prevent chronic upper airway infection such as conjunctivitis, sinusitis, bronchitis leading to bronchiectasis, so some patients
would apply the IgG preparation locally as nose or eye drops, or by nebulization.
d) Patients were observed to develop severe, often lethal complications following live vaccines, if T cell-deficient.
this is also true to selective live vaccines in antibody deficient patients, such as XLA who can develop paralytic polio following oral polio vaccine.
e) Serious infections with enteroviruses, such as Coxsackie or ECHO viruses in XLA patients can be prevented by adequate doses of IVIG and cured by very high doses
of IVIG or intrathecal IVIG.
f) progressive neurodegeneration in XLA and XHIGM is infectious due to unusual viruses (e.g. astrovirus) but difficult to diagnose.
g) transfusion of blood or blood products can safe lives, but also can kill patients with IEI by causing GvHD when T-cell deficient.
h) the concept of phenocopies of IEI:
transcobalamin deficiency (hypogammaglobulinemia, antibody deficiency, effectively treated by parenteral B12)
autoantibody to IFN gamma (adult onset susceptibility to mycobacteria, severe COVID19 disease), autoantibodies to IL-17 and IL-22 (candidiasis),
to GM-CSF (pulmonary alveolar proteinosis), to CI inhibitor (atypical hemolytic-uremic syndrome due to spontaneous activation of the alternative C pathway)
somatic mutations (ALPS, e.g. FAS, NRAS)
i) Self-infusion of IVIG is possible if motivated patients are trained, improving quality of life, adjusting dose and interval of infusions
j) use antibiotics wisely but frequently, as treatment or as prophylaxis.
k) understand unconventional genetics:
dominant negative effect (STAT3 in Job syndrome),
GOF mutations (STAT1,3, PI3KD)
Haplo-insufficiency
Permissive spermatogonia (PI3KD)
Gonadal mosaicism
l) collaboration: Palestinian child with unusual infections, developmental delay, leukocytosis evaluated by an Israeli physician who arranges for bringing the patient
and his family to Seattle for evaluation of neutrophil function. Collaboration with hematology, immunology from several centers discovers a new genetic defect of
neutrophil adhesion, and in 4 original publications.
WAS and XLT (and intermittent thrombocytopenia) are caused by mutations in the same gene.
m) working with patient organization supports patient needs and facilitates research

Hassan Vatandoost

Worldwide status of insecticide resistance of Aedes aegypti and Ae. albopictus, vectors of Zika, Dengue, Chikungunya , Yellow fever

☑ **Professor of Medical Entomology and Vector Control, Department of Medical Entomology and Vector Control, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran**

Aedes aegypti and Ae. albopictus are major vectors of 5 important diseases. Vector control using insecticides is recommended, but the emergence of insecticide resistance is threat for control and prevention of vector borne diseases. Understanding of insecticide resistance helps to formulate a global strategy to control insecticide resistance in vectors.

Worldwide insecticide resistance in these species was found by the available papers and map of the data for carbamates, organochlorines, organophosphates, pyrethroids, microbial and insect growth regulator insecticides were done. An intensive search of scientific literature was done in "PubMed", "Web of Knowledge", "Scopus", "Google Scholar", "SID", etc.Results showed a wide variety of susceptibility/resistance status of Aedes aegypti and Ae. albopictus to these insecticides in world. Due to importance of these species in transmission of diseases , resistance management strategies should be further considered in to prevent from insecticide resistance and replacement of novel approach for vector control.

Igor Grossmann

World after COVID: How good is expert judgment of societal change?

☑ **Associate Professor of Psychology, University of Waterloo, Waterloo, Canada**

What are expert predictions for post-pandemic societal change? What factors impact scientists' accuracy in estimating societal change during the pandemic? In a series of large-scale initiatives, I explored scientists' top predictions for the world after COVID, and processes guiding scientists' estimates for phenomena of broad societal relevance, including political polarization, prejudice, traditional values and well-being. Structured interviews with world's leading academics (WorldafterCovid.info) revealed convergence on a set of social/societal themes (e.g., greater appreciation for social connection, increasing political conflict), but also a substantial diversity and uncertainty in expert predictions. Half of the experts approached their post-COVID predictions dialectically, highlighting both positive and negative features of the same domain of change. Moreover, focus on prosocial goals and meta-cognition—two chief tenants of practical wisdom—were evident in experts' recommendations for how to cope with possible consequences of Covid ahead. Furthermore, forecasting surveys among academics (N=717) and representative samples of lay Americans (N=394) at the beginning and middle of the pandemic revealed substantial estimation inaccuracy, with greater confidence and reliance on personal experiences and ad-hoc news reports reducing accuracy of estimates. Finally, in a large-scale forecasting tournament of social, economic and data scientists (predictions.uwaterloo.ca; over 120 teams from around the world), scientists relying on intuition and theory (but not on data) fared poorly at predicting social and psychological consequences of the pandemic, with estimates indistinguishable from lay people and worse than naïve statistical models, suggesting that consideration of base-rates in past data improves accuracy. I will conclude by discussing implications of communicating intellectual humility and uncertainty in expert judgment, the value of balancing explanation with predictions in expert judgment, and possible ways to foster accuracy of social scientists' judgments.

Jean-Marc Cavaillon

Revisiting the work of the polymath Elie Metchnikoff in the light of COVID-19

☑ **French National Research Agency (ANR), Paris, France**

Revisiting Metchnikoff's work in light of the COVID-19 pandemic illustrates how much this amazing scientist was a polymath, and one could speculate how much he would have been fascinated and most interested to follow these events. Since he coined the word gerontology, he would have been enthralled by this new infectious pathology, and by the concepts of immunosenescence and inflammaging that characterize the SARS-CoV-2 infection. While Metchnikoff's work is mainly associated with the discovery of the phagocytes and the birth of cellular innate immunity, he regularly invited his closest collaborators to investigate humoral immunity, and it was within his laboratory that Jules Bordet made his main discovery of the complement system. While Metchnikoff and his team investigated many infectious diseases, he also contributed to studies linked to vaccination, such as those on typhoid fever performed in chimpanzees, illustrating that non-human primates are helpful animal models to decipher the pathophysiology as for the COVID-19 virus. I will illustrate how much his own work and those of his trainees were pertinent to this new disease.

Juan C. Sáez

Social Integration Focusing on Mental Wellbeing in Prenatal and Adolescent Stages

☑ **Professor of Neuroscience, Instituto de Neurociencias, Universidad de Valparaíso, Valparaíso, Chile**

Epidemiological studies have revealed a clear relationship between different types of stressors acquired during brain ontogeny and manifestations of brain disorders at later ages (e.g., depression and schizophrenia). It is now widely accepted that stress-induced brain disorders are transferred to the progeny through epigenetic mechanisms, indicating that reversal of such disorders could take at least three generations. This is particularly evident in low income and middle income countries, causing significant social burdens in most areas around the globe. These observations have also been replicated in laboratory animals, where disrupted patterns of brain cells in young adults have been found to correlate with a spectrum of brain disorders. Reverting this phenomenon (i.e., unwiring and rewiring the brain) seems unlikely at present, but preventing it might be approachable. To accomplish meaningful results, the potentiation of scientific efforts through collaboration is essential toward finding molecular targets that may prevent brain alterations triggered by a diversity of stressors at different early ages. In parallel, scientific findings should be clearly translated to government leaders, so that progress can be made relative to integral health policies that protect women, mothers and young children. Focus can also be placed upon educating communities. In this sense, achieving a healthier society depends on reinforcing and accelerating investments for programs designed to promote the wellbeing of vulnerable populations, rather than just developing a strong macro economy.

Kotohiro Nomura

Bio-based Polymers from Plant Oils for Better Chemical Recycling

☑ **Professor of Applied Chemistry, Department of Chemistry, Tokyo Metropolitan University, Hachioji, Japan**

Development of sustainable polymers (green plastic) from bio-renewable feedstocks has been considered as an important subject. Many researchers focus on design and development of renewable polymers with various architectures by development of new strategies and methods by precise chemical (polymerization) techniques. Development of functional polymers derived from hydrocarbon-rich molecular biomass (vegetable oils and fatty acids such as linseed, sunflower, soybean, castor, palm, and olive oils), most abundant and low cost molecular biomass, has thus been recognized as an attractive subject. In particular, development of advanced polyesters, which display tunable mechanical properties and biodegradability, from so-called bio-based monomers by precise polymerization techniques attracts considerable attention.

In this lecture, two approaches for synthesis of long chain aliphatic polyesters, promising semicrystalline materials expected as alternative to linear polyethylene (widely used in our daily life), especially by condensation polymerization and acyclic diene metathesis (ADMET) polymerization, including our recent results, will be introduced. These materials can be depolymerized by chemical modification, the approach, conversion of polymer to monomers or fine chemicals called "chemical recycling", has also been considered as important subject (key technology) to establish green, sustainable circular economy. Another approach for synthesis of bio-based polyolefins will also be introduced.

Lisa A. Levin

Deep-sea Science for Societal Needs: Sustainability Challenges for the Deep Half of the Planet

☑ **Distinguished Professor of Biological Oceanography and Marine Ecology, Scripps Institution of Oceanography, University of California, San Diego, USA**

The deep sea (the ocean below 200 m water depth) covers half the planet and represents over 95% of the habitable volume on earth. It is home to a wealth of biodiversity and provides many ecosystem functions and services critical to the health of the planet, including climate mitigation. But the deep ocean remains largely unexplored – and so it is a vast elephant in the dark. The tremendous heterogeneity of the deep sea means that every visit to the deep ocean reveals different forms of life. As the human population continues to grow, pressures on the deep ocean from resource extraction, pollution and climate change are inextricably rising, creating a serious situation in our planet's greatest frontier. This presentation will consider how ecosystems may be faced simultaneously with direct disturbance from fishing, energy extraction, mining, or contamination while simultaneously subject to climate-induced warming, ocean acidification, or oxygen loss or changing food supply. Managing for sustainability of the deep ocean will require new knowledge, climate consciousness and a way to surmount the significant challenges posed by current siloed governance systems. I will discuss how scientific networks such as the Deep Ocean Stewardship Initiative (DOSI) and the Deep Ocean Observing Strategy (DOOS) bring together deep-sea practitioners across disciplines to address these challenges.
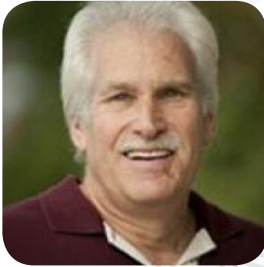
Marc D. Abrams

Oak as an Indigenous Landscape in the Eastern United States

☑ **Professor of Forest Ecology and Physiology, Department of Ecosystem Science and Management, The Pennsylvania State University, Pennsylvania, USA**

Land use by Indigenous people (Native Americans) and climate are major factors in the dynamics of oak (Quercus) forests, among others, in the eastern United States. Prior to Euro-American settlement, vast areas in the Eastern Deciduous Forest were dominated by oak species. The role of periodic understory burning, agriculture, and other forms of land management by Indigenous peoples are frequently noted by cultural anthropologists and historical ecologists. However, these points are often debated by paleoecologists and climate scientists. Here we present a literature review and synthesis and data summary to investigate the role of altered land-use and season of burning versus climate change in relation to pre- and post-Euro-American changes in forest composition. Human-based ignitions, as reflected by dormant-season fires, prevailed over the oak- and pine-dominated forests, with intermediate fire frequency during Indigenous periods. During the 18th century onward, Euro-American populations rapidly expanded, impacting much of the eastern U.S. through extensive timber harvesting, land clearing, and severe fires. Starting in the 20th century, a variety of ecological phenomena established, including land abandonment and old field succession, chestnut blight, fire suppression, and urbanization, resulting in dramatic vegetation changes in eastern landscapes. These trends have culminated in recruitment failures of most oak species on all but the most xeric sites and an increase in mid-successional, mesic hardwoods, most notably red maple (Acer rubrum), a species with very low density in our analysis of the witness tree record. We conclude that prescribed burning, agriculture, and other land-uses by Indigenous peoples created a mosaiced landscape of expansive oak savannas, woodlands, and forests in the eastern US. A warming world over the last century should have promoted warm-adapted, fire-tolerant, xerophytic genera such as oak, hickory (Carya) and pine (Pinus) and grassland communities, but instead have promoted the invasion by cool-adapted, fire-sensitive, mesophytic trees due to the absence of burning, much to the detriment of these major vegetation biomes. Understanding that eastern oak, and other pyrogenic ecosystems, represent an Indigenous landscape strengthens our ability to understand how to best manage vegetation against the invasion of less desirable species and restore historic fire cycles through prescribed burning.

Massimo Capaccioli

Dante a natural philosopher?

☑ **Emeritus Professor of Astronomy, Faculty of sciences, University of Naples Federico II, Italy**

Above all in the Divine Comedy, his universal masterpiece, and in the Convivio, but not only there, Dante Alighieri shows off his mathematical, geographical, physical and astronomical knowledge and skill. To this vast culture, acquired by reading, discussing and reflecting on his own, he associates some extraordinary intuitions that make him, a great medieval thinker, a forerunner of very modern scientific ideas and concepts. The conversation will focus mainly on these "Pindaric flights" of the Supreme Poet, also to celebrate the 700th anniversary of his death.

Matin Qaim

Challenges for Sustainable Global Food Security

☑ **Professor of Economic and Technological Change and Director of Center for Development Research (ZEF), University of Bonn, Bonn, Germany**

Around 10% of the world population suffer from chronic hunger, meaning that these people do not have sufficient access to food energy. Even more suffer from other forms of malnutrition, including micronutrient deficiencies, overweight, and obesity. Malnutrition and unhealthy diets are the leading risk factors for premature death and morbidity, causing not only human suffering but also severe economic and social development problems. Food production needs to be further increased to nourish the still rising world population. However, production increases need to happen while respecting existing planetary boundaries. Fertile land and water are becoming increasingly scarce, and agricultural production and food systems more broadly contribute considerably to climate change and many other environmental problems. Also, climate change has negative effects on agricultural production in many parts of the world. This lecture provides an overview of these multiple challenges and discusses what types of technical and behavioral changes are required to achieve sustainable food and nutrition security for all. It is argued that major transformations are required, in terms of both food production and consumption and in rich and poor countries alike, to bring food systems on more sustainable trajectories.
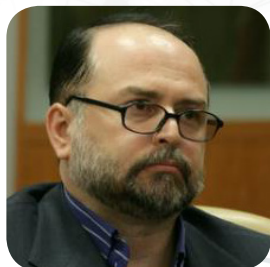
Mohammad Abdollahi

Environmental Toxicants and Epigenetics

☑ **Professor of Pharmacology and Toxicology, Department of Toxicology and Pharmacology, School of Pharmacy, Tehran University of Medical Sciences, And Toxicology and Diseases Group (TDG), Pharmaceutical Sciences Research Center, The Institute of Pharmaceutical Sciences (TIPS), Tehran, Iran**

Currently, we require understanding people's health problems and diseases by focusing on environmental toxicants. Many studies these days are disclosing the relationship between human chronic illnesses and exposure to environmental toxicants. We believe that different aspects of toxicity exposures from the soil composition to the air, food from the farm to tables, microbial and chemical pollution of the land, water, air, waste of various pharmaceuticals, and consequences of the global climate changes are the main elements of such belief. For instance, exposure to pesticides may induce many diseases, from cancer to CNS and cardiovascular disorders. Heavy metals that accumulate in some countries' drinking water are now considered the cause of diabetes and metabolic syndrome. The presence of these toxicants may reduce the development of the brain in children and embryos. There are many complex issues between the existence of environmental toxicants and the induction of diseases. In this regard, Scientists are expected to be the first sensitive group to impede any action that might pollute the environment. In my opinion, the best way is to call scientists to socialize with everyday people to understand the problems better. Science, even in the most complicated form, must include benefits for the people. Therapeutic approaches to intervene the toxicant-induced disorders rely on understanding the mechanism of toxic actions at every level. It is known that environmental toxicants could exert their disrupting effects through genotoxic and non-genotoxic mechanisms. Epigenetic modifications have recently been recognized as a critical player in the etiology of pathophysiological conditions. The epigenetic area will likely become the focus of future biological and pharmaceutical research. Considering the key role of epigenetic abnormalities in the etiology of many diseases, investigating the epigenotoxic impact of chemicals is of high priority to human health. At the time being, few epigenetic drugs are available in the market, and many are in the preclinical and clinical trial phases. Besides pharmaceutical approaches, there is a growing body of evidence that epigenetically natural compounds have a protective role in regulating pathological progressions and could be considered a potential alternative for epigenetic therapy. Catechins, curcumin, genistein, quercetin, and resveratrol are examples of such compounds that could reverse epigenetic alterations. Scientists should consider the above conditions, primarily through scientific networking and sharing resources, skills, and information.

Nikos Hatziargyriou

Towards a more decarbonized, digitalized, decentralized, democratized energy system

☑ **Retired Professor of Power Systems, Division of Electric Power, National Technical University of Athens, Athens, Greece**

Today's power systems face tremendous challenges in their transition to a sustainable model of energy production and management. The driving force behind this transition is the need to combat the dramatic consequences of climate change and this is sought for by a rapid increase of Renewable Energy Sources in the energy mix, of distributed energy resources at the lower voltage levels of the systems and the empowerment of the citizens' roles as active consumers and energy producers. Moreover, electrification of the heating, cooling and transportation sectors (e.g.: EVs, electric ships and aviation), introduces multi-carrier and cross-carrier flexibility highlighting the role of electricity networks, as the backbone of future integrated energy systems. With the increasing penetration of distributed energy resources the passive distribution networks become active and operating decisions are shared along the whole energy chain from centralized Energy Management Systems at transmission system level, to Distribution Management Systems, Microgrids, Smart Cities, Smart Homes and active consumers. At the same time, the explosive increase of data availability coupled with the admirable achievements in information and telecommunication technologies offer tremendous opportunities for a more decentralized, efficient, sustainable and democratic energy system.

In the presentation, the benefits and technical and commercial challenges of Distributed Energy Resources will be presented and the main characteristics of active Distribution Networks will be introduced. In particular, the capability of Intelligent Distribution Networks to enhance the overall stability and resilience of the Power System and provide local support for voltage, frequency and restoration by coordinating local distributed resources will be discussed. Novel coordination schemes by distributing the control and by sharing the intelligence and the operating responsibility of the power system from a high level central point to several lower levels of the grid, such as end-users will be presented. Additional features such as the facilitation of local energy marketplaces and community initiatives will be briefly overviewed.

Paul Myles

Reverse Translation in Perioperative Clinical Research: Linking Back to the Laboratory

☑ **Professor and Director of the Department of Anaesthesiology and Perioperative Medicine, Monash University and Alfred Hospital, Melbourne, Australia**

Clinical practice should be guided by medical research, typically starting with basic science, then small studies in humans – translation from bench to bedside – and finally large clinical trials. Yet most clinical trials do not change practice; this suggests that their results are either unreliable or that such trials are irrelevant to clinical practice. The use of surrogate, or intermediate, outcome measures in surgery and anaesthesia is widespread. Such surrogate markers are of questionable significance and often have no convincing relationships with patient outcome. Severe complications leading to death or chronic disability are rare, but it is these that patients (and doctors!) are concerned about. Such low event rates have important implications for trial design.

Because most improvements in medicine are modest and incremental, large numbers of patients need to be studied in order to have adequate statistical power to detect a clinically important difference in serious adverse outcomes. Such studies require a sample size in the many 1,000s to provide sufficient statistical power and reliable estimates of effect. Large trials with straightforward requirements reflecting standard practice are sometimes called effectiveness, pragmatic, or practical trials. They thus optimize generalisability and so are clinically relevant.

But it must be kept in mind that large clinical trials are focused on the question, "Does this intervention work" (i.e. improve outcome)? They are not designed to investigate how or why a drug or techniques does or doesn't work – that is, underlying mechanisms and explanations often remain unclear.

Large trials offer two key, frequently under-utilised benefits for those engaged in basic science. First, they offer a great opportunity to embed one or more substudies, with additional blood and other sampling in a subgroup of patients, to provide mechanistic insights. Second, there are often unexpected findings in large clinical trials, and these can inform the design of follow-up secondary studies to investigate how or why such effects occur. That is, reverse translation. It should be kept in mind that most medical discoveries are serendipitous, identified through the inquisitive minds of attentive investigators.

Reza Malekzadeh

Prevention of Premature Death in low and Middle Income Countries

☑ **Distinguished Professor of Gastroenterology and Hepatology, Digestive Disease Research Institute, Tehran University of Medical Sciences, Tehran, Iran**

Prevention of Premature deaths (death before 70 years of age) is one of the United Nation's sustainable development goals (U.N SDG) for 2030. The burden of premature mortality is particularly high in the low/middle-income countries (LMICs); over 80% of these premature deaths occur in the LMICs. Economic losses associated with premature deaths in LMICs is expected to increase to about US$7trillion by 2030.The Aim of this presentation is to discuss a feasible and cost effective strategy to extend life expectancy by avoiding disability and premature death.

Golestan Cohort Study (GCS) data with 50,000 participants and more than 10 years' prospective follow up in northeastern Iran were used to find the main causes of premature mortality and its associated risk factors. We also used the result of PolyIran trial a cluster randomized pragmatic trial nested in GCS to estimate the efficacy of fixed Dose Combination Therapies with aspirin (Polypill) in Primary cardiovascular (CVD) Prevention which was the most common etiology for premature death in GCS.

The mean age (SD) of participants at baseline was 52 years. Fifty-eight per cent were women, 74.4% were Turkmen, 79.9% lived in rural areas, 87.8% were married and 70.2% had no formal education. Of the 50045 cohort participants, 47547 (95.0%) were younger than 70 years old, potentially at risk of premature death. The follow-up duration up to age 70 years was 444168 person-years (median 10, and maximum 14.2 years). During the follow-up, 6347 of the cohort

participants died and 439 were lost to follow-up. Ischemic heart disease was the leading cause of death in all age categories. Stroke was the second cause of death except for deaths that occurred younger than 50, for which road injury was the second cause of death. During the 60 months follow up, in PolyIran trial the number of CVD events was 301 in control group and 202 in polypill group. The result suggested a 57% and 34% decrease in the risk of CVD events in polypill group with high adherence (taking more than 70% of tablets during 60 months follow up) and average adherence respectively. In Addition to adherence the effects of Polypill was related the duration of polypill use 34% during 24-39 months and 53% after 40-60 of follow up. The frequencies of adverse events (peptic ulcer, GI bleeding hemorrhagic stroke) were comparable and there was no significant difference between the Polypill and control group.

Polypill with aspirin are a widely applicable low cost approach that will substantially reduce premature death from CVD and avoid between 5 to 10 million premature deaths from CVD events each year. It can also assist in reaching U.N. SDG goal to reduce premature deaths from NCDs by 1/3 by 2030.

Sabu Thomas

Polymer Nanocomposite Scaffolds for Tissue Engineering

☑ **Professor of Polymer Science and Engineering and the Vice Chancellor of Mahatma Gandhi University, Kottayam, India**

Biodegradable polymer scaffolds are useful materials to integrate the femoral part of the implant with the bone, and provide a matrix for cellular growth. Synthetic biodegradable polymers can provide temporary scaffold for cell adhesion and expansion both in vitro and in vivo and guide tissue regeneration with defined sizes and shapes. The fibrillar structure is important for cell attachment, proliferation and differentiated function in tissue engineering. The structure allows for growth and is convenient for transport of nutrients. The synthetic polymers such as Polycaprolactone (PCL), Poly l-lactic acid (PLLA), and their copolymers have attracted wide attention for their biodegradation in the human body and are used for tissue engineering. Several methods have been practiced to create highly porous scaffold including fiber bonding, solvent casting/ salt leaching, gas foaming, phase separation and electrospinning. Out of which electrospinning is the simple and cost-effective technique for producing nanofibers from polymer solution. Introduction of organically modified clay in polymers leads to different types of structures which include intercalated or exfoliated morphology. The nano reinforcement increases the mechanical rigidity, mobility, stiffness and biodegradability in biodegradable polymers. Moreover, it also increases the porosity of the polymer nanocomposite. Nanoparticle reinforced scaffolds are yet to achieve importance. In fact they have wide range of interest in tissue engineering. Literature reports regarding nanoparticle reinforced scaffolds are very scant. Hence the present investigation will be interesting and will find application in tissue engineering in the foreseeable future. In the present talk the state of the art on the synthesis, morphology, structure, properties and applications of dual porous nanocomposite scaffolds will be presented.

Seyed Moein Moghimi

Idiosyncratic Infusion Reactions to Nanomedicines: Can we Predict the Unpredictable?

☑ **Professor of Pharmaceutics and Nanomedicine, School of Pharmacy, Newcastle University, Newcastle upon Tyne, UK**

Infusion reactions to nanomedicines in human subjects are idiosyncratic and apparently non-IgE-dependent, but outwardly reproducible in pigs. While equivocal investigations indicate a role for the complement system activation and generated anaphylatoxins (e.g., C3a and C5a) in infusion reactions to nanomedicines, recent evidence suggest that the porcine reactions are related to robust nanoparticle clearance by pulmonary intravascular macrophages (PIMs) and rapid release of arachidonate metabolites from these cells. Similar to pigs, other animals that have resident PIMs in their lungs also respond to intravenously injected particles, where rapid particle clearance by PIMs correlate with peak periods of cardiopulmonary distress (robust phagocytic responses hypothesis). Thus, the severity of reactions is apparently regulated by kinetics of nanomedicine clearance, the nature of the responding immune cell receptor, and their associated signalling threshold. Normal human lungs, however, do not have PIMs, but "induced" PIMs have been identified in pulmonary circulation dependent on pathology. Nanomedicine-mediated infusion reactions in humans might be related to "a moment of immune cell intoxication" as in the case of induced PIMs and/or other responsive immune cells outside the pulmonary circulation. Human adverse reactions are could be avoided with slow nanomedicine infusion or through nano-engineering strategies that delays robust immune cell interception (e.g., through nanoparticle shape modification) independent of complement activation, thereby supporting the role of the robust phagocytic response hypothesis. Notwithstanding, global nanomedicine safety assessment in the porcine model (and other ruminants and species with PIMs) is inappropriate and misleading, and these models should not be advertently promoted and their applications in nanomedicine safety exaggerated.

Steven C. Hayes

The dark history of "Normal": why applied behavioral science needs idionomic concepts

☑ **Nevada Foundation Professor in the Behavior Analysis Program, Department of Psychology, University of Nevada, Reno, USA**

For nearly 150 years applied behavioral science has been driven by normative concepts and the statistical and methodological tools they imply, such as traditional randomized trials, mediational analysis, psychometrics, and classical statistics. Many of these tools have a dark history linked to eugenics and efforts to fit people into repetitive industrial tasks but in the modern world normative concepts are falling away.

In this talk I will explain why that trend is positive, socially and scientifically. Human behavior is not ergodic, and there is no reliable way to apply normative data to the processes of change in individuals over time. Creation of a new class of "idionomic" (not normative) concepts is essential to a multi-dimensional and multi-level understanding of human action that gives proper attention to biophysiological, sociocultural, and psychological knowledge. Process-based therapy will be used as an example of these trends.

Thomas C. G. Bosch

Discovering the role of the microbiome in health and disease relies on multidisciplinary studies

☑ **Professor of General Zoology, University of Kiel, Kiel, Germany**

Research on host–microbe interactions has become an emerging cross-disciplinary field. Today we know that the human body represents a scaffold upon which a multitude of mutualistic and symbiotic species build a residence, creating a diverse ecosystem composed of bacteria, archaea, protozoa, fungi, and viruses. Individuals are not solitary, homogenous entities but consist of complex communities of many species that likely evolved during a billion years of coexistence. In this lecture I will demonstrate that health is fundamental multi-organismal; and that any disturbance within the complex community of host and microbial cells has drastic consequences for the wellbeing of the individual member of this association. This newfound awareness of the dependency of phenotypes on other species and environmental conditions presents additional layers of complexity for the life sciences including medicine and evolutionary theory. I will conclude that we can broaden and change our understanding of how humans interface with the world via the microbiome by fostering interactions and discussions between disciplines that normally do not speak with each other.

Tommaso Dorigo

Searching in the dark: unsupervised learning meets fundamental science

☑ **First Researcher of Experimental Particle Physics, Italian Institute for Nuclear Physics (INFN), Member of the CMS Experiment at CERN, Padua, Italy**

After the discovery of the Higgs boson in 2012, fundamental physics and related disciplines have turned to artificial intelligence with heightened interest, due to the verification that new discoveries are enabled by cutting-edge techniques developed in computer science. Supervised learning is now commonly exploited to improve the sensitivity of experiments, yet experts know that the real frontier is unsupervised learning - when machines may find structure in our data without explicit guidance. In this talk I will describe what I consider important avenues of exploitation for deep learning methods in the future, and what are the future prospects of this new development for fundamental science.

Vicentiu Radulescu

Some mathematical models in applied sciences: singularities, fractals and non-Newtonian fluids

☑ **Professor of Applied Mathematics, Department of Mathematics, University of Craiova, Craiova, Romania**

We are concerned with several basic problems at the interplay between pure and applied sciences. The models are presented from a mathematical perspective but by highlighting the importance of interdisciplinary and transdisciplinary works. The main direction considered in this talk take into account some important phenomena dealing with various types of singularities, fractals and non-Newtonian (smart) fluids.

Vivette Glover

Prenatal stress, effects on the fetus and the child, and interventions; a global perspective

☑ **Professor of Perinatal Psychobiology, Department of Surgery & Cancer, Imperial College London, London, UK**

Women suffer from as many symptoms of depression and anxiety during pregnancy as they do postnatally. As many as 15% have symptoms of concern in high income countries, and often about double that in low income countries. Many pregnant women suffer from increased stress also, including from domestic abuse. Again this is often higher in low income countries, together with the additional stresses caused by poverty and food insecurity. War or climate change can also cause increased stress. All this matters for the pregnant woman herself, but also for her baby. If a woman is depressed, anxious or stressed during pregnancy this increases the risk for her future child. They have an increased risk of neurodevelopmental problems such as ADHD, conduct disorder or being on the autistic spectrum, as well as having symptoms of anxiety or depression themselves. They are at increased risk of premature delivery or having other physical conditions such as of asthma. Most children are not affected, but for those that are it is serious. Whether they are affected, and in what way, depends in part on the specific genetic vulnerabilities of the child. It can also depend on the quality of the postnatal care, but there is good evidence that prenatal stress, anxiety and depression can also play a causal role in child outcome. We are starting to understand the biological mechanisms that may underlie this. Several research groups have shown that if the mother is stressed or anxious, this alters the function of the placenta, allowing more of the stress hormone cortisol to pass from the mother to the fetus. This in turn can alter the development of the fetal brain. Other biological pathways including the immune system, and cytokines, are likely to be involved also.

All this means that it is important to help pregnant women improve their mental health and reduce stress. In high income countries health professionals should ask about symptoms of depression, anxiety and stress, including domestic abuse, and then provide suitable help. This can include talking therapies and appropriate drugs when necessary. Many are quite safe. In low income countries this may not be possible, but family and community can provide emotional support. We have also recently found that a music intervention, in which the whole antenatal clinic sing and dance, reduced symptoms of common mental disorders. More help of this kind will improve the wellbeing of the women, and also improve the outcome for the next generation.

Wenju Cai

Climate extremes in a warming climate

☑ **Director of the Centre for Southern Hemisphere Oceans Research (CSHOR), Hobart, Australia**

Ongoing greenhouse warming is hypothesised to inhibit an incipient ice age, and this seems to be supported by observations of Arctic sea ice and Antarctic ice mass loss, as well as glacier retreat. Whether greenhouse warming has already affected variability remains unclear. In this presentation, I will present emerging evidence that greenhouse warming is likely to increase frequency of extreme weathers.

Francesco Pasqualini

How (not) to build a heart

☑ **Associate Professor of Industrial Bioengineering, Synthetic Physiology Laboratory, Department of Civil Engineering and Architecture, University of Pavia, Pavia, Italy**

The plan for tissue engineering has always been to deliver human tissue products that can repair, regenerate, and replace our organs. As far as the heart is concerned, that plan is being punched - hard - by reality (Cit. Mike Tyson). Through the lens of my post-doctoral research at Harvard, we will review advancements in heart muscle engineering and examine some of the fundamental roadblocks to its clinical translation. Specifically, we will see how simple bioengineering and image analysis tools can be used to establish unbiased and quantitative metrics of the phenotypic quality of stem cell-derived cardiac muscle cells. Further, we will see how techniques from biophysics can be used to provide a multiscale assessment of muscle contractility. Finally, we will examine how these tools are being adopted in the biotechnology industry. Based on my ERC project starting in 2021, we will conclude with why I do not think we are on the right track to "build" a heart and what we should do to "grow" one, instead. Round 2 with reality: ready, go!

Christopher Ryan Maboloc

Global Justice and Posthuman Ethics

☑ **Associate Professor, Ateneo de Davao University, Visiting Professor for Global Justice, American University of Sovereign Nations**

The ubiquitous presence of modern gadgets has reduced life into some material value in which the transcendental meaning of being human is narrowed into the virtual. Artificial Intelligence or AI threatens to take over human society. Big tech now controls the world. Social Media is the elephant in the room. In this investigation, I attempt to explain the influence of big tech and social media in the lives of people. Superintelligence comes as a threat to human freedom. Machine learning has enabled computer systems to analyze with speed data inputs that in the process will influence the choices that people make. The problem lies in the lack of critical attitude on the part of society. It is from this type of technological determinism that that future of the world hangs in the balance. To overcome this, the concept of the radical subject is introduced. This Marcusean concept shows forth the refusal of the human being to be controlled by the dominant forces of our time. While the products peddled by consumer society gratifies and alienates at the same time, the potential is there to resist the effects of repressive online technologies.

Albert C. Fahrenbach

A Complex Reaction Network for Understanding Early Earth Chemistry

☑ **Assistant Director of Australian Centre for Astrobiology (ACA) and Lecturer in the School of Chemistry, University of New South Wales, Australia**

Complex abiotic reaction networks on ancient Earth are often supposed to have contributed to the first molecules needed for life's emergence, in particular, nucleic acids and peptides. Experimental models for reaction networks of this ilk have been undergoing rapid development in recent years. In this online talk, a reaction network driven by ionizing radiation that produces a complex set of molecules including known synthetic precursors for ribonucleotides and amino acids will be presented. Model reaction networks of this sort can help us understand how important biomolecules like RNA and peptides may have arisen spontaneously; they also serve as valuable experimental platforms for better understanding and exploring the behaviour of complex chemical systems.

Alireza Mani

Interdisciplinary research in Network Physiology: Lessons from hypoxia

☑ **Principal Lecturer, Division of Medicine, University College London, London, UK**

A network approach in physiology represents a shift from a reductionist approach and reveals the functional interactions between different components of physiological systems. This approach evaluates the degree of information transfer between organ systems rather than evaluating each physiological process separately. Network Physiology has potential to provide solutions to unsolved questions in medicine such as the mechanism of multiple organ failure and acute respiratory distress syndrome. While the aims of Network Physiology are well defined, development of tools to quantify functional interaction of organs requires an interdisciplinary collaboration of scientists and mathematicians. Methods that have previously been developed for assessment of physical systems and telecommunication (e.g. entropy and information theory) are being used in analysis of physiological interactions. In this talk we will discuss the application of a network approach in evaluating physiological response to hypoxia in health and disease (e.g. COPD, sepsis and mountain sickness). Network analysis of organ systems require collaboration across disciplines and may provide insight in developing novel assessment tools and pave the way for addressing better ways to prevent and treat complex multifactorial disorders.

Amine Harbi

Translating the Emir Abdelkader' poetry: being lost in translation

☑ **Assistant Professor of Social Sciences and Humanities, Souk Ahras University, Souk Ahras, Algeria**

The Emir Abdelkader is widely known as a military leader who fought the French colonial forces and a Sufi master. A lesser known aspect of his life is his place in Arabic literature as a poet whose diwan covers various important events of his life. Indeed, like classical Arab poets, millstones of his life were marked by poems that covered a wide range of classical themes such as: amāsah (war and valour poems), ghazals (love poems), al-madī   (praise poems)…etc. His pluridisciplinary personality is manifest in his poems were the Mālikī faqīh , the erudite grammarian, and the innovative poet all contribute to a complex and refined approach to poetry. One is surprised, yet delighted, to see how a literary reference to Abu Nawas for instance, is used by the poet to praise the knowledge and Baraka passed on to him by a Sufi master performing the hajj. Hence, one is sometimes literally "lost in translation" because the poet often uses meanings and metaphors to make the reader, or the reciter lose his own being(his nafs) as reader, in order to be able to perceive the signs of the higher realm(his true Being). This is true not only when it comes to his metaphysical poems but also for poems that are a priori part of the profane catalog. While the emir's books on Sufism were often translated as well as his sufi poems, his diwan attracted less attention. We think that poetry is paramount in understanding the emir as a character and as an archetype of a civilization different from our own. Our work is an attempt to translate the emir's diwan to French, and to contribute to the understanding of his pluridisciplinary and nuanced personality in times of media consumerism and reductionist approaches in understanding non-materialist civilizations that while holding feet in the physical/material word, raise the head toward the metaphysical realm, as one of the emir's poems eloquently suggests.

Amirhossein Takian

So far so near: Global Pandemics and the essential need for multidisciplinary approach to policy-making

☑ **Chair and Professor of Health Policy, Department of Global Health and Public Policy, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran**

A pandemic is a global event that affects human beings' livelihoods and doesn't respect boundaries. COVID-19 pandemic has become the biggest global challenge since World War II. The ongoing crisis has disrupted all aspects of human life worldwide and revealed global health systems' frangibility. The numerous uncertainties, the unpredictable direction of the pandemic, and its psychological, social, economic, political, cultural, humanitarian, and development consequences have led to the most dangerous threat to health, social welfare, global economy and wellbeing in recent history.

The COVID-19 pandemic highlighted the necessity of global alliance, solidarity, and partnership to achieve good health and well-being for all (SDG 3). In this context, it is crucial to turn the outbreak to a learning curve, aiming to prevent greater losses during similar future crises of global scale. The complexity of fighting pandemics requires integrated and coordinated global actions beyond the whole-of-government and whole-of-society approaches, and in line with a whole-of-world approach. The necessity of increasing inter-sectoral action for sustainable health development, and the application of interdisciplinary sciences in all stages from policy-making to policy implementation, have contributed to the conceptual framework of drawing policy and management lessons from this pandemic.

This talk aims to elaborate the urgent need for a major policy shift towards fostering a meaningful and functioning interdisciplinary approach for policy-making towards strengthening the current response to COVID-19; otherwise, the world is likely to face chaos and devastating catastrophes for years and perhaps decades to come.

Anne Wyllie

### *Saliva as a reliable sample type for mass SARS-CoV-2 testing strategies*

☑ **Research Scientist in Epidemiology (Microbial Diseases), Department of Epidemiology of Microbial Diseases, Yale School of Public Health, New Haven, USA**

Quickly detecting and isolating individuals positive for SARS-CoV-2 is essential for limiting virus spread. Policy makers rely on the number of active cases to make decisions, and individuals use this information to evaluate risk should they return to public spaces. Robust testing strategies have been plagued with limited authorized diagnostic assays and high test prices, with large-scale implementation hampered by worldwide supply chain issues.

Having identified its potential early in the pandemic, we simplified saliva-based COVID-19 diagnostic testing by (1) not requiring collection tubes with preservatives, (2) replacing nucleic acid extraction with a simple enzymatic and heating step, and (3) testing specimens for SARS-CoV-2 in dualplex RT-qPCR. Moreover, we validated this approach ("SalivaDirect") with reagents and instruments from multiple vendors to circumvent supply chain disruptions.

SalivaDirect's simplified protocol does not compromise on sensitivity. In our hospital cohort, we found a high positive agreement (94%) between saliva tested with SalivaDirect and nasopharyngeal swabs tested with a commercial RT-qPCR kit. With the National Basketball Association we tested 3,779 saliva specimens from healthy individuals and detected low rates of invalid (0.3%) and false-positive (< 0.05%) results. Using comparative assays and sample types, we also demonstrated SalivaDirect to efficiently detect SARS-CoV-2 in asymptomatic individuals.

Saliva is a valid alternative to swabs for SARS-CoV-2 screening. Importantly, SalivaDirect enables labs to utilize existing infrastructure, improving test implementation time and requiring limited investment to scale-up to meet mass testing needs. With the safe and reliable self-collection of saliva, our vision is to help provide accessible and equitable testing solutions, especially in low-resource and remote settings.
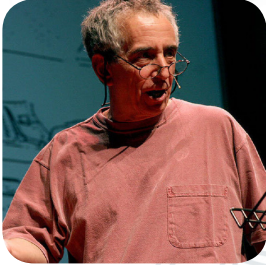
Barry Schwartz

*Freedom, Security, Efficiency, and Resilience:
Some lessons from the Covid Pandemic*

☑ **Professor of Social Theory and Social Action, Haas School of Business, U.C. Berkeley, USA**

Human beings value freedom. Nobody likes being told what to do. And if some freedom is good, then more is better. Human beings also value efficiency. Nobody likes to waste resources or pay more than necessary for goods and services. And if some efficiency is good, then more is better. We are right to value freedom and efficiency, but wrong to think that more is always better. We purchase freedom at the price of security, and we purchase efficiency at the price of resilience. Sometimes, the price we pay for more freedom and more efficiency is just too high. One of the lessons of the Covid pandemic is that taking security and resilience for granted can kill. We need, collectively, to find the "sweet spot" between too much freedom and too little_between too much efficiency and too little.

Juan Carlos Aldave Becerra

Didactics and teamwork to improve patient care in Immunology

☑ **Professor of Allergy and Immunology, Hospital Nacional Edgardo Rebagliati Martins, Lima, Peru**

Innovative educational resources to improve medical learning, and continuous teamwork are fundamental pillars for excellent patient care. I am pleased to share with the audience our experience and knowledge on didactic strategies and international collaboration to improve the outcomes of patients with immunologic diseases in a developing country.

Brian Little

Human Flourishing:
Well-Doing and the Sustainable Pursuit of Core Projects

☑ **Senior Fellow in Person-Analytics, Wharton School, University of Pennsylvania, Philadelphia, USA**

The trajectories of our lives, whether we flounder or flourish or simply muddle through, is examined by a diversity of fields, all grasping one part of the elephantine creature that is our species.

Within psychology, there is extensive evidence that well-being is intimately linked to stable traits of personality such as extraversion (+) and neuroticism (-). This evidence is compelling, but incomplete.

I propose a social ecological model of human flourishing in which biogenic, sociogenic and Idiogenic features converge to shape the course of our lives.

Central to this model is a focus on well-doing, or felicitous action. By systematically exploring individuals' personal projects we bring into focus the full range of factors conducive to human flourishing. We provide evidence that human flourishing comprises the sustainable pursuit of core projects in our lives. This requires a shift from independent disciplinary stabs in the dark about the human condition. It requires that we make direct inquiries of the elephant herself.

Carson Bruns

Biomedical Smart Tattoos

☑ **Assistant Professor of Mechanical Engineering, ATLAS Institute, University of Colorado, Boulder, USA**

Although intradermal tattoos are best known in the domain of body art, they also have a variety of biomedical applications. While ordinary tattoo pigments have been used for decades in medical aesthetics and surgical procedures, a new wave of biomedical tattoo inks with specialized functions is on the rise, driven by innovations in nanotechnology. This session will provide an overview of the past, current, and future applications of tattooing in biomedicine.

Chi-Ming Lam

Rationality as an Educational Aim

☑ **Associate Professor of Philosophy and Education, Department of International Education, Education University of Hong Kong, Hong Kong, China**

Despite the apparent ample justification for teaching children to be rational, there is considerable controversy among philosophers over whether rationality is worth defending as a basic educational ideal. For instance, while some critical theorists assert that the extraordinary success of reason, in the form of scientific rationality and means/end calculations, in offering mankind domination over nature leads inexorably to domination of humans over humans, many feminist philosophers argue against rationality on the grounds that our traditional ideals of rationality are often modelled on stereotypically masculine traits (e.g. being dispassionate) and then used to denigrate the stereotyped nature of women (e.g. being emotional). In this paper, I first argue that, following Nicholas Rescher, rationality should be conceptualized as comprising cognitive, practical, and evaluative rationality. For one thing, this conception is comprehensive and thus able to remedy the defects of the popular means/end theory. For another, the ideal of rationality implicit in this conception is an inclusive rather than an exclusive one: not only does it not force us to choose between the cognitive and emotional components of our nature, it actually forbids nothing that is good for us. Based on this tripartite conception of rationality, I then advance an argument founded on pragmatic considerations for rationality as a fundamental educational ideal. Finally, in order to promote the development of rationality in children, I suggest that teachers should engage them in doing philosophy in the classroom, especially by means of Matthew Lipman's Philosophy for Children programme.

Clara Vasconcelos

Pro-environmental attitudes and behaviours to respondably protect nature

☑ **Interdisciplinary Centre of Marine and Environmental Research of the University of Porto; Faculty of Sciences of the University of Porto**

Pro- Environmental conscious behaviours can be defined as efforts conducted with the explicit goal of conserving the natural environment, whether in its entirety or in specific ecosystems, from the detrimental effects of human activity. Environmental issues have become more essential than ever before, and individual actions are widely admired, as humankind's impacts on the environment are growing every day. Some studies refer that pro-environmental behaviours and attitudes depend on socio-economic factors (age, life cycle, gender, education, household structure and income), psychological factors (beliefs, attitudes, awareness, norms, values, identity, knowledge about the environment, care for the environment, emotions, habits, place of control, personal responsibility), social factors (reference groups, reputation, norms) and institutional factors (sanctions, country's development status). But all citizens must be well-informed in order to deal with emerging concerns such as climate change, plastic in the oceans, pandemics, natural resource exploration, natural disasters and others environment emergent threats to human life on the Earth system. Pro-environmental behaviours and attitudes, as well as social and economic new ways of thinking and acting are required to responsibly protect nature. However as referred in the literature even if we are determined to change our behaviours to more environment-friendly ones, if we do not practice new habits long enough, old habits will return, and we will be trapped in our old routines. From a simple ride in a bicycle or using public transportation instead our individual cars, or to turn of the tap whenever we are not using the water, to more complex changes in behaviours like electric cars and biological food, it is time to think in saving the Earth to enable our life in this planet.

Daniel King

Challenges and opportunities in addressing unhealthy digital technology habits

☑ **Associate Professor in Psychology and Clinical Psychologist, College of Education, Psychology, and Social Work, Flinders University, Adelaide, Australia**

Globally, there is growing recognition of the harms generated by unhealthy digital technology habits. The World Health Organization (WHO) recognizes, for example, problematic gaming and gaming disorder in the International Classification of Diseases (ICD-11). Some individuals, such as adolescents, are more vulnerable than others to developing unhealthy habits, which may progress to addiction in the absence of protective countermeasures. Public health recommendations have included delaying gaming involvement and restricting screen time during early developmental periods of life. However, the high accessibility, convenience, and affordability of gaming and other digital technologies across home, work, and school domains has often made these recommendations difficult to follow. This talk will summarize some of the current guidelines and research on interventions for problem digital technology use. Addressing these problems effectively requires the collaboration of multiple areas of influence including families and peers, schools, health providers, government bodies, and the industries that provide online content.

Delfin Ortega Sanchez

### STEAM and social studies education: integrating scientific disciplines to solve social problems

☑ **Department of Specific Didactics, Faculty of Education, University of Burgos, Burgos, Spain**

This paper aims, on the one hand, to reveal the educational potentialities of the integration of Science, Technology, Engineering, Arts and Mathematics (STEAM) in social studies education; on the other hand, it aims to approach the perceptions and self-efficacy of future Secondary Education teachers (n = 107) according to gender (male = 56, female = 51). Considering the linkage of STEAM education with the bases of problem-based learning and the promotion of critical thinking skills, this research seeks to approach how future teachers perceive and feel able to implementing integrated education in social science.

In accordance with the purposes of social studies education to educate in citizen participation, this study of quantitative approach evaluates the degree of agreement and strength of agreement in their representations about the usefulness of integrated education to teach to understand and intervene in contemporary social problems. To this end, Cohen's Kappa coefficient is calculated from an instrument constructed by two theoretical dimensions (perceptions and self-efficacy), and 6 statements about the relevance of integrated education in social studies and its possibilities of real application in the classroom. The rating items, arranged on a 5-point Likert scale, were based on the contribution of integrated education to the development of critical and creative thinking skills (social thinking) and, in particular, to the understanding and resolution of contemporary social problems.

The results obtained report a high degree of agreement between men and women on the existence of a lack of confidence and understanding of the benefits of integrated education in social studies education ($\kappa \geq 0.71$, p = 0.000). Although the curricular relevance of this approach is affirmed, the perception of its difficulties of application and in its anecdotal nature regardless of gender, is generalized.

We agree with Penner (2019) on the need for a "teacher education of purposeful integration". Indeed, the absence of research results on integrated teaching in the initial training of social studies teachers motivates the need to design, implement and evaluate programs specifically aimed at integrated teaching. This teaching would necessarily have to include social problems, as the main content, in history and geography education.
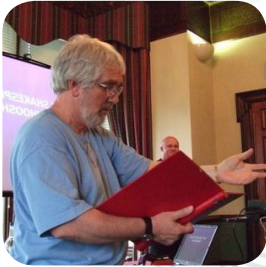
Brian Lighthill

Integrated Education

☑ **Actor, Television and Radio, Drama Producer/Director, Facilitator and Lecturer Round the UK to Learners in both an Academic Setting and in the Real-Life World**

Now is the opportunity to re-imagine Learning:
The theme of this year's Conference is 'The Elephant in the dark' - a variant on: 'The elephant in the room' (defined as: 'a major problem or controversial issue that is obviously present but avoided as a subject for discussion'). Let me name this elephant 'Pedagogy'. My paper will shine a light on this cumbersome animal by exploring two key questions, "Is Pedagogy, as-is, the best way to develop young learners academically, socially, and for the good of humankind?" and, "Is Pedagogy, as-is, moving with the times - or is it, like the elephant, stuck in the 'dark' - the Dark Ages".

Julia Espinosa

Physical and causal inferences in domestic dogs

☑ **PhD Candidate in Psychology, University of Toronto, Toronto, Canada**

Domestic dogs are primarily recognized for their social reasoning and skillful interactions with humans, but comparatively little is known about how they make inferences about physical objects or recognize cause-and-effect relationships in the environment. How do dogs perceive the world around them and what cognitive processes are involved in winning a game of fetch or finding a ball that has rolled under the couch? While these might seem like trivial scenarios, the ability to track objects (even toys) in one's environment and make inferences about how they will behave are mental abilities that support a wide variety of behaviours from play to hunting to understanding social interactions. I address this gap with empirical studies of dogs' physical and causal reasoning, examining their ability to make inferences about object interactions and recognize underlying causal structures. My work sheds light on the evolutionary origins of fundamental cognitive processes by exploring how dogs interact with objects in their environment.

Fabien Lotte

Brain-Computer Interaction: At the crossroad of Machine and Human Learning research

☑ **Research Director, National Institute for Research in Computer Science and Control (INRIA) Bordeaux Sud-Ouest, Bordeaux, France**

Brain-Computer Interfaces (BCIs) are systems that can translate the brain activity patterns of a user into messages or commands for an interactive application. Such brain activity is typically measured using Electroencephalography (EEG), before being processed and classified by the system. A prominent type of BCI is Mental Task-based BCI (MT-BCI), with which users send commands by performing mental tasks, e.g., imagined movements or mental subtractions, which are recognized by the BCI. MT-BCIs have proven promising for a wide range of applications ranging from communication and control for motor impaired users, to gaming targeted at the general public and stroke rehabilitation, to name a few. Despite this promising potential, MT-BCIs are still scarcely used outside laboratories for practical applications. The main reason preventing MT-BCIs from being widely used is arguably their poor usability, which is notably due to their low robustness and reliability. There is thus a need to make BCI more reliable.

A MT-BCI should be considered a co-adaptive communication system: its users learn to encode commands in their brain signals (with mental tasks) that the machine learns to decode using signal processing. Therefore, designing a truly reliable BCI requires careful understanding and design of both machine learning algorithms and user training paradigms. Indeed, we need robust machine learning algorithms to process and classify EEG signals, despite their variability and low signal-to-noise ratio. We also need an understanding of BCI user learning psychology to provide optimal feedback and training tasks to users so that they could learn as effectively and efficiently as possible how to control the BCI. Finally, we need to consider both aspects together, the feedback provided to BCI users being the output of the machine learning algorithms. In this talk we will thus present both aspects of BCI design - human and machine - and how they can or should interact for designing reliable BCIs.
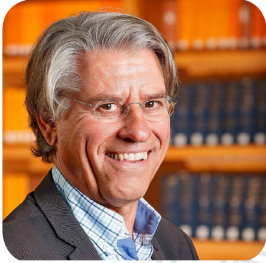
Frans von der Dunk

The importance of space lawyers

☑ **Professor of Space Law, University of Nebraska College of Law, University of Nebraska, Lincoln, USA**

Most people perhaps might not take the concept of 'space law' very seriously – 'OK, so tell me then, who owns the Moon?'. Using the impending arrival of 'space tourism' on the scene as a case study, this presentation however will argue that 'space law' is key to help preserve and enhance the beneficial aspects of space activities while limiting their less benign aspects. The recent suborbital flights of Richard Branson and Jeff Bezos and the plans of Elon Musk's company to fly passengers to the Moon and beyond are not taking place in a 'lawless void'; and how the law applicable and applied to these activities in the future will be further developed will also determine the future of private manned spaceflight.

Giulia Grancini

Understanding and Optimizing Interface Energetics and Processes: an essential step towards efficient and stable perovskite solar cells

☑ **Professor of Chemistry, University of Pavia, Pavia, Italy**

Engineering interfaces in perovskite solar cells is nowadays paramount in the optimization of multilayer perovskite device stack. This stem true for multi-dimensional (2D/3D) perovskite based solar cells, where high efficiency can be combined with promising device durability. However, the exact function of the 2D/3D interface in controlling the device behaviour and the interface physics therein are still vague.

Here I will discuss the 2D/3D functions which can simultaneously act as surface passivant, electron blocking layer, and driving efficient and selective charge extraction. In particular, I will demonstrate that the exact knowledge on the interface energetics is crucial to obtain for a smart interface engineering. As an example, I will discuss the case of thiophene-based 2D perovskite/ 3D perovskite interfaces forming a p-n junction. This leads to a reduction of the electron density at the hole transport layer interface and ultimately suppress the interfacial recombination. As a consequence, we demonstrate that photovoltaic devices with enhanced fill factor (FF) and open-circuit voltage (VOC) of 1.19V which approaches the potential internal Quasi-Fermi Level Splitting (QFLS) voltage of the perovskite absorber, nullifying the interfacial losses. We thus identify the essential parameters and energetic alignment scenario required for 2D/3D perovskite systems in order to surpass the current limitations of hybrid perovskite solar cell performances. This knowledge turns fundamental for device design, opening a new avenue for perovskite interface optimization.

Hassan Abolhassani

Alteration of T cell repertoire in inborn errors of immunity associated with DNA repair and methylation defects

☑ **Division of Clinical Immunology at the Department of Biosciences and Nutrition, Karolinska Institutet at Karolinska University Hospital Huddinge, Stockholm, Sweden.**

Inborn errors of immunity (IEI) or primary immunodeficiency diseases (PIDs) constitute a group of highly heterogeneous genetic disorders caused by defects in the immune system, predisposing individuals to an increased frequency and severity of infections, immune dysregulation, autoimmune manifestations and malignancies. The establishment of adaptive immunity in a selected group of IEI patients with DNA repair and methylation defects might be perturbed, resulting in a restricted diversity of the immune repertoire, and increased susceptibility to infections. However, the mechanism underlying the defects relate to T cell receptor (TCR) repertoire and phenotypic heterogeneity of immunodeficiency remains obscure. We studied the TCR repertoire in patients with different monogenic IEI associated with DNA repair pathway and methylation regulation and uncovered distinct characteristics of repertoire diversity. We propose that early aberrancies in thymus T cell development predispose to the heterogeneous phenotypes of the immunodeficiency spectrum. Shorter complementarity-determining region 3 (CDR3) lengths in ATM-deficient patients, resulting from a decreased number of nucleotide insertions during VDJ recombination in the pre-selected TCR repertoire, as well as the increment of CDR3 tyrosine residues, lead to the enrichment of pathology associated TCRs, which may contribute to the phenotypes of ATM deficiency. Furthermore, patients with DNMT3B and ZBTB24 mutations who exhibit discrepant phenotypes present longer CDR3 lengths and reduced number of known pathology associated TCRs. Despite unique observations, it should be noted that the aberrations in repertoire diversity are inferred with limited sample size, an independent case-control cohort design can presumably generate different overall patterns in terms of some repertoire metrics. This is even more challenging considering other sources of variability in clonotype abundance from repertoire sequencing experiments (biological repertoire variations and fictitious deviation due to noise). Even in single-cell immune repertoire sequencing that does not bias from expression noise and PCR affects the individual nature of each cell cause an irreducible source of clonotype variability.

Indre Viskontas

Creativity under Stress

☑ **Assistant Professor of Psychology, University of San Francisco, San Francisco, USA**

Anxiety is often a killer of creativity, as it pushes us towards seeking out what we know, rather than taking risks. What happens in the brain when we are stressed? How do these changes affect creativity? In this talk, Dr Viskontas will present an overview of the acute and chronic effects of stress on the brain, and will explain how different facets of creativity are affected by stress. She will then propose ways to mitigate the effects of stress and anxiety to enhance creative expression, based on recent findings from labs studying the neuroscience of creativity and her own experience as both an opera singer and director.

Jill Seubert

Precision Timing and Autonomous Deep Space Navigation: How Advancements in Atomic Clock Technology Can Influence the Future of Deep Space Exploration

☑ **NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA**

Traditionally, the navigation of spacecraft traveling through deep space has been performed on the Earth, as a two-way tracking system is required to remove onboard timing errors. The recent demonstration of a high-precision, high-accuracy space-rated atomic clock now makes it possible to collect navigation data onboard the spacecraft with no loss in data quality, a fundamental capability required to further develop autonomous deep space navigation. This presentation explores why timing is so critical to navigation, and how advancing autonomous deep space navigation can shape the future of space exploration.

Kim Gorgens

Brain Injury:
Disrupting the Revolving Door of the Juvenile Justice System

☑ **Professor of Psychophysiology, Clinical Neuropsychology and Psychology of Criminal Behavior, Graduate School of Professional Psychology, University of Denver,Denver, USA**

This brief presentation will highlight a decade of data from more than 4500 adults and young people involved in the correctional and court systems in a mountain state in the US. This presentation will also highlight a novel programming model from Colorado that is designed to disrupt the trajectory of adults and youth in the US criminal justice system. The Colorado TBI Model was designed and is used to identify brain injury history, assess cognitive functioning and to identify psychosocial vulnerabilities in the service of making recommendations for treatment modification and community referrals that support the youth and adults through (and ultimately out of) the criminal justice system. The research has been spotlighted in a 2018 TED talk on brain injuries in criminal justice with nearly 4 million views and in feature stories in US News, Newsweek, and a 2021 story in the Economist (Banged up. Brain injuries are startlingly common among those who have committed crimes: Preventing them could lower crime rates).

Leah C. Georges

The Case For and Against Generations as a Demographic Construct

☑ **Associate Professor and program director of Interdisciplinary Leadership doctoral program, Creighton University, Omaha, USA**

For the first time in modern history, there are five generations interacting in society (Veterans, Baby Boomers, Generation X, Millennials, and Generation Z). Popular press and media has drawn our attention to how each generation is distinctly different from the next and how these inherent differences often lead to conflict at work and beyond. However, social science research from across several disciplines hasn't revealed the dramatic differences between these generations that the media and some popular press might lead us to believe. This talk will present a focused summary around how generations have been holistically defined and provide some arguments around whether (and how) we might conceptualize this idea of 'generations' in our research and in practice.

Salvatore Lorusso

Multidisciplinarity, interdisciplinarity, transdisciplinarity and some emblematic examples: the historical-technical journal "conservation science in cultural heritage" - the case of Leonardo's Mona Lisa

☑ **Former Professor, University of Bologna Alma Mater Studiorum, Department of Cultural Heritage, Italy**

Firstly, just why inherent to the aims of the USERN Congress 2021, it is considered of particular significance to point out the clear distinction of the conceptual term "multidisciplinary" when compared to "interdisciplinarity" and "transdisciplinarity" or "crossdisciplinarity" in scientific research, academic didactics and in the respective territories in which Cultural and Productive Units are present. Three concepts which, as they imply initial stages, paths and different objectives, they arrive at different results.

Following the distinction between the three concepts, at an international level, it is appropriate to highlight situations that are attributable to a confused phase anchored to "multidisciplinary", but also to others that are representative of "interdisciplinary studies and activities".

These, operating in Institutions, Universities, Research Centers, also involve the territorial forces which, by interacting together, produce positive and synergistic effects.

In particular, the what has been said finds a natural application in the context of the numerous and diversified problems in the cultural and environmental heritage sector, whose resolution requires interdisciplinary skills and experiences in compliance with the holistic value of the cultural artefact.

As a result of scientific synergy transferred to the reality of the territory, a tangible emblematic case is that of the Journal "Conservation Science in Cultural Heritage". The Journal, founded in 2001 at the University of Bologna, with the title "Quaderni di Scienza della Conservazione", became an international Journal in 2007 (https://conservation-science.unibo.it/).

The Journal's achievements in the world of research and scientific information are based on two conceptual terms: interdisciplinarity and internationalization.

After the Journal's Qualified Reviewers have evaluated papers sent by Authors, using double blind peer review, the Journal publishes in hard copy and online research, studies, experimental contributions, thematic collections, as well as congress and conference proceedings, covering the complex and diversified historical-humanistic, philosophical-philological-social, technical-economic-managerial-legal-identity and, therefore, interdisciplinary problems relating to cultural and environmental heritage.

The concept of internationalization is respected through its Scientific Board, which includes Italian and foreign personalities with various cultural backgrounds and competences from Universities, Academies, Ministerial and Cultural Institutions and Scientific Organizations, with published papers arriving from Authors from different parts of the globe.

In addition, the Journal addresses the subject of professional figures in the heritage sector, covering topics such as the employment market and relevant actors, such as Universities, Ministries and territorial forces. The Journal is present in international platforms and data bases and is indexed in many university and library catalogs and has, moreover, important certification for open access journals.

Equally significant is the case study of Leonardo's Mona Lisa, an example of the synergy between art and science and the result of the different experiences and skills in the context of the debated open issue of the evaluation of a work of art. The intent on this occasion is also to mention this case study, which for some time has been the subject of my research as well as the subject of a heated debate at international level between scholars of historical and technical extraction.

Livio Luongo

Endocannabinoid signalling in chronic pain and related co-morbidities

☑ **Department of Experimental Medicine, Università della Campania "L. Vanvitelli, Italy**

Pain is one of the most common symptoms of disease and occurs when something hurts, causing an unpleasant feeling. Pain is a complex perception that differs extremely from patient to patient; moreover, each individual is the best judge of his or her own pain. Pain can be felt in one area of the body or all over and can be distinguished in acute and chronic pain. The first, warns you that you may have a problem; the second is different, indeed, may last for weeks, months, or even years. Different are the original causes an injury, infection, but also arthritis or cancer. Often, the real cause does not exist environmental and psychological factors can make chronic pain worse. Conversely, chronic pain is often difficult to treat and can be very debilitating disease. For thousands of years, Cannabis has been used for medicinal purposes. It's known that human body has an endocannabinoid system (ECS) that receives and translates signals from cannabinoids. This system produces some cannabinoids by itself, which are called endocannabinoids such as anandamide and 2-arachydonoyl-glycerol. The ECS contribute to regulate several functions such as sleep, immune-system responses, and pain. The modulation of the cannabinoid signaling could be very effective in some form of chronic pain and in particular neuropathic pain of various origin that is often refractory also to the opioids. Recently, we have pharmacologically characterized, in collaboration with other research groups, new phytocannabinoids in the Cannabis plant and some of them exert a very interesting analgesic effect.

Mohammad Mahdi Hasani-Sadrabadi

Artificial Immune Cells: How Close Can We Get

☑ **Assistant Project Scientist (Research Faculty), Department of Bioengineering, Henry Samueli School of Engineering, University of California, Los Angeles, USA**

The unique properties of immune cells have inspired many efforts in engineering advanced biomaterials capable of mimicking their behaviors. However, an inclusive model capable of mimicking immune cells in different situations remains lacking. Such models can provide invaluable data for understanding immune–biomaterials/stem cells crosstalk. Inspired by T lymphocytes, we have developed a new class of soft microparticles with physicochemical properties similar to naïve and active T lymphocytes. These artificial cells were not only presenting the physical properties similar to their original versions but can also synthesize therapeutic proteins on demand to manage and alter local immunity. This biomimicry model enables optimization of design parameters required for engineering more efficient drug carriers and serves as a potent replica for understanding the mechanochemical behavior of immune cells.

Majid Ebrahimi Warkiani

Novel microengineered for biomedical research

☑ **Associate Professor, School of Biomedical Engineering, University of Technology Sydney, Australia**

Micro/nano-fluidics, a technology characterized by the engineered manipulation of fluids at the micro/nano-scale, has shown considerable promise in point-of-care diagnostics and clinical research. Micro/nano-fluidic platforms are creating powerful tools for cell biologists to control the complete cellular microenvironment, leading to new questions and new discoveries. By simply miniaturizing macroscopic systems and taking advantage of the possibility of massive parallel processing, some micro/nano-fluidic chips enable high-throughput biological experiments such as cell sorting, single cell analysis, PCR, ELISA and chromatography.

Over the past 10 years, my group has developed several microfluidic systems, which are translated into practice. In this seminar, I will describe our recent efforts in development of new Microfluidic systems using 3D printing and microfabrication for various biological research applications. I will showcase our novel systems for high-throughput rare cell sorting (e.g., circulating tumour cells (CTCs), circulating fetal cells, and circulating stem cells) and their clinical utilities. I will present some of our efforts for large-scale manufacturing and enrichment of hybridoma cells inside perfusion bioreactors for drug development and therapeutic applications. In addition, I will present some of our new 2D and 3D microfluidics systems for single cell analysis, stem cell research and drug screening.
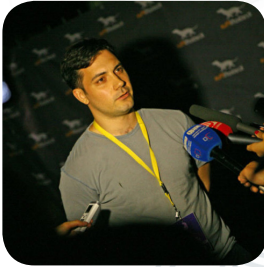
Miloš Milošević

Multidisciplinary approach to sport, psychology and creativity studies - a step beyond traditional application of psychology in sport

☑ **Professor Of Psychology, Singidunum University, Belgrade, Serbia**

Studies of sport and sport performance traditionally focus on the characteristics of the individual functioning of athletes and overlook the fact that sport is a collective activity in which the end result is not a simple sum of contributions and behavior of individuals but rather the result of their complex interaction. According to this feature, sports such as basketball, football, etc., can be classified in the domain of collective and collaborative creative practice, the same as theater or film, for example. This observation opens a new filed for interdisciplinary research of sport performance, but also of collective creative practices and collective creativity, especially when it comes to top and professional sport.

The results of studies of collective creativity show that in strictly selected and highly creative groups the quality of communication and interaction of group members lies in the basis of creativity of group work products. Interpersonal reactivity, which refers to different dimensions of empathy, is one of the basic preconditions for quality communication and interaction in group work. It should be no surprise that empathy has been shown in empirical studies to be a better predictor of group creativity than the creative ability tests. Although high creativity is a prerequisite for success in artistic work, highly developed empathy is necessary for this ability to be manifested in a group context. An analogy with sports could be easily made, so that although a high level of physical abilities and technical-tactical training is a prerequisite for sport success, high empathy could be necessary for them to be maximally manifested in a team context.

Group creativity is a special subject of study within the study of creativity, which requires measuring and evaluating both the creative abilities of group members and the creativity of the products of the group process. The validity of assessment and measurement would significantly contribute if both aspects of creativity were assessed and measured in the same way and by the same procedure. That is why an alternative method of assessment through the coefficients of creativity and uniqueness, which showed good metric characteristics in validation studies, was proposed.

The aim of this presentation will be to summarize open issues regarding proposed multidisciplinary methodologies and solutions as well as to present preliminary results of ongoing studies associated with it.

Natalya Shelkovaya

On the Nature of Human Evil

☑ **PhD in Philosophy and Associate Professor at the Department of Philosophy, Cultural Studies and Information Activity, Volodymyr Dahl East Ukrainian National University, Severodonetsk, Ukraine**

In the modern world evil and aggression reached the point when the issue of mankind's self-destruction becomes topical. What are the nature and the cause of human evil and what should be done to prevent the catastrophe? Philosopher's meditation on the Bible can help to answer these questions.

Having created man according to His image, God forbade him to eat from the tree of knowledge of good and evil, lest "thou shalt surely die" (Gen. 2:17). And God did not lie. Indeed, after man had put his will, his ego first and thus 'exchanged' God and the heart (the receptacle of "God's sparkle") for cognition and intellect he died as a hu(e)-man, a God-like being.

But, having died as a God-like being, man did not turn into an animal. His spirituality "fell," became "horizontal." It did not disappear, but it transformed into a deformed, Herostratus-like spirituality. And it was this deformed spirituality that gave birth to such monster as ethical sadomasochism.

Overemphasizing the ratio, man gradually turned into a programmed bio-machine trapped in the internet web or an appendage to his own creatures like computers and cell phones. Having abandoned the real, feeling "world of the heart" man came to the artificial virtual "world of the head." And this is an unavoidable pattern.

As a result of this choice depersonalization and depravity of identity take place, a person turns into "mass man" (Ortega y Gasset). More than that, we are witnessing mass moronization and zombization. Who benefits from it? Authorities (it is easier to rule this way). What is it done for? For Her Majesty Power, for the Golden Calf. Live human sacrifices are offered to an abstract power, to the dead golden calf. The dead dominate over the alive.

"God is love' (1 Jn. 4:8). Having betrayed and having forgotten God, man betrays and forgets love. Having lost the feeling of the sacred, man is losing the divine felling of love to all that is. Man is becoming aggressive. But according to the boomerang law man's aggression comes back. So, mankind is committing a suicide.

Is it possible to prevent this suicide, to stop the movement to the abyss of non-existence, to purify human soul of evil? Yes, by re-turning to our own self. The meaning of this expression (according to numerous mystics) is coming back to God or to yourself as a God-like being, homo cardiacus, regaining our lost spirit-soul-body integrity.

Orlando Manuel da Costa Gomes

Utility under the Dark Tetrad

☑ **Professor of Economics, Lisbon Accounting and Business School, Lisbon Polytechnic Institute (ISCAL-IPL), Portugal**

Literature in Psychology highlights four traits that shape an amoral and antisocial personality: Machiavellianism, narcissism, psychopathy, and sadism. Together these personality traits are known as the Dark Tetrad. Traits comprising the Dark Tetrad share similar characteristics and often overlap when applied to specific social contexts. However, there are distinguishing features that make them separate entities: Machiavellianism is mainly associated with the manipulation of others for personal gain; narcissism reflects egocentrism and a sense of entitlement; psychopathy is typically attached to impulsiveness, callousness and lack of empathy; and sadism is the trace one can associate to the enjoyment of cruelty. The Dark Tetrad has been extensively discussed in the literature in the context of individual behavior in school, in the workplace, and in other social environments, both from empirical and theoretical perspectives. In this study, the Dark Tetrad is approached from an economic theory point of view, emphasizing the impact of dark personalities over production and consumption outcomes. Given the respective definitions, the four traits have distinct implications on the behavior of economic agents and on the utility they draw from their own consumption and the consumption of others. Such implications are scrutinized in the context of a social-interaction dynamic economic model.

Ricardo Vinuesa

AI, computational fluid dynamics and sustainability

☑ **Associate Professor, KTH Engineering Mechanics, Stockholm, Sweden**

The advent of new powerful deep neural networks (DNNs) has fostered their application in a wide range of research areas, including more recently in fluid mechanics. In this presentation, we will cover some of the fundamentals of deep learning applied to computational fluid dynamics (CFD). Furthermore, we explore the capabilities of DNNs to perform various predictions in turbulent flows: we will use convolutional neural networks (CNNs) for non-intrusive sensing, i.e. to predict the flow in a turbulent open channel based on quantities measured at the wall. We show that it is possible to obtain very good flow predictions, outperforming traditional linear models, and we showcase the potential of transfer learning between friction Reynolds numbers of 180 and 550. These non-intrusive sensing models will play an important role in applications related to closed-loop control of wall-bounded turbulence. We also draw relevant connections between the development of AI and the achievement of the 17 Sustainable Development Goals of the United Nations.

Rossella Castagna

Biohybrid electrospun materials: the role of complex interfaces

☑ **"Seal of Excellence" MSCA-IF holder, Latvian Institute of Organic Synthesis, Riga, Latvia**

Biohybrid materials are formed by the combination of biogenic and non-biogenic components. Indeed, bio-molecules, cells or tissues can be combined with synthetic polymers or inorganic elements to generate active biohybrid materials, provided that the biocomponent retains its biological function during material processing and fabrication.

The electrospinning technique has proven very effective for incorporating delicate biomolecules into fibrous nanostructures for different applications. For instance, biohybrid nanofibrous membranes can serve as innovative solutions for sequestering drugs and their metabolites from wastewater. We electrospun poly(vinyl alcohol) (PVA)/bovine serum albumin (BSA) blended nanofibers starting from a bi-component feed solution. By demonstrating that our mats can remove ketoprofen from water, we showed that the combination of a BSA-induced biofunctionality with a nanostructured fibrous material allows for the development of an efficient biohybrid filtering device for the large and widely used family of nonsteroidal anti-inflammatory drugs (NSAIDs), which are often found in wastewaters as contaminants. Finally, we provided the crystal structure of the complex between BSA and ketoprofen, confirming the interaction between the two species.

Safa Baris

CD28 signaling and related Inborn Errors of Immunity

☑ **Professor of Pediatrics, Marmara University Hospital Pediatric Allergy and Immunology, Istanbul, Turkey**

Recently, many new types of human inborn errors of immunity (IEI) have been discovered with the advance of the high-throughput next-generation sequencing technologies. The most recent classification of IEI by the International Union of Immunological Sciences provides a huge number of single gene defects, responsible for unique IEI, including 450 diseases, and 65 of them are newly defined in the last two years. Understanding the monogenic causes and underlying mechanisms offers a clearer view for the distinct phenotypes that may be caused by different types of mutations resulting in loss- or gain-of-proteins' function (LOF/GOF). This also provides a comprehensive analysis to understand the genotype-phenotype relationship for the related defective genes. Co-signaling with the CD28 receptor provides a critical second signal for T cell activation and Treg development. CD28-mediated activation has diverse effects on T cell function, including forming immunological synapse, phosphorylation, transcriptions, post-translational modifications along with cytoskeletal remodeling for proper cellular functions. Inherited deficiencies have been recently discovered in CD28 pathways. The capping protein regulator and myosin 1 linker 2 (CARMIL2) and CD28 deficiencies. The CARMIL2 binds to cellular membranes via vimentin, and activates T cells by ligating CD28 and CARMA1 to mediate NF-kB signaling. Biallelic loss-of-function mutations in CARMIL2 cause combined immunodeficiency associated with dermatitis, inflammatory bowel disease, and Epstein-Barr virus-related smooth muscle tumors. Interestingly, CD28-deficient patients exhibit clinical symptoms due to human papillomavirus-2 and -4 infections, display increased levels of Epstein-Barr virus and cytomegalovirus in the blood, and respond poorly to vaccines but are otherwise healthy. The diversity between disorders locating in same pathway addresses the requirement of further investigational studies to better characterize the clinical and immunological features of diseases.

Sara De Biasi

Single cell approaches for T cell monitoring in viral infections and cancer

☑ **Assistant Professor of General Pathology and Immunology, Department of Medical and Surgical Sciences for Children and Adults, University of Modena and Reggio Emilia, Modena, Italy**

Over the past two decades, a pressing need to deeply profile either the tumour microenvironment or cells responsible for the immune response in viral infection has led investigators to integrate data obtained from traditional approaches with those obtained with new, more sophisticated, single-cell technologies, including high parameter flow cytometry, single-cell sequencing and high resolution imaging. The introduction and use of these technologies had, and still have a prominent impact in the field of cancer immunotherapy and viral infection, allowing delving deeper into the molecular and cellular crosstalk between cancer and immune system, and fostering the identification of predictive biomarkers of response. Besides the molecular and cellular cancer-immune system interactions, in this talk it will be discussed how cutting-edge single-cell approaches are helping to point out the heterogeneity of immune cells.

Shirin Moossavi

Multi-disciplinary microbiome research: when microbiome science meets philosophy and engineering

☑ **CIHR Postdoctoral Fellow, Department of Physiology and Pharmacology and Biomedical Engineering, University of Calgary, Canada**

Microbiome research has fundamentally changed our perception of the host-microbe interaction in maintaining health and predisposing or causing disease. Next-generation sequencing, culture-enriched molecular profiling, and gnotobiotic animal models have greatly expanded this field. However, major conceptual and technological hurdles and challenges exist necessitating a multi-disciplinary approach. Microbiome research can excel by meeting philosophy and engineering. Some examples from my research include rethinking causal frameworks in microbiome research, using organ-on-chip technology for microbiome research, developing microbiome-based diagnostics, and devising novel microbiome sampling technologies.

Sławomir Sztajer

Multidisciplinarity for the scientific study of religion

☑ **Employee of the Department of Comparative Research, Adam Mickiewicz University, Poznań, Poland**

The scientific study of religion has never been a homogenous discipline. Scholars of religion come from several different disciplinary settings including sociology, history, psychology, philosophy, phenomenology, geography, biology, and cognitive science. What is interesting is that the contemporary study of religion employs knowledge from different broader scientific fields such as natural sciences, social sciences, and the humanities. As a result, it uses disparate methodological strategies for interpreting and explaining religious phenomena. Fostering cooperation between different disciplines of the study of religion requires the ability to avoid the trap of simplistic reductionism. Reductionism is understood here as a tendency to explain the richness of religious phenomena in terms of narrow disciplinary concepts and theories. The opposite danger is to understand religious phenomena as sui generis phenomena. This approach may hinder interdisciplinary cooperation by excluding a variety of new insights and explanations. The multidisciplinary science of religion can try to avoid those trams and limitations by fostering openness to a multitude of approaches and seeking a balance between interpretive and explanatory endeavors.

Surapati Pramanik

Scientific misconduct: A study

☑ **Assistant Professor of Mathematics, Nandalal Ghosh B.T. College, West Bengal, India**

Scientific misconduct refers to the violation of the standard codes of scholarly conduct and ethical behavior in scientific research and is characterized by falsification, fabrication, and plagiarism. In Indian context, Society for Scientific Values (SSV) aims to promote integrity, objectivity, and ethical values in the pursuit of science. SSV helps in combating the hagiographical account of scientific practices in India. This study presents an overview of scientific misconduct and the crisis of scientific misconduct in India. It presents a chronological order to analyze scientific misconduct and its historical evolution in India. In Indian scenario document based analytical study is employed for the study.

Umberto Crisanti

Can you see the elephant yet? CBT and its candles

☑ **Psychotherapist and CBT Supervisor, Canterbury, UK**

On 22 June 2021, the Royal Collage of Psychiatrists tweeted: "If antidepressants are not working we have 3 options: increase dose, switch the drug or add in another medication".

The rise in specialisation has led to isolating and partitioning healthcare providers, and more worryingly, the activities of the brain, the mind and the body. Contrary to this current, Cognitive Behavioural Therapy (CBT) is the most widely accepted biopsychosocial treatment for depression and anxiety, which integrates neuroscience and a variety of perspectives such as physical, cognitive, emotional, social, and behavioural – along with their interdependence and the interaction between these dimensions. Here I present the case of a widowed 51 year old client who presented symptoms of depression as apathy, lethargy, oversleeping, isolating herself, feeling bad about herself, and symptoms of anxiety presenting as feelings of tightness in her chest, headaches, nausea, thoughts of 'I am going to be sick' and avoidance of leaving the house, public transport and socialising. Rather than isolate certain components and medicating those, treatment involved providing a safe environment, building a relationship, and teaching emotional regulation. PHQ, GAD7 and PCL-5 were used to assess depression, anxiety and trauma pre and post treatment. Results show that the client has met full recovery, with her symptoms of depression, anxiety and trauma improving significantly. This case study has some clinical implications for psychotherapists providing evidence-based treatments and suggests that biological alterations may support negative cognitions, emotions and dysfunctional behaviours and that the whole person is greater than the sum of its parts.

Valentina Cianfanelli

Breakthroughs in the coordinates regulation of autophagy and cell proliferation may fuel advances in biomedical medicine

☑ **Postdoctoral Fellow, Department of Pediatric Onco-Hematology and Cell and Gene Therapy, IRCCS Bambino Gesù Children's Hospital, Rome, Italy**

Autophagy controls important physiological functions through the degradation and recycling of cellular components. In this way, autophagy rapidly provides fuel for energy and building blocks for renewal of cellular structures. Autophagy is also a quality control mechanism which eliminates damaged proteins and organelles, thus counteracting the negative consequences of aging and preventing several diseases, including cancer.

The key cell-fate decision to initiate cell division integrates a large number of intra- and extracellular inputs, which are often impinging on autophagy too. In addition, disrupted autophagy results into altered cell proliferation. Regardless the clear functional link between autophagy and cell proliferation, the molecular mechanism(s) underlying their coordinated regulation were poorly understood.

Altogether, our discoveries led to a new paradigm in the understanding of how the cell coordinates autophagy and proliferation, and its crucial relevance in embryonic development, tumorigenesis and chemoresistance. In our studies we used cellular and molecular approaches, as well as in vivo models of tumorigenesis/tumor progression and embryonic development.

Initially, we identified the pro-autophagic protein AMBRA1 as a novel regulator of the proto-oncogene c-MYC. Through its interaction with the c-MYC phosphatase PP2A, AMBRA1 affects c-MYC stability, as well as c-MYC-dependent cell proliferation and tumorigenesis. As a result of this regulation, AMBRA1 is a tumor suppressor gene (1). Interestingly, we also reported mTOR, the master regulator of cell proliferation and autophagy, to be responsible for the regulation of the AMBRA1-PP2A-c-MYC axis (1).

Next, we further characterized the relevance of AMBRA1 in cell proliferation, and we found AMBRA1 to mediate the ubiquitylation and proteasomal degradation of D-type cyclins as a substrate receptor for the Cullin 4 E3 ligase complex (2, 3). In this way, AMBRA1 regulates D-type cyclins levels, and, in turn, the response of cancer cells to CDK4/6 inhibitors (2, 3). Of note, our findings were confirmed by 3 independent laboratories, and attracted the attention of prominent researchers in the field of cell proliferation and cancer (2-5).

We also show that the increase in D-cyclins, caused by AMBRA1 loss, triggers DNA damage and replication stress (2). As a result, the CHK1 kinase is activated, thus rendering low-AMBRA1 tumors particularly sensitive to CHK1 inhibitors (2).

Similarly to AMBRA1, general autophagy is also relevant to preserve the genome integrity. In fact, we demonstrated that autophagy prevents aberrant mitosis, which are a common cause of genomic instability in tumorigenesis. In this scenario, autophagy preserves centrosome organization through targeting Centriolar Satellites (CS) (6-8). Mechanistically, the interaction between the CS organizer PCM1 and the autophagy receptors drive the degradation of the CS (6).

Vittorio Limongelli

Virtual microscopes to reproduce in silico molecular binding processes in realistic conditions

☑ **Professor of Computational Biology & Pharmacology, Institute of Computational Science (ICS), Faculty of Biomedical Sciences, University of Lugano USI, Switzerland**

Molecular binding interaction like drug/protein or protein/protein is one of the fundamental processes in biology. Elucidating its structural and energetic aspects might help in understanding cell functioning and develop ad hoc exogenous control (e.g., drug design) [1]. However, studying such processes is often elusive to both experimental and theoretical techniques due to their limiting size- and time-scale.

We demonstrate that it is possible to overcome such limitations developing virtual microscopes in which advanced free-energy calculations reproduce behaviour of molecular binding partners in close-to-physiological conditions [2]. We will see the case of G-Protein Coupled Receptors, molecular target of top selling drugs, which form functional dimers in membrane that are for the first time characterized at atomistic level through minute-timescale binding simulations (Fig. 1). In particular, we could resolve the structures of homo- and heterodimers of CCR5 and CXCR4 chemokine receptors, showing that certain transmembrane helices form the preferred binding modes between protomers. In addition, the diverse dimer structures differ in the access to the binding sites of the ligand (extracellular) and the effector G-protein (intracellular), indicating that dimerization de facto is a fine allosteric mechanism to modulate receptor activity in which the activity of one protomer can be regulated by the binding of another one (crosstalk regulation) [3].

The presented results, together with the recent advance in drug/protein binding studies achieved in our group [4-6], pave the way to the design of ligands able to regulate GPCRs dimerization and in turn their activity, with therapeutic potential for a broad spectrum of disease.

Minghao Yu

Towards High-Power Energy Storage: Materials, Electrochemistry, and Devices

☑ **Center for Advancing Electronics Dresden (cfaed), Faculty of Chemistry and Food Chemistry, Technische Universität Dresden, Germany**

Electrochemical energy storage technologies have been brought into the spotlight as they provide elegant and efficient approaches to store, transport, and deliver energy harvested from sustainable energy resources. Typically, supercapacitors and batteries differ in electrochemical mechanisms, hence featuring almost opposite energy and power characteristics. However, the demand for power and energy supply is equally imperative in actual use and is keen to expand in the future. Thus it is highly desirable to design new electrode materials or rationally re-construct the recognized electrode materials for energy storage devices to mitigate the power-energy tradeoff.

Here, we will present our recent efforts in exploring 2D layered organic/inorganic materials for high-power energy storage applications. We will show 2D redox-active carbon-rich frameworks as promising electrode alternatives for high-power energy storage devices by demonstrating 2D polyarylimide covalent organic framework (COF) as the first COF anode for Zn-ion aqueous batteries5 and dual-redox-site 2D conjugated metal-organic framework as a high-capacitance and wide-potential-window pseudocapacitive electrode. Moreover, we have demonstrated several interlayer engineering strategies for inorganic 2D layered materials to regulate the ion transport behaviors and boost the power-energy performance of the assembled energy storage devices.Finally, we will introduce our recent studies on developing wearable, self-protection, and functional energy storage devices.

Wayne Slater

The Dark Side of Productive Struggle and Productive Persistence

☑ **Associate Professor of Teaching and Learning, Policy and Leadership, University of Maryland, College Park, USA**

The Carnegie Foundation for the Advancement of Teaching (2009) grounded their conceptualization of productive struggle and productive persistence from the National Research Council's report How People Learn (2005) by establishing three principles of learning: 1) new understandings are constructed on a foundation of prior understandings, 2) the brain constructs cognitive networks that are important in the learning process, and 3) the ability to self-monitor (metacognition) enhances learning in mathematics and science education. Two key concepts in their framework are productive struggle and persistence. Productive struggle focuses on challenging and relevant tasks, explicit connections to concepts, and deliberate, sustained problem solving. Productive persistence focuses on the "non-cognitive" elements of learning such as mindsets, "grit" or passion and perseverance for long-term goals, and self-control articulated in a five-dimensional framework: Students believe it is possible to learn; feel socially tied to peers, faculty, and the course; feel that the material has value; have the skills, habits, and know-how to succeed; and faculty and schools support student mindsets and skills. Moving beyond mathematics and science education, this review focuses on the level of emphasis on productive struggle and persistence in PK-12 literacy education. Using discourse analysis informed by validity and reliability checks, this focus is on literacy education peer-reviewed policy documents, such as, the Standards for the Preparation of Literacy Professionals (2017), and mathematics and science education peer-reviewed policy documents, such as, Principles, Standards, and Expectations: National Council of Teachers of Mathematics (2021) published from 2009 to the present. Findings indicate a greater emphasis on productive struggle and persistence in mathematics and science education when compared to PK-12 literacy education with its greater emphasis on the non-cognitive dimensions of learning, productive persistence. At the same time, this research revealed a dark side to an emphasis on productive struggle and productive persistence that hinders learning. Implications for students' acquisition of literacy for the 21st century will be considered.

Ekaterini Goudouris

Multidisciplinary studies should reflect multidisciplinary practice: the case of inborn errors of immunity

☑ **Professor of Pediatrics, Allergy and Clinical Immunology, Faculty of Medicine, Universidade Federal do Rio de Janeiro, Brazil**

The inborn errors of immunity are a large and quite heterogeneous group of diseases, which is responsible for the increasing complexity of their management, demanding knowledge of multiple medical specialties and other health professions.

The practice with these patients shows us and imposes on us multidisciplinarity in daily life. However, scientific production does not always follow this daily practice, consisting of specific publications of each specialty involved. We consider it relevant to promote this academic multidisciplinarity in order to improve the treatment of this group of patients.

We will discuss proposals to reflect the multidisciplinarity of daily practice in scientific publications.

Alireza Abdollah Shamshirsaz

Multidisciplinary management of placenta accreta spectrum

☑ Associate Professor of Fetal surgury/Maternal Fetal Medicin, Department of Maternal Fetal Medicine, Texas Children's Fetal Center, USA

Antonio Condino-Neto

The implementation of universal Newborn Screening for Primary Imunodeficiencies in Brazil, a model for developing countries

☑ Professor of Immunology and Experimental Medicine, Department of Immunology, Institute of Biomedical Sciences, University of São Paulo, São Paulo, Brazil

Armin Arbab-Zadeh

The Urgency to Pivot Back to Hippocratic Medicine

☑ Director of Cardiac Computed Tomography, Associate Professor of Medicine, Johns Hopkins University, Baltimore, USA

Ashkan Mowla

Role of Artificial Intelligence in the Management of Acute Ischemic Stroke

☑ Clinical Assistant Professor of Neurological Surgery (Clinician Educator), Division of Endovascular Neurosurgery, Department of Neurological Surgery, Keck School of Medicine, University of Southern California (USC), Los Angeles, USA

Serena Sanseviero

Simultaneity of vision and incremental knowledge

☑ **Guest Lecturer In Visual Communication And Design Of Communication, University G.D Annunzio Cdl In Design, Corradino D Ascanio Salerno Area, Italy**

Mohammad Hossein Nekoofar

Critical Appraisal, a Scientific Tool to Touch it in the Dark

☑ **Associate Professor of Endodontics, Department of Endodontics, School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran**

Frank Sellke

Surgical vs transcatheter aortic valve replacement: Resolving the different perspectives of clinicians

☑ **Karlson Professor and Chief of Cardiothoracic Surgery and Director of the Cardiovascular Institute at the Alpert Medical School of Brown University and Lifespan Hospitals, USA**
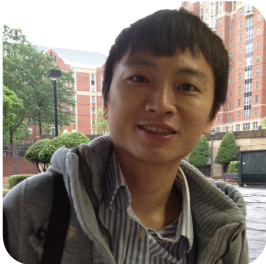
Zong-Hong Lin

The Understanding and Application of Triboelectrification

☑ **Assistant Professor, Institute of Biomedical Engineering, Hsinchu, Taiwan**

Ivan Hung

Update on antiviral treatment for Covid19 patients

☑ **Professor and Assistant Dean, Department of Medicine, LKS Faculty of Medicine, University of Hong Kong, Hong Kong, China**

Jan Nouwen

Education during a Pandemic: Time for Virtual Mobility!

☑ **Chairman of Research Master Programs, Coordinator of Research & Global Health Education, Trainer sub-specialty of Infectious Diseases, Erasmus MC, Rotterdam (Erasmus MC), The Netherlands**

Kenneth Kosik

How demographic history of drift and founder effects can produce a modern mutational landscape of neurodegenerative conditions

☑ **Professor of Neuroscience, University of California, Santa Barbara, USA**

Kevin Lowe

The impact of the Dark Triad on leader selection and performance

☑ **Professor of Leadership, Business School, University of Sydney, Sydney, Australia**

Manoj Gupta

Resorbable Magnesium For Reducing Human Pain

☑ **Former Head of Materials, Division of the Mechanical Engineering, Department and Director designate of Materials Science and Engineering Initiative at NUS, Singapore**

Seyed Farshad Allameh

Blended Learning: The Missing Piece of the Education Puzzle

☑ **Associate Professor of Internal Medicine, Department of Internal Medicine, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran**

Matthias Georg Von Herrath

The winner's curse - or how positivity bias in transmission of scientific knowledge slows the recovery process

☑ **Diabetes Center at La Jolla Institute for Allergy and Immunology, San Diego, USA**

Mehdi Farokhnia

Identification of novel therapeutic targets for addiction: Can we overcome the "valley of death"?

☑ **Staff Scientist, CPN, NIDA IRP and NIAAA DICBR, National Health Institute (NIH), USA**

Mehdi Mirsaeidi

Mask off-policy in the shadow of emerging SARS-CoV2 variants

☑ Associate Professor of Pulmonary & Critical Care, University of Miami, USA

Rafael Franco

Why metabolomics provide a myriad of data but not useful knowledge

☑ Professor of Biochemistry and Molecular Biology, Department of Biochemistry and Molecular Biomedicine, Barcelona, Spain

Moslem Bahadori

Converging in Medical Sciences for a Better Performance

☑ Emeritus Professor, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

USERN Congress Meet the Experts

https://userncongress.tums.ac.ir

Prof. Nima Rezaei

Meet the Founder of USERN

He is an Iranian scientist, a professor of clinical immunology and allergy at Tehran University of Medical Sciences, Associate Dean of International Affairs in the School of Medicine and the Director of Global Academic Program (GAP).

He is the mastermind, founder and current president of the Universal Scientific Education and Research Network (USERN).

He is known for his research in Primary Immunodeficiencies, characterization and treatment. He initiated the Iranian Primary Immunodeficiency Diseases Registry (IPIDR) in 1999 under supervision of Professor Asghar Aghamohammadi, which earned him the best research project award in the 4th Avicenna festival.

Prof. Hans Ochs

Meet the USERN Advisor

Prof. Hans Dieter Ochs is an immunologist and pediatrician. He is Professor of Pediatrics, Division of Immunology, Department of Pediatrics, University of Washington School of Medicine, Seattle.

His research focuses on the molecular basis of Primary immunodeficiency diseases with special interest in the genes that have been linked to the Wiskott–Aldrich syndrome, Hyper IgM syndrome, X-linked agammaglobulinemia, IPEX syndrome and autosomal dominant Hyper IgE syndrome. To improve the long-term outcome of these disorders, he has actively participated in clinical trials to develop strategies of immunoglobulin replacement therapies, hematopoietic stem cell transplantation, and gene therapy.

His clinical interests focus on the use of intravenous and subcutaneous immunoglobulin in patients with antibody deficiencies and the in vivo analysis of antibody production using bacteriophage Phi X 174. He and his collaborators contributed to the identification of several genes associated with Primary immunodeficiency diseases located on the X chromosome, including CD40L, Wiskott–Aldrich syndrome protein, Bruton's tyrosine kinase, and FOXP3.

Prof. Armin Arbab-Zadeh

Meet the USERN Advisor

He is Associate Professor of Medicine at the Johns Hopkins University School of Medicine and Director of Cardiac Computed Tomography in the Division of Cardiology at the Johns Hopkins Hospital in Baltimore, MD. After attending medical school in Germany and completing internships in medicine and surgery in Germany and Britain, he spent several years in cardiovascular research at the University of California at San Diego to study coronary artery disease using intravascular ultrasound. He then completed his postgraduate training in Philadelphia and Dallas to join the cardiology faculty at Johns Hopkins Hospital after a CT imaging fellowship in 2005.
Dr. Zadeh directs the CT coronary angiography core laboratory for the CorE-320 multicenter trial and is member of its steering committee. He is also co-director of the SCCT Board Review Course and editor of the SCCT Board Review Preparation Book.
Dr. Zadeh's particular clinical and investigational focus is the pursuit of strategies to better identify patients at risk for future cardiac events using cardiac imaging. Dr. Zadeh is board certified in internal medicine, cardiology, and cardiovascular CT. He reviews manucripts for numerous scientific journals, including JACC, JACCimaging, JCCT, AJR, Heart, AJC, and is an author of articles in Circulation, New England Journal of Medicine, JACC, AHJ, and others.

Prof. Bahram Mobasher

Meet the USERN Advisor

He is professor of Physics and Astronomy at University of California Riverside. His main research interest is focused on the study of formation and evolution of galaxies using multi-waveband galaxy surveys obtained with 8-10 meter ground-based telescopes (Gemini, VLT, Subaru, Keck) and space facilities (HST, Spitzer, GALEX, Chandra). Using the observational data and stellar synthesis models, he studies properties of galaxies as a function of star formation rate, morphology, environment, color, luminosity and redshift. Over the past two years he has been involved in the following studies: developing the Balmer Break technique for identifying very high redshift massive galaxies, using the combined HST and Spitzer data; discovery of an extremely massive and evolved galaxy at $z \sim 7$ (this has been the subject of extensive press release); study of the density-morphology relation over the largest dynamic range in density, and its evolution with redshift; planning and execution of the new Hubble Ultra Deep Field (HUDF), doubling the area and increasing the depth of the original HUDF; finding candidates for galaxies at $z \sim 8$ through searches for J-band dropouts in the new HUDF; study of the properties (SFR, mass, extinction) of high redshift galaxies selected through narrow-band Lyman emission (LAE) at $z = 5.7$ and comparison with Lyman Break Galaxies at the same redshift; developing a photometric redshift code to calculate redshift, spectral types and stellar masses of galaxies. He has been seriously involved in the Great Observatories Origins Deep Survey (GOODS) and The Cosmic Evolution Survey (COSMOS) projects. He has also been leading parts of the new HST treasury project to survey the core and outskirt of the Coma cluster.

Prof. Abass Alavi

Meet the USERN Advisor

Prof. Abass Alavi is an Iranian-American physician-scientist specializing in the field of molecular imaging, most notably in the imaging modality of positron emission tomography (PET).

In August 1976, he was part of the team that performed the first human PET studies of the brain and whole body using the radiotracer [18F]Fluorodeoxyglucose (FDG).

He holds the position of Professor of Radiology and Neurology, as well as Director of Research Education in the Department of Radiology at the University of Pennsylvania. Over a career spanning five decades, he has amassed over 2,300 publications and 60,000 citations, earning an h-index of 125 and placing his publication record in the top percentile of scientists

Prof. Alireza Shamshirsaz

Meet a Great Physician and Lecturer

Dr. Shamshirsaz is a Fetal Surgeon and a dual board certified obstetrician and gynecologist and maternal fetal medicine specialist. He did his medical school in Tehran University of medical sciences in Iran and spent 4 years on research as a post-doc fellow in two of the best research institutes of the country. In 2003 he came to the United States as a graduate post-doc research fellow working at University of Colorado Health Science Center. He did his internship and residency at University of Buffalo and University of Iowa Health Care. He, then, attended the University of Connecticut where he gets his maternal fetal medicine fellowship.

In 2012, his enthusiasm to patient care, research and innovation brought him to Baylor College of Medicine for two more years of training in fetal intervention and perinatal surgery; where he works as an assistant professor of obstetrics and gynecology, maternal fetal medicine specialist and fetal surgeon now.

USERN Congress Workshops
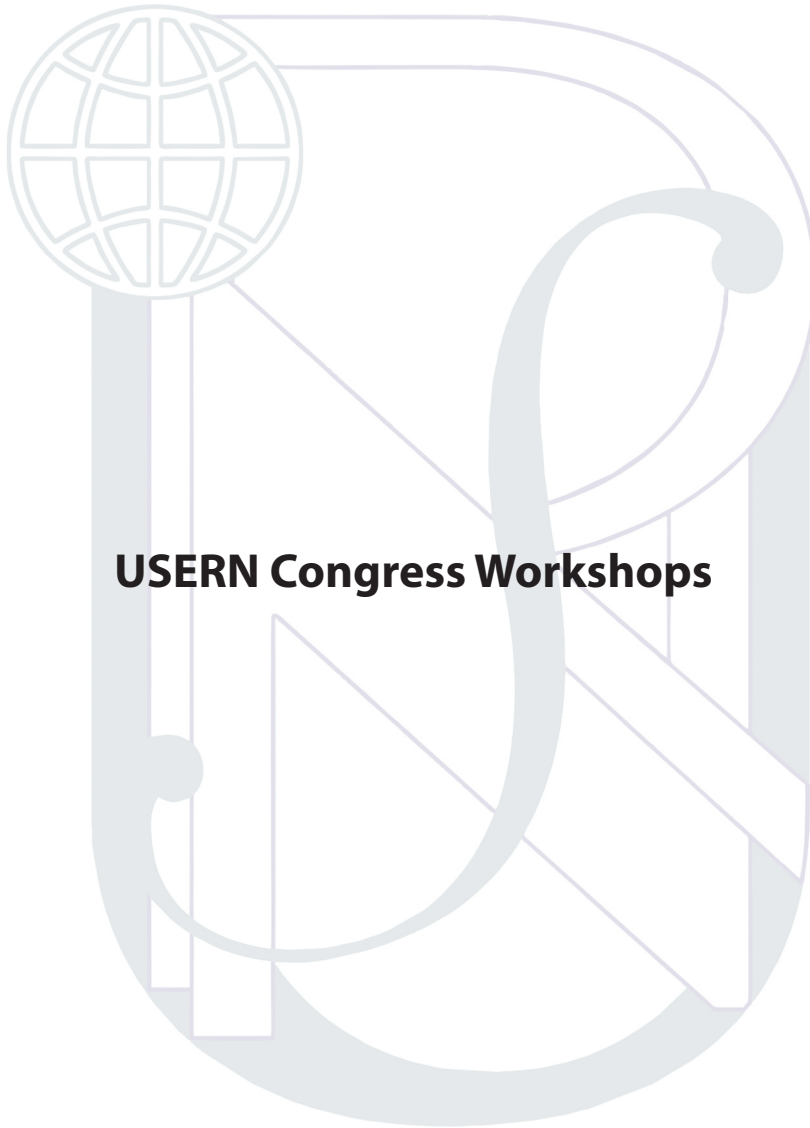
Alexander Leemans

How To Process/Analyze Diffusion MRI Data For Investigating Brain Fiber Pathways?

☑ **Associate Professor of Medical Imaging, Image Sciences Institute, University Medical Center Utrecht, The Netherlands**

Alexander Leemans is a physicist who received his Ph.D. in 2006 at the University of Antwerp, Belgium. From 2007 to 2009, he was a postdoctoral researcher at Cardiff University Brain Research Imaging Center (CUBRIC), Wales, UK. In 2009, he joined the Image Sciences Institute (ISI), University Medical Center Utrecht, Netherlands, where he currently holds a tenured faculty position as Associate Professor. His current research interests include modeling, processing, visualizing and analyzing diffusion MRI data for investigating microstructural and architectural tissue organization.

Amirhossein Takian

How To Write A Motivation Letter

☑ **Professor of Global Health and Public Policy, Tehran University of Medical Sciences, Tehran, Iran**

Amirhossein Takian (MD MPH PhD FHEA) is Full Professor and Department Head of Global Health & Public Policy, and Vice-Dean for International Affairs at the School of Public Health (SPH)- Tehran University of Medical Sciences (TUMS), Iran. He is also Advisor for Medical Education Reform and Member of the National Examination Board for Health Policy, Economics and Management, at the Ministry of Health and Medical Education (MOHME)- Iran. Amir is Chief Research Officer at the Health Equity Research Centre (HERC)- TUMS and TUMS' focal point at M8 Alliance, serving as a member of World Health Summit (WHS) Executive Committee since 2017, and Secretary of 7th World Health Summit Regional Meeting, 2019.

From 2013-2018, he was Deputy for International Organizations at the MOHME-Iran, overseeing the relationship between Iran and global organizations, i.e., WHO, UNDP, UN, UNICEF, UNFPA, etc. Dr. Takian is an elected member of National Academy of Medical Sciences, Iran; a member of National Committee for Prevention and Control of Non-Communicable Diseases, MOHME, Iran; member of Steering Committee for National Health Assembly- Iran; member of advisory committee on health information technology (HIT), AcademyHealth- USA; founding member of Supreme Council for Health & Peace Research Center, Shiraz University of Medical Sciences, Iran; member of editorial board at the International Journal of Health Policy and Management; and Associate Editor at the International Journal of Public Health.

A physician by training, Prof. Takian has a track record research in health policy analysis in the field of evidence-based policymaking, primary care, global health, non-communicable diseases, universal health coverage, and eHealth. He has published over 120 peer reviewed journal articles, 19 books, 4 book chapters, and 18 commissioned national and international reports. Amir has been a principal investigator in several collaborative research projects at the national and international levels, with a value equivalent to over Seven million Euro. Dr. Takian has supervised/advised over 39 MSc and 42 PhD students, plus two Post-doctorate fellows in Iran and other countries. He has been an invited keynote speaker in tens of global events, i.e. the United Nations, WHO, World Health Assembly, World Health Summit, PMAC, etc., and a frequent TED speaker. Prof. Takian was awarded the best educational national award of Iran in the field of medical sciences in 2017, the global AMEE award in 2018, the best teacher award of SPH-TUMS in 2019, and the joint international figure of TUMS and Tehran University in 2019 and 2021. Dr. Takian is a lifetime fellow of Higher Education Academy of the United Kingdom. He is main author and Editor of the Reference Book of Health Policy in Iran (March 2021).

Arutha Kulasinghe

Introduction To Spatial Transcriptomics

☑ **Peter Doherty NHMRC Research Fellow, The University of Queensland, Brisbane, Australia**

Arutha Kulasinghe completed his Bachelor of Science and Honours majoring in Medical Microbiology at the University of Pretoria (South Africa). In 2014, he undertook his PhD studies in the investigation of circulating tumor cells in head and neck cancers at the Queensland University of Technology (QUT), receiving his doctorate in 2017. In 2019, Dr. began a Peter Doherty NHMRC Early Career Fellowship to develop biomarkers of immunotherapy response in head and neck squamous cell carcinoma (HNSCC) and lung cancer. His research aims to use spatial analysis of the tumor microenvironment and profiling of liquid biopsy (circulating tumor cells/circulating tumor DNA) to identify biomarkers of response to immune checkpoint inhibitors. Dr. is supported by several funding agencies including the NHMRC, Cure Cancer, the PA Research Foundation and the GPRWMF.

Habib Sadeghirad

☑ **PhD student of oncology and cancer biology, Translational Research Institute, Queensland University of Technology, Brisbane, Australia**

Marshall Feterl

☑ **PhD of Microbiology and Immunology from Discipline of Microbiology and Immunology, James Cook University, Townsville, Australia**

Farhana Amy Sarker

☑ **PhD candidate of cell/cellular and molecular biology, The University of Sydney, Sydney, Australia**

Farshid Noorbakhsh

System Biology

☑ **Associate Professor of Immunology, Tehran University of Medical Sciences, Tehran, Iran**

Farshid Noorbakhsh is a professor of immunology at Tehran University of Medical Sciences. He is a professional lecturer, and his main research interests were neuroimmunology and systems biology.

George Perry

Scientific Publication And Scientific Progress

☑ **Professor of Biology and Chemistry, The University of Texas at San Antonio, San Antonio, USA**

George Perry is a professor of biology at The University of Texas at San Antonio. Perry is recognized in the field of Alzheimer's disease research particularly for his work on oxidative stress.

Perry received his bachelor's of arts degree in zoology with high honors from the University of California, Santa Barbara. After graduation, he headed to Scripps Institution of Oceanography and obtained his Ph.D. in marine biology under David Epel in 1979. He then received a postdoctoral fellowship in the Department of Cell Biology in the laboratories of Drs. Bill Brinkley and Joseph Bryan at Baylor College of Medicine where he laid the foundation for his observations of abnormalities in cell structures.

Facts And Fiction About The Elephant: Health Pseudoscience And Multidisciplinary Studies

Kiarash Aramesh

☑ Director and faculty member of the Bioethics Institute, Edinboro University of Pennsylvania, Edinboro, USA

Pseudoscience and COVID-19 Pandemic: Examples from US and Iran

Farin Kamangar

☑ University Distinguished Professor of Epidemiology, Morgan State University, Baltimore, USA

Moral Problems In Traditional Bone Healing: Perspectives From the Global South

Cornelius Ewuoso

☑ Department of Medicine, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa

Resignifying Medical Training Through The Understanding of Pseudoscientific Aspects

Ivani Nadir Carlotto

☑ Postdoctoral fellow of bioethics, Department of Biology & Health Services, Edinboro University of Pennsylvania, Edinboro, USA

Patterns of Complementary And Alternative Medicine Use Among Arab Immigrants In The US

Dina Siniora

☑ PhD Candidate in Healthcare ethics, Duquesne University, Pittsburgh, USA

Serge Brand

*Statistics For Dummies: Reporting P-Values And Effect Sizes; How To Calculate Sample Sizes With G*Power*

☑ **Professor of Psychology and Psychotherapist, Psychiatric Clinics and Department of Sport, Exercise and Health, University of Basel, Basel, Switzerland**

Firstly, Prof. Serge Brand studied Italian language science, Italian literature, sport sciences and history, and he was working for several years as a high school teacher and interpreter at different civil and criminal courts.
Next, he studied general, cognitive and clinical psychology. The topic of the thesis (PhD) was the influence of mood and learning in dyads on individual learning and transfer performance. The topic of the habilitation was the association between sleep and psychological functioning from early childhood to early adulthood.
Now, he is working at the University of Basel (Basel, Switzerland), Psychiatric Clinics, at the Faculty of Psychology, and the Department of Sport, Exercise and Health, Division of Sport Science and Psychosocial Health. Further, he is visiting professor at the Kermanshah University of Medical Sciences (KUMS; Kermanshah, Iran), Substance Abuse Prevention Research Center and Sleep Disorders Research Center.
In August 2019 Professor Brand was presented with the TUMS Distinguished Visiting Professor Title from 2019 through 2022 by the Head of Psychiatry Department, TUMS School of Medicine.

Shirin Moossavi

Introduction To Microbiome Analysis

☑ **CIHR Postdoctoral Fellow, Department of Physiology and Pharmacology and Biomedical Engineering, University of Calgary, Calgary, Canada**

Shirin Moossavi is a CIHR Postdoctoral Fellow in the Department of Physiology and Pharmacology and Biomedical Engineering, University of Calgary. Shirin obtained her Medical Doctorate from Tehran University of Medical Sciences, Iran; her MSc in Genetic Manipulation and Molecular Biology from the University of Sussex, UK; and her PhD in Medical Microbiology from the University of Manitoba, Canada. She is the Early-Mid Career Ambassador of the International Society of Microbial Ecology and the Founding Director of Microbiome and Microbial Ecology Interest Group, Universal Scientific Education and Research Network. She is interested in cross-disciplinary transformative research combining engineering, theoretical biology, and experimental microbiome research. She believes in transformative leadership and was recently recognized as an Emerging Leader.

Tommaso Dorigo

Artificial Intelligence Challenges In Science And Society

☑ **First Researcher of Experimental Particle Physics, Italian Institute for Nuclear Physics (INFN), Padua, Italy**

Tommaso Dorigo is an experimental particle physicist collaborating with the CMS experiment at the CERN Large Hadron Collider; he has authored over 1500 scientific publications in peer-reviewed journals (H-index over 170). Dorigo works as a First Researcher for the Italian Institute of Nuclear Physics (INFN) in Padova; he got his Ph.D. in 1999 with research on data from the CDF experiment at the Tevatron collider. He has been the Scientific Coordinator (2014-2019) of AMVA4NewPhysics, a training network funded by the Horizon2020 program of the EC, as well as Scientific Coordinator (2016-2020) for accelerator-based physics in Padova. Dorigo is the Editor of two Elsevier journals (Reviews in Physics, Physics Open), and is very active in research at the crossroads of particle physics, statistics, and machine learning; in CMS he belongs to the Statistics Committee, which he chaired in 2012-2015.

Christoph Weniger

☑ **Associate professor of physics, the center of excellence for GRavitation AstroParticle Physics Amsterdam, and the Institute of Physics at the University of Amsterdam, Amsterdam, The Netherlands**
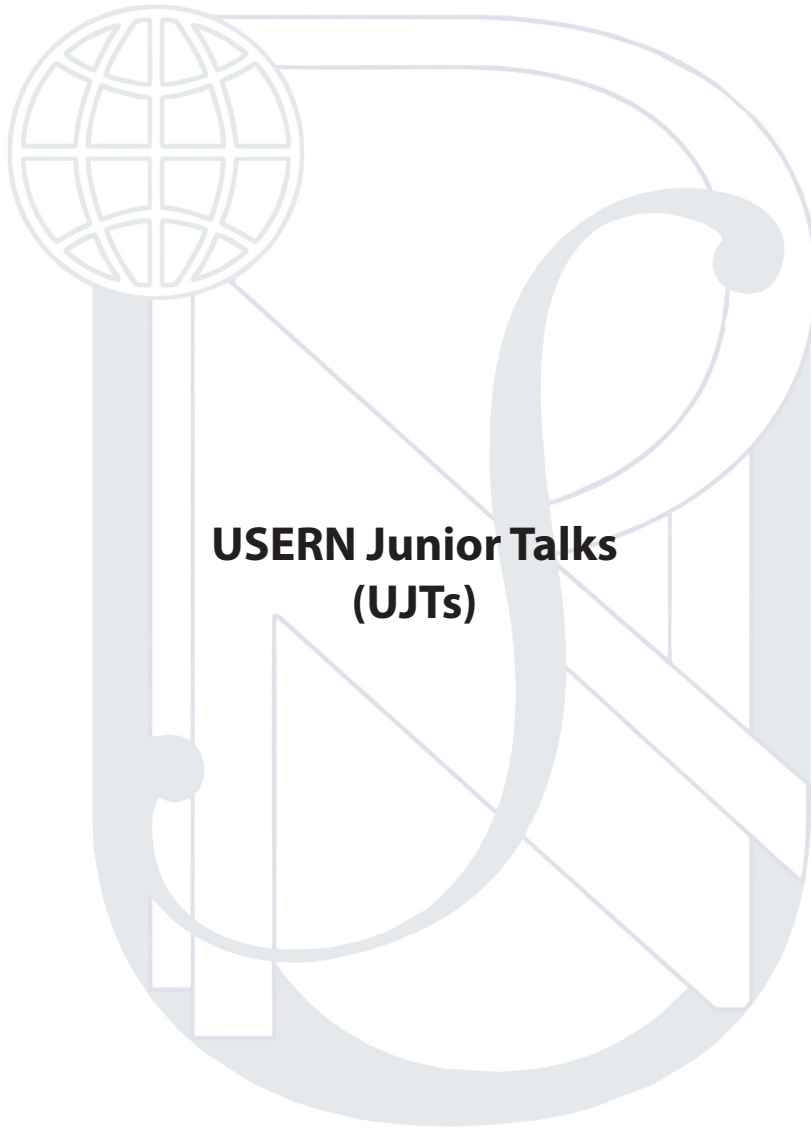
Mauro Da Lio

☑ **Full Professor of Mechanical Systems, Department of Industrial Engineering, University of Trento, Trento, Italy**

Pietro Vischia

☑ **Particle physicist (CMS at LHC) and FNRS fellow, Institut de recherche en mathématique et physique, Université catholique de Louvain, Belgium**

USERN Junior Talks (UJTs)

Mostafa Abdollahi Sarvi

The effects of gamification on time perception

Mostafa Abdollahi Sarvi, Amirhossein Karimizadeh, Sepehr Mani, Mahnia Asadollahi

Medical Students Research Committee, Iran University of Medical Sciences, Tehran, Iran

Perception of time is one of the essential capacities of humans that takes part in different aspects of cognitive activities. Recent findings indicate that various factors can change our perception of time and one of these factors is gamification. Gamification uses game mechanics in a non-game activity to make it more engaging while using elements like reward, competition, scoreboards, etc. also using these elements in other cognitive activities has had an Impressive positive effect. The question we addressed in this study is whether the different gamification elements affect the perception of time.

Here we designed an online 3d game with 6 different levels using gamification elements including empty level, passive reward, active reward, competition, limitation in movement, and reward prediction error. participants performed a time estimation about levels duration at the end of each level and their performance was measured based on a scale from 0 to 10.

The results show that facing passive and active rewards were perceived to last shorter, but with competition, limitation, and reward prediction error, the perception of the time remained unaffected. Also, these elements were more effective for subjects with higher performance in the game.

We think the reason behind the effectiveness of both passive and active rewards, and also the strength of this effect among players with different performances is modulation of attention that leads to distortion of how we can perceive time. we argue that being online and adapting to a specific activity are key points of losing attention and engagement about the unaffectedness of other gamification elements.

Mina AkbariRad

Evaluation of the serum IgG-4 level in patients with autoimmune hypothyroidism and its association with Anti-TPO changes

Mina AkbariRad[1], Zahra Mazloum Khorasani[2], Hossein Ayatollahi[3], Milad Beizae[4]

1. Assistant Professor, Department of Internal Medicine, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
2. Assistant Professor, Department of Internal Medicine, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
3. Professor, Department of Hematology and Blood Banking, Cancer Molecular Pathology Research Center, Ghaem Hospital, Mashhad University of Medical Sciences, Mashhad, Iran
4. Student Research Committee, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

This study aimed to evaluate the blood level of IgG-4 in patients with autoimmune hypothyroidism and its relationship with the Anti-TPO level.

This cross-sectional study was performed on newly diagnosed autoimmune hypothyroid patients from March 2017 to March 2019 at the Endocrinology Department of Ghaem Hospital (Mashhad, Iran). The serum levels of IgG-4, TSH, Anti-TPO, and Free T4 were measured and based on the IgG-4 levels, patients were divided into two groups of autoimmune hypothyroidism associated with IgG-4 (>135 mg/dl) and the unrelated group (IgG-4 ≤ 135 mg/dl). Data analysis was performed using SPSS version 22 software.

Totally, 44 patients, 79.55% female, and 20.45% male, were included in this study, and 15.9% of patients were characterized as IgG-4-related autoimmune hypothyroidism and 84.1% were IgG-4 negative. Although the TSH and Anti-TPO antibody levels were higher in the IgG-4 positive group, none of the variables of age, gender, Free T4, and Anti-TPO level were significantly different between the two groups. There was only a significant correlation between TSH and IgG-4.

Measuring the blood level of IgG-4 in autoimmune hypothyroid patients can contribute to better management of these patients considering that the IgG-4-related disease is not a disease associated with only one organ. Therefore, measuring the IgG-4 level can be a starting point for a better understanding of the progress of the disease in the mentioned patients.

Milad Akbarzadehmoallemkolaei

Protective effect of oxytocin on Autism Spectrum Disorder model of zebrafish larvae, molecular and behavioral study

Milad Akbarzadehmoallemkolaei[1,3], Mahdi Gholami[2], Shokoofeh Hassani[2], Mohammad Abdollahi[2], Hooman Rahmati Holasou[3]

1. Animal Model Integrated Network (AMIN), Universal Scientific Education and Research Network (USERN), Tehran, Iran
2. Pharmaceutical Sciences Research Center, Tehran University of Medical Sciences
3. University of Tehran, Faculty of Veterinary Medicine, Department of Aquatic Animal Health, Tehran, Iran

Changes in social behavior have been linked to brain disorders, including mood disorders, stress, schizophrenia, Alzheimer's disease, and autism spectrum disorders (ASD). Autism is a complex neurodevelopmental disorder characterized by deficits in social interaction, communication disorders, anxiety, hyperactivity, and limited interests. The zebrafish is one of the most social vertebrates that is used as a model in biomedical research, and that helps to understand the mechanisms that underlie social behavior.

After spawning and exposing the eggs in the first 48 hours of VPA exposure, the eggs were divided into eight groups. Except for the negative and normal control groups, there were six treatment groups based on oxytocin concentration (25, 50, 100 µM) and time point (24, 48 hour). Treatment was performed on days 6 and 7 because the blood-brain barrier can be penetrated in zebrafish larvae until eight days post-fertilization (dpf), which was examined by labeling oxytocin with FITC and imaging with a confocal microscope. Behavioral studies including darkness-light, shoaling behavior, social preference, and mirror test were performed on 11 to 14 days post fertilization (dpf), respectively.

The results showed that the most significant effect of oxytocin was at a concentration of 50 µM and a time point of 48 hours. Increased expression of shank3a, shank3b, oxtr genes was also significant at this oxytocin concentration. Also, behavioral studies compared to the negative control group showed the following: 1. increasing the frequency of contact between two larvae per minute 2. Increasing the time spent in contact between two larvae 3. Reducing the distance in the larval group 4. Increasing the amount of time spent at a distance of one centimeter from mirror 5. Increase the time spent in the dark area

Increased expression of shank3a, shank3b, oxtr genes, and improvement of autistic behavior proved that administration of oxytocin in the larval stage could significantly improve autism.

Marwa Al-Habsi

Towards a Business Intelligence System Implementation Framework for the Public Sector: The Case of Oman Vision 2040 Implementation Follow-Up Unit (OVIFU).

Marwa Al-Habsi

Sultan Qaboos University, College of Economics and Political Science, Department of Information Systems, MSc in Information Systems

Organizations continuously strive to increase their competitiveness and performance by the use of the latest technologies. Gartner regarded Augmented Analytics and Business Intelligence Systems (BIS) as one of the emerging trends in 2019. Such systems aim to synthesize and analyze corporate data to enhance the decision-making process. While BIS aims and benefits are clear, adoption in the public sector is modest. In addition, investigating the connection between BIS and organizational performance in the literature is mainly focused on the private sector. Moreover, very few government-based BIS have been implemented worldwide and regionally.

Given the evident differences between the private and public sectors and the fact that most available BIS are developed with a private-sector focus, it is crucial to investigate whether current BIS contributes to organizational performance in the government sector. This study aims to develop a BIS implementation framework mapped to enhancing governmental organizational performance. This framework will be concluded from a focused literature review, refined and enhanced via a qualitative exploratory case study on Oman Vision 2040 Implementation and Follow-up Unit.

Roshanak Amirian

Autoimmunity immunomodulation by biomaterials

Roshanak Amirian

Department of Pharmaceutical Biomaterials, Faculty of Pharmacy, Kermanshah, Iran

Immune system adverse reactions (FBR) are challenges that reduce the treatment quality of various autoimmune diseases. Recent advances in biomaterial science and deeper knowledge of immune modulation have led to interesting approaches for autoimmune diseases treatment. Using immunomodulatory biomaterials to moderate immune responses is quite intelligent in this field. Modifications on the chemistry and topography of the biomaterial, designing micro/nanoscale of biomaterials, and other modifications to moderate immune responses are strategies that have been considered.

These studies have shown that the modification of biomaterials with anti-inflammatory agents through covalent and non-covalent bonds has been able to suppress early inflammatory responses and reduce side effects in the long term in autoimmune diseases such as Silicon probe, PLGA nanoparticle, Liposome, Lipid microsphere, Bioadhesive gel, and Polylactic acid microsphere for target delivery of Dexamethasone, Indomethacin, Methotrexate, etc. On the other hand, studies were done on tissue engineering and cell therapy technology by using biomaterials like; PDMS, PLGA, Silk or PEG macroporous scaffold in diabetes type 1, hyalograft C or Collagen for knee issue in arthritis rheumatoid and ulcerative. Another approach to designing immunomodulatory biomaterials is the intracellular programming of immune cells in the graft microenvironment through up-regulation (anti-inflammatory cytokine like IL-10, TGF-beta and..) or downregulation (inflammatory cytokine TNF-α, INF-gama) as specific genes in targeting of immune responses. Meanwhile, in the autoimmune disease vaccine, PLGA biomaterials, gold and iron oxide particles have been used as a significant strategy in delivery systems. However, researchers have targeted surface chemistry of biomaterials as a general approach for improving the size, shape, topography and the percentage of surface hydrophilization too.

Each of these strategies as a new generation of therapies has results.; Although, a more in-depth research is needed, but advances in immunomodulation by biomaterials may be able to open a new window to improve the treatment of autoimmune diseases.

https://userncongress.tums.ac.ir

Saboura Ashkevarian

Nano-Enzyme based biosensor Applications

Saboura Ashkevarian[1,2], Aghdas Banaei

1. Research Institute of Applied Sciences, ACECR, Shahid Beheshti University, Tehran, Iran

2. Institute of Biochemistry and Biophysics, University of Tehran, Tehran, Iran

Enzyme-based biosensors have been widely developed over the past few years, and the integration of these techniques with nanomaterials is now being highly considered by researchers. Enzyme-based biosensors attached to the nanomaterial substrate offer high advantages, such as high sensitivity and specificity, portability, cost-effectiveness. These properties make this kind of sensor more attractive for a variety of industrial application from clinical diagnosis to food and drug industries. This study investigates the principles of operation of enzymatic-nano biosensors that work using electrochemical, optical, thermistor and piezoelectric measurement techniques and their applications in different cases.

Sara Mostafavi

Epidemiology of asthma in patients with COVID 19 illness: respiratory allergy is not a risk factor for COVID-19 severity

Sara Mostafavi, Mozhgan Moghtaderi, Saeed Hosseini Teshnizi, Ali Mostafavi, Mohammad Ali Ashraf

Shiraz University of Medical Sciences

The outcome of coronavirus disease 2019 (COVID-19) is complicated by various comorbidities; asthma as a common chronic disease, which can be defined as a probable alternative. This study aimed to investigate the effect of asthma comorbidity on the prognosis of COVID-19 patients.

This retrospective study includes all RT-PCR confirmed COVID-19 patients recorded in the Shiraz health department's electronic database from January to May 2020. A questionnaire was designed to collect information about patients' demographics, asthma, other comorbidities, and severity of COVID-19 by dialing their numbers. 109 Of 3163 COVID-19 patients (3.4%) had self-reported asthma with a mean age of 42.7 ± 19.1 years. Most of the patients (98%) had mild to moderate asthma while 2% had severe types. Among asthmatic patients, fourteen (12.8%) were admitted to the hospital and five (4.6%) died. Univariate logistic regression results showed that asthma had no significant effect on hospitalization (OR 0.95, 95% CI: 0.54-1.63) and mortality (OR 1.18, 95% CI: 0.48-2.94) in patients with COVID-19. Compared living and deceased patients with COVID-19, the pooled OR was 18.2 (95% CI: 7.3–40.1) for cancer , 13.5 (95% CI: 8.2–22.5) for age 40-70 years, 3.1 (95% CI: 2–4.8) for hypertension, 3.1 (95% CI: 1.8–5.3) for cardiac disease and 2.1 (95% CI: 1.3–3.5) for diabetes mellitus.

This study showed asthma is not associated with increased risk of hospitalization and mortality in patients with COVID-19. Further studies are needed to investigate the risk of different phenotypes of asthma on severity of COVID-19 disease.

Kosar Asnaashari

Genetic roots of PFAPA (Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis) syndrome: a review

Kosar Asnaashari[1], Nima Rezaei[1]

1. Children's Medical Center, Tehran University of Medical Sciences

There have been lots of debates on the origins of the autoinflammatory syndrome: Periodic fever, aphthous stomatitis, pharyngitis, and cervical adenitis (PFAPA). PFAPA presents as regular attacks accompanied by elevated inflammatory markers. Since PFAPA shares some characteristics with other autoinflammatory disorders such as Familial Mediterranean Fever and considering its family clustering, a genetic basis is suggested for the disease. Genome analysis has revealed mutations in genes such as MEFV, NLRP, TNFRSF1A, CARD15/NOD2 and MVK. Inflammasomes, cytosolic receptors of innate immune system that are responsible for inflammatory responses, are proposed to be involved in PFAPA pathogenesis. The investigations show that PFAPA might have a multifactorial or polygenic basis, in which an environmental trigger can provoke inflammasome activation and induce PFAPA flares.

We searched MEDLINE and Web of Science for English-language sources using the keywords PFAPA and "Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis". All the found articles were read and the relevant ones were included. The search was conducted in December 2020 and then repeated in February 2021 to check for updates.

Significant familial clustering was shown in many studies, highlighting the genetic basis of PFAPA; yet no single gene can be proposed individually for PFAPA pathogenesis. PFAPA seems to have a polygenic or multifactorial origin. Sequence variants in genes such as NLRP3 involved in inflammasomes and variants such as CARD8-FS interacting with them are activated during flares, triggering innate immune system by production of interleukin 1B, a mechanism which is in favor of a polygenic basis.

Extensive cohorts are needed to be run in order to investigate the roles of each factor in a polygenic, inflammasome based model for PFAPA. Analyzing differentially methylated DNA is a new approach that needs to be further studied in order to assess genetic associations of PFAPA.

Elham Azarnoosh

mRNA vaccines: The future of vaccine

Elham Azarnoosh
Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

It is shown that scientific knowledge is improving with speed and humans are witnessing the development of different novel methods; Messenger RNA (mRNA) has emerged as a new category of therapeutic agent. New mRNA vaccines are showing great promise for the future. In the first figure chart we can see the timeline of some key milestones for mRNA and lipid nanoparticle development. In this article we indicate some of the studies conducted to show the efficacy of mRNA vaccines.

This review article was carried out by using different search engines and latest scientific magazines.

coronavirus 2 (SARS-CoV-2) emerged globally, prompting an effort to develop a vaccine. FDA approved the use of the Pfizer-BioNTech (BNT162b2 vaccine) and Moderna vaccine (mRNA-1273 vaccine). modified mRNA–LNP is protective against ZIKV. CV9103 and CV9104 are anti-prostate cancer vaccines. RNA vaccine enhanced immune response against melanoma, gastrointestinal cancer and influenza A.

The SARS-CoV-2 pandemic introduced the world to a new type of vaccine based on mRNA encapsulated in lipid nanoparticles (LNPs) and researchers are eager to developing more mRNA based vaccines to diseases.

Marzieh Pirzadeh

COVID-19 in Iran: Clinical presentations and outcomes in three different surges of COVID-19 infection

Marzieh Pirzadeh, Azar Hadadi, Sina Kazemian, Haleh Ashraf, Mehdi Ebrahimi, Shahrokh Karbalai Saleh, Moham-mad Talebpour
Research Development Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

A few studies compared the characteristics and outcomes of COVID-19 patients during the first and second surges of the disease. We aimed to describe the clinical features and outcomes of COVID-19 patients across the first, second, and third surges of the disease in Tehran, Iran.

We conducted a retro-respective cohort study of patients with COVID-19 admitted to Sina hospital of Tehran, Iran, during three surges of COVID-19 from February 16 to October 28, 2020.

Surge 1 patients were younger with more prevalence of hypertension. They also presented with significantly higher oxygen saturation, systolic blood pressure, and respiratory rate on admission. Patients had higher levels of neutrophil to lymphocyte ratio, Urea, CRP, and ESR, in surge 2. The incidence of dyspnea, chest pain, and neurological manifestations followed a significant increasing trend from surge 1 to surge 3. There was no difference in severity and in-hospital mortality between the surges. However, the length of hospital stays and acute cardiac injury (ACI) was less in surge 1 and acute respiratory distress syndrome (ARDS) in surge 2 than in other surges. Patients did not significantly differ in disease severity, ICU admission, and mortality between surges; however, length of hospital stay and ACI increased during surges, and the number of patients developing ARDS was significantly less in surge 2 compared to other peaks.

Firuzeh Badreh

Kidney renin-angiotensin system plasticity is affected by age and fasting patterns

Firuzeh Badreh[1,2,3,4], Siyavash Joukar[1,2,3,4]

1. Physiology Research Center, Institute of Basic and Clinical Physiology Sciences, Kerman University of Medical Sciences, Kerman, Iran
2. Cardiovascular Research Center, Institute of Basic and Clinical Physiology Sciences, Kerman University of Medical Sciences, Kerman, Iran
3. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Sciences, Kerman, Iran
4. Department of Physiology and Pharmacology, Afzalipour Faculty of Medicine, Kerman University of Medical Science, Kerman, Iran

Kidneys are among the organs affected by the aging process. Changes in the activity or responsiveness of the renin-angiotensin system (RAS) occur with aging. One of the interventions that effectively regulate local RAS is intermittent fasting. The present study investigated the effects of age and intermittent fasting on expression of local renal renin-angiotensin system components.

Fifty-four male Wistar rats were divided into three different age groups (3, 12, and 22–24 months old). Animals of each age group were randomly assigned to three models of dietary treatments for 3 months as fed ad libitum (AL), every other day fasting (EOD), and fed ad libitum and fasted 1 day per week (FW). Finally, Ang II receptors (AT1aR and AT2R) and angiotensin-converting enzyme 2 (ACE2) genes and proteins expression of the kidney and the plasma level of angiotensin II (Ang II) and klotho protein were assessed.

Old rats showed significant increase in plasma angiotensin II, significant reduction in plasma klotho levels ($P<0.001$ vs. young group), significant decrease in kidney AT2R protein ($P<0.01$) and significant increase in AT-1aR/AT2R proteins ratio ($P<0.05$ vs. young group). Both FW and EOD fasting significantly decreased the plasma angiotensin II in middle age and old animals but only increased the ACE2 protein expression in old animals. EOD fasting also significantly increased the AT2R protein and decreased the AT1aR/AT2R proteins ratio in old group ($P<0.001$, $P < 0.01$ in comparison to corresponding AL group, respectively).

These data suggest that fasting, especially EOD through regulation of local RAS and hence increasing klotho may be slowing the kidney aging process.

Maryam Balibegloo

A meta-analysis assessing safety of immune checkpoint inhibitors in breast cancer

Maryam Balibegloo[1,2,3], Seyed Aria Nejadghaderi[1,2,4], Mona Sadeghalvad[1,5], Alireza Soleymanitabar[1,6], Sasan Salehi Nezamabadi[1,7], Amene Saghazadeh[1,8], Nima Rezaei[3,5,8]

1. Systematic Review and Meta-Analysis Expert Group (SRMEG), Universal Scientific Education and Research Network (USERN), Tehran, Iran
2. Cancer Immunology Project (CIP), Universal Scientific Education and Research Network (USERN), Tehran, Iran
3. Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran
4. School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
5. Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
6. Student Research Committee, Baqiyatallah University of Medical Sciences, Tehran, Iran
7. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
8. Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

Breast cancer is among the most common malignancies with a high number of cancer-related deaths worldwide. Recently, the therapeutic effects of immune checkpoint inhibitors (ICIs) have attracted considerable attention in the treatment of breast cancer. Although, their safety profile regarding adverse events (AEs) and immune-related AEs (irAEs) have not been assessed comprehensively.

We investigated any-grade and grade 3-5 AEs and irAEs of ICIs in comparison to the control medication consisting of any other conventional therapies in adult patients with breast carcinoma. PubMed, Scopus, Web of Science, EMBASE, the Cochrane Central Register of Controlled Trials, metaRegister of Controlled Trials, and Clinical-Trials.gov were searched systematically up to March 12, 2021. We assessed the quality of studies based on version 2 of the Cochrane risk-of-bias tool for randomized trials (RoB 2).

Nine controlled clinical trials with 4687 participants were included. Except for two studies, all others had a high overall bias. All of the studies defined AEs according to Common Terminology Criteria for Adverse Events (CTCAE). The most frequent irAEs were rash and infusion reaction. Meanwhile, among irAEs, hyperthyroidism, hypothyroidism, and adrenal insufficiency had the most observed difference between the two groups in favor of ICIs, in descending order. Increased aspartate aminotransferase (RR = 1.91; 95% CI, 1.11–3.28) and cough (RR = 1.32; 95%CI, 1.11–1.57) were grade 3-5 and any-grade non-immune AEs with the highest relative risks in favor of ICIs, respectively. Overall any-grade and grade 3-5 irAEs were more common in the ICI group.

Our study demonstrated that all the AEs and irAEs of all four categories were more frequent among those patients treating with ICIs compared to other therapies.

Morteza Banakar

Oral Manifestations of Acquired Immunodeficiency Syndrome in Children: A Systematic Review

Morteza Banakar, Mohammad Hasan Banakar, Alireza Aghajanian
Dental Research Center, Dentistry Research Institute, Tehran University of Medical Sciences, Tehran, Iran
Health Policy Research Center, Institute of Health, Shiraz University of Medical Sciences, Shiraz, Iran

The goal of this study was to explain oral findings in HIV-positive children and treatment options.

Review literature was identified through a systematic search of English articles from Embase, Web of Science, SCOPUS (2015, May 2020). It's yielded 24 results by using "oral manifestations AND human immunodeficiency virus", "oral manifestations AND Acquired immunodeficiency syndrome," and related terms as keywords. Not only were these articles investigated, but also some references of them were reviewed.

Oral symptoms are early and common clinical indicators of AIDS in children, just as they are in adults; however, the signs differ. Oropharyngeal candidiasis in children is the most generally recognized AIDS symptom, and it is closely linked to HIV infection progression markers. In children, common oral symptoms include herpes simplex, linear gingival erythema, parotid enlargement, and recurrent aphthous ulcers. Children with HIV are more susceptible to bacterial infections than adults, making them more prone to periodontal disease and tooth caries. We will encounter these children in our dental offices more frequently as asymptomatic youngsters with a chronic condition as a result of the multidrug combination.

The majority of the children had at least one oral lesion, and the occurrence of oral lesions was linked to World Health Organisation clinical staging and CD4+ counts. Some of the lesions were associated with discomfort during oral functions. As a result, HIV-positive children's care should involve a proactive preventative approach. More research is needed on how oral symptoms are used to predict illness progression and their impact on infected children's quality of life.

Mohammad Barary

SARS-CoV-2-related and COVID-19 vaccine-induced thromboembolic events: A comparative review

Zeinab Mohseni Afshar[1], Arefeh Babazadeh[2], Feizollah Mansouri[1], Mohammad Barary[3], Rezvan Hosseinzadeh[3], Amirmasoud Alijanpour[4], Terence T. Sio[5], Mark J. M. Sullman[6,7], Kristin Carson-Chahhoud[8], Soheil Ebrahimpour[2]

1. Clinical Research Development Center, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Infectious Diseases and Tropical Medicine Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
3. Student Research Committee, Babol University of Medical Sciences, Babol, Iran
4. Faculty of Medicine, Semmelweis University, Üllői út 26, Budapest, H - 1085, Hungary
5. Department of Radiation Oncology, Mayo Clinic, Phoenix, Arizona, USA
6. Department of Social Sciences, University of Nicosia, Nicosia, Cyprus
7. Department of Life and Health Sciences, University of Nicosia, Nicosia, Cyprus
8. Australian Centre for Precision Health, University of South Australia, Adelaide, Australia

Since the start of the pandemic, thrombotic events have been a well-known and severe complication associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Nevertheless, the initiation of the vaccination programs brought another rare yet highly fatal thrombotic event, vaccine-induced immune thrombotic thrombocytopenia (VITT), which has caused extensive debate regarding the safety of vaccines. This review defines the thromboembolic events following infection and vaccination, identifies their risk factors, describes their pathophysiology, and discussing their management, treatment, and prevention.

Nima Beheshtizadeh

Artificial intelligence in tissue engineering and regenerative medicine

Nima Beheshtizadeh[1], Mahmoud Azami[2]

1. Department of Tissue Engineering and Applied Cell Sciences, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Iran
2. Regenerative Medicine group (REMED), Universal Scientific Education and Research Network (USERN), Tehran, Iran

The ultimate goal of regenerative medicine is to repair, regenerate, or reconstruct functional loss in failed tissues and/or organs. All endeavors in this field go through in silico, in vitro, in vivo, and clinical trials, which are prerequisites to translating such approaches from the bench to the bedside. Here, the convergence of various scientific majors could promote regenerative medicine in reaching its objectives.

Artificial intelligence with all its branches, especially machine learning, possesses the possibility of accelerating the understanding of parameters and conditions that affect regenerative medicine products. From forecasting the experimental and clinical outcomes to optimization of multiple influential factors, could be accessible via artificial intelligence, which results in decreasing the need for repeating several in vitro and in vivo works and increasing the work efficiency. Scaffold fabricating techniques in tissue engineering, like electrospinning, gas foaming, and additive manufacturing methods like 3D printing, are the key areas where machine learning could improve their function and efficiency. It is anticipated that evolution could be occurred in regenerative medicine science by employing artificial intelligence and machine learning fields, which could ameliorate our conception from the unknown areas as well as knowing the science behind the curtain.

Dmytro Butov

Effectiveness of using intravenous ethambutol and isoniazid administration in patients with tuberculosis and HIV co-infection

Dmytro Butov, Nadiya Sapelnik, Olena Borysova, Tetiana Butova
Kharkiv National Medical University, Kharkiv, Ukraine

The aim of this study was to investigate the effectiveness of intravenous isoniazid (H) and ethambutol (E) administered in patients with new sputum positive drug-susceptible pulmonary tuberculosis (TB) with tuberculous meningoencephalitis (TM) and human immunodeficiency virus (HIV) co-infection in the intensive phase of treatment.

Fifty-four patients with TB/TM and HIV co-infection were enrolled for this study. Group 1 comprised of 23 patients treated with E and H intravenously, while rifampicin and pyrazinamide were prescribed orally. Group 2 consisted of 31 patients treated with the first-line anti-TB drugs orally. The concentrations of H and E in blood serum were detected using a chromatographic method.

A significant improvement in the clinical symptoms and X-ray signs in patients treated intravenously with H and E was observed and compared to group 2. The sputum Mycobacterium tuberculosis positivity was observed during the second month of the treatment in 25.0% of patients from group 1 and 76.1% of the patients from the control group (p=0.003). In addition, nine patients (39.1%) died up to 6 months when H and E were prescribed intravenously compared with 22 (70.9%) in group 2 (p=0.023).

In TB/TM with HIV, the intravenous H and E treatment was more effective than oral H and E treatment at 2 months of intensive treatment in sputum conversion as well as in clinical improvement, accompanied by significantly higher mean serum concentrations. In addition, the mortality rate was lower in intravenous H and E treatment compared to oral treatment.

Farzaneh Darbeheshti

Cross-talk between Complex ceRNA Networks in Tumor Cells: The Hidden Players in Angiogenesis

Farzaneh Darbeheshti, Yaser Mansoori
Department of Genetics, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
Medical Genetics Network (MeGeNe), Universal Scientific Education and Research Network (USERN), Tehran, Iran

Owing to high-throughput sequencing and microarray technologies, more and more types of RNAs have been identified and categorized. The competitive endogenous RNA (ceRNA) concept suggests that RNAs can regulate each other by competing for shared miRNAs. ceRNA networks could modulate different biological processes such as malignancies. Circular RNAs (circRNAs) are endogenous non-coding RNAs that are evolutionarily conserved and could function as miRNA sponges through ceRNA axes.

Cellular responses to hypoxia in tumors are orchestrated by HIF-1A/VEGF signaling pathway. Triple negative breast cancer (TNBC) is one the most aggressive tumors with a high tendency to metastasis. The purpose of this study is to uncover the circRNA-mediated ceRNA network involved in HIF-1A/VEGF signaling in TNBC using an integrative bioinformatics approach.

Three microarray datasets GSE101124 (for circRNAs), GSE21653 and GSE45827 (for mRNAs) containing the data of triple negative tumors and normal mammary tissues were achieved from GEO database and analyzed. The circRNA/miRNA/mRNA axes involved in the HIF-1A/VEGF signaling in TNBC were constructed using multiple databases and bioinformatics tools through a system biology approach. In the next step, we sought to underpin and validate the expression of the most influential DEC (differentially expressed circRNA) in primary TNBC samples by real-time PCR.

Our results revealed potential complex molecular interactions which may uncover hidden mechanisms for the aggressive behavior of TNBC. The circ_0047303 has the highest degree in the discovered circRNA-mediated ceRNA network and shows a significant up expression in TNBC compared with adjacent normal tissues.

This study suggests that circRNAs could play pivotal roles in the upstream of onco-mechanisms in TNBC. The circ_0047303 could be a promising therapeutic target and prognostic marker for TNBC patients.

Sepideh Ebrahimi Meimand

Alterations of BRCA genes in Gliomas

Sepideh Ebrahimi Meimand, Ahmad Pour-Rashidi, Maryam Masoumi Shahrbabak, Esmaeil Mohammadi, Faridadin Ebrahimi Meimand, Nima Rezaei

Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

Department of neurosurgery, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

Kerman university of Medical Sciences, Department of Obstetrics & Gynecology, Kerman, Iran

Department of Pediatric Neurosurgery, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

Sina Trauma and Surgery Research Center, Tehran University of Medical Sciences, Tehran, Iran

Minimally Invasive Surgery Research Center, Iran University of Medical Sciences, Tehran, Iran

Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

Gliomas are prevalent type of central nervous system tumors with a very poor prognosis. Low-grade gliomas(LGG) include grade I and II of glioma and Glioblastoma multiform(GBM) refers to grade IV. BRCA (Breast cancer) genes are involved in DNA repair.

LGG and GBM cohorts dataset from The Cancer Genome Atlas was used for this study.

We used Kaplan-Meier and Log-rank analysis for finding out whether there is an association between BRCA1&2 expression with survival.

Lower survival rates were seen in LGG patients with lower expression of BRCA 1 and 2 (p-value<0.01). However, we did not find the same results in GBM patients.

Expression BRCA1 and 2 can be considered as negative prognostic factors in glioma patients. future experiments can help to comprehend the process of gliomagenesis and finding treatments through gene regulation.

Mohammad-Reza Fattahi

Clinical characteristics of 365 hospitalized COVID-19 patients with neurological symptoms: An observational study

Fahimeh Vahabizad, Mansoureh Togha, Shadi Arianfar, Mohammad-Reza Fattahi, Samaneh Haghighi, Zahra Ebadi, Sanaz Ahmadi Karvigh, Sara Heidari, Maryam Shafai, Hale Ashraf, Azar Haddadi, Mohammad Talebpour, Arash Safaei, Hoda Asefi

1. Department of Neurology, Sina hospital, Tehran University of Medical Sciences, Tehran, Iran

2. Headache Department, Neurology Ward, Sina University Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

3. Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

4. Research Development Center, Sina hospital, Tehran University of Medical Sciences, Tehran, Iran

5. Department of Internal Medicine, Sina hospital, Tehran University of Medical Sciences, Tehran, Iran

6. Department of Surgery, Sina hospital, Tehran University of Medical Sciences, Tehran, Iran

7. Department of Emergency Medicine, Tehran University of Medical Sciences, Tehran, Iran

8. Department of Radiology, Tehran University of Medical Sciences, Tehran, Iran

Since the beginning of the COVID-19 pandemic, a number of COVID-related neurological manifestations have been reported. We aimed to categorize the features of hospitalized COVID-19 patients who experienced neurological symptoms.

In this descriptive, cross-sectional study, we enrolled all patients hospitalized with COVID-19 who experienced neurological symptoms in two hospitals in Tehran. Diagnosis of COVID-19 was established by PCR tests or computed tomography of the chest combined with COVID-19 clinical findings. The clinical characteristics, laboratory data, and imaging findings from 365 patients were analyzed.

The average patient age was 43.3 ± 11.8 years and included 213 males and 152 females. The most prevalent neurological symptoms were headache (56.2%), impaired consciousness (55%), and dizziness (20.5%). During hospitalization, most of the patients did not require mechanical ventilation (81.9%). The percentage of patients with end-organ damage was 9% and mortality was 15%. Regression analysis on the neurological symptoms indicated that the mortality rate of patients with headaches was 84% lower than for the other neurological symptoms. Hyperglycemia was significantly related with end-organ damage and mortality ($p = 0.029$, $p = 0.08$, respectively). New vascular lesions were evident on brain MRIs of 9 patients and brain CTs of 16 patients.

Among the neurological symptoms of patients with COVID-19, headache appeared to indicate a protective factor against development of end-organ damage as well as mortality.

Azar Ghasemi

Beyond EBM: towards a phenomenological alternative

Azar Ghasemi[1], Arsham Amjadyan[1], Mohammad Dehghannejad[2]
1. *Medical Humanities Association, Universal Scientific Education and Research Network, Iran*
2. *Kermanshah University of Medical Sciences, Kermanshah, Iran*

Medicine today is a paradigm based on Cartesian metaphysics. After Descartes, his physical-mental duality and mechanical view of the human body became an important part of the EBM. We are looking for a way to get past EBM.

The EBM model, as the governing model of modern medicine, methodologically recognizes the symptoms of the disease, but will not go beyond the disease. For EBM, the disease and its symptoms are like separate objects from the patient. But when the physician intends to interpret the symptoms of a person's illness, he needs to refer to the person himself. Each person's illness is specific to him or her, and understanding the illness is equal to understanding oneself. This is a loop that, wherever we start, eventually includes the patient. This hermeneutic loop of understanding is a requirement of clinical practice. Unlike EBM, the intuitive and intrinsic dimensions of physician and patient are involved in this hermeneutic understanding.

EBM's measuring features and algorithmic thinking overshadow all aspects of clinical work and are devoid of patient features and existential values. EBM has become an automated science production gestell. In this context the relationship between physician and patient, instead of being a mutual, existential relationship, is reduced to subject-object relationship in which nothing but the disease is examined.

The physician must see the art of healing as an attempt to restore balance, and all the physician's efforts have an internal connection to the nature itself. To prioritize the patient, we need a new approach that transcends the Cartesian subjectivism in EBM and moves towards to the wholeness of the patient's dasein. To embody the art of healing in the practice of medicine, the physician must be a Dasein, and this requires going beyond Cartesian metaphysics and towards a phenomenological approach to human being and the world.

Farbod Ghobadinezhad

Next-generation strategies to improve regulatory T cell-based therapies

Farbod Ghobadinezhad[1], Zhila Izadi[2]

1. USERN Office, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Pharmaceutical Sciences Research Center, Health institute, Kermanshah University of Medical Sciences, Kermanshah, Iran

Regulatory T cells are a part of the adaptive immune system with the chief role of maintaining immune homeostasis and immune tolerance. Defects in immune tolerance will lead to several autoimmune diseases which affect more than 50 million individuals only in the United States. To date, non-specific drugs represent the first choice of treatment in many autoimmune disorders and require long-term administration. Considering the fact that regulatory T cells are a part of the adaptive immune system, these cells can have greater specificity and can restore immune tolerance through various mechanisms along with specific recognition and these properties make them ideal for the treatment of several autoimmune disorders. Recent developments in the field of cell engineering and immunology lead to advanced manufacturing and designing strategies which make regulatory T cells even more specific and functional. These approaches mainly consist of TCR-based engineerings and chimeric antigen receptor (CAR) regulatory T cells. However, these approaches have several drawbacks and some disadvantages regarding the type of strategy used to generate specific regulatory T cells. For instance, CAR-based strategies are ideal for recognizing whole proteins expressed in target tissues but they become functional when these antigens are expressed highly in the target tissue.

In conclusion, novel strategies should be embarked on to overcome these drawbacks in the field of autoimmune disease adoptive cell therapy. These approaches can focus on synthetic biology, cytokine signaling, and genome editing (mainly through CRISPR-Cas9 technology).

https://userncongress.tums.ac.ir

Amir-Esmaeil Sabbaghian

Transcriptome analysis of the notch1 signaling pathway associated-genes in differentiation of human dental pulp stem cells

Saeed Gholami-Moghadam[1], Amir-Esmaeil Sabbaghian[2], Masoud Golalipour[3], Ezatolah Kazeminejad[4,5], Ayyoob Khosravi[2,5]

1. Department of Medical Biotechnology, Faculty of Advanced Medical Technologies, Golestan University of Medical Sciences, Gorgan, Iran
2. Department of Molecular Medicine, Faculty of Advanced Medical Technologies, Golestan University of Medical Sciences, Gorgan, Iran
3. Department of Human Genetics, Golestan University of Medical Sciences, Gorgan, Iran
4. Dental Research Center, Golestan University of Medical Sciences, Gorgan, Iran
5. Stem Cell Research Center, Golestan University of Medical Sciences, Gorgan, Iran

The Notch signaling pathway regulates diverse biological activities in human dental pulp stem cells (hDPs) including stemness, proliferation and differentiation. Manokawinchoke J et al were investigated the response of hDPs to the indirect immobilized Notch ligand Jagged1. In the present study, the RNA-seq raw data were extracted from above study and analyzed to investigate the genes associated with hDPs differentiation in the notch signaling pathway.

After extracting the RNA-seq raw data, differential gene expression analysis was performed using Deseq2 to address the most significant genes associated with the differentiation of hDPs in the notch signaling pathway. Also, the related miRNAs to candidate genes were analyzed. Differential gene expression was determined by absolute fold change > 2 and P-value < 0.05.

Eight genes were suggested that could have main roles in the differentiation of DPSCs (e.g., COL5A3, CNIH3, HTRA3, BMP8B, TMEM158, FGF5, ADAMTS12, and Anti-sense to COL5A3). Also, three miRNAs (hsa-mir-27a-3p, hsa-let-7b-5p and hsa-mir-1-3p) showed the highest correlation to these genes.

Our study provides further insight for understanding the genes that have the main role in the differentiation of hDPs through the notch signaling pathway.

Mohaddeseh Hasanzadeh

Comparison of high-fat and low-carbohydrate weight loss diet with standard weight loss diet on appetite and anthropometric measurements in overweight and obese children

Mohaddeseh Hasanzadeh[1,2], Maryam Mahmoodi[1,2], Mir Saeed Yekaninejad[3], Abbas Yousefinejad[1,2]
1. Department of Community Nutrition, School of Nutrition and Dietetics, Tehran University of Medical Science
2. Nutritional Health Team (NHT), Universal Scientific Education and Research Network (USERN), Shiraz, Iran
3. Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Overweight is a global health issue. According to the World Health Organization, from 1975 to 2016, obesity and overweight in children increased almost 10 times in the world. Obesity and overweight are among the leading causes of death, with an estimated 2.8 million people dying each year. To prevent this, it is necessary to pay serious attention to diet. This study aimed to compare the effects of the recommended diet and "low-carbohydrate and high-fat diet" on appetite, and anthropometric indices in children.

The present study is a randomized controlled trial and evaluates the effects of two types of diet. The study method was that 94 obese or overweight children were admitted. Individuals were equally and randomly divided into two groups. In one group of 47 people, a high-fat and low-carbohydrate diet (55% of total energy as fat, 20% of total energy as protein and 25% of total energy as carbohydrate) and in the other group recommended diet (25% of total energy as fat, 20% of total energy as protein and 55% of total energy as carbohydrate). The duration of intervention was 6 weeks. In the first and sixth weeks, the amount of appetite, and anthropometric indices such as:" weight, height, body mass index, waist circumference, hip circumference, and their ratio were measured; Finally, the data were statistically analyzed using SPSS software tests.

Due to the lack of significant changes in physical activity, energy, macronutrient levels at the beginning and end of the study for individuals, high-fat and low-carbohydrate diet caused significant weight loss, waist circumference, hip circumference (P-value less than 0.001). A high-fat, low-carbohydrate diet can lead to a minimum of 0.94 scores and a maximum of 1.5 scores more reduction in appetite score compared to the recommended diet (P-value less than 0.001). But the increase in height was significantly higher than the recommended diet group (P-value = 0.02).

Both diets cause weight loss, waist circumference, hip circumference and appetite, but this reduction is significantly greater in the high-fat, low-carbohydrate diet. These results were in line with the results of previous studies. Both diets also increased height in the subjects, but this increase was significantly greater in the recommended diet. This difference can also be attributed to the difference in the age of the subjects because according to the studies, the recommended diet group of people were relatively younger than the high-fat and low-carbohydrate diet, and this naturally has an effect on height increase.

Farbod Hatami

Spectrum of cardiovascular complications in hospitalized patients with COVID-19

Farbod Hatami[1], Farzad Jalali[1], Mehrdad Saravi[1], Iraj Jafaripour[1], Mohammad Taghi Hedayati[1], Kamyar Amin[1], Roghayeh Pourkia[1], Saeid Abroutan[1], Mostafa Javanian[2], Soheil Ebrahimpour[2], Niloufar Valizadeh[3], Saeede Khosravi Bizhaem[3]

1. Department of Cardiology, Babol University of Medical Sciences, Babol, Iran
2. Infectious Diseases and Tropical Medicine Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
3. Cardiovascular Diseases Research Center, Birjand University of Medical Sciences, Birjand, Iran

Myocarditis, acute coronary syndromes, ST-elevation myocardial infarction, cerebrovascular accident, and deep vein thrombosis in 15 (7.7%), 12 (6.1%), 10 (5.1%), 8 (4.1%), and 4 (2%) patients, respectively. The proportion of patients with elevated hs-TpI, NT-proBPN, left ventricular diastolic dysfunction, and heart failure with preserved ejection fraction was greater in the CV complication group. Severe forms of COVID-19 comprised nearly two-thirds (64.3%) of our study population and constituted a significantly higher share of the CV complication group members (75.9% vs 59.9%; P=0.036). Intensive care unit admission (64.8% vs 44.4%; P=0.011) and stay (5.5 days vs 0 day; P=0.032) were notably higher in patients with CV complications. Among 196 patients, 50 died during hospitalization and 10 died after discharge, yielding all-cause mortality of 30.8%. However, there were no between-group differences concerning mortality. Heart failure, cancer/autoimmune disease, severity, interferon beta-1a, and arrhythmia were the independent predictors of all-cause mortality during and after hospitalization.

CV complications occurred widely among COVID-19 patients. Moreover, arrhythmia, as the most common complication, was associated with increased mortality.

Somayeh Igder

Highly IBD-related colorectal cancer susceptibility associated with the cooperative oncogenic modification of cripto-1 and KRAS gene status as well as a signature composed of three miR-NAs (miR-21, miR-148a, and miR-106a)

Somayeh Igder[1], Pooneh Mokarram[2]

1. Department of Biochemistry, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

2. Autophagy Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Colorectal cancer (CRC) and inflammatory bowel disease (IBD) are classified as two members of idiopathic colorectal mucosal disorders group that their potential adverse synergisms is undeniable. An ongoing inflammatory microenvironment provides positive signals for pro-tumorigenic transformation arises from inflammation-associated molecular patterns that influence the tumor transition process in CRC.

From a total 101tissue specimens including IBD biopsies, colorectal adenomatous polyps (adenomas), CRC and matched normal tissue, whole RNA was isolated to operate mature miRNA quantification through qPCR analysis. Direct DNA-based sequencing and IHC screening were also used to enforce the accurate detections of KRAS and PIK3CA mutations and aberrant upstream expression of Cripto-1 (CR-1) protein, respectively.

In the context of harboring various KRAS mutation in codon12, 13 and 61, our data support the contribution of only mutated phenotype of p.G12D in codon 12 as 12.5% in IBD, 13.3% in adenomas, and 36%in CRC according to finding of a strong link with disease activity. Corresponding to other somatic mutations in PIK3CA in codon 542, 547 and1047, all were non-responders. MiRNAs 21 and 106a were overexpressed differently in irritated, precancerous, and cancerous tissue samples versus normal samples (p <0.001) as well as in CRC and adenomas as against IBD (p <0.001); While miR-148a expression profile was significantly down-regulated from normal mucosa to inflamed to adenoma and to CRC lesions (p <0,001). More outputs indicate a discriminatory immunostaining of CR-1 protein between CRC and benign-appearing adenomatous epitheliums relative to normal IHC in healthy epithelium (p <0,001), and the adenomatous group vs the paired-normal group (p < 0, 05).

Collectively, these key findings from our research implied that, the co-occurrence of mutated RAS oncogene (potentiated KrasG12D) and differential patterns of CR-1, miRNAs 21, 148a and106a expression can manifest a relevance in the onset and progression of IBD-associated CRC.

Nasrin Kakaei

Application of Biomaterials Engineering in Cell Therapy

Nasrin Kakaei, Zhila Izadi

Pharmaceutical Sciences Reasearch Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran

Cell therapy is one of the efficient approaches for the treatment of a wide range of diseases such as cardiovascular, ischemia, type 1 diabetes and cancer. The aim of this review is to investigate the role of biomaterials engineering in cell therapy.

Cells can also be used in the clinic, because these cells have the ability to differentiate into specific cell lines or proliferate while maintaining potency. To achieve this goal in the past cell cultures in a two dimensional culture medium containing components and grows factor. While using biomaterials with special three-dimensional environment and optimal physical and chemistry properties can be more efficient in maintaining potential pluripotent and distinction to a particular cell line. Cell behavior are always influenced by stimuli and their niche characteristics. This is cell-biomaterial interaction stimulates adhesion, proliferation and direct differentiation of implanted cells at the injured site. An engineered niche suitable for cells requires the presence of various physical and biochemical factors such as cell-cell and cell-ECM interactions, biomolecules embedded in the environment, oxygen penetration, mechanical force external and many other factors. But because most biomaterials do not have complete surface properties and optimal performance, therefore surface modification and engineering of biomaterials play an important role in adapting the surface and performance of biomaterials in order to be more compatible with the physiological environment.

Anti-inflammatory agents such as SDS-1α and IL-10 are used in combination with biomaterials to prevent implant rejection. Another strategy in biomaterials engineering is to load growth factors such as FGF, VEGF and EGF with biomaterials in order to use exogenous cells to increase tissue regeneration and repair.

Sina Kazemian

The association between baseline vitamin D status and long-term clinical outcomes in patients with COVID-19: a 7-month follow-up cohort study

Azar Hadadi[1], Fatemeh Chichagi[2], Sina Kazemian[3,4], Marzieh Pazoki[5], Samira Kafan[5], Hedieh Moradi Tabriz[6]

1. Research Center for Clinical Virology, Tehran University of Medical Sciences, Tehran, Iran

2. Research Development Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

3. Students' Scientific Research Center (SSRC), Tehran University of Medical Sciences, Tehran, Iran

4. Cardiac Primary Prevention Research Center (CPPRC), Tehran Heart Center, Tehran University of Medical Sciences, Tehran, Iran

5. Department of Pulmonary Medicine, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

6. Department of Pathology, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

Since recognizing the COVID-19, vitamin D supplementary therapy has been suggested as a beneficial factor by some scientific sources. In this study, we aimed to find out whether the circulating level of vitamin D is a contributing factor to long-term outcomes in patients with COVID-19 or not.

In this cohort study, we evaluated all patients ≥18 years of age who experienced respiratory symptoms with a diagnosis of COVID-19 and were hospitalized at Sina hospital between February 16, 2020, and October 28, 2020. The cut-off point of sufficient, insufficient, and deficient levels of vitamin D was defined as ≥ 30 ng/mL, 20–29 ng/mL, and <20 ng/mL, respectively. We included 636 patients of whom 34% had sufficient vitamin D levels. Patients were followed for 7 months on average to compare long-term outcomes between sufficient group and the rest of the patients.

After conducting logistic regression and adjusting with possible cofounders, our results showed a significantly higher in-hospital mortality rate in Vitamin D insufficient group (OR: 2.28, 95% CI: 1.30-4.00, P: 0.004). Furthermore, the multivariate model demonstrated a statistically significant higher risk of multiorgan damage in patients with an insufficient level of vitamin D (OR: 1.60, 95% CI: 1.03-2.49, P: 0.035). We did not find any association between 7-months all-cause mortality or other in-hospital complications and the baseline level of vitamin D.

Among patients with COVID-19, the patients with an insufficient circulating level of vitamin D were more vulnerable to multiorgan damage and in-hospital mortality.

Mahsa Keshavarz-Fathi

Methylation Status of the SOCS3 Promoter in Juvenile Systemic Lupus Erythematosus

Mahsa Keshavarz-Fathi[1,2,3], Golshid Sanati, Maryam Sadr, Bahareh Mohebbi, Vahid Ziaee, Nima Rezaei
1. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Cancer Immunology Project (CIP), Universal Scientific Education and Research Network (USERN), Tehran, Iran
3. Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

Cytokine dysregulation is one of the hallmarks of Systemic Lupus Erythematosus (SLE) in both pediatric and adult patients. The cytokine dysregulation can be caused by alterations in the shared downstream pathways of cytokine signaling including the non-receptor Janus kinase (JAK) and suppressor of cytokine signaling (SOCS) family members. SOCS3 is one of these proteins which could inhibit both JAK and cytokine receptors. We conducted this study to understand if the methylation status of the SOCS3 promoter is altered in juvenile SLE (JSLE). Pediatric patients with SLE and healthy controls without any history of autoimmune and inflammatory diseases were included. Peripheral blood samples were obtained and DNA extraction was performed. The promoter methylation was assessed by using the bisulfite conversion system and real-time quantitative multiplex methylation-specific PCR (QM-MSP).

Twenty-five patients with JSLE and 24 healthy controls were enrolled. DNA methylation of the SOCS3 promoter in their peripheral blood samples was compared and aberrant promoter methylation was observed in patients with JSLE.

The pathogenesis of systemic lupus erythematosus (SLE) is multifactorial and is affected by both genetic and epigenetic alterations. Recently, several studies have assessed the methylation status of the genes responsible for autoimmunity in pediatric and adult patients. Due to the substantial role of inflammatory cytokines in the pathogenesis of SLE, we have evaluated DNA methylation of the SOCS3 promoter in the current study. Our results showed the hypermethylation of the SOCS3 promoter in JSLE. This can be a possible mechanism for silencing the SOCS3 gene and prevention of its inhibitory function on the JAK-STAT pathway. Therefore, a hyper-activated cytokine signaling through the JAK-STAT pathway can be expected in JSLE.

Kseniia Lepilina

Oral Health Changes In Tobacco Smoking Orthodontic Patients

Kseniia Lepilina, Liudmyla Kryvenko

Department of Pediatric Dentistry and Implantology, Kharkiv National Medical University, Kharkiv, Ukraine

A presence of orthodontic appliances in oral cavity affects oral hygiene status directly. Tobacco smoking, in turn, is a significant risk factor for periodontal disease. The adverse effects of tobacco smoking on oral health are well investigated. The aim of this study was to examine the relationship between tobacco smoking, oral hygiene and gingival health in young patients who smoke cigarettes and undergo orthodontic treatment.

The study was carried out among young adults (the age ranged between 20 to 30 years) at the University Dental Center of Kharkiv National Medical University. Twenty individuals with orthodontic appliances and tobacco smoking were examined. Demographic data was collected using a questionnaire; clinical dental examination was done according to protocols of a dental patient examination. The participants were clinically examined to obtain gingival index (GI) and oral hygiene index (OHI-S).

According to obtained data patients with smoking habits showed poor oral hygiene, the level of OHI-S was equal to 1,1±0,47. The clinical examination showed symptoms of bleeding and inflammation in gums, definition of GI (1,095±0,57) approved a presence of inflammation in tissues.

The effect of smoking is major risk factor in orthodontic patients. The data gathered in this study show that it is necessary to increase awareness among young adults about harmful effects of smoking on oral health. Further thorough analysis of oral health among cigarette-smokers with orthodontic appliances should be done to improve methods of prevention of periodontal diseases.

AmirReza Mazandarani

Misty Impact of Social Media on Medicine utilization: Case of Selected pharmaceuticals in COVID-19 Pandemic

AmirReza Mazandarani, Nazila Yousefi, Hamid Reza Rasekh

Department of Pharmacoeconomics and Pharma Management, Faculty of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran

The role of social media in shaping opinions is crucial. So that, it would become a major source of public information in the COVID-19 pandemic. However, unprecedented setting for the spread of information (infodemic) could potentially lead to induced demand and safety challenges that may increase the unpleasant outcomes as well as the costs.

This study aims to investigate two antiviral medications (Favipiravir and Remdesivir) in the Iranian content of social media to understand the impact of social media on pharmaceuticals utilization in the first year of the COVID-19 pandemic.

Following the text mining of Twitter, Instagram, and Telegram along with news agencies from February 2020 to February 2021, the contents were analyzed quantitatively on a time-frequency basis followed by a qualitative and content analysis on recurring peak points on the social media. In addition, we obtained a word cloud for recurring words; then, the media frames of peaks were analyzed using nine preset frames for coding. Finally, the impact of social media on the use of medicines was investigated by matching results with the sales of selected medicines, as well as the number of patients.

The total number of 125,757 records were extracted (78,634 Remdesivir and 47,123 Favipiravir). We found 23, 21, and 15 peaks in Twitter, Telegram, and Instagram, respectively. In the qualitative content analysis, a word cloud was created for each peak, which the most frequent frames were "attribution of responsibility", "politicization", "economic consequences", and "hope".

Despite presence of some confounding variables, correlations between the frequencies of the media content and the spikes in the trend of use is clear. Moreover, content analysis reveals that the public pressure might force Iranian government for providing the pharmaceuticals such as Favipiravir without sufficient evidences on its efficacy and improper allocation of budget in the pandemic management.

Elahe Meftah

Effectiveness of psychological first aid training for the students of medical sciences: a controlled study

Elahe Meftah[1], Najmeh Keynezhad[2], Forough Nouri Najafi[2]
1. *Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran*
2. *Family Department, Shahid Beheshti University, Tehran, Iran*

Psychological first aid (PFA) is suggested as a preferred method of initial psychosocial support for people who have experienced a traumatic event. The purpose of this study was to evaluate the effectiveness of PFA training on the level of knowledge, attitude, and ability of medical sciences students—the future providers of forefront services during a crisis.

Eighty Iranian students of medical sciences were divided into two groups of 40 experimental and 40 control participants. The control group did not receive any training, while the experimental group received eight hours of online PFA training. In four sessions, topics such as "approach to people affected by crises," "protecting yourself and others during crises," and "recruiting the main pillars of PFA—prepare, look, listen, and link" were discussed. Based on their field of study, we grouped the participants into eight heterogeneous groups to boost performance. A trained psychologist was assigned to each group to facilitate group discussions. After each lecture, each group discussed their given scenario in a breakout room. The participants would then role-play the scenario in the main room and improve their performance with feedback. The effectiveness of the course was evaluated using pretests and posttests. Both experimental and control groups filled a questionnaire with 15 questions on knowledge and 14 on the attitude and ability to perform PFA.

Contrary to the control group, the experimental group earned significantly higher posttest scores of knowledge and attitude than its pretest scores ($P<0.05$). ANCOVA demonstrated a significant difference between the experimental and control groups ($P<0.05$) regarding knowledge and attitude variables, with the experimental showing higher scores than the control.

Training PFA to students of medical sciences can prepare them for performing PFA during disasters, as this training improves the knowledge, attitude, and ability of the trainees regarding PFA.

Golsa Mesbahi

Applying Computational Methods in Psychiatry: Ruling Out Subjectivity?

Golsa Mesbahi, Dorsa Shekuh
Shiraz University of Medical Sciences, School of Medicine

Computational psychiatry has aimed to picture a clearer understanding of etiology and risk factors of mental health disorders and to utilize more rigorous and accurate approaches to diagnosis, treatments, and prognosis: Computational theory mathematically models neurobehavioral mechanisms of psychiatric conditions; Machine learning techniques process the neuroimaging, molecular and socio-behavioral data to classify disorders better and to predict response to treatments; Internet of things facilitates access to big data and allows clinicians to monitor symptoms remotely. The rising precision of these approaches raises questions concerning whether they will replace subjective data – which have commonly been neglected and condemned to bias and lack of meticulous strategies to be analyzed.

In this mini-review, we highlighted the recent advances of different approaches of computational psychiatry, the pros and cons of subjectivity in this field, and the reciprocal benefits that technology and subjective data can provide. We conducted a search in PUBMED and Google Scholar, and Web of Science using terms "psychiatry," "computational psychiatry," "machine learning," and "subjectivity."

The way the patients explain their symptoms is not merely of diagnostic value but also -if decently considered- helps clinicians better involve the patients in the diagnosis and treatment process, which has proved to promote their response to treatment. Subjective data can also help clinicians recruit machine intelligence methods that are consistent with the unique needs of individuals. Along with the services of subjectivity, machine intelligence methods have stepped beyond focusing only on objective data and are trying to broaden their horizons and improve their efficacy by making sense of subjective data.

Ruling out subjectivity does not seem to be the aim or prevailing technology's natural result. Conversely, both approaches are the necessary limbs of the process. They are the most beneficial when integrated to maintain precision as well as phenomenology to assure stepping toward individualized psychiatry.

Saba Mirikermanshahi

Narrative Medicine: A road towards rehumanizing medicine

Saba Mirikermanshahi*, Saba Mirikermanshahi, Anastasia Papamicheal, Pelayo Aguilera, Melanie Saavedra, Khushbakht Shoeib

Medical Humanities Association, Universal Scientific Education and Research Network, Kermanshah, Iran

Reflective writing is one established method for teaching medical students empathetic interactions in Narrative Medicine. We aimed to develop narrative competence and stimulate reflection to promote professional and personal growth.

An online survey was sent to healthcare students to assess their knowledge of narrative medicine added three reflective writing-orientated exercises. Answers were anonymously published on the project's Instagram account. Finally, a subjective questionnaire was sent to the participants to assess their level of satisfaction and how the project made them feel.

Most of the 67 participants were 18-22 years of medical students in clinical years; 64% did not know narrative medicine or reflective writing. The second survey gathered 42 responses. Over 90% of participants were delighted with the experience and claimed it would affect their future work with patients.

We aimed to give people space to speak about their emotional experiences anonymously, where it is possible to be a healthcare practitioner and a human. It is not typical to share emotional experiences in the medical professional atmosphere, and the results of this survey show that it might have serious effects, but such activities can help realize others even from different countries, feel the same, and empathize with you. It makes us feel we are humans beyond all pressures and burnout to recognize our patients' humanity. This is how narrative medicine works and builds a road through rehumanizing medicine.

Our qualitative findings highlight the richness of the experience. Most of the participants were deeply moved. They described how they feel as Heard, Hopeful, Liberated, Alleviated, etc. It shows the necessity of integrating humanitarian viewpoints in medicine because The world currently needs readers of the body and the soul of persons who can respond to the complex disease experience.

Danial Nejadmasoom

Virtual Reality Hypnosis; a cognitive intervention for motor function improvement

Danial Nejadmasoom
Islamic Azad University of Chalus, Chalus, Iran

Hypnosis provides a state in which attention and suggestibility of the brain increases, therefore, a person in a state of hypnosis can better accept the therapist's suggestions. Hypnosis can be a practical method for modulating cognitive processes; in this way, we can consider hypnosis as a cognitive intervention. Neuroscience researchers also can use hypnosis to understanding neural mechanisms of some diseases or normal states of the brain. Previous studies shows this method has also been used for a wide range of clinical conditions such as neuro-motor rehabilitation in stroke and Parkinson's disease (PD). Besides clinical application of hypnosis, it is also useful for motor enhancement in healthy people even elite athletes. Many studies show that motor imagery can improve motor function and muscle strength. The hypnosis process also highly relies on the cognitive ability to the imagination; but not all individuals have the same brain capability for mental imagery. For solving this challenge, we can use Virtual Reality (VR) technology to making immersive images during hypnosis. According to previous studies on other applications of Virtual Reality Hypnosis (VRH), I expect that with better imagination and absorption during hypnosis through VR, the influence of this method will improve. This article reviews the application of VRH as a multidimensional (Technology, Mental Imagery and hypnosis) cognitive intervention for the improvement of motor function in healthy and non-healthy people.

Morvarid Noormohammadi

Junk food consumption and microbiome health with a focus on bacterial vaginosis

Morvarid Noormohammadi, Ghazaleh Eslamian, Seyyedeh Neda Kazemi, Bahram Rashidkhani

Department of Cellular and Molecular Nutrition, Faculty of Nutrition and Food Technology, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Diet is one of the crucial factors affecting the diversity of the human microbiome. Bacterial vaginosis, the most common vaginal infection in women of childbearing age, is characterized by an imbalance in the vaginal microbiome. However, the association between dietary intakes and bacterial vaginosis remains largely unexplained. Therefore, this study aimed to investigate the association between junk food consumption and odds of bacterial vaginosis. In a setting of hospital-based case-control study using a simple sampling method in 2020, 144 incident bacterial vaginosis cases diagnosed by Amsel criteria and 151 controls entered the study through the gynecology clinic in Tehran, Iran. Using a food frequency questionnaire, dietary intakes in the last year were collected. Food items with low nutritional quality and high in sugar, salt, saturated and trans-fatty acids were categorized in the "Junk food" group. This group included sweets and desserts (biscuits, doughnuts, cookies, chocolates, cakes, and candies), sweet beverages and fast foods (pizza, hamburgers, and sausages), chips, and cheese puff. There was no significant difference in the mean±SD age of the cases and controls (30 ± 6 and 31 ± 7 years, respectively). The mean±SD body mass index was significantly higher in the cases (26.3 ± 4.4) compared to the controls (25.4 ± 4.9). Family history of bacterial vaginosis was significantly higher in the cases than in the controls ($p < 0.001$). After adjustment of confounding variables, the odds of bacterial vaginosis in the highest tertile of junk food consumption were more than two times greater compared to the lower tertile (aOR: 2.27, 95%CI: 1.11-4.63, ptrend = 0.025). The results show that there is a positive association between junk food consumption and bacterial vaginosis, and therefore junk food consumption may disturb the balance of the vaginal microbiome.

Negin Nouraei

COVID-19 pandemic: Possible Condition for Homecoming

Negin Nouraei, Saba Miri Kermanshahi, Mahdi Azadi badrbani
Medical Humanities Association (MHA), Universal Scientific Education and Research Network (USERN).kermanshah university of medical sciences, Kermanshah, Iran

This article, aims to review the Heideggerian ontological concept of "not-being-at-home" according to Kevin Aho's description of the crisis caused by the COVID-19 pandemic. Furthermore, by considering the conceptual fusion of "not-being-at-home" and illness, as described by Fredrik Sveneaus, we claim to present a phenomenological perspective of health compared to a standard description of health in the modern health system and study how this perspective is related to the theory and practice of medicine. In this article, we aim to point to the insufficiency of the current approach in modern medicine, which is more understood during the pandemic, alongside emphasizing the necessity to adopt an existential approach based on humanities which can understand the human being, not only as an organism but as a person who experiences different conditions like health, disease, anxiety, and etc.

Niloufar Yazdanpanah

Autoimmune Complications of COVID-19

Niloufar Yazdanpanah[1,2], Nima Rezaei[1,2]

1. Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

2. Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

Coronavirus disease 2019 (COVID-19) is still propagating a year after the start of the pandemic. Besides the complications patients face during the COVID-19 disease period, there is an accumulating body of evidence concerning the late-onset complications of COVID-19, of which autoimmune manifestations have attracted remarkable attention from the first months of the pandemic. Autoimmune hemolytic anemia, immune thrombocytopenic purpura, autoimmune thyroid diseases, Kawasaki disease, Guillain-Barre syndrome, and the detection of autoantibodies are the cues to the discovery of the potential of COVID-19 in inducing autoimmunity. Clarification of the pathophysiology of COVID-19 injuries to the host, whether it is direct viral injury or autoimmunity, could help to develop appropriate treatment.

Mohammadreza Rostami

Biomaterials and novel 3D printing and electrospinning strategies could affect human life quality

Mohammadreza Rostami, Gholamreza Jahed Khaniki

Food Safety & Hygiene Division, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

With increasing the growth of various diseases around the world and many efforts that have been made in the field of prevention and treatme nt of diseases and health problems that have made human life complicated, it is observed that with all the knowledge that exists, sometimes the smallest biological size of creation, De-balances the natural life of man and creates unfavorable consequences. However, experience has shown that during creative disasters, only human empathy and cooperation can eradicate creative issues. It is observed that the treatment of many diseases is done using biological biomaterials and human beings always need to know the nature and properties of available and usable materials. Another challenge after identifying the therapeutic properties and effects of biomaterials is the processes and methods that make these substances effective and complement the period of prevention or treatment of a disease or defect. Among these, we can mention the use of biomaterials such as proteins, polysaccharides, gums, polyphenols, and all substances present and effective in nature. These processes include additive manufacturing techniques, like 3D printing, and electrohydrodynamic processes, such as electrospinning and electrospray, which have many applications in the fields of medicine, pharmaceuticals, tissue engineering, regenerative medicine, coating of bioactive materials, filtration, adsorbents, and food packaging.

The combination of the science of occurrence and use of substances in nature has been more responsive to human needs and the solution to the problems ahead. Sometimes, a process, its application, and its connection in different fields is a beacon for human darkness. In this research, it is considered that by using the materials available in nature and using new human science in the field, methods and techniques such as 3D printing and electrohydrodynamic process seek the minimum available treatments for some diseases, which aims to introduce biomaterials and processes and how this research results in human lifestyle.

Kiarash Saleki

Interferon treatment in SARS, MERS, and COVID-19: A systematic review and meta-analysis of clinical evidence

Kiarash Saleki[1,2], Shakila Yaribash[2,3], Mohammad Banazadeh[2,4], Ehsan Hajihosseinlou[2,5], Mahdi Gouravani[2,5], Amene Saghazadeh[2,6], Nima Rezaei[6,7,8]

1. Student Research Committee, Babol University of Medical Sciences, Babol, Iran

2. Systematic Review and Meta-analysis Expert Group (SRMEG), Universal Scientific Education and Research Network (USERN), Tehran, Iran

3. International Campus, School of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

4. Pharmaceutical Sciences and Cosmetic Products Research Center, Kerman University of Medical Sciences, Kerman, Iran

5. School of medicine, Tehran University of medical sciences, Tehran, Iran

6. Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

7. Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

8. Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

As of late 2021, the COVID-19 pandemic is still ongoing. Although many effective vaccines have been verified, current vaccination programs have failed to eradicate the novel coronavirus, highlighting the role of drug re-purposing and discovery. Interferon (IFN), in addition to other antivirals and therapies, have been utilized to treat and prevent MERS-CoV, SARS-CoV, and SARS- CoV2 infections. We evaluated the prospect of IFN therapies and combinational therapy with antivirals, corticosteroids, and other therapeutics.

Major web databases were explored. A multi-phase screening was performed, and eligible articles were assessed according to the protocol. Risk of bias was performed for each study type at the level of study by NIH tools. After merging overlapping studies, Fifty-five articles were found.

We found a potential benefit for IFN or its combination therapies. A good-caliber cohort exploration found that during the time range of day 0–20 (upon onset of symptoms), on average, patients treated solely with the ARB regimen had elevated CRP compared to patients treated with single-drug or combinational IFN and ARB, by 25.7 mg/L. In a COVID-19 trial, total adverse drug events (ADEs) were significantly lower in the Favipiravir (FPV) + IFN-α group in comparison with the LPV/RTV group ($P = 0.001$). Moreover, nausea in subjects administered with FPV + IFN-α regimen was significantly lower ($P = 0.03$). Quantitative assessment of mortality did not exhibit a clear effect for IFN/RBV therapy in six moderately heterogeneous MERS-CoV articles (log OR=-0.05, 95% CI: (-0.71,0.62), I2 =44.71%). A meta-analysis of three COVID-19 studies did not detect a conclusive nor significant link among administration IFN and COVID-19 severity (log OR=-0.44, 95% CI: (-1.13,0.25), I2 =31.42%).

We advise that the administration of these treatments follows thorough attention until future research further clarifies the role of IFN in COVID-19 patients.

Simin Seyedpour

Acitretin and methotrexate combination therapy in psoriasis, results from a cross-sectional study

Bahareh Gholami[1], Behzad Khodaei[1,2], Simin Seyedpour[1,2], Samira Gholami[3], Maryam Nasimi[4]

1. School of Medicine, Tehran University of Medical sciences, Tehran, Iran
2. Nanomedicine Research Association (NRA), Universal Scientific Education and Research Network (USERN), Tehran, Iran
3. School of Medicine, Shahid Beheshti University of Medical sciences, Tehran, Iran
4. Department of Dermatology, Razi Hospital, Tehran University of Medical Sciences, Tehran, Iran

Acitretin and methotrexate are two mainstream treatments for psoriatic lesions. Each of these two drugs exerts hepatotoxicity. However, Acitretin and methotrexate combination therapy have been rarely implemented. We aimed to study the efficacy and the potential side effects of combination therapy with Acitretin and methotrexate in psoriatic patients.

In this cross-sectional study, we identified 21 patients who were on combination therapy with methotrexate and Acitretin. We extracted laboratory and clinical characteristics of the patients, including the Psoriasis Area and Severity Index (PASI) score before and after combination therapy. Descriptive statistics and non-parametric statistic tests were used to compare pre-and post-treatment differences.

The majority of the patients (66%) demonstrated clinical improvement. Among patients receiving combination therapy, only seven out of twenty-one patients had developed abnormal liver function tests (33.3%), of which four had an increase in AST and ALT levels. Two had, increased ALT and one had increased ALP levels. None of the patients had any changes in complete blood count (CBC); however, one had developed elevated triglycerides and cholesterol during combination therapy. The PASI score comparison of patients pre-and post-combination therapy showed significant improvement, which can indicates a favorable effect of the combination therapy regime.

Combination therapy with Acitretin and methotrexate had no severe adverse effects in our patients, and their efficacy could be further evaluated in future experiments.

Reza Shakiba

Investigation of the antidepressant effect of caffeine through NO/cGMP pathway in mice forced swimming test

Reza Shakiba[1], Ahmad Reza Dehpour[2]
1. Scholar dentistry, Mashhad University of Medical Sciences, Mashad , Iran
2. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

In the current study we examined the possible involvement of Nitric Oxide/cyclic Guanosine Monophosphate (NO/cGMP) in caffeine antidepressant effect in animal models.

We investigated this effect by evaluating the immobility time in the forced swimming test (FST) and locomotor activity by the open field test (OFT).

Our data revealed that intraperitoneal (i.p.) administration of caffeine (50mg/kg) 30 minute prior to the FST significantly decreased the immobility interval in the FST. It was found that non-effective dose of N(G)-nitro-l-arginine methyl ester (L-NAME)(10 mg/kg), non-specific NO synthase (NOS) inhibitor, and 7-nitroindazole (7-NI)(25mg/kg), selective neural NOS (nNOS) inhibitor co-administrated with non-effective dose of caffeine decreased the immobility time while non-effective dose of aminoguanidine (50mg/kg) , selective inducible NOS (iNOS) inhibitor did not augment the antidepressant effect of non-effective dose of caffeine. Furthermore, the antidepressant-like property of caffeine was prevented by administration of effective dose of L-arginine (750mg/kg) and sildenafil (5mg/kg).These treatments did not affect the locomotor activity of animals in the OFT.

Our results support the role of NO/cGMP pathway in antidepressant-like effect of caffeine in the mice FST model.

Parisa Feizollahi

Evaluation serum levels of Insulin Growth Factor-1 (IGF-1) and its association with clinical parameters in severe COVID-19

Parisa Feizollahi, Seyed Askar Roghani, Mahdi Taghadosi
Immunology Department, Faculty of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

Severe coronavirus disease-2019 (COVID-19) is associated with dysregulated immune response and extreme inflammatory injury. Considering the role of insulin growth factor-1 (IGF-1) in immune-mediated and inflammatory reactions, this study was conducted to investigate the IGF-1 contribution to the pathogenesis of severe form of COVID-19.

Sixty-two patients with severe COVID-19 and 52 healthy subjects were enrolled in this study. The serum levels of IGF-1 were measured using a solid-phase enzyme-linked chemiluminescent immunoassay on an Immulite 2000 system (Siemens Healthcare Diagnostics.

The serum levels of IGF-1 had no significant difference in COVID-19 patients compared to the healthy subjects (p=0.359). There was a positive correlation between IGF-1 and age in the severe COVID-19 patients, while a negative correlation was observed for the serum levels of IGF-1 and age in the control group (r=0.364, p=0.036, r=-0.536, p=0.001, respectively).

Our results pointed to the complex role of IGF-1 in the severe form of COVID-19, and its association with clinical parameters, and some risk factors in the severe form of COVID-19.

Alireza Sarkar Lotfabadi

Novel Xylomannan Coated Iron Oxide Nanocomposite Enhances the In-vitro Maturation Rate of Vitrified Mouse GV Oocytes

Alireza Sarkar Lotfabadi[1,2], Samira Hajiaghaloo[2], Mohammadreza Ghalamboran[1], Rouhollah Fathi[2]

1. Department of Bioengineering and biotechnology, faculty of life sciences and biotechnology, Shahid Beheshti University, Tehran, Iran
2. Department of Embryology, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran

The importance of storing gametes is increasing every day, because it allows couples to maintain their fertility, especially in acute conditions in which their reproductive system may be affected. Cryopreservation is a method applied to preserve the biological samples (organs, tissues and cells) at -196°C temperature of liquid nitrogen for future usage.

In the course of cryopreservation, the process of freezing and thawing leads to cryo-injuries of the cells. For instance, formation of intracellular and extracellular ice crystals leads to cell membrane rupture and causes osmotic shock via fluctuation of the salts' concentration inside the cells. Cryoprotectant agents (CPAs) are substances which are applied to reduce these types of damages during the cryopreservation process; however, their toxicity is considered as another major challenge.

Nanotechnology as a new horizon in most fields of science can be used to enhance the efficiency of cryopreservation and overcome its challenges. In this study, first, purified powder of xylomannan, which is an antifreeze material, was extracted from Enoki mushroom, then added to iron oxide nanoparticles while they were at the synthesis system to fabricate the Xylomannan Coated Iron Oxide Nanocomposite (XCIONc).

Characterization tests such as DLS, Z-potential, XRD and FT-IR were performed to ensure hydrodynamic size, stability, type and chemical surface of nanocomposites, respectively.

The aim of this study was investigating whether use of mentioned nanocomposite increases post-warming survival and in-vitro maturation (IVM) rates of mouse GV oocytes. Results indicate that vitrified-warmed mouse GV oocytes in the medium containing XCIONc have significant IVM rate (non-vitrified (Control): 46.05%, Vitrified: 67.18% and XCIONc -Vitrified: 89.17%).

It is concluded that using the novel xylomannan coated iron oxide nanocomposite in vitrification process of mouse GV oocytes, improves cryopreservation outcome and enhances their next IVM rate.

Parinaz Sedighi

Clinical and Laboratory Pattern of COVID-19 Related Multi-System Inflammatory Syndrome in Children

Parinaz Sedighi[1,2], Iraj Sedighi[3], Kiana Karimi[1,2], Asadolah Tanasan[3], Zohreh Shalchi[3], Fahimeh Molaei[3], Alireza Soltanian[4], Hassan Bazmamoun[3]

1. Student research committee, Hamadan University of Medical Sciences, Hamadan, Iran.
2. Universal Scientific Education and Research Network (USERN), Tehran, Iran.
3. Department of Pediatrics, Faculty of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran.
4. Department of Biostatistics, Hamadan University of Medical Sciences, Hamadan, Iran.

Multi-System Inflammatory Syndrome in Children (MIS-C) first has been warned by National Health Service in England following the Coronavirus disease 19 (COVID-19) pandemic. Later, Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) defined criteria for MIS-C diagnosis. The pathophysiology of MIS-C is not well understood, but immune system dysfunction appear to play a greater role than viral factors leading to manifestations similar to Kawasaki disease and Toxic Shock Syndrome.

In this descriptive study, 47 patients under 21 years old with definite diagnosis of MIS-C were evaluated and clinical manifestations, laboratory findings, treatment plans and further complications were recorded.

Of the total cases, 25 (53.2%) patients were male and the median age of participants was 5.58 years. The most common clinical manifestations among cases were fever, rash, conjunctival injection, mucous membrane changes, periorbital edema, gastrointestinal symptoms (vomiting and diarrhea), respiratory distress, tachycardia, and swollen hands and feet.

Regarding to the results of our study, the mean age of MIS-C patients is more than patients with Kawasaki disease. We can conclude that simultaneous fever, diarrhea, vomiting, and limb or periorbital edema in children is a key feature for MIS-C diagnosis when we are in COVID-19 pandemic since gastroenteritis usually is associated with dehydration and edema is an unusual finding. so, we can conclude that in case of gastroenteritis plus limb or periorbital edema in children, there are two important differential diagnoses including Hemolytic Uremic Syndrome (HUS) and MIS-C. Also, evidence of SARS-CoV-2 infection should be evaluated in suspected cases of Toxic Shock Syndrome (TSS) or Kawasaki disease due to very similar manifestations of these two disease with MIS-C secondary to SARS-CoV-2 infection.

Farnoosh Shemirani

A randomized clinical trial of the effects of Paleolithic-based low-carbohydrate vs moderate-carbohydrate diet with portion-control and calorie-counting on body composition, adipo/hepatokines and endothelial damage in adults with metabolic syndrome

Farnoosh Shemirani, Maryam Mahmoudi, Kurosh Djafarian, Nima Rezaei, Leila Azadbakht, Akbar Fotouhi
Tehran University of Medical Sciences, Tehran, Iran

Several recent studies have been undertaken into carbohydrate-restricted diets. it has not been clearly demonstrated whether diets with different proportions of energy from carbohydrate exert distinct effects on metabolism and inflammation or not. The current randomized clinical trial has been conducted to further elucidate the effects of severe and mild carbohydrate restriction on inflammation and cardiometabolic status in adults with metabolic syndrome.

Eighty adults with metabolic syndrome were randomized to one of the four carbohydrate restricted diets: Paleolithic-based low-carbohydrate diet with calorie-counting (PLCD-CC) (n=20), Paleolithic-based low-carbohydrate diet with portion-control (PLCD-PC) (n=20), moderate-carbohydrate diet with calorie-counting (MCD-CC) (n=20) and moderate-carbohydrate diet with portion-control (MCD-PC) (n=20) for 10 weeks. PLCD is consisted of 25-30% of energy from carbohydrate, 30% of energy from protein and 40-45% of energy from fat and encourages consumption of fruits, vegetables and lean meat. MCD is characterized as 40-45% carbohydrate, 30% protein and 30-35% fat. Body weight and composition, Asprosin, leptin, CTRP-6 and endothelial microparticles were tested at baseline and at the end of 10 weeks.

A total of 69 participants completed the trial. At the end of the study, significant reduction in all body composition elements was observed in all four intervention arms (p<0.001). Also, the between-group differences were not statistically significant (p>0.05). Moreover, we found significant reduction in CTRP6 and leptin in all intervention groups (p<0.001). Reduction of Asprosin level was also statistically significant between 4 groups (p<0.05). All four intervention groups were found to improve endothelial microparticles and the between-group differences were marginally statistically significant (p=0.073).

The current RCT in adults with metabolic syndrome revealed that both moderate and Paleolithic-based low carbohydrate diets with both delivery approaches have comparable beneficial effects in terms of body weight and composition, endothelial integrity and metabolism-related adipo/hepatokine profile.

Anton Tkachenko

Effects of GdYVO4:Eu [3+] Nanoparticles on Apoptosis of Leukocytes in Vitro

Anton Tkachenko[1], Anatolii I. Onishchenko[1], Svetlana L. Yefimova[2], Volodymyr Yu. Prokopyuk[1], Pavel O. Maksim-chuk[2], Vladimir K. Klochkov[2]

1. Kharkiv National Medical University, Kharkiv, Ukraine
2. Institute for Scintillation Materials, National Academy of Sciences of Ukraine, Kharkiv, Ukraine

Nanomaterials are known to deliver chemotherapeutic, immunomodulatory and gene silencing agents to tumors tissues. In addition, they are used in the radiotherapy of cancer. GdYVO4:Eu3+ nanoparticles have been reported to be promising theranostic agents in cancer therapy. Thus, the evaluation of their safety is of huge importance. The aim of our research was to assess the ability of GdYVO4:Eu3+ nanoparticles to induce apoptosis of leukocytes in vitro.

Aliquots of blood collected from 9 adult WAG rats were incubated in RPMI 1640 and 5% fetal bovine serum with GdYVO4:Eu3+ nanoparticles (0-20-40-80 μg/ml) for 4 h. Leukocyte suspensions obtained from the incubated blood samples were stained with antibodies to CD45 (BD PharmingenTM APC-CyTM7 Mouse Anti-rat CD45, BD Biosciences, USA) to discriminate leukocytes and the mitochondrial membrane potential probe 5,5′,6,6′-tetrachloro-1,1′,3,3′-tetraethylbenzimidazolocarbo-cyanine iodide (JC-1, BD™ MitoScreen Kit, BD Pharmingen™, USA) to assess GdYVO4:Eu3+-induced leukocyte apoptosis. Data were acquired using BD FACSCanto™ II flow cytometer (BD, USA). Kruskal-Wallis and Dunn's tests were used for post-acquisition comparison of results.

The percentage of apoptotic cells, i.e. those with depolarized mitochondria that don't form J-aggregates, was not affected when low concentrations of nanoparticles (20 and 40 μg/ml) were used. However, this parameter was over 3-fold higher in the samples treated with 80 μg/ml GdYVO4:Eu3+ nanoparticles ($p < 0.0001$) compared with controls. In addition, the mean fluorescence intensity of J-aggregates in leukocytes with active mitochondria was analyzed. The difference with the control samples was statistically insignificant for the concentrations of 20 and 40 μg/ml. As for 80 μg/ml, incubation with this concentration statistically significantly ($p < 0.0001$) decreased MFI values by 30%.

In contrast to low concentrations of GdYVO4:Eu3+ nanoparticles (20 and 40 μg/ml), their high concentrations (80 μg/ml) induce apoptosis of leukocytes in vitro.

Farshid Vahdatinia

Photobiomodulation Therapy and Dental-derived Mesenchymal Stem Cells: a Review of Literature

Farshid Vahdatinia, Reza Fekrazad

Private dentist, Member of International Association for Dental research (IADR), Dental Research Center, Dental School, Hamadan University of Medical Sciences, Hamadan, Iran

TThe role of PBMT in regulating cellular activity as well as its biostimulation effect on cell proliferation or inhibition has led a group of studies to investigate its effect on stem cells. The aim of this review study was to investigate the effect of photobiomodulation therapy (PBMT) on the function of Dental Derived Mesenchymal Stem Cells (DDMSCs).

The study was done by reviewing laboratory and clinical studies conducted until 2020 according to the following keywords: Photobiomodulation therapy, Low Level Laser Therapy, Regeneration, Dental Derived Mesenchymal Stem Cells using "and" conjunction in Pub med, Medline, Springer, Elsevier, and Science direct databases.

The findings of 9 related articles indicated the role of PBMT in improving proliferation and viability of DDMSCs. Also, the functional improvement of stem cells in the regeneration of dental pulp can be one of the most crucial effects of PBMT.

In general, the most important finding of this study was the positive effect of PBMT in proliferation and differentiation of Mesenchymal stem cells (MSCs). However, the insufficient clinical trials remain an obstacle in achieving definitive results in examining the relationship between PBMT and MSCs.

Mehrdad Sahranavard

Targeted Star-Shaped Copolymeric Micelles for Hydrophobic Agents Drug Delivery

Mehrdad Sahranavard[1,2,3], Mahsa Shahriari[1,2,4], Khalil Abnous[1,5], Farzin Hadizadeh[6], Seyed Mohammad Taghdisi[7], Reza Zolfaghari[1], Mohammad Ramezani[1,2], Mona Alibolandi[1,2]

1. Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran
2. Department of Pharmaceutical Biotechnology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran
3. Student Research Committee, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran
4. Department of Pharmaceutical Biotechnology, Faculty of Pharmacy, Zabol University of Medical Sciences, Zabol, Iran
5. Department of Medicinal Chemistry, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran
6. Biotechnology Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran
7. Targeted Drug Delivery Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran

The use of the potent antineoplastic agent, camptothecin, for the third common cancer type in the world, colorectal cancer, has been limited due to instability and low solubility of active form accompanied by severe adverse effects. Targeted star-shaped micelles can target tumor cells and provide an efficient drug delivery system with low critical micelle concentration and high thermodynamic stability to avoid hydrophobic agents, including camptothecin, drug delivery drawbacks. Herein we synthesized and characterized epithelial cell adhesion molecule (EpCAM) targeted star-shaped polylactic acid (PLA)-polyethylene glycol (PEG) copolymer to deliver camptothecin to colorectal tumor cells. Also, we performed in vivo and in vitro assessments of the formulation. 3-azido-2,2-bis(azidomethyl)propan-1-ol was synthesized and used as the initiator of PLA synthesis through ring-opening polymerization. Three PLA molecules were conjugated with 1,3,5-benzenetricarbonyl trichloride, and three alkyne-PEG-maleimide molecules were conjugated to the end of each PLA using click reaction. Maleimide terminal of PEG was used for EpCAM targeting aptamer conjugation. 1H nuclear magnetic resonance, gel permeation chromatography and differential scanning calorimetry were used to confirm synthesis steps. Loading and release profiles, size distribution and shape of camptothecin-loaded copolymeric micelles were studied using dynamic light scattering and scanning and transmission electron microscopy. Also, in vitro studies on C26, HT29 and CHO cell lines were performed followed by in vivo tumor suppression efficacy, biodistribution and histopathological evaluation. Analysis showed proper copolymer synthesis. Targeted camptothecin-containing micelles were Spherical and 192 nm in diameter. Size distribution polydispersity index was 0.2 and Zeta potential was found to be -17.3 mV. Camptothecin loading content was 3.7±0.4 and encapsulation efficiency (EE%) was 73.7±8.2. In vitro assays showed significantly higher dose-dependent cytotoxicity respectively in targeted and non-targeted formulations than free drug on C26 and HT29 cell lines, while no significant difference was found on CHO cell line. Observed in in vivo studies, targeted camptothecin copolymeric micelles showed better efficiency than other formulations and then non-targeted camptothecin copolymeric micelles and the free drug showed better efficiency, respectively. Biodistribution studies showed significantly higher entrance of non-targeted formulation into the tumor after 6 hours, while it showed significantly higher entrance of targeted formulation into the tumor after 18 hours. Appropriate results of analysis of the present nano drug delivery system make it a good candidate for targeted drug delivery of hydrophobic agents and raises hope for overcome camptothecin clinical drawbacks.

Liudmyla Kryvenko

Inflammation and immune markers in oral cavity of cigarette and e-cigarette smokers

Liudmyla Kryvenko

Kharkiv National Medical University, Kharkiv, Ukraine

The objective of the study was to evaluate the periodontal health status among cigarette smokers and e-cigarette smokers. methods. The study included 40 patients (20 cigarette smokers and 20 e-cigarette smokers) aged 18-23 years. The subjects were randomly selected from the patients attending University Dental Center, Kharkiv National Medical University, Ukraine. Community Periodontal Index (CPI) score, SBI index by Muhlemann Son were recorded for each patient, as well as a questionnaire and informed agreement was completed by each patient. The level of sIgA was measured in saliva of both group. The statistical analyses were made by t-test and regression analyses. Results. Periodontal status as assessed by CPI score showed that there was no statistically significant difference in the findings between cigarette smokers and e-cigarette smokers. CPI score in cigarette smokers group was equal to 1,87±0,48; in e-cigarette group it was equal to 1,92±0,63. The level of SBI was equal to 3,14±0,6 in cigarette smokers, 3,07±0,84 in e-cigarette smokers. After the sIgA level was measured, the regression analyses were done to define the correlation between level of inflammation and sIgA level. The regression analyses showed strong correlation between levels of SBI and sIgA in e-cigarette smokers, coefficient of determination was equal to 0,82. Conclusions. The gingivitis and bleeding were observed both in cigarette smokers and e-cigarette smokers. There was defined strong correlation between the level of bleeding SBI and the immune status marker sIgA.

Heliya Ziaei

Oral Manifestations of Patients with Inherited Defect in Phagocyte Number or Function: A Systematic Review

Heliya Ziaei[1,2,3], Arghavan Tonkaboni[4], Ahmadreza Shamshiri[5], Nima Rezaei[2,6,7]

1. Dental Research Center, School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

2. Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

3. Maxillofacial Surgery and Implantology and Biomaterial Research Foundation, Tehran, Iran

4. Oral & Maxillofacial Medicine Department, School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

5. Research Center for Caries Prevention, Dental Research Institute, Department of Community Oral Health, School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

6. Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

7. Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Inherited phagocyte defects are one of the subgroups of primary immunodeficiency diseases (PIDs) with various clinical manifestations. As oral manifestations are common at the early ages, oral practitioners can have a special role in the early diagnosis.

A comprehensive search was conducted in this systematic review study and data of included studies were categorized into four subgroups of phagocyte defects, including congenital neutropenia, defects of motility, defects of respiratory burst, and other non-lymphoid defects.

Among all phagocyte defects, 12 disorders had reported data for oral manifestations in published articles. A total of 987 cases were included in this study. Periodontitis is one of the most common oral manifestations.

There is a need to organize better collaboration between medical doctors and dentists to diagnose and treat patients with phagocyte defects. Regular dental visits and professional oral health care are recommended from the time of the first primary teeth eruption in newborns.

Asena Pınar Sefer

Expanding the clinical and immunological phenotypes and natural history of MALT1 deficiency

Asena Pınar Sefer[1,2,3], Hassan Abolhassani[4,5,6], Basak Kayaoglu[7], Sevgi Bilgic Eltan[1,2,3], Altan Kara[8], Baran Erman[9,10], Naz Surucu Yılmaz[7], Cigdem Aydogmus[11], Sezin Aydemir[12], Louis-Marie Charbonnier[13]

1. Marmara University, Faculty of Medicine, Pediatric Allergy and Immunology, Istanbul, Turkey;
2. Istanbul Jeffrey Modell Diagnostic and Research Center for Primary Immunodeficiencies, Istanbul, Turkey
3. The Isil Berat Barlan Center for Translational Medicine; Department of Biological Science
4. Research Center for Immunodeficiencies, Pediatrics Center of Excellence, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran
5. Division of Clinical Immunology, Department of Biosciences and Nutrition, Karolinska Institute, Stockholm, Sweden
6. Division of Clinical Immunology, Department of Laboratory Medicine, Karolinska Institute at Karolinska University Hospital Huddinge, Stockholm, Sweden;
7. Department of Biological Sciences, Middle East Technical University, Ankara, Turkey
8. TUBITAK Mar-mara Research Center, Gene Engineering and Biotechnology Institute, Gebze, Turkey;
9. Hacettepe University, Institute of Child Health, Ankara, Turkey
10. Hacettepe University, Can Sucak Research Laboratory for Translational Immunology, Center for Genomics and Rare Diseases, Ankara, Turkey
11. University of Health Sciences, Basaksehir Cam Sakura City Hospital, Division of Pediatric Allergy and Immunology, Istanbul, Turkey
12. Istanbul University-Cerrahpasa, Faculty of Medicine, Pediatric Allergy and Immunology, Istanbul, Turkey
13. Boston Children's Hospital and Department of Pediatrics, Harvard Medical School, Division of Immunology, Boston, MA, USA

MALT1 deficiency is a combined immune deficiency characterized by recurrent infections, eczema, chronic diarrhea, and failure to thrive. Clinical and immunological characterizations of the disease have not been previously reported in large cohorts. We sought to determine the clinical, immunological and genetic features of MALT-1 deficiency and the natural history of the disease in a large cohort.

The clinical findings and treatment outcomes were evaluated in nine new MALT1-deficient patients. Peripheral lymphocyte subset analyses, cytokine secretion and proliferation assays were performed. We also analyzed ten previously reported patients to comprehensively evaluate genotype/phenotype correlation.

The mean age of patients and disease onset were 33±17 and 1.6±0.7 months, respectively. The main clinical findings of disease were recurrent infections (100%), skin involvement (100%), failure to thrive (100%), oral lesions (67%), chronic diarrhea (56%), lymphoproliferation (67%), and autoimmunity (44%). Eosinophilia and high IgE were observed in six (67%) and two (22%) patients, respectively. The majority of patients had normal T and NK cells, while eight (89%) exhibited reduced B cells. Immunoglobulin replacement and antibiotics prophylaxis were mostly ineffective in reducing the frequency of infections and other complications. One patient received hematopoietic stem cell transplantation (HSCT) and five patients died as a complication of life-threatening infections. Analyzing this cohort with reported patients revealed overall survival in 11 (58%), which was higher in patients who underwent HSCT (P=0.03).

This cohort provides the largest analysis for clinical and immunological features of MALT1 deficiency. HSCT should be offered as a curative therapeutic option for all patients at the early stage of life.

Niloufar Valizadeh

Comparison of Recombinant Tissue Plasminogen Activator and Dual Antiplatelet Therapy in Treatment of Patients with Ischemic Stroke

Niloufar Valizadeh

Birjand Cardiovascular Diseases Research Center, Birjand University of Medical Sciences

Current treatment options for acute ischemic stroke include recombinant tissue plasminogen activator (rt-PA) or dual antiplatelet therapies (DAPT). This study aimed to evaluate the complications of rt-PA in the treatment of patients with ischemic stroke.

This clinical trial incorporated 127 patients with acute ischemic stroke, who were admitted to the neurology ward of Vali-e-Asr hospital in Birjand from 2018 to 2020. The data about complications of treatment were collected using a set of questionnaires and analyzed in SPSS 21. The significance level was set at p ≤0.05.

Thirty-one (24.4%) patients received rt-PA and ninety-six (75.6%) received conventional DAPT. The groups were matched in terms of age and sex. The history of hypertension was present in 32.3% and 67.7% of the rt-PA group and the conventional treatment group, respectively (p = 0.03). In the DAPT group, 99% of patients (n = 96) were discharged; in the rt-PA group, 96.8% of patients (n = 31) were discharged, with one death occurring in each group (p = 0.4). Regarding complications, intraventricular hemorrhage was developed in two patients of the rt-PA group (6.5%, p = 0.06).

The incidence of mortality was comparable in the groups. Also, the difference regarding complications was not statistically significant. Researchers recommend further clinical trials with a greater sample size to confirm our results.

Fatemeh Zareian

Autoimmune diseases in the era of Artificial Intelligence: A review

Fatemeh Zareian, Nima Rezaei

USERN Office, Noncommunicable Diseases Research Center, Fasa University of Medical Sciences, Fasa, Iran

Over the past few decades, autoimmune diseases have become one of the most common clinical problems due to their growing prevalence among the population. They are considered as one of the leading causes of disability and death, especially among women. Autoimmune diseases are characterized as chronic and multifactorial disorders, in which the host's immune system is misdirected towards itself and produces autoantibodies to attack healthy tissues. Several factors contribute to these conditions: genetics, hormonal, immunological, and environmental factors. In spite of this, the onset of at least 50 percent of autoimmune disorders is the result of unknown triggers.

Early diagnosis and treatment of these diseases can be very challenging since in the early stages, symptoms can overlap with symptoms of other conditions, and despite tremendous pharmacological advances, current therapies for autoimmune diseases are not yet disease-specific. In the past few years, innovations in autoimmune disease diagnosis such as genomic sequencing development along with large clinical and 'omic data, including proteomic and metagenomic data, have attracted rising interest in interpreting these large datasets. Leveraging this big data into clinically meaningful tools can optimize the use of these datasets in autoimmune disease prediction and diagnosis.

To reach a meaningful insight into these massive datasets, artificial intelligence through machine learning and deep learning techniques enable clinicians to extract patterns within patient data and use them to predict, diagnose, and manage autoimmune diseases.

Throughout this paper, recent machine learning applications on the four most common autoimmune diseases, including rheumatoid arthritis (RA), multiple sclerosis (MS), systemic lupus erythematosus (SLE), and inflammatory bowel disease (IBD) are reviewed, and future challenges and developments are discussed.

Mozhgan Moghtaderi

Epidemiology of asthma in patients with COVID 19 illness: respiratory allergy is not a risk factor for COVID-19 severity

Mozhgan Moghtaderi, Sara Mostafavi , Saeed Hosseini Teshnizi , Ali Mostafavi , Mohammad Ali Ashraf
Shiraz University of Medical Sciences, Shiraz, Iran

The outcome of coronavirus disease 2019 (COVID-19) is complicated by various comorbidities; asthma is a common chronic disease, which can be defined as a probable alternative. This study aimed to investigate the effect of asthma comorbidity on the prognosis of COVID-19 patients.

This retrospective study includes all RT-PCR confirmed COVID-19 patients recorded in the Shiraz health department's electronic database from January to May 2020. A questionnaire was designed to collect information about patients' demographics, asthma, other comorbidities, and the severity of COVID-19 by dialing their numbers.

109 Of 3163 COVID-19 patients (3.4%) had self-reported asthma with a mean age of 42.7 ± 19.1 years. Most of the patients (98%) had mild to moderate asthma, while 2% had severe types. Among asthmatic patients, fourteen (12.8%) were admitted to the hospital, and five (4.6%) died. Univariate logistic regression results showed that asthma had no significant effect on hospitalization (OR 0.95, 95% CI: 0.54-1.63) and mortality (OR 1.18, 95% CI: 0.48-2.94) in patients with COVID-19. Compared living and deceased patients with COVID-19, the pooled OR was 18.2 (95% CI: 7.3–40.1) for cancer, 13.5 (95% CI: 8.2–22.5) for age 40-70 years, 3.1 (95% CI: 2–4.8) for hypertension, 3.1 (95% CI: 1.8–5.3) for cardiac disease and 2.1 (95% CI: 1.3–3.5) for diabetes mellitus.

This study showed asthma is not associated with an increased risk of hospitalization and mortality in patients with COVID-19. Further studies are needed to investigate the risk of different phenotypes of asthma on the severity of COVID-19 disease.

Fatemeh Sodeifian

A novel LIG4 variant in DNA ligase IV deficiency: Case report and review of literature

Fatemeh Sodeifian[1,2,3,4], Noosha Samieefar[1,2,3,4], Sepideh Shahkarami[5,6], Elham Rayzan[5,6], Simin Seyedpour[7,8], Nima Rezaei[3,4,6]

1. *Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran*
2. *USERN Office, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran*
3. *Network of Interdisciplinarity in Neonates and Infants (NINI), Universal Scientific Education and Research Network (USERN), Tehran, Iran*
4. *Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran*
5. *International Hematology/Oncology of Pediatric Experts (IHOPE), Universal Scientific Education and Research Network (USERN), Tehran, Iran*
6. *Research Center for Immunodeficiencies, Pediatrics Center of Excellence, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran*
7. *MD-MPH, School of Medicine, Tehran University of Medical Sciences*
8. *Postdoctoral Research Fellow at Research Center for Immunodeficiencies (RCID)*

DNA ligase IV deficiency (LIG4 syndrome) is a rare primary immunodeficiency which is associated with other systemic features. DNA ligase IV is required to repair DNA double stranded breaks and prevent mutagenesis and apoptosis, which can result from DNA double strand breakage caused by intracellular events including during DNA replication and meiosis or extracellular events such as reactive oxygen species (ROS) and ionising radiation damage. Patients present with primordial growth failure with severe microcephaly and a spectrum of learning difficulties. Diagnostic methods include immunophenotyping, and radiosensitivity testing. Furthermore, microcephaly is a predominant feature. Treatment is mainly supportive, although haematopoietic stem cell transplantation could be used.

A 1.5-year-old boy was referred to our clinic with complaint of prominent gastrointestinal problems. He had non-bloody diarrhea and protein loosing enteropathy and failure to thrive. His GI complaints worsen following contacting visceral leshmaniasis 6 months ago. Subsequently, he developed cirrhosis and Jaundice and anemia and passed away recently at age of 6 years. His lab results demonstrated CD3=7.9%, CD4=5.9%, CD8=2.9%, CD16-56=69%, IgG=1920, IgM=93, and IgA=5. The sample of this patients and his parents had been sent to the laboratory. Our genetic screen has identified a sequence variant in LIG4 (c.1282G>C; p. Gly428Arg) in our patient. Sequence variations in LIG4 gene have been previously associated with primary immunodeficiency.

LIG4 syndrome is rare condition characterized by microcephaly, neurodevelopmental delay and immunodeficiencies with radiosensitivity. Prenatal microcephaly with growth retardation and developmental delay, marrow hypoplasia, and recurrent infection with lymphocytopenia are specific features that could raise the diagnostic suspicion.

Seyed Amir Ahmad Safavi Naini

Excess Mortality and COVID-19 Reported Fatality in Iran: Predicted-Observed Gap of All-Cause Death during the Pandemic until Spring 2021

Seyed Amir Ahmad Safavi Naini, Yeganeh Farsi, Mohamad Amin Pourhoseingholi
Students research committee, school of medicine, Shahid Beheshti University of medical sciences, Tehran, Iran

The real impact of the COVID-19 pandemic on mortality is still unknown. Excess all-cause mortality may better demonstrate the consequence of COVID-19 fatality. This study investigates the gap between predicted mortality and observed mortality from the start of the pandemics in Iran until spring 2021.

Seasonal and weekly all-cause mortality was gathered from the National Organization for Civil Registration, and daily COVID-19 deaths and cases were collected from the Ministry of Health and Medical Education. Auto-Regressive Integrated Moving Average was used to predict Seasonal mortality in 2020 and 2021, based on seasonal mortality from spring 2013 until autumn 2019. Excess deaths and confidence intervals were then calculated as a gap of predicted and observed mortality. The age-specified mortality rate (ASMR) of the first 22 weeks of 2019 was compared to 2020 to examine percent change in 5-years age groups.

From 22 June 2020 to 21 June 2021, the all-cause excess death was 149792 (114908 - 184676). The rate of excess deaths in men (200.85 per 100,000 population) was higher than in females (162.50 per 100,000 population). Highest ASMR percent change was for 65-69 age group (female: 86%, male: 77%), and the lowest was for 20-24 age group (female:21%, male: -1%). COVID-19 reported deaths covers 49% (39% - 64%) of excess deaths. Highest The weekly COVID-19 fatality and all-cause deaths showed a significant relation ($p = 0.001$, coefficient $= 1.84$).

There is a significant rise in all-cause mortality during the pandemic, especially in older adults. Although COVID-19 fatality explains some of the rise in all-cause death, the role of other previously leading causes of death and underestimation of reported data should not be undertaken.

Poster Presentations
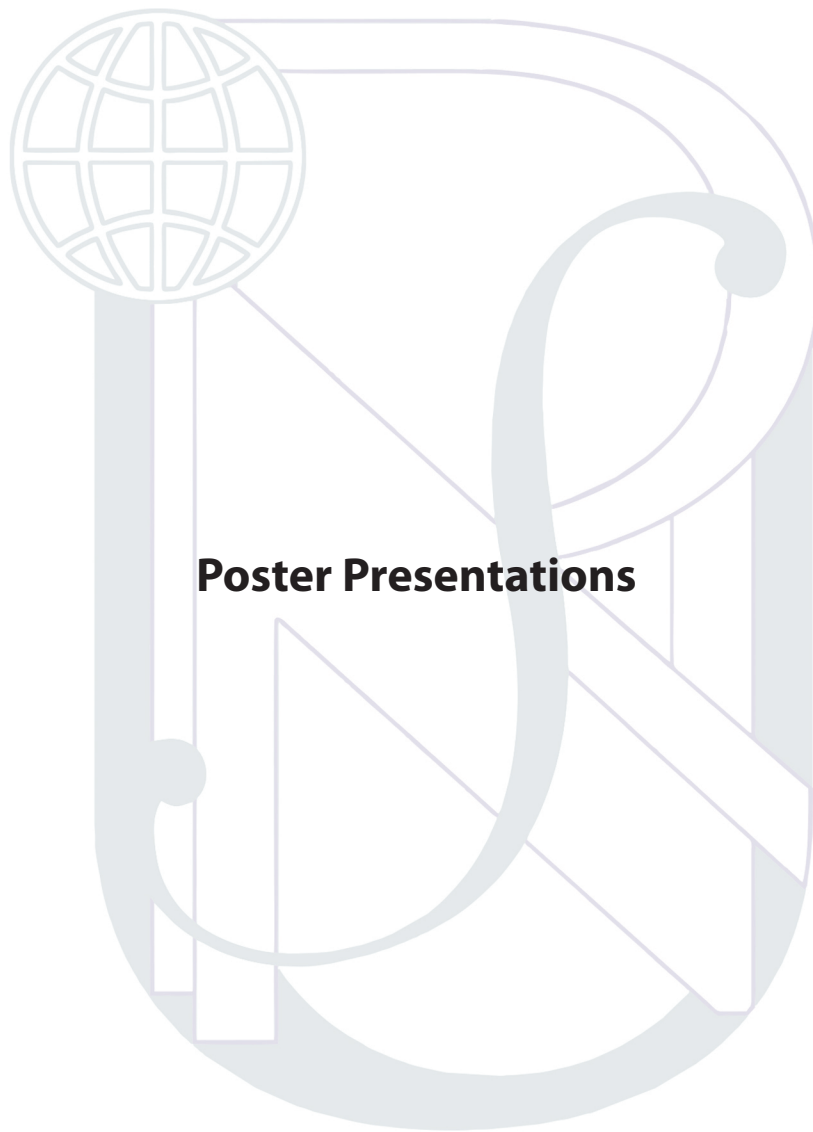
Rojin Adabdokht

A Comparison between survival rate and the most mutated genes in the oral squamous cell carcinomas with different primary sites, utilizing genomic datasets

Rojin Adabdokht[1], Mohammad Javad Alaeian[2]

1. Private Dentist

2. Private General Practitioner

Accumulation of genomic alterations such as deletions, over expressions, and epigenetic modifications can lead to Oral Squamous Cell Carcinoma(OSSC). As OSCC accounts for almost 95% of head and neck cancers with a mortality rate of about 50%, it is crucial to recognize the most relevant mutaotions and the factors that can affect the prognosis. The present study aimed to compare the survival rate and other factors in OSCC with different primary sites in the oral cavity and introduce the most mutated genes and types of these mutations.

The clinical and genes mutations data was collected from GDC, UniProt, NCBI Gene. The TCGA-HNSC project, with 528 reported cases was analyzed, using SPSS 26 and the GDC Data portal's analysis tab.

Results suggested that the OSCCs, which were first appeared in the bottom of the tongue, had a significantly higher survival rate compared to the ones that originated from the floor of the mouth (p= 3.71e-2). However, this rate was not statistically different between men and women with the primary site of the floor of the mouth. Also, 66.54% of the cases showed mutations in TP53, followed by FAT1 and CDKN2A with 22.83% and 19.88%, respectively. The minimum percentage was for RUNX1T1 with 4.92% of the cases.

It seems that missense mutation in TP53 is the most significant gene alteration leading to OSCC, and the primary site of the neoplasm is better to be considered as a prognostic factor.

Helya Bolouki Azari

Critical approach towards empathy in family medicine

Helya Bolouki Azari, Sadaf Agahi
Department of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Empathy is tied to the concept of narrative medicine. By knowing the patient's story, the physician realizes the patient as a "subjective-self" rather than "objective" one – not merely as a collection of molecules. Narrative medicine is well understood in the context of family medicine. Given this, it may be hypothesized that empathy is best achieved in family medicine.

The physician-patient relationship in the family medicine context is different from the usual physician-patient relationship. Since family physicians know the patients' narrative, the disease background, and even non-medical preferences, because of long-standing acquaintance with the patient, implementing empathy is easier for them. Family physicians are less likely to experience fatigue and other cognitive errors related to treating a large group of unfamiliar patients. They also have more availability, which strengthens the patient's sense of empathy.

However, empathy does not entirely occur consciously. The physician - as a human being - has innate emotions that form an emotional dimension of empathy towards the patient. In family medicine, due to deep and long-term acquaintance with the patient, it is possible that the physician's emotions, if not controlled, cause the disappearance of the psychotic distance necessary to medical practice; forming an affective error. In these cases, the physician usually employs the "clinical detachment approach" by eliminating all the emotions involved, which minimizes empathy; whereas, they should take an "other-oriented approach", in which they try to understand the patient's feelings while not feeling the pain themselves.

Other issues like the "paradox of freedom-justice", may also reduce the positive impact of empathy as a family medicine privilege. This paradox argues that while family medicine provides primary health care to all members of society righteously, it reduces the freedom of individuals choosing desired services.

All together, judgment about family medicine is a complicated matter and requires further investigation.

Nahid Javadifar

The effect of pelvic floor muscle training on the treatment of pregnancy-related urinary incontinence to improve sexual function: A systematic review

Nahid Javadifar[1], Ayda Ahmadibeni[2], Atefeh Rahmani[3]

1. Faculty of Midwifery, Reproductive Health Promotion Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
2. BS student in Midwifery, Student Research Committee, School of Nursing and Midwifery, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
3. BSc Student of Physiotherapy, Student Research Committee, School of Rehabilitation, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran/ USERN office, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Pregnancy and childbirth are risk factors for Urinary Incontinence (UI). Urinary Incontinence (UI) is a common disorder in women that can often lead to sexual dysfunction. This disorder can negatively affect many aspects of women's lives. Pelvic Floor Muscle Training (PFMT) is important to improve women's pelvic health. The aim of this study is evaluating the effect of pelvic floor muscle training for the treatment of pregnancy-related urinary incontinence to improve sexual function.

The present study is based on articles extracted from Pubmed, Web of Sciene and Scopus databases and Google scholar search engine. Initially, 240 articles related to the keywords; Pregnancy, Urinary Incontinence (UI), Sexual Function and Pelvic Floor Muscle Training (PFMT) were found during the years 2011 to 2021. Then, with further reviews, 15 completely related articles based on the PRISMA checklist were selected to review.

A review of the literature suggests that Pelvic Floor Muscle Training (PFMT) can be recommended as a first-line treatment for urinary incontinence. Regarding the effect of this treatment and its outcomes to improve sexual function, 11 articles emphasized positive effect of these exercises and the improvement of urinary incontinence on sexual function and two articles indicated the negative effect. The other two articles did not find a link between improved urinary incontinence and sexual function.

According to the reviewed articles in this study, it seems that Pelvic Floor Muscle Training (PFMT) is one of the most effective ways to treat and improve urinary incontinence due to pregnancy, which can improve sexual function to some extent.

Amirreza Allahgholipour Komleh

The COVID-19 related anxiety in parents and children with cancer

Amirreza Allahgholipour Komleh[1], Kiana Mirhashemi[2]

1. Medical Ethics and Law Research center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

2. Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

During the COVID-19 pandemic, healthcare workers have a higher risk of infection due to high exposure. Nurses are experiencing higher workloads than ever before due to the pandemic, this can affect their psychological State and subsequently the care services. At this point, some course of action can provide psychological support for healthcare workers society by improvement of their mental health and therefore on abatement of disease damages. MBSR is one of the outstanding techniques due to its availability, low cost, and also self-care. It is an educational package of mindfulness skills along with a training program that is presented within eight weeks.

In a research project approved at Shahid Beheshti University of medical science, designing performance and evaluation of MBSR Online education program on mental health promotion and sleep quality of nurses working at COVID-19 wards of selected hospitals of SBMU is studied.

MBSR Educational contacts were allowed to translate and modify culturally by email permission and used as online content mostly in the form of audio, video, and readable files.

The content is translated and dubbed by a group of SBMU nursing students. The occupational questionnaire has been available on the "Parsline" website and filled out by nurses working at COVID-19 wards who were randomized into intervention and control groups. The study is based on the census method, not sampling.

After filling the survey, a WhatsApp Group was created due to the presentation of the provided files. Forms were uploaded in the intervention group systematically for 8 weeks. We sent the link of imaged documents which were uploaded to the Aparat website, to the group.

28 people from the intervention group and 25 people from a control group of current nurses working at one of the SBMU hospitals completed an 8-week intervention.

This program has task worksheets filled by participants and after that, they received feedback on how the exercises had been done.

The early results showed that there are no significant differences between the average of occupational stress in the intervention and also control group which means these two groups are similar. The results of the test before the intervention indicated high occupational stress in nurses as 78% of them have descriptive their stress as relatively severe or severe occupational stress.

Mahtab Amiri

Updates on the use of Solid lipid nanoparticles (SLNs) and nanostructured lipid carriers (NLCs) to enhance brain drug delivery

Mahtab Amiri[1], Samira Jafari[1], Masoumeh kourd[2], Hamed Mohamadpour[2], Maryam Khayati[2], Farbod Ghobadinezhad[3,4], Hossein Derakhshankhah[1,4], Soroor Sadegh Malvajerd[5], Zhila Izadi[1,4]

1. Pharmaceutical Sciences Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Trita Nanomedicine Research Center (TNRC), Trita Third Millennium Pharmaceuticals, Tehran, Iran
3. Student's Research Committee, School of medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. USERN Office, Kermanshah University of Medical Sciences, Kermanshah, Iran
5. Department of Pharmaceutical Nanotechnology, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

The blood brain barrier (BBB) and its probable integrity defects in central nervous system (CNS) disorders like neurodegenerative diseases and brain cancers can be considered as the most challenging factor in brain drug delivery. Presently, several CNS disorders remain untreatable. There are many candidate drugs for the treatment of CNS diseases but they cannot be used because of their inability in passing the BBB and then access to the CNS. Engineered solid lipid nanoparticles (SLNs) as well as nanostructured lipid carriers (NLCs) with their specific features, including their small size, lipid nature, appropriate stability, improving drug's aqueous solubility and consequently enhancing the bioavailability, being biocompatible, suitable release profile, etc., as ideal nanodrug delivery systems, play crucial roles in diagnosis, targeted drug delivery, controlled released drug delivery and gene therapy of CNS diseases. This review represents the progressions in optimizing these nano carriers to facilitate the drug delivery to the brain.

Sina Arabi

Evaluation of COVID-19 infection and hospitalization rate in people living with multiple sclerosis: A report from Iran

Sina Arabi, Aryan Kavosh

Neurology Department, Kashani Hospital, Isfahan University of Medical Sciences, Isfahan, Iran

Despite investigations on the effect of disease modifying therapies (DMTs) used in multiple sclerosis (MS) on coronavirus disease 2019 (COVID-19); there are still controversies. We designed this study to evaluate the epidemiological features of covid-19 in a large sample of people with MS (pwMS) in Isfahan, Iran, as well as the association between DMTs, risk of COVID-19 infection and hospitalization.

In an observational pwMS, we interviewed subjects on their MS and COVID-19 history.

3050 subjects were included (74% female) with a mean age of 41.36. 423 (13.8%) had confirmed COVID-19 which shows that pwMS are at a higher risk of infection compared to the general population. No significant relationship was observed in COVID-19 infection when individual drugs. Dimethyl fumarate and rituximab had the lowest and the highest relative risks for hospitalization rate compared to other drugs, respectively.

We found no evidence supporting a higher prevalence of COVID-19 in pwMS compared to the general population. However, our results show pwMS to be more prone to hospitalization compared to the general population. Therefore, it is advised to use safer treatment if possible until complete vaccination, and to postpone the use of rituximab.

Maryam Asadi

Effect of weight-loss diet combined with taurine supplementation on fasting levels of FGF19, FGF21 and beta -klotho co-receptor in obese women: a randomized clinical trial

Maryam Asadi[1], Fatemeh Haidari[2], Javad Mohammadi Asl[3], Kambiz Ahmadi-Angali[4]

1. Nutrition department, Shoushtar Faculty of Medical Sciences, Shoushtar, Iran

2. Department of Nutrition, Nutrition and Metabolic Diseases Research Center, Ahvaz Jundishapur University of Medical sciences, Ahvaz, Iran.

3. Department of Medical Genetics, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

4. Faculty of Public Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Taurine (Tau) is synthesized endogenously in the body from methionin or cysteine. Tau has a role in regulation of glucose and lipid metabolism, increase in energy expenditure, inflammation reduction and appetite control. According to some studies, obesity associated with reduction in serum Tau level. Thus, for the first time this randomized clinical trial evaluated the effect of Tau supplementation along with a weight-loss intervention on FGF19, FGF21 and β-Klotho co-receptor in obese women. Individuals were allocated randomly into two groups (standard weight-loss group + cap Tau 3 g/day for 8 weeks, n = 20 vs standard weight-loss group + cap placebo for 8 weeks, n = 18). To weight loss, a 30% reduction in calculated total energy intake of participants was considered. We used Chi-square test to compare categorical variables between two groups at pre-intervention. Paired t test and independent-sample t test were used to assess the parametric continuous data within and between the two groups, respectively. To control confounding variables, analysis of covariance was applied.

At the post-intervention, the mean changes β-Klotho (p = 0.01) decreased significantly in Tau group compared with the control group. No significant results were found in the mean changes of FGF19 and FGF21 between the two groups (p > 0.05).

For the first, we demonstrated the effects of Tau supplementation on FGFs and β-Klotho as new markers of obesity.

Parvaneh Asgari

Dancing With Death in the Dust of Coronavirus: The Lived Experience of Iranian Nurses

Parvaneh Asgari[1], Fatemeh Bahramnezhad[1], Babak Kavand[2]

1. School of Nursing and midwifery, Tehran University of Medical Sciences

2. Anesthesiologist

The novel coronavirus disease (COVID-19) pandemic as a public health emergency poses dramatic challenges for healthcare systems. The experiences of health-care workers are important in planning for future outbreaks of infectious diseases.

This study explored the lived experiences of 14 nurses in Tehran, Iran caring for coronavirus patients using an interpretative phenomenological approach as described by Van Manen. In-depth interviews were audio-recorded between March 10 and May 5, 2020. The essence of the nurses' experiences caring for patients with COVID-19 was categorized as three themes and eight subthemes: (a) Strong pressure because of coronavirus: initial fear, loneliness, communication challenges, exhaustion. (b) Turn threats into opportunities: improvement of nursing image, professional development. (c)Nurses' expectations: expectations of people, expectations of government. The findings of this study showed that identifying the challenges and needs of health-care providers is necessary to create a safe health-care system and to prepare nurses and expand their knowledge and attitudes to care for patients in new crises in the future.

Parisa Bozorgzad

The relationship between health literacy and illness belief in patients with heart failure

Parisa Bozorgzad, Parvaneh Hadadi, Tahmineh Salehi, Yasaman Azad

Department of Medical-Surgical Nursing, School of Nursing & Midwifery, Iran University of Medical Sciences, Tehran, Iran

TThe chronic and complex nature of heart failure has led to raise the need for self-care as the core of care and treatment of the patients. Health literacy and illness belief are factors may affect self-care and the way they can cope with the disease. This study was conducted to determine the association, if any, of health literacy and illness beliefs among patients with heart failure.

This study is a descriptive-correlational performed on 133 patients with heart failure hospitalized in Cardiac Care Unit in Karaj. They were selected by the convenience sampling method. Data collection method included a demographic questionnaire, the Iranian Health Literacy Questionnaire (Montazeri 2013) and the illness belief (Albert 2007) in heart failure.

The total mean score of the health literacy was 73.01 (±13.08) and the total mean score of the correct belief illness was 3.07 (±0.45). There was no significant association of health literacy with illness belief (r = 0.130 and P = 0.137).

More than a quarter of the patients had inadequate health literacy, and more than 40 percent had incorrect beliefs about heart failure. Therefore, to improve health behaviors, it is necessary not only to promote health literacy, but also to consider incorrect illness beliefs.

Shayan Dasdar

Diagnostic cues for the prediction of complicated brucellosis

Shayan Dasdar[1], Nika kianfar[1], Sirous Jafari[2], Mohammadreza Salehi[2]

1. Department of Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Infectious Diseases, Imam-Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran

Brucellosis is a zoonotic disease currently endemic in many developing countries, including Iran and Turkey. The clinical presentations of brucellosis are nonspecific and multi-system, which is why it is named the great masquerader. In this study, we sought to determine the usefulness of hematological parameters in predicting complicated brucellosis.

Patients with a confirmed diagnosis of brucellosis hospitalized at the department of infectious diseases of Imam-Khomeini hospital were enrolled between April 2013 and January 2019. Demographic data and laboratory findings of the patients including white blood cell (WBC) count, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), mean platelet volume (MPV), hemoglobin (Hb), Red blood cell distribution width (RDW), platelet distribution width (PDW), platelet count, MCV, lymphocyte count, neutrophil count, neutrophil to lymphocyte ratio, platelet to lymphocyte ratio, were compared between the patients with and without brucellar complications.

The study included 46 patients with a male to female ratio of 1:1.4. The mean age of the patients at diagnosis was 48.7 ± 18.85 years. Among the patients, 26 (56.5%) and 17 (37%) were from rural and urban areas, respectively. The disease was in the acute phase in 19 (41.3%) patients, subacute in 21 (45.7%), and chronic in 5 (10.9%). Among the patients, 24 (52.2%) had the complicated disease as follows: osteoarticular in 13 (28.3%), neurobrucellosis in 10 (21.7%), genitourinary in two (4.3%), and no cardiovascular or pulmonary complication. We found a significant difference in the MPV, RDW, and PDW values between the patients with and without brucellar complications ($p=0.011$, $p=0.017$, $p=0.033$, respectively). There was no statistically significant difference between the two groups regarding the other laboratory parameters ($P > 0.05$).

We suggest that RDW, PDW, and MPV values can be used as markers of inflammation to evaluate the presence of complications in patients with brucellosis.

Mohaddeseh Davari

Effectiveness of Natural compounds in the prevention and treatment of Oral Squamous Cell Carcinoma: an in vivo review of literature

Mohaddeseh Davari[1], Farzaneh Agha-Hosseini[2], Mahdieh-Sadat Moosavi[3]

1. Professor, Dental Research Center, Dentistry Research Institute, Tehran University of Medical Sciences and Department of Oral Medicine, Faculty of Dentistry, Tehran University of Medical Sciences, Tehran, Iran, The Academy of Medical Sciences Tehran, Iran, DDS, MSc, Fellowship of Research Biology

2. Postgraduate student, Department of Oral & Maxillofacial Medicine, Tehran University of Medical Sciences, Tehran, Iran

3. Associated Professor, Dental Research Center, Dentistry Research Institute, Tehran University of Medical Sciences and Department of Oral Medicine, Faculty of Dentistry, Tehran University of Medical Sciences, Tehran, Iran.

Oral cavity cancer is one of the most common and deadly malignancies of the head and neck, which is considered the sixth common cancer worldwide. Usual treatments have not been able to increase the survival of patients with Squamous cell carcinoma over decades, indicating a need for alternative and complementary treatments. This review study aims to gather components may be effective in the prevention or inhibition of progress of oral Squamous cell carcinoma.

We searched, gathered, and assessed English articles in databases of Google Scholar, Scopus, PubMed, and Science Direct using keywords of OSCC and herbal medicine from 1960 to 2020 February.

This overall review could be used firstly at the prevention phase through dietary recommendations and medication prescriptions in the effective dose and form for individuals with premalignant lesions or at risk; the components further could help people to have a healthier lifestyle, thereby reducing the early occurrence and high global prevalence of OSCC over the following decades. Moreover, these components could be used as a complementary treatment with high efficiency, low toxicity, and long survival.

Danial Farsi

A comprehensive look at yawning

Danial Farsi, Parisa Hosseini, Amin Mahnam

Bachelor of biomedical engineering, University of Isfahan,Associate Professor of Biomedical Engineering, University of Isfahan

Yawning is a phenomenon found in most animal species, including mammals, birds, amphibians, reptiles, and fish. We yawn several times a day without knowing why it happened. Understanding this phenomenon is important because researchers have been able to find a link between yawning and a group of diseases. For example, some diseases have identified yawning disorders, including schizophrenia, Parkinson's, autism, and multiple sclerosis (MS). In addition, the symptoms of MS change with yawning, or in some patients with epilepsy, acute yawning attacks have been observed before and after epilepsy. Another critical issue with yawning is that researchers have used yawning to design a diagnostic protocol for diagnosing neurological diseases. Researchers have done many studies to find the cause and the role of yawning and have made several hypotheses, but none of these hypotheses has been conclusively proven, and the nature of yawning in the body remains a mystery.

Sasan Ghaffari

SARS-CoV-2 Virus-specific T cells (VSTs) Expansion as a Potential Therapy in COVID-19 Patients

Sasan Ghaffari[1], Hanif Kazerooni[2]

1. Department of Science and Technology, Supreme National Defense University, Tehran, Iran

2. Student Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran

The coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has become a global pandemic taking the lives of millions. One therapeutic approach would be to adoptively transfer T cells of convalescent patients to the critically ill to stop the virus from spreading. Considering the urgency of formulating a therapy, here, we evaluated whether expanding functional virus-specific T cells (VSTs) to sufficient numbers from convalescent donors is possible.

We systematically searched articles indexed in PubMed, Scopus, and ISI Web of Science databases. The keywords used for literature search were as follows: "T-lymphocyte", "T cell", "expansion", "cell culture", "SARS-CoV-2", and "COVID-19". We included observational, in vitro studies that isolated polyclonal VSTs from convalescent COVID-19 patients and expanded them to functional T cells.

After screening the articles, 7 studies met the criteria and were included. We read these studies which used rapid expansion protocols to expand polyclonal, functional VSTs. Two studies expanded either memory T cells or vaccination-induced VSTs. SARS-CoV-2 VSTs were extracted from peripheral blood and isolated in vitro. The cells were then stimulated via culturing VSTs with dendritic cells carrying SARS-CoV-2 antigens. The VSTs expanded to clinically relevant numbers. Also, the cells responded to virus stimulation by secreting IFN-γ and reducing the viral load in culture. However, VSTs had to be collected within two months after convalescence since VST numbers significantly dropped after such time.

Based on the published results, it seems possible to isolate anti-SARS-CoV-2 VSTs from recovered COVID-19 patients, expand them in cell culture conditions, and potentially use them as a therapeutic approach for COVID-19. These cells are not only able to expand to great numbers, they also retain their anti-viral functions, making them a great asset against SARS-CoV-2 and other possible viruses in the future.

Negin Ghahremani

Evaluation of Antifungal Effect of Ganoderma Gel and Clotrimazole Gel in Patients with Denture Stomatitis, a Randomized Clinical Trial

Fahimeh Pakravan[1], Afsaneh Yegdaneh[2], Somayeh Teymouri[3], Shiva Rahimi[4], Negin Ghahremani[4]

1. Dept. of Oral Medicine, Dental Implants Research Center, Dental Research Committee, Dental School, Isfahan University of Medical Sciences, Isfahan, Iran
2. Dept. of Pharmacognosy, School of Pharmacy and Pharmaceutical Sciences, Isfahan Pharmaceutical Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
3. Dept. of Pharmaceutics, School of Pharmacy and Novel Drug Delivery System Research, Isfahan University of Medical Sciences, Isfahan, Iran
4. Student Research Committee, Isfahan University of Medical Sciences, Isfahan, Iran

Denture stomatitis is the most common form of oral Candida infections, which is a chronic inflammatory disease that affects the mucosa under removable dentures, especially in the upper jaw. Clotrimazole gel is one of the first lines of treatment for denture stomatitis which has accompanied with complications such as drug resistance in some patients. On the other hand, Ganoderma is one of the most valuable and well-known fungus in Asia though there is not enough studies about its antifungal effects yet. The aim of this study was to compare the effect of Ganoderma with clotrimazole in treatment of denture stomatitis lesions.

This study is a double-blind randomized clinical trial that was performed on 50 patients with type 1 and 2 denture stomatitis. They were randomly divided into two equal groups. The sample group was given Ganoderma gel and the control group was given clotrimazole gel. All patients were asked to perform oral and prosthetics hygiene. Then put a thin layer of gel in the tissue part of the prosthesis and put it inside the mouth. On days 7 and 14, the clinical improvement of the lesion was evaluated based on Budtz-Jorgenson's index.

To compare the two drugs Mann-Whitney nonparametric test was performed and no significant difference was observed, indicating a similar improvement between the two drugs after 14 days. Among the studied variables, only the Newton scale and the use of dentures during sleep showed a significant difference, which was eliminated by using logistic regression analysis and no significant difference was found between the two groups.

Since the antifungal effect of Ganoderma in clinical improvement of patients with denture stomatitis has been estimated similar to clotrimazole, it can be used as an alternative treatment, especially in patients resistant to azoles. However, further clinical studies are needed in this area.

Zahra Ghanbarinasab

Synthesis of Silver-Doxycycline Complex Nanoparticles and Their Biological Evaluation on MCF-7 Cell Line of the Breast Cancer

Zahra Ghanbarinasab

Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

In the current study, we aim to evaluate the effect of the combination of silver and doxycycline (silver-doxycycline complex) on the viability of the MCF-7 cell line of the breast in comparison with each of them. The Ag-doxycycline NPs were synthesized using silver nitrate and doxycycline solutions.

The synthesized Ag-doxycycline NPs were characterized with several analyses.

Agdoxycycline NPs with a concentration of 25 μM is significantly more effective in decreasing the viability of MCF-7 cells than Ag with the same concentration ($P < 0.05$). Doxycycline with a concentration of 6.25 μM also has a more potent effect on the viability of MCF-7 cells than Ag with the same concentration ($P < 0.05$). Ag-doxycycline NPs with a 25 μM concentration is more effective than the concentration of 3.125 μM ($P < 0.05$).

Ag-doxycycline NPs were found to be more effective than AgNPs alone in inhibiting the growth of the MCF-7 cells. Also, the increasing utility of nanotechnology in multiple aspects of medicine can lead to using this technology in the treatment of different types of cancer in the future.

Golnar Ghane

Concept analysis of the Four-Season-Symphony of Intellectuality-Spirituality-Ethics-Aesthetics (FSS: I SEA) in nursing research

Golnar Ghane[1], Mohammad Ali Cheraghi[2], Shahzad Pashaeypoor, Fatemeh Najafi[4]

1. PhD Candidate in Nursing, Medical Surgical Nursing Department, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

2. PhD, Professor, Spiritual Health Group, Research center of Quran, Hadith and Medicine, Tehran University of Medical Sciences, Tehran, Iran

3. PhD, Associate Professor, Department of community health and geriatric nursing, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

4. PhD Candidate in Nursing, Medical Surgical Nursing Department, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

The Four-Season-Symphony of Intellectuality, Spirituality, Ethics, and Aesthetics(FSS: I SEA) in nursing research is a new concept that has not been addressed in previous nursing theories and studies. This study was conducted to clarify the concept of the FSS: I SEA in nursing research.

This study has been conducted based on Wilson's 11-step approach by searching keywords with Symphony, Rationality, Intellectuality, Spirituality, Ethics, Aesthetics and Nursing research in databases including Google Scholar, PubMed, Scopus, CINAHL, Sid, Oxford Dictionary, Dehkhoda Dictionary, and nursing theory textbook.

Richness and elegance of the symphony in nursing research cannot be achieved by a single-tool benchmark; rather, a more integrated assessment can be achieved with the use of a tool combining different intellectuality, spirituality, ethics, and aesthetics tools. This symphony contains a philosophical and deep understanding of the meanings of researcher, research problem, research process, and symphonic product. Through identifying the facilitators and barriers of this concept, nursing researchers, professors, and practitioners will be able to design and implement their research activities on FSS basis to pave the way for the continued transcendence of comprehensive nursing care.

Arian Ghannadi Karimi

Atorvastatin is related to GDF-9 and BMP-15 expression and in-vitro maturation of mouse oocytes

Arian Ghannadi Karimi[1], Fatemeh Sabbaghziarani[2], Raziyeh chegini[1], Fariba Zafari[1,2]

1. Student Research Committee, Faculty of Medicine, Qazvin University of Medical Sciences, Qazvin, Iran
2. Cellular and Molecular Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran

This study investigates the effects of atorvastatin on GDF-9 and BMP-15 expression and explores its connection with apoptosis and oocyte maturation in mice. GDF-9 and BMP-15, both members of the TGF -β superfamily and secreted by oocytes, these have similar structure and function as critical essential regulators of follicular growth and ovarian function. Stress causes the production of ROS on the ovaries body, which is one factor in the removal of germ cells through induction of apoptosis.Atorvastatin is one of the statin drugs commonly used to decrease blood cholesterol and in addition to that, antioxidant, anti-apoptotic effects, increasing GDF-9 and BMP-15 expression rate and oocytes maturation rate also have been reported

Oocytes of 40 female mousses were removed from the ovaries after stimulation of ovulation and these oocytes were divided into two groups of 100, including the control group and atorvastatin group (receiving 2 mg/kg atorvastatin). After oocyte culture in DMEM medium, GDF-9 and BMP-15 expression were evaluated by Real using real-time PCR. The rate of oocyte apoptosis and maturity were evaluated using fluorescent microscope and tunnel staining method, Data were analyzed using ANOVA test

The expression level of GDF-9 and BMP-15 in control and atorvastatin groups were 2.3 and 4.8 (P≤0.05) and 1.2 and 3.4, respectively (P≤0.001). The oocyte maturation rate in the atorvastatin and control groups was 82% and 76%, respectively, and it was increased in the atorvastatin group (p> 0.05). The apoptosis rate in the atorvastatin and control group was 24% and 22%, respectively, and the difference was not significant (p = 0.11)

The use of atorvastatin in low doses increases GDF-9 and BMP-15 genes in mouse oocytes and increases the quality and success rate of in vitro fertilization. This increased expression is related to the in-vitro maturation of mouse oocytes.

Seyed Mohammad Saleh Hadavi

Using data mining to predicting and discovering association relations and important effects between the characteristics of COVID-19 patients

Seyed Mohammad Saleh Hadavi
Shiraz University of Technology, Shiraz, Iran

Since late 2019, the outbreak of COVID-19 and its epidemic has severely affected people. Considerable attention has been paid to statistical models for classifying medical data with Due to this sensitive disease and its consequences. According to COVID-19, you can prevent its spread by recognizing some influential factors. Affording to the huge data and information of people who are affected by this disease, important factors can be identified by various methods, including data mining in computer science.

In this study, by comparing the two classified algorithms j48 and the decision tree on 1000 patients who are in hospitals in Shiraz, Iran, who are divided into whether to go to the ICU or not, we have identified the best factors.

After the data collection and preparation steps, we pre-processed them in which we performed cleaning data, selecting feature variables, sampling, discretization, and balancing in WEKA 3.9 software. By investigative these algorithms, important features Fever, chills, malaise, cough, and background diseases, such as diabetes, cancer, and asthma Also, with BMI between 24-26 and those who were in serious contact with people suspected of having corona disease were among the important factors who went to the ICU after a short examination and hospitalization with 85% probability and 75% accuracy of the data.

In this study, with a combination of computer science and medical science, by presenting a combined method of clustering and classification in the number of people who go to the ICU, it is predicted to help physicians to evaluate their patients with a high probability.

Fatemeh Hajibabaie

Reversing molecular signaling pathways involved in Alzheimer's disease pathogenesis via high physical activity in old age

Fatemeh Hajibabaie, Farzaneh Taghian, Navid Abedpoor

1. Department of Physical Education and Sport Sciences, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran,

2. Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran

Alzheimer's disease, as the most frequent disorder in dementia, is a progressive neurological path that is recognized by loss of memory, disability to respond to environmental, speaking, and determined with the accumulation of amyloid-beta proteins and tau in neurons. Although dementia is a multifactorial disorder, and there are several genetic and environmental factors involved in the pathogenesis of Alzheimer's, aging is the well-establishment risk factor in the pathophysiology of Alzheimer's. Moreover, a sedentary lifestyle is an enhancement condition to the development of Alzheimer's patients. In the current research, we analyzed microarray datasets by R programming language software to compare physical activity impact in reversing pivotal genes expression and offset of neurodegeneration between sedentary Alzheimer patients and high-activity Alzheimer's cases in the hippocampus region of the homo sapiens brain. Analysis of network conducted with apply central diameters and selected 108 hub genes with differential gene expression in high activity training that these hub genes are associated with inflammation, BDNF, PI3K-Akt, AGE-RAGE, thyroid hormones, and Alzheimer disease- presenilin, neuronal system, p53, FGF and Apoptosis signaling pathways. Furthermore, these molecular signaling pathways are potential therapeutic approaches for the treatment of dementia and Alzheimer's which reverse by physical activity and exercise training in old age.

Fatemeh Harandi

The effect of sheep ghee on pain, stiffness, physical function and range of motion of the knee joint in older people with osteoarthritis of the knee in Rafsanjan in 2020

Fatemeh Harandi[1], Seyedhamid Seyedbagheri[2], Arefeh NajjarMohiabadi[1], Mahboobeh Jamali[1], Mitra Abbasifard[3], Ahmadreza Sayadi[4], Fatemeh Ramezani[1], Mohammad pourdavar[1], Amirreza Mirzaei[1]

1. Nursing student, Student Research Committee, Rafsanjan University of Medical Sciences, Rafsanjan, Iran
2. Non-Communicable Diseases Research Center, Dept. of Pediatric Nursing, Nursing and Midwifery School, Rafsanjan University of Medical Sciences, Rafsanjan, Iran
3. Assistant Professor of Rheumatology, Department of Internal Medicine, School of Medicine, Ali Ibn Abitaleb Educational and Tretment Hospital, Rafsanjan University of Medical Sciences
4. Assistant Professor, Department of Psychiatric Nursing, School of Nursing and Midwifery, Social Determinants of Health Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

Osteoarthritis is the most prevalent form of joint disease, particularly in the knee, where it causes the most debilitating pain. Natural remedies, owing to their relative safety, can play a significant role in its treatment. Due to the important components of sheep ghee, it plays a critical role in reducing inflammation. The current study aimed to determine the effect of sheep ghee on pain, stiffness, physical function, and range of motion in the knee joint in older patients with osteoarthritis of the knee in Rafsanjan, Iran in 2020.

The current study was a three-group clinical trial in which 75 older patients with osteoarthritis of the knee were selected purposefully and were assigned randomly to one of three groups. The standard WOMAC questionnaire was used to assess pain intensity, stiffness, and physical function; the VAS scale was used to assess pain intensity; and range of motion was assessed face to face twice (before and immediately after the intervention). The intervention group applied one gram of sheep ghee to the painful areas (front, side, and back) of the knee twice a day for a month. The placebo group used Vaseline at the same dose as the intervention group, while the control group received only a one-minute normal massage. SPSS18 was used to analyze the data.

The mean age of all participants was 59.05±9.53, and the majority of them were female (70%), married (92%), housewifely, and overweight. There was a significant difference in the WOMAC pain scores between the intervention and placebo groups before and after the intervention, and both sheep ghee and Vaseline reduced pain, with the difference being that the pain reduction was greater in the sheep ghee group than the Vaseline group. Joint physical function and stiffness were also improved by using sheep ghee.

Ghee was found to be effective in reducing joint pain and stiffness, improving physical function, and knee range of motions in the older people. The sheep ghee can be used in conjunction with pharmaceutical methods as a non-pharmacological treatment.

Sara Hosseini

Nanoparticle-based MSC Therapy in SLE

Sara Hosseini, Mahmoud Mahmoudi

1. Immunology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
2. Immunology Department, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
3. Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran

Systemic lupus erythematosus (SLE) is a chronic systemic autoimmune disorder with multi-organ involvement. SLE is characterized by the production of pathogenic autoantibodies, immune complex deposition, inflammatory Tcell responses and inflammation within damaged organs. Even though its etiology is still unknown, it is widely recognized that hormonal, environmental, and genetic factors would trigger immune responses to which disease progression occurs. Current approaches for treatment of SLE comprise corticosteroids and immunosuppressive drugs, however, they are not highly curative but can manage the disease up to a point. Recently, immunotherapy has become a potential candidate to the treat SLE. This point is aptly illustrated by taking advantage of Mesenchymal stem cells (MSCs). MSCs are multipotent stem cells which can easily differentiate to distinct kinds of cells along with low immunogenicity. They are also capable of possessing a wide range of immunomodulatory properties through soluble mediators as well as direct cell-cell contact. Since Nanotechnology, have attracted increasing attention in recent years, variety of multifunctional nanoparticles (NPs) have been taken into consideration for immunotherapies. NPs can be used as labeling elements or carriers to deliver the intended compounds to targeted organs/cells. Evidence demonstrated that NPs undertake immune stimulation, tolerance, immune signaling regulation and inflammation. As a matter of fact, NPs suppress the activation of T helper and T cytotoxic lymphocytes in addition to Bcells. Some different studies have shown the effect of Nanoparticle-based MSC in treatment of inflammatory diseases such as CIMVs-MSCs that decreased secretion of epidermal growth factor (EGF) and pro-inflammatory Fractalkine in a population of PBMCs. They can also release anti-inflammatory mediators which results in reducing inflammation. With regard to inhibitory role of NP-MSCs, we aimed to study the impact of these cells in order to treat SLE disease.

Ahad Jafari Rahbar Alizadeh

A review of the neurological manifestations of SARS-CoV-2

Ahad Jafari Rahbar Alizadeh

Department of Basic Sciences, Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

SARS-CoV-2 and how the virus behaves has been one of the top human priorities since the presence of Covid-19 in Wuhan, China, as we all know. As the name of SARS-CoV-2 (acute respiratory syndrome coronavirus 2) implies, the human respiratory system is the source of the majority of its difficulties. In the meantime, the virus targets not just the respiratory system, but also other organs throughout the body. One of the organs involved in certain cases was the central nervous system. The objective of this study was to see if there was a correlation between the Corona Virus and Nervous System Clinical Signs.

From February 2020 to August 2021, related published articles were searched in Google Scholar, Web of Science, and PubMed. The following search method was employed in this electronic database, with these keywords (in the title): "Covid-19" OR "SARS-CoV-2" OR "Coronavirus" AND "Nervous System" OR "Brain"

Studies and clinical observations, even in other members of the Coronaviridae family, including most human coronaviruses and some animal coronaviruses, show Neuroinvasive properties of these viruses. Symptoms seen in clinical observations of the disease include necrotizing hemorrhagic encephalopathy, encephalitis, meningitis, ischemic and hemorrhagic stroke, acute diffuse encephalomyelitis, venous sinus thrombosis, epileptic seizures, and endothelial dysfunction, due to damage to the central nervous system. Loss of sense of smell and taste can also be noted as a result of damage to the peripheral nervous system.

Even though the virus's behavioral information is updated daily, investigations to date have found a substantial link between coronavirus infection and nervous system involvement. This connection is becoming more common among patients as the coronavirus becomes more aggressive during mutations.

Parnian Jamshidi

Skin manifestations as a prognostic indicator for COVID-19 severity: A systematic review

Parnian Jamshidi, Mohammad Javad Nasiri

School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Passing about twenty months from the start of the SARS-CoV-2 pandemic, the world is still facing the crisis. Up to date, there are many reports on cutaneous manifestations in COVID-19 patients. However, the link between skin manifestations and disease severity is still controversial. We conducted a systematic review to evaluate the temporal relationship between different types of skin lesions and the severity of COVID-19.

A systematic search was conducted for relevant studies published between January and July 2020 using Pubmed, Embase and Web of knowledge. Out of 381 articles, 47 satisfied the inclusion criteria and a total of 1847 patients with confirmed COVID-19 were examined. Considering the description of the lesions, we categorized them into six groups: chilblain-like, vesicular, urticaria-like, maculopapular, vascular (e.g. petechiae, purpura, livedo and necrosis) and miscellaneous.

The prevalence of cutaneous manifestations in COVID-19 patients was 5.95%. Maculopapular rash was the main reported skin lesion (37.3%). Forty-eight percentages of the patients were outpatient (mild), 32% were hospitalized (moderate) and 20% were ICU added (severe). Mild disease was mainly correlated with chilblain-like and urticaria-like lesions and severe disease was mainly correlated with vascular lesions. The overall mortality rate was 4.5%. The highest mortality rate was amongst the patients with vascular lesions (18.2%) and patients with urticaria-like lesions had the lowest mortality rate (2.2%).

There is a wide range of skin manifestations related to COVID-19. The occurrence of specific types of skin manifestations in COVID-19 patients might be a predictor for the disease severity. Chilblain-like and vascular lesions are the ends of a spectrum in which from chilblain-like to vascular lesions, the severity of the disease increases, and the patient's prognosis worsens. Those with vascular lesions should also be considered as high-priority patients for further medical care.

Ali Kalhori

Mechanisms linking Iodine deficiency to the risk of dementia

Ali Kalhori[1], Mojtaba Daneshvar[2]
1. Nutrition Department, Science and Research Branch, Islamic Azad University, Tehran, Iran
2. Tehran University of Medical Sciences; School of Nutritional and Dietetic Sciences, Tehran, Iran

The article's primary purpose is to summarize the possible interactions from the anti-oxidative and anti-inflammatory perspective of iodine and thyroid hormones in the body, as many studies discussed the role of iodine deficiency and thyroid dysfunction in forming dementia in a short communication format.

After searching primary electronic registries, including PubMed, Cochrane database of systematic reviews, and PROSPERO, to check the overlap. We performed a systematic literature search of databases PubMed, Scopus, Embase, and Web of Sciences on 05/06/2021. The search strategy was based on the following medical subject headings (MeSH) and non-MeSH terms keywords: "dementia" OR "AD (cognitive impairment)" AND. We also reviewed reference lists of eligible studies for additional relevant studies.

Increased Blood-Brain Barrier (BBB) permeability and resulting impaired brain functions are considered gut dysbiosis results. The term dysbiosis can refer to a discrepancy of the microbiota, and its functions, which can diversify its beneficial state to detrimental effect, leading to various dysfunctions, including neurological and cognitive disorders when transmitting stimuli Gut-Brain-axis is disturbed. The vital role of balanced and stabilized gut microbiota in transmitting signals can prevent intestinal permeability breakdown, triggering cytokine realization into the bloodstream reaching the CNS. The existence of intestinal inflammation markers and elevated serum levels of proinflammatory cytokines pertain to intestinal barrier damage. However, supplementation with probiotics improved cognitive functions in humans and animals probably by regulating inflammation throughout 'Gut-Brain-Axis' as one of the four possible pathways associated with Dementia. All of the four pathways are summarized in this article.

THs exert a comprehensive series of effects, acting upon many issues. Thyroid hormone deficiency induces excess Reactive Oxygen Species (ROS) generation, which causes selenium level reduction in the brain and can cause further cognitive impairments.

Farnaz Khaleseh

Confocal Raman Microscopy and applications in pharmaceutical development

Farnaz Khaleseh[1,2,3,5], Farnoosh Khaleseh[4,5], Farnaz Monajjemzadeh[6]

1. Student Research Committee, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran
2. Department of Pharmaceutics, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran
3. Pharmaceutical Sciences Research Center, Health Institute and School of Pharmacy, Kermanshah University of Medical Sciences, Kermanshah, Iran
4. School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran
5. USERN Office, Kermanshah University of Medical Sciences, Kermanshah, Iran
6. Food and Drug Safety Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Confocal Raman microscopy (CRM) is a kind of analytical spectroscopic method which has wide application in different fields of science because of sensitivity and precision, but the present study focuses on the applications in pharmaceutical products. Also, the basic data and method characteristics have been reviewed.

The articles in databases like PubMed and Scopus have been collected according to different keywords to find the articles which have pointed to CRM as a method for analysis of pharmaceutical products.

Raman spectroscopy is a kind of analytical light scattering spectrophotometric method with the basis of light interactions with chemical bonds of materials, which is resulted from laser light. It provides fingerprint identity information about the structure of materials. A combination of Raman spectroscopy and confocal microscopy will lead to a more precise technique for analysis. Comparison of CRM with other analytical methods shows advantages like no sample preparation, evaluation of solid, liquid, or gas samples, and the most important one is that CRM can analyze samples even in the package. The most important limitation of CRM is that quantitative results are difficult to achieve; although Raman intensity is proportional to the concentration of the scattering species, but several effects deduce quantitative output.

The application of CRM in drug discovery and development includes chemical identification, formulation, raw material qualification and quality control analysis. For example, by CRM images, the homogeneity of solid dosage forms can be observed as each component is shown by a distinct color. On the other hand, the content uniformity of different formulations can be evaluated even after packaging.

In conclusion, CRM is a helpful tool for the investigation of pharmaceutical products that provides unique data for scientists and makes the analysis easier.

Zahra Khoshbin

A Simple Paper-supported Fluorescent Aptasensor for Simultaneous Detection of Water Pollutants

Zahra Khoshbin[1], Mohammad Reza Housaindokht[1], Mohammad Izadyar[1], Asma Verdian[1]

1. Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran

The adverse effects of mercury ($Hg2+$) and lead ($Pb2+$) ions on the environment and public health make it necessary to develop detection methods with great specificity and selectivity for the ions. Metal ions commonly coexist in environmental and biological samples. Hence, it is an essential demand to develop a simple and low-cost method for the simultaneous determination of metal ions, peculiarly in the case of coexisting $Hg2+$ and $Pb2+$. This study introduces a simple paper-based aptasensor for the simultaneous detection of $Hg2+$ and $Pb2+$ in an ultra-trace level by taking advantage of the FRET process. The sensing mechanism of the proposed array is based on the conformational switch of $Hg2+$- and $Pb2+$-specific aptamers and their release from the GO surface after the injection of the target sample containing both $Hg2+$ and $Pb2+$ on the paper-based platform. Through monitoring the changes of the fluorescence recovery against the diverse concentrations of the injected ions, $Hg2+$ and $Pb2+$ could be selectively determined as low as 1.33 and 0.47 pM. To the best of our knowledge, the paper-based FRET aptasensor can simultaneously detect $Hg2+$ and $Pb2+$ within about 10 minutes. The developed aptasensor has been successfully applied to determine $Hg2+$ and $Pb2+$ in tap water, lake water, milk, and human blood serum. The designed aptasensor with the main advantages of simplicity and feasibility holds great potential for the development of a cost-effective and efficient sensing tool for environmental monitoring, food safety, and human diagnostics.

Amir Hossein Mansourabadi

The immune system as a target for therapy of SARS-CoV-2: A systematic T review of the current immunotherapies for COVID-19

Amir Hossein Mansourabadi, Mona Sadeghalvad, Hamid-Reza Mohammadi-Motlaghd, Nima Rezaei

Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Network of Immunity in Infection, Malignancy and Autoimmunity (NIIMA), Universal Scientific Education and Research Network (USERN), Tehran, Iran

Systematic Review and Meta-Analysis Expert Group (SRMEG), Universal Scientific Education and Research Network (USERN), Tehran, Iran

The immune response is essential for the control and resolution of viral infections. Following the outbreak of novel coronavirus disease (COVID-19), several immunotherapies were applied to modulate the immune responses of the affected patients. In this review, we aimed to describe the role of the immune system in response to COVID-19. We also provide a systematic review to collate and describe all published reports of using immunotherapies, including convalescent plasma therapy, monoclonal antibodies, cytokine therapy, mesenchymal stem cell therapy, and intravenous immunoglobulin and their important outcomes in COVID-19 patients.

A thorough search strategy was applied to identify published research trials in PubMed, Scopus, Medline, and EMBASE from Dec 1, 2019, to May 4, 2020, for studies reporting clinical outcomes of COVID-19 patients treated with immunotherapies along with other standard cares.

From an initial screen of 80 identified studies, 24 studies provided clinical outcome data on the use of immunotherapies for the treatment of COVID-19 patients, including convalescent plasma therapy (33 patients), monoclonal antibodies (55 patients), interferon (31 patients), mesenchymal stem cell therapy (8 patient), and immunoglobulin (63 patients). Except for nine severe patients who died after treatment, most patients were recovered from COVID-19 with improved clinical symptoms and laboratory assessment.

Based on the available evidence, it seems that treatment with Immunotherapy along with other standard care could be an effective and safe approach to modulate the immune system and improvement of clinical outcomes.

Bita Moudi

Prognostic significance of GPC3 in patients with hepatocellular carcinoma: a systematic review and meta-analysis

Bita Moudi, Zahra Heidari , Hamidreza Mahmoudzadeh-Sagheb

Infectious Diseases and Tropical Medicine Research Center, Zahedan University of Medical Sciences, Zahedan, Iran

Hepatocellular carcinoma (HCC) is a common malignant cancer and the second cause of cancer-related death worldwide. Glypican-3 (GPC3) is established as an important prognostic factor for HCC, but the results are still controversial. Moreover, its utility as an immunohistochemical marker for HCC is not conclusive. Herein we aimed to find the prognostic significance of GPC3 in HCC patients.

The PubMed, Web of Science, EMBASE, SCOPUS, and Cochrane Library databases were searched and eligible studies based on the GPC3 expression and survival outcome of HCC (odds ratios or hazard ratios) included in the current meta-analysis. The STATA 12.0 and RevMan 5.3 software was used for statistical evaluations.

17 articles contained 2618 patients, were included in the recent meta-analysis. Our findings revealed a significant association between tumor stage, higher tumor grade, presence of vascular invasion, shorter overall survival, shorter disease-free survival, and high expression of GPC3. The subgroup analyses based on sample size, cutoffs, and follow-up period were also conducted to examine the association between GPC3 and OS and also to increase the homogeneity of the study.

the current study found a significant association between GPC3 expression and poor prognosis of HCC and especially related to the HCC invasion and progression. It was recommended to design more prospective studies based on the relationship between GPC3 and HCC to confirm our results.

Fatemeh Najafi

Clarifying the concept of the four-season symphony (I SEA) in nursing practice: A Wilson's approach to concept analysis

Fatemeh Najafi, Mohamadali Cheraghi
Department of Medical–Surgical Nursing, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

Acquired knowledge provides one with intuitive rationality as a means of achieving a goal. Spiritual, ethical, and esthetic competencies are also required for acquiring intuitive rationality. Nurses pay less attention to intuitive rationality, think only with their brain rather than observe with their heart, and therefore deprive themselves of proper, immediate, and comprehensive cognition of their environment. An initiative to harmonize sensory receptors in charge of thinking, speaking, and acting in nurses is required for establishing a symphonic intellectual, spiritual, ethical, and aesthetic (I SEA) nursing practice. The present research was conducted to clarify the concept of a four-season symphony of I SEA in nursing practice. The present study was conducted by employing Wilson's method of concept analysis and searching databases, including Google Scholar, ScienceDirect, Scopus, PubMed, SID, and Magiran using symphony, rationality, intellectuality, spirituality, ethics, aesthetics, and nursing practice as keywords. According to the integrated concept of the four-season symphony in nursing care, nursing practice refers to performing the symphonic action of four seasons of I SEA in orderly and smart thinking, speaking and acting in looking, listening, speaking, heartfelt sympathy, and using the hands for caregiving and steps for accompanying patients. This symphony provides an opportunity for the emergence of perfect nurses of four seasons and helps with individual and organizational symphonic improvements in nursing care and nurses. According to this perspective, nurses should always ask themselves whether their thought, speech, and action are intellectual, spiritual, ethical, and aesthetic.

Parinaz Nezhadmokhtari

Smart co-delivery of 6-mercaptopurine and methotrexate using disulphide-based PEGylated-nanogels for effective treatment of breast cancer

Parinaz Nezhadmokhtari, Marjan Ghorbani, Farideh Mahmoodzadeh
Department of Medical Nanotechnology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Nanosized drug delivery approaches have been offered for targeting cancer cells because of their improved permeability and retention effect (EPR), enhanced bioavailability of drugs, and the circulation time in the bloodstream. Besides, combination therapy has become an appealing approach for clinical cancer treatment to reach synergistic effects through reducing toxic drugs side effects due to the low drug dose administration. The purpose of this study was to design biocompatible and novel multi-stimuli responsive polymeric nanogels (PEGIAn-ss-PNIPAAm-ss-PDAEMAQ NGS) for intracellular co-delivery of methotrexate (MTX) and 6-mercaptopurine (MPU) to the MCF7 cell line. The developed NGs revealed many favorable abilities, including a narrow size distribution range (60 nm), high drugs loading capacities (26% for MTX and 11% for MPU), and stimuli-responsive drug release. The improved efficiency of the obtained NGs was verified by MTT assay, DAPI staining, and cellular uptake analysis. According to the achieved results, it was concluded that the developed smart NGs have many hopeful abilities for co-delivery of MTX and MPU and can be applied in effective cancer therapy.

Maryam Noori

Mediterranean dietary pattern and bone mineral density: a systematic review and dose-response meta-analysis of observational studies

Maryam Noori, Ahmad jayedi, Tauseef Ahmad Khan, Sajjad Moradi, Sakineh Shab-Bidar
Student Research Committee, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

We aimed to systematically review the literature and test the dose-response relationship between adherence to the Mediterranean diet (MedDiet) and values of bone mineral density (BMD) in adults.

Relevant observational studies were selected through searching PubMed, Scopus, and ISI Web of Science databases up to March 4, 2021. A random-effects dose-response meta-analysis was performed to estimate the change in total and regional-specific BMD for a 2-point increment in the score of adherence to the MedDiet and to clarify the shape of these associations.

Seven cross-sectional and one cohort studies with a total number of 13,209 participants were included in the final analysis. Each 2-point increment in the score of adherence to the MedDiet was associated with 0.009 (95% CI: 0.002, 0.016; $I2 = 34\%$, n = 7), 0.006 (95% CI: 0.001, 0.012; $I2 = 34\%$, n = 7), 0.005 (95% CI: 0.003, 0.007; $I2 = 1\%$, n = 4), 0.005 (95% CI: 0.002, 0.008; $I2 = 0\%$, n = 3), and 0.007 (95% CI: 0.005, 0.009; $I2 = 0\%$, n = 4) gr/cm2 higher BMD of lumbar spine, femoral neck, hip, trochanter, and whole body, respectively. There was a positive linear relationship between the MedDiet adherence score and BMD of hip and trochanter. A nonlinear relationship was seen for lumbar spine, femoral neck, and whole body, with sharper increase in the BMD at lower MedDiet scores. The associations remained significant after controlling for important confounders including body weight, physical activity, smoking status, and energy intake.

Greater adherence to the MedDiet was associated with a small but important increase in BMD at the lumbar spine, femoral neck, hip, trochanter, and whole body. Adopting a Mediterranean-style eating pattern may have modest beneficial effects on bone health.

Alireza Rahbar

Evaluation of surgical treatment of congenital kyphosis deformity with posterior vertebral resection technique (PVCR) in Imam Khomeini Hospital from 2017 to 2019

Alireza Rahbar, Hooman Farmand

Department of Orthopedic Surgery, Tehran University of Medical Sciences, Tehran, Iran

Congenital kyphosis deformity is an excessive curvature of the spine in the sagittal plane. In cases where the angle of curvature is such that it causes patient self-appearance dissatisfaction, mechanical, neurological, respiratory, and functional injuries, as well as when non-invasive treatments are not effective, surgery is required. The older the patient, the more difficult the surgery and the less correction of the deformity angle, and failure to intervene in the treatment of patients with progressive disease leads to prolonged fusion and increased neurological risk. Since surgery can have possible complications during and after surgery, choosing the right surgical method with the least complications and the most desirable results is a priority. According to the studies of other researchers, in previous methods such as the anterior-posterior approach, due to multiple surgical incisions, the duration of the operation, the duration of hospitalization, and complications during and after surgery are reported to be high. One of the surgical methods used today to correct congenital kyphosis deformity is posterior vertebral column resection with the help of Decancellation. Considering that this approach leads to shorter operation time, intraoperative bleeding, hospital stay, and finally better deformity correction and patient satisfaction compared to other methods, the necessity of this research is to use the PVCR method to obtain the most desired results in Imam Khomeini Hospital with the least complication and maximum patient satisfaction.

In a cross-sectional study, 13 patients under the age of 18 underwent PVCR surgery and were followed up for up to 12 months. In order to measure the general satisfaction of patients with the treatment measures, the SRS-30 questionnaire form is filled in before and after the operation by the patients themselves and under the age of 10 by their guardians. In order to analyze the results, statistical methods are used with SPSS version 26. In this study, the statistical distribution of patients is normal, and the P-value calculated by the Shapiro-Wilk test is higher than 0.05. Therefore, parametric methods are used to analyze the data. In the end, the results of statistical and radiographic analyzes are recorded and reported.

In this study, the mean age of patients was 10 years with a minimum age of 4 and a maximum of 17 years. Of these, 61% were female and 39% were male, with 38% of patients reaching puberty. A total of 13 hemivertebrae were resected. The mean fusion level of 4 vertebrae, the mean Cobb angle of curvature correction before and after the operation were 11.49 and 14.28 degrees, respectively, and in the last follow-up, it was 84.27. The percentage of Cobb angle correction immediately after the operation and in the last follow-up was reported to be 64.42% and 32.43%, respectively. The average overall satisfaction of patients based on the questionnaire was 106 points. Based on the analysis of statistical data, the maturity of patients with the percentage of postoperative angle correction and in the last follow-up, the amount of intraoperative bleeding, patient performance, duration of surgery, length of hospital stay, and the amount of intraoperative bleeding were significant (P-value <0.05). In addition, a boundary relationship was observed between patients' overall satisfaction and maturity. None of the patients suffered from nerve damage, fractures, or infections.

According to the reported data, in adult patients, the rate of correction of Cobb angle, postoperative function, and borderline overall patient satisfaction was lower than in immature patients. In all patients, the difference before and after surgery was significant for the correction of Cobb angle, self-image, performance, pain, and overall satisfaction (P-value <0.05). These findings indicate the effectiveness of PVCR in treatment and patient satisfaction. Since this approach has less surgery time, complication, length of hospital stay, invasiveness, as well as the degree of curvature correction and satisfaction compared to other surgical methods, it is the surgical method of choice for the treatment of patients with kyphosis deformity.

Parisa Rahimirad

Evaluation of Effectiveness of Aloe Vera Extract in comparison with other drug combinations for the treatment of Oral Mucosal Diseases: A Systematic Review

Parisa Rahimirad, Nazanin Bashardoust, Nastaran Mirfarhadi, Behnaz Badfar
Student Research Comittee, School of Dentistry, Guilan University of Medical Sciences, Rasht, Iran

Oral health is important in the quality of life of all age groups. Oral disease can cause discomfort or pain in a person's daily activities such as chewing, swallowing, and talking, which may cause symptoms such as halitosis, dry mouth, or numbness. Steroids and other drug combinations commonly used to treat various oral diseases have many side effects, and scientists are less likely to seek out other treatments with less potency and side effects. In recent years, aloe vera has been considered by researchers as an alternative treatment for various oral diseases due to its numerous medicinal properties with minimal side effects and anti-inflammatory, antibacterial, anti-tumor, anti-fungal, and immune-boosting effects. Studies have shown that aloe vera has important therapeutic uses in the treatment of oral diseases such as lichen planus, fibrosis under the oral mucosa, radiotherapy-induced mucositis, mouth burning syndrome, dry mouth, and pests. Evidence is based on the evaluation of studies on the effectiveness of aloe vera extract in the treatment of oral mucosal diseases.

Asma Rasouli Osalu

Biomarkers linking metabolic syndrome and periodontal diseas

Asma Rasouli Osalu, Mahsa Zohdi
Tabriz University of Medical Sciences, Tabriz, Iran

Over the last years, the connection between periodontal disease (PD) and metabolic syndrome (MS) has been studied, nevertheless the relationship between them still remains controversial. The aim of this study is to evaluate the biomarker profile in metabolic syndrome patients and periodontitis disease. We tried to find the association between metabolic syndrome and periodontal disease by analyzing the mutual biomarkers in these disorders.

1273 participants were included from 6 case-control and cross-sectional studies. Serum CRP (C-reactive protein), Interleukin (IL)-1β, IL-6, IL-8, Tumor necrosis factor (TNF)-α, Matrix metalloproteinase (MMP) -8, MMP-9, MMP-13, Homocysteine (HCY), Fasting plasma glucose (FPG), Total cholesterol (TC), Low-density lipoprotein (LDL), High-density lipoprotein (HDL), Triglycerides (TG) were assayed by Enzyme-linked immunosorbent assay (ELISA) and Turbidimetric immunoassay.

Li et al. (2020) reported that in MS patients, CRP level is higher than in those without any systemic problems. No difference was detected in the level of IL-1β and IL-6 between controls and MS patients. The level of IL-6 in MS participants with mild periodontitis was significantly lower than in MS participants with severe/moderate periodontitis. In Chauhan et al.'s study (2016) in (MS+PD), (MS) and (PD) group higher TNF-α and lower IL-10 than the control group was reported. Torumtay et al. (2015) reported that periodontitis patients with MS had higher CRP and IL-6 levels than those without MS. In Kim et al. study (2014) higher prevalence of MS was shown in the periodontitis group in comparison with the non-periodontitis group. Han et al. (2012) reported that IL-6 and TNF-α were synergistically related with the MS-periodontitis coexistence. Han et al. research on Koreans (2012) showed that MMP-8, MMP-9, and MMP-13 were associated with Mets-periodontitis coexistence non-synergistically in both men and women. MMP-8, MMP-9, MMP-13 have related to periodontitis in both genders; also, MMP-9 and MMP-13 had an association with Mets in women.

The results suggest that some biomarkers such as Serum CRP, IL-1β, IL-6, IL-8, TNF-α, MMP-8, MMP-9, and MMP-13 may be valuable biomarkers to recognize the patients with both metabolic syndrome and periodontal disease.

Fatemeh Razavinia

Antimicrobial Activity Improvement of Metronidazole in Conjugation with Gold Nanoparticles against Helicobacter pylori

Fatemeh Razavinia, Roohollah Fateh, Ali Javadi

1. Department of Student Research Committee, Qom University of Medical Sciences, Qom, Iran
2. Department of Microbiology, School of Medicine, Qom University of Medical Sciences, Qom, Iran
3. Department of Pathobiology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Helicobacter pylori is considered a major agent is causing gastritis and peptic ulcer disease. Unfortunately, the occurrence of increasing drug resistance to this bacterium would result in some difficulties in its treatment. Therefore, the application of nanotechnology has been suggested to resolve such problems. Nanoparticles usage in medical research has been expanded in recent years. Among nanometals, gold nanoparticles have exclusive features that can be used in such applications. Using nanotechnology in medical science could help mankind to solve this problem in the future. Our aim in this research was to investigate the antimicrobial effect of gold nanoparticles on H. pylori strains.

Gold nanoparticles were synthesized by the Turkevich method. Then, their size and dispersion were investigated using spectrophotometry, DLS, and TEM microscopy. Subsequently, the combination of metronidazole and gold nanoparticles was obtained by mixing method, and then the anti-helicobacter effects of the two were evaluated according to CLSI.

The largest size of gold nanoparticles was between 12 and 9 nm, and the maximum absorbance was 522 nm; however, in the conjugated state, the maximum absorbance was 540 nm, which indicated the accumulation of drug-conjugated nanoparticles in the conjugate state. Some changes indicated the binding of metronidazole to gold nanoparticles. Antimicrobial testing of gold nanoparticles and metronidazole did not affect Helicobacter pylori. Therefore, the combination of gold nanoparticles and metronidazole had a 17- mm growth inhibition zone.

The anti-helicobacter effects of metronidazole significantly increased in conjugation with gold nanoparticles.

Farzan Safi Dahaj

Prognostic role of EGFR in patient with lung adenocarcinoma: A retrospective analysis to resolve the dispute

Farzan Safi Dahaj, Shokouh Taghipour zahir, Mohammadreza Mortazavizadeh
Student research committee, Shahid Sadoughi Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Prognostic value of EGFR (Epidermal growth factor receptor) in lung adenocarcinoma remains a contentious topic. Albeit the 2nd and third rank of lung cancer in cancer-related deaths in men and women, EGFR tyrosine kinase inhibitors in NSCLCs opens a new window in improving the survival rate. In this study, we will investigate EGFR status and its relationship with survival in patients with lung adenocarcinoma.

In this retrospective study, using immunohistochemistry, 56 formalin-fixed, paraffin-embedded lung adenocarcinoma tissues were evaluated for EGFR status. Patients referring to Shahid Sadoughi and Mortaz hospitals in Yazd, Iran, during 2012-2017 were included in this census study. Using SPSS v.20, data were analyzed.

The mean age in patients (32 men and 22 female subjects) was 59.64±14.79 years. EGFR expression was positive for 13 (24.1%) patients. There was no significant relationship between EGFR status and survival rates (P=0.572). Also, no significant association was found between the tumor location, tumor grading, and survival rate (P=0.612, 0.758). However, significant associations were seen between survival rates and patients` age and gender (P=0.024, 0.026).

Based on these findings, the elderly and male gender predicts a lower chance of survival in patients with lung adenocarcinoma. Moreover, EGFR mutation is not a strong prognostic marker, according to our results.

Mojde Salehi

Biomimetic artificial PLA nerve conduit containing exosomes promotes peripheral nerve regeneration

Mojde Salehi, Somayeh Ebrahimi-Barough

Department of Tissue Engineering and Applied Cell Sciences, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran

Peripheral nerve injury is a major health challenge, and it affects the quality of a patient's life. Recent evidence has revealed the therapeutic effects of exosomes in tissue injuries and inflammatory diseases. This study constructed PLA neural guidance conduit that combined with exosomes to peripheral nerve regeneration.

In this study, PLA neural guidance conduit was constructed by the electrospinning method and characterized for its physicochemical properties and biocompatibility. The exosomes were extracted by ultracentrifuge methods. The extracted exosomes were characterized by SEM, transmission electron microscopy, Western blot, and DLS. Then the exosomes were combined with PLA conduits. In vitro studies of Schwann cells were used to evaluate the neuroprotective and neurotrophic effects of exosomes in neural conduits.

The SEM image analysis revealed the nanoscale texture of the neural guidance conduit. The appropriate morphological and biochemical properties of PLA neural guidance conduit enhanced cell adhesion and proliferation. Also, the mechanical properties and cell biocompatibility outcomes demonstrated PLA was an acceptable biomaterial to prepare neural guidance conduit. Then we investigated the effects of exosomes on peripheral nerve regeneration in vitro study. Our in vitro outcomes demonstrated after being internalized by Schwann cells, exosome significantly enhanced Schwann cells proliferation, migration, myelination, and secretion of neurotrophic factors by upregulating corresponding genes in PLA conduits.

This study suggests that exosomes combined with biodegradable PLA nerve guidance conduits are novel therapeutic interventions in peripheral nerve regeneration.

Minoo Shahbazifar

Bilateral feedback from speech-language pathologist with primary school teachers to reduce dyslexia in exceptional children

Minoo Shahbazifar
Isfahan School of Rehabilitation of Medical Science, Isfahan, Iran

Today, Dyslexia is one of the most common disorders that affect many children, especially children with special needs. Therefore, a lot of research has been done on the importance of this issue and the relationship that should exist between experts in this field.

This article seeks to show the feedback that should be between SLP and primary school teachers in order to become more familiar and reduce Dyslexia in exceptional children. This article deals with the relationship between experts in this field with a purposeful review of the latest articles published in this field.

The keywords of a transdisciplinary approach, speech-language pathologist, Dyslexia, phonology were used to search google scholar and PubMed databases from 1970 to 2020. There were 50 articles in the search, and after reading the title and summary, 28 of the most relevant ones were used for writing.

Exceptional children, children who need special training to approach the level of normal children due to the difference in physical, motor, cognitive, etc. Characteristics. Dyslexia is one of the most common disorders with features such as difficulty reading and due to problems in the field of phonology in these school-age children.

To further reduce this disorder, communication between experts in this field is needed, so a feedback model based on the FMS feedback model is presented, which consists of 4 parts: student, database, SLP, and exceptional child teacher.

As we know, reading is a basic skill, so more and more communication between experts in this field can lead to a reduction in Dyslexia.

It is good to establish related courses in order to communicate more and create a common language between these two experts, as well as to hold workshops related to these areas.

Saeede Sharifi

Effect of foliar application of chitosan nanoparticles on the relative expression of Mentofuran synthase gene in peppermint leaves

Saeede Sharifi, Mohammadreza Ghalamboran
Shahid Beheshti University, Tehran, Iran

Menthol and mentofuran are the most important secondary metabolites in peppermint. Many genes are involved in the biosynthetic pathway of these compounds, including the key genes, which are located in the methylerythritol phosphate pathway, and the activity of this gene causes the conversion of pulegone to Mentofuran. Mentofuran is important because it regulates the biosynthesis of essential oils in peppermint by controlling a downstream monoterpene reductase. In the present study, the effect of chitosan nanoparticles as biological elicitors at two concentration levels (control and 50%) on the relative expression of the gene in peppermint was investigated. Chitosan nanoparticles were synthesized by the ion gelation method, and the diameter of the nanoparticles was characterized and determined (Average 80 nanometer). Then peppermint rhizomes were planted in 25 by 35 cm boxes, and when it was ten days old, a solution of chitosan nanoparticles was sprayed on mint plants in 2-time stages, and the spraying interval was ten days. For each time interval, the expression of the gene relative to the reference gene () was evaluated using Real-Time PCR. The results showed that the expression of the gene was ten times higher than the control sample on day 10 and 28 times higher on day 20. Therefore, chitosan nanoparticles can play an effective role in increasing the expression of the main gene of the menthol biosynthesis pathway.

Ahang Taghvamanesh

Rapid detection of Burkholderia cepacia using colorimetric loop-mediated isothermal amplification

Ahang Taghvamanesh
Shahid Beheshti University, Tehran, Iran

Burkholderia cepacia is an opportunistic pathogen inpatient with a gap in their immune system, especially patients with cystic fibrosis. Early diagnosis might be a helpful way to prevent the progression of the disease. In this manner, many molecular detection methods have been employed.

In this study, we used colorimetric loop-mediated isothermal amplification (LAMP) to amplify the target gene of Burkholderia cepacia only in sixty minutes and hydroxy naphthol blue (HNB) dye as an amplification product detector. The amplicons were detected by gel electrophoresis, and observation of color change of HNB from violet to sky-blue was accepted as a positive result right after the amplification was done. To confirm the observed results, a nanodrop was used. In this technique, we were able to detect positive reactions that have been diluted 100 times. The specificity of this method was tested using the genome of 9 other species of bacteria and eukaryote cells.

In this study, we showed that colorimetric LAMP assay could be a method to detect any kind of cells containing nucleic acids in less than an hour with high efficiency.

Vida Tajiknia

Flavonoids and COVID-19 antiviral & Immunomodulatory charecteristics, what do we know?

Maryam Ghandali[1], Mehrad Rokni[2], Ali Afrasiabi[3], Ardavan Ahmadvand[1], Farzaneh Mashayekhi[3], Vida Tajiknia
1. Department of Internal medicine, Iran University of Medical Sciences, Tehran, Iran
2. Rajaie Cardiovascular, Medical and Research center, Iran University of Medical Sciences, Tehran, Iran
3. Department of internal medicine, Rasoul Akram Hospital, Iran University of Medical Sciences, Tehran, Iran

Coronavirus-related disease 2019 (COVID-19) became a pandemic in February 2020 and caused unprecedented health challenges. All around the globe, researchers try to tackle the disease with existing treatments and known antiviral drugs of all kinds or to develop novel compounds inhibiting viral spreading. Nature has gifted us with an immense supply of natural products with therapeutic characteristics. Flavonoids, already known as antivirals in general, are considered to have activities specific to the viral agent causing COVID-19, SARS-CoV-2. The anti covid-19 activity of Flavonoids can be categorized based on which part of the viral cycle they affect. Multiple studies have reported promising characteristics of flavonoids in the management of new coronavirus (covid-19) disease. Here in this mini-review, we discussed the five major antiviral pathways and also immunomodulatory effects in the inflammatory phase of the disease. flavonoids have demonstrated the most effective and can actually pave the way of managing this highly contagious novel disease and the major international concerns by developing new pharmacological agents by worldwide researchers.

Kimia Taslimi

Acupressure and management of adverse events in breast cancer fighters and breast cancer survivors

Kimia Taslimi, Nasim Aminaie, Zahra Zare
Nursing and Midwifery Department, Tehran University of Medical Sciences, Tehran, Iran

Breast cancer patients suffer from different complications related to cancer and cancer therapies. Most breast cancer patients experience adverse events (AEs) such as chemotherapy-induced nausea and vomiting (CINV), constipation, and Arthralgia that impacts QOL and treatment outcomes; therefore, controlling these AEs has always been challenging for the medical team.

Acupressure is a popular non-pharmacological therapy used for treating a variety of conditions. Many studies have been done on the effect of acupressure on controlling AEs of breast cancer. Due to the importance of controlling these AEs properly, a systematic review was done in 2008 about acupoint stimulation and managing breast cancer AEs; But many studies have been done in this domain since then, which needs to be gathered together to obtain a reference for the medical team. This study is designed to gather results of clinical trials conducted in the field of the effect of acupressure on AEs in breast cancer.

A literature search was done without considering the year of publication, on five English and Persian databases, including PubMed, Google Scholar, Web of Science, Scopus, and SID, using keywords of "acupressure" and "breast cancer" to identify studies designed to examine the effect of acupressure on AEs of breast cancer.

302 possibly relevant titles were identified. Eventually, 17 papers satisfied the inclusion criteria and entered the study. The 17 articles were published between 2006 and 2020. They assessed the application of acupressure on nine conditions related to breast cancer and anticancer therapies, including CINV, chemotherapy-induced constipation, Arthralgia, fatigue, QOL, quality of sleep, pain, anxiety, and depression. Various acupressure used included auricular acupressure, P6 Acupressure, self-administered acupressure, and acupressure waistbands.

The results in the articles are different, but most of the articles indicate the positive effect of acupressure on managing the AEs of breast cancer and anticancer therapies.

Amirreza Yaghoubpour

Rift Valley Fever outbreak in Iran – A need for One Health approach

Amirreza Yaghoubpour, Lena Yaghoubpour
Islamic Azad University, Baft Branch, Baft, Iran

Rift Valley fever (RVF) is an emerging, viral, zoonotic, and mosquito-borne disease that is modulated by eco-climatic factors. It severely affects several species of mammals, in particular, domestic, wild ruminants, dromedaries, and humans. It is transmitted from animals to humans directly through exposure to blood, body fluids, or tissues of infected animals or via mosquito bites.

RVF is endemic to Africa but has recently spread to Iran. Our aim was to explain how to prevent the spread of this disease in the future of Iran through the one health approach.

To find the prevalence of RVF in Iran, Using the terms 'Iran' and 'RVF,' articles were identified by searching PubMed, Google Scholar, SID, Civilica, and web pages of international organizations as well as local sources in Iran.

The first and only outbreak of RVF was reported in a cross-sectional study focusing on the livestock population in the border areas of Kurdistan province in the west of Iran in 2017, which infected two cattle and three sheep. The successful curb of the RVF at an early stage will protect humans and the public health system from being overwhelmed by the disease later.

The alarm of the outbreak of RVF has been sounded in Iran. Also, Iran's neighborhood with Saudi Arabia, where the disease is endemic, has worsened the situation, so there is a need to adopt a strategy to prevent and control it.

RVF occurs at the animal, human, and ecosystem interface, so the One Health approach, which is cross-sectoral and interdisciplinary, is the best strategy and approach for the prevention and control of RVF.

To implement One Health in Iran, the Veterinary Organization of Iran, the Ministry of Health and Medical Education of Iran, and the Department of Environment of Iran must cooperate with each other.

Zahra Yousefsani

A Comprehensive Review of cutaneous manifestations of COVID-19 infection

Zahra Yousefsani

Department of Basic Sciences, Faculty of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

COVID-19 is an infectious disease caused by SARS-CoV-2 that has precipitately spread all around the world since December 2019. In addition to causing significant damage to patients' respiratory systems, the disease affects other organs, including the skin. Skin manifestations have been reported as an adverse effect of COVID-19 disease in many patients.

This comprehensive review was conducted based on recently published articles in scientific databases such as Google Scholar, PubMed, and Scopus. There are various types of COVID-19 skin manifestations. The most common skin lesions were urticaria, erythema, chilblain-like lesions, urticaria, rash containing macules and papules, vesicular lesions, petechiae, purpuric "vasculitis" pattern, and livedo reticularis.

Studies have shown that Covid 19 exacerbates allergies in people with a history of allergies. These skin manifestations are usually seen in adults and children from the ninth day of infection. It is not yet clear exactly why these demonstrations occur only in some people, and this issue needs further investigation.

Studies have shown that there is a significant association between Covid 19 disease and skin problems. Studies of hospitalized patients have shown that the sooner we notice skin problems during the infection, the easier it is to treat. Also, early onset of skin manifestations in some patients may help physicians diagnose Covid 19 disease more rapidly.

Hamed Zahraee

Investigation of the secondary structure change of beta-amyloid peptide in the presence of sodium dodecyl sulfate by molecular dynamics simulation

Hamed Zahraee, Mohammad Reza Bozorgmehr

Department of Chemistry, Mashhad Branch, Islamic Azad University, Mashhad, Iran

The two processes of beta-amyloid aggregation and the transformation of the tau protein are the main mechanisms of Alzheimer's disease. Beta-amyloid accumulation is due to the transfer of this peptide from the surface of the cell membrane to the extracellular environment. This shift leads to a change in hydrophobic forces. On the other hand, one of the compounds used to study changes in the hydrophobic forces of water is sodium dodecyl sulfate (SDS). In this study, the effect of low and high concentrations of SDS on the beta-amyloid structure was investigated by molecular dynamics simulation. To determine the force field parameters of the SDS, its structure was optimized by the B3LYP density functional method along with a 6-311G++ (d, p) basis set. Monomer, dimer, trimer, and tetramer systems of the peptide were simulated in the presence of 10 and 40 SDS molecules. Therefore, eight different simulations were designed. The Berendsen thermostat was used to control temperature and pressure. The simulations were equilibrated in two steps and finally simulated for 100 nanoseconds with a time step of 2 femtoseconds. The secondary structural changes of the beta-amyloid peptide in different simulated conditions were calculated by the DSSP method.

Examination of the figures shows that SDS concentration had a heterogeneous effect on the secondary structure of the beta-amyloid peptide. For example, the beta-sheet structure is not observed in a quaternary system of the beta-amyloid peptide at high SDS concentrations. However, this structure is present in low concentrations of SDS. Alpha helices have also become more widespread at high SDS concentrations. In general, the results obtained in this work are consistent with the experimental hypothesis that beta-amyloid behaves heterogeneously due to changes in hydrophobic forces.

Zahra Fotoukian

Psychometric evaluation of Life Attitude Profile Scale-Revised in Patients with Cancer

Zahra Fotoukian

Nursing Care Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

Increasing life expectancy and improving the quality of life of patients with cancer is one of the health priorities. The attitude towards life is one of the most important effective factors. The objective of present study was psychometric evaluation of revised life attitude scale in cancer patients undergoing chemotherapy.

This was a methodological study. 138 patients with cancer patients undergoing chemotherapy have been selected by simple random sampling. First, the scale was translated to Persian. Internal consistency was estimated using Cronbach's coefficient alpha. The validity was determined by constructed validity using exploratory factor analysis exploratory, content validity (by calculating content validity index and content validity ratio) and also face validity.

Results of factor analysis showed six essential factors as the basis of Persian life attitude profile-revised scale. The first factor (goals) explained the main portion of variance of scale's questions. The index of Kaiser-Meyer-Olkin showed the adequacy of sample size. (0.601). Content validity index was 0.79-0.85. The content validity ratio for the above choices of scale was equal to +0.99 (p<0. 05).

According to the results of this study the Persian version of life attitude in patients scale in cancer patients had appropriate validity and reliability. The mentioned tool is also suitable for researches and useful as a screening tool in clinical environments.

Amirhossein Hajialiasgari Najafabadi

IDH1 impact in prognosis and drug resistance of Glioblastoma

Amirhossein Hajialiasgari Najafabadi

Department of Cell and Molecular Biology and Microbiology, Faculty of Biological Science and Technology, University of Isfahan, Isfahan, Iran

One of the most common malignant brain tumors is glioblastoma (GBM). It is a well-known subject that non-coding RNAs (ncRNA) may also participate in a vast number of different cancer types. In the following study, the relation between one of the Prognostic markers in gliomas with related ncRNAs was performed in terms of interaction, SNP prediction, pathway analysis, and drug prediction.

To realize the connection among the Intended biomarker in GBM, which was found by exploring in related articles and ncRNA, in the beginning, differential gene expression analysis between normal and the tumor was performed through R and GEPAI2. Then the lncRNAs related to this biomarker were identified by applying lncRNASNP2 that recognized associated SNPs. After that, a miRNA that was able to attach mutation gained lncRNA was selected, and its predictable target genes were investigated through the miRWalk database. The pathway analysis was performed based on gene targets of selected miRNA. Finally, a drug prediction analysis was carried out by GEO profiles.

our finding demonstrated IDH1 as a prognostic marker in GBM, in which its overexpression was obvious in GEPIA2. IDH1-AS1 was overexpressed in GBM, and G/A mutation in the position of rs751658716 was frequent that made hsa-miR-3117-3p able to attach to the mentioned lncRNA. This miRNA aimed at ABCD2 as a target that is implicated in cancer drug resistance, and its expression falls by taking the Y15 drug.

The IDH1 is a prognostic marker in GBM, which its related variants of ncRNAs may participate as a key role in miRNA target-based drug resistance. This gene and its interactions can be used to decline drug resistance caused by the ABC protein family.

Asal Safarbalou

The neuroprotective effects of esculetin on the neurological scores, blood brain –barrier permeability and brain water content after severe traumatic brain injury in male rat: A behavioral study and biochemistry

Asal Safarbalou[1], Ali Siahposht-Khachaki[2], Davood Farzin[3], Mohammad Mahdi Nadim[4], Mohaddese shafiee pour[5]
1. Pharmacy Student, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
2. Department of Physiology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
3. Department of Pharmacology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
4. Pharmacy Student, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran
5. Pharmacy Student, Mazandaran University of Medical Sciences, Ramsar Campus, Sari, Iran

TBI pathogenesis is a complex process that results from primary and secondary injuries that lead to temporary or permanent neurological deficits. The secondary injury can happen from minutes to days from the primary impact and consists of a molecular, chemical, and inflammatory cascade responsible for further cerebral damage. Esculetin (6, 7-dihydroxy coumarin) is a natural coumarin compound isolated from various plant species, such as Cichorium intybus. Esculetin possesses multifarious pharmacological activities, including antioxidant, anti-inflammatory, and hepatoprotective effects. Therefore, in this study, we investigated the effects of neuroprotective esculetin after severe traumatic brain injury in male rats.

The male Albino Wistar rats received different doses of esculetin (1, 2, 4 mg/kg, i.p.). All animals were intubated before surgery. In the TBI groups except for sham and intact control groups, diffuse TBI was induced by using a weight 450 gr by the Marmarou method. The neurologic scores (VCS) and brain water content, the beam–walk–balance task (WB), and BBB integrity (Evans blue) were recorded for three days. At the end of the third day, from deeply anesthetized animals, CSF was collected from cisterna magna and then analyzed MMP-9 with Elisa assay. Our results showed that following TBI, cerebral edema, cerebrospinal fluid, neurological scores, and Vestibulomotor function become defective and MMP-9 increases in comparison with intact-sham control groups ($P<0.001$), but IP injection esculetin in dose-response manner improved above neurology dysfunctions and decreases MMP-9 but in 4 mg/kg dose results were better in compare with TBI-saline control groups ($P<0.001$). These findings showed that esculetin has beneficial neuroprotective effects on neurological scores, neural repair, and brain edema. Also, it can decrease MMP-9 and BBB permeability after traumatic brain injury.

Fatemeh Moadab

Role of CCL2/CCR2 axis in the immunopathogenesis of rheumatoid arthritis: Latest evidence and therapeutic approaches

Fatemeh Moadab, Hossein Khorramdelazad, Mitra Abbasifard
Student Research Committee, Rafsanjan University of Medical Sciences, Rafsanjan, Iran
Department of Immunology, School of Medicine; Molecular Medicine Research Center, Institute of Basic Medical Sciences Research, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

Evidence suggests that uncontrolled immune system responses and their components play a significant role in developing rheumatoid arthritis (RA), which is considered an autoimmune disease (AD). Among immune system mediators, cytokines and chemokines are involved in numerous physiological and pathological processes. CCL2 or monocyte chemoattractant protein-1 (MCP-1) is known as a CC chemokine that can induce the locomotion and recruitment of monocytes and macrophages to the site of injury. When CCL2 binds to its receptors, the most important of which is CCR2, various signaling pathways are triggered, eventually leading to various immunological events such as inflammation. This chemokine also participates in several events involved in RA pathogenesis, such as osteoclastogenesis, migration of effector T cells to the RA synovium tissue, and angiogenesis. In this review article, the role of the CCL2/CCR2 axis in RA pathogenesis and the immunotherapy opportunities based on CCL2/CCR2 axis targeting have been discussed based on existing investigations.

Fateme Khademi

The effect of mandala coloring on anxiety in hospitalized COVID-19 patients: A randomized controlled clinical trial

Fateme Khademi

Department of Nursing, Faculty of Nursing, Arak University of Medical Sciences, Arak, Iran

COVID-19 significantly affects patients' mental health, triggering a wide range of psychological disorders, including anxiety. The aim of this study was to investigate the effect of mandala coloring on the anxiety of hospitalized COVID-19 patients. In this randomized controlled clinical trial, 70 hospitalized patients with COVID-19 were randomly divided between the intervention and control groups. Standard care was provided for both groups. The intervention group spent 30 min/day for six consecutive days performing mandala coloring. Patient anxiety was measured prior to and subsequent to the intervention in both groups using the Spielberger State-Trait Anxiety Inventory. Data were analyzed using SPSS software version 25. The mean anxiety score was not significantly different between the two groups before the intervention (P = 0.08). Subsequent to the intervention, the mean anxiety score in the intervention and control groups was 44.05 _ 4.67 and 67.85 _ 6.25, respectively, indicating a statistically significant (P = 0.0001) decrease in the anxiety measured among the intervention group as compared with that of the control group. The results of this study show that 30 min of mandala coloring daily is an effective strategy for reducing anxiety in hospitalized COVID-19 patients. Mandala coloring can complement routine treatment and provides a non-pharmaceutical option for decreasing patient anxiety.

Irene Ling

Host-guest chemistry and the self-assembly complexities of the calixarene driven by diverse guest molecules

Irene Ling[1], Alexandre N. Sobolev[2]

1. School of Science, Monash University Malaysia, Jalan Lagoon Selatan, 47500 Bandar Sunway, Selangor, Malaysia
2. School of Molecular Sciences, M310, The University of Western Australia, 35 Stirling Highway, Perth, WA 6009, Australia

Calyx [n]arenes, with their preformed concave-shaped cavities in various sizes depending on the numbers of phenolic units linked together, are comprehensively explored in the area of supramolecular chemistry and crystal engineering owing to the enormous possibilities of structural elaborations through facile syntheses that can be done to the molecules. The non-covalent multi-molecular assembly of calixarene derivatives often led to different types of nanosized aggregates or superstructures in the solid-state encompassing from the linear bilayer arrangement (resemblance of biominerals) to curved and globular morphologies. The hierarchical supramolecular architecture of these superstructures lends itself to unlimited potentials in applications, including medicinal chemistry, biology, and materials technology.

Mojtaba Daneshvar

Insight into the Interaction of vitamin D and selenium: cross-talk of nutrients and inflammatory diseases

Mojtaba Daneshvar

Universal Scientific Education and Research Network (USERN), Tehran, Iran

Both vitamin D and selenium have shown similar effects by exerting antioxidative and anti-inflammatory properties in human and animal studies. Body of evidence suggests a possible interaction between these nutrients. MEDLINE, Scopus, and Web of Sciences were searched for related articles. Search terms of "vitamin D," "selenium," interaction, and inflammation were used.

Clinical studies showed improvement in selenium-containing proteins after supplementation with vitamin D. enhanced CYP27B1 expression also resulted after treatment by selenium. By pooling data from different in vivo and in vitro studies, we hypothesized a metabolic pathway that increased selenium by mediating glutathione, up-regulates CYP27B1 expression, and activates vitamin D. On the other hand, the active form of vitamin D interacts with cystathionine-beta-synthase (CBS) and the cysteine-homocysteine cycle. CBS function leads to consuming seleno-homocysteine and increased seleno-cysteine levels, which are necessary information of seleno-proteins. Eventually, this synergistic interplay between selenium and vitamin D results in suppressing oxidative and inflammatory damage.

This interaction between selenium and vitamin D might introduce a new pathway to prevent and treat inflammatory disorders. Considering this interplay correction of vitamin D deficiency before treatment with selenium improves clinical outcomes in inflammatory disorders. The same theorem exists for selenium background.

Oksana Tishchenko

Potential caries and oral hygiene risks of vaping in Ukrainian adolescents

Oksana Tishchenko, L. S. Kryvenko

Department of Pediatric Dentistry and Implantology, Kharkiv National Medical University, Kharkiv, Ukraine

Since the 2000s, conventional tobacco cigarettes have been replaced by electronic nicotine delivery devices, so-called vapes. These devices have a new manipulative slogan - "We do not smoke, we soar," thus attracting teenagers. Tobacco heating systems are increasingly given the appearance of manufacturability as if indicating that it is modern, better, and safer. But we must not forget that the form of tobacco delivery is not important at all, and worldwide, smoking is the cause of the vast majority of diseases. Cigarettes, cigars, and smokeless tobacco lead to devastating effects in the oral cavity, ranging from tooth discoloration and tartar formation to periodontal disease, tooth loss, complications from implants and surgeries, and oral cancer. The aim of our study was to determine the intensity of caries and the level of oral hygiene of adolescents who use electronic cigarettes - vapes.

A clinical dental study of 20 adolescents aged 14 to 17 years using e-cigarettes. The comparison group includes 20 adolescents who are physically healthy and are not registered with related specialists.

Among all examined children found 100% prevalence of caries. The average rate of caries intensity in the soaring group was 7.66 ± 0.33 and in the comparison group 4.1 ± 0.21. Analysis of the state of oral hygiene revealed that the average OHI-S index in adolescents of the main group was 1.7 ± 0.17, which is interpreted as unsatisfactory. No child of the main group had "good" oral hygiene. The index of the OHI-S index in the comparison group was 1.1 ± 0.12, which is considered a "satisfactory" indicator. 4 adolescents (20%) had "good" oral hygiene. Our study shows that among adolescents who use electronic cigarettes (vape), there is an increase in the prevalence and intensity of caries. Also, these teens have a low level of oral hygiene compared to non-smokers. The obtained data are the basis for further research and educational discussions on the use of the latest smoking devices.

Mehdi Azadi Badrbani

Targeted Protein Degradation in Neurodegenerative Diseases

Mehdi Azadi Badrbani[1], Zhila Izadi[2], Hossein Derakhshankhah[2]
1. USERN Office, Kermanshah University of Medical Sciences, Kermanshah, Iran
2. Pharmaceutical Sciences Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran

Neurodegenerative Diseases (NDs), including Alzheimer's disease, Parkinson's disease, Huntington's disease, and prion disease, are a group of progressive diseases that have a disastrous impact on the Central Nervous System (CNS). These diseases cause damage to the structure and function of neural cells and lead to cognitive and mobility impairment. Toxic oligomers and misfolded proteins are the chief causes of NDs. Therefore, targeting the proteins involved in NDs, such as tau protein and alpha-synuclein, seems to be a viable strategy to develop an effective cure for NDs. However, targeting these proteins by conventional small molecule inhibitors has been quite challenging so far.

Targeted Protein Degradation (TPD) is a novel technology that has gained much attention recently. The TPD technology employs the protein degradation machinery of the cell by a heterobifunctional molecule to degrade the protein of interest (POI).

Herein we discuss the advantages and limitations of TPD technology applications in NDs. To conclude, we will explore possible targets and future perspectives of TPD technology in NDs drug discovery.

Noosha Samieefar

Integrated Medical Education; New Perspectives

Noosha Samieefar[1,2], Sara Momtazmanesh[3,4], Fatemeh Sodeifian[1,2], Nima Rezaei[3,4]

1. Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2. USERN Office, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Teh-ran, Iran
3. Universal Scientific Education and Research Network (USERN), Tehran, Iran
4. Tehran University of Medical Sciences, Tehran, Iran

The multidisciplinary and interdisciplinary medical education have become one of the main subjects of interest in medical education. The aim is to make knowledge more long-lasting and education more enjoyable. In these curricula, the basic and clinical sciences are integrated which is called vertical integration. The other aspect is multidisciplinary and interdisciplinary medical education (horizontal integration) that is bringing together distinct but relevant disciplines, not only in basic sciences, but also within clinical specialties. Last not least, we must perceive the patients as human beings with not only physical but also social, with physiological and spir-itual constituents. Spiral integration is the final goal, when all parts of a medical curriculum are joined together to create a unique educational.

Olga Smolina

The problem of compatibility of «homo ecological» and «homo digital» in the cultural paradigm

Olga Smolina

Department of Philosophy, Cultural Studies and Information Activity, Volodymyr Dahl East Ukrainian National University, Severodonetsk, Ukraine

The urgent need to preserve the Earth's nature demands formation of a new type of person «homo ecological». Two basic approaches to the «parameters» of him can be distinguished. The «scientific» one implies overcoming environmental problems through further development of high technologies, autotrophic human existence and type «homo autonomous». The «humanitarian» approach implies the ability to perceive nature as a subject, a holistic world view, the priority of spiritual values, «ecological asceticism».

The digitalization causes changes in culture, axiology sphere and human identity. How do these changes affect man's relationship with nature?

analysis, comparison and projection.

The virtualization of human and social life forms «homo digital». His one of the main goals is to implement cultural practices in their online version freely, to receive accompanying emotions, but to be free from the requirements. This, firstly, contradicts the universal ethical principle on the relationship between freedom and responsibility, and secondly, it will not contribute to a responsible attitude towards nature. Virtualization increases the number of people not interested in the real world. Digital rationality is a pragmatic one. Nevertheless, the attitude towards nature must contain an element of selfless admiration, contemplation.

Modern culture is characterized by the development of virtualization and digitization processes, which have proved to be contrary to the ecocentric cultural paradigm. The focus of the conflict lies in the different directions of these phenomena. In the ecocentric paradigm, a person should be turned to the environment and open to other people. In contrast, the virtualization process forms «a digital person» who gradually loses communication skills in offline and is characterized by a craving for unlimited virtual freedom, not balanced by responsibility. Under such circumstances, the results of efforts to preserve the ecological balance will not be sustainable.

Yuliia Khlystun

The use of measuring instruments in the study of painting programs of Orthodox churches

Yuliia Khlystun

Department of Philosophy, Cultural Studies and Information Activity, Volodymyr Dahl East Ukrainian National University, Severodonetsk, Ukraine

The aim is to study the possibilities of using metrology (the science of measurements) in cultural studies, to select the appropriate tools for the cultural measurement in the programs of murals in Orthodox churches.

Studying the iconographic programs of Orthodox churches from the point of view of cultural studies, it is impossible not to encounter the need to use measuring instruments, thanks to which one can more accurately assess the qualitative characteristics of a particular iconographic program. In this case, metrology can be applied - the science of measurements, which is used, among other things, for measuring cultural values.

Measurement is the main foundation of metrology. In measuring cultural values, not only material aspects are considered, but also spiritual, so-called immaterial aspects. In turn, physical quantities are subdivided into measurable and estimated quantities. Measurements can be quantified in terms of a specific number of preset units. Physical quantities, for which a unit cannot be entered, can only be evaluated, the quantities being evaluated using scales. Non-physical quantities are characterized by qualitative indicators, the measurement of which will be determined by the assessment of the characteristics of the measurement object .

Thanks to scaling, it is possible to more clearly define the positions in the measurement of cultural objects. The scale of a physical quantity, according to metrology, is an ordered set of values of a physical quantity, which serves as the initial basis for measuring a given quantity. Typically, this is a conventionally accepted sequence of values assigned to a physical quantity as it increases (or decreases). This sequence is determined by the accepted method of measuring the quantity. For the study of cultural objects, a similar definition is used, where the concept of physical quantity is replaced by the concept of "cultural value". Thus, the scale of "culturological value" is an ordered set of values of the "culturological value", which serves as the initial basis for measuring this value.

The main theme of iconographic program of the temple in honor of St. Sergius of Radonezh is the theme of the dedication of the temple, this is the only theme presented in the "dolny" temple. The murals occupy only one level. In the axiological aspect, this program can be assessed as "minimal": only saints are depicted in the "lower" part of the temple, there are no images of holidays, the Most Holy Theotokos, subjects of the Sacred history, Passion or Easter cycles. The painting in the altar also occupies one level, the "upper" of the temple is indicated by the image of the Cherubim (that is, also one theme).

Having examined the iconographic programs of two temples with similar internal architecture, we can conclude that the programs of painting temples can be evaluated on a scale of order (ranks) depending on the number of themes of iconographic subjects included in the program, as well as on the number of "levels painting "(often reflecting the level of complexity of the program). The axiological significance of iconographic plots can be compared with the "cultural value" and can also be ranked. But the program of painting a church does not always reflect its dedication. This theme may be completely absent from the iconographic subjects. In the period of the late 1990s - early 2000s, many such churches were painted. Then it is possible to introduce a scale of "names", which will reflect the aspect of the theme of the dedication of the temple.

Kholoud Ben Said

Crisis Communication in Social Media Era

Kholoud Ben Said
Sultan Qaboos University, Muscat, Oman

Over the last couple of decades, organizations have become more vulnerable to crises. Extensive research has been done to address crisis and risk communication. With the development of different social media platforms, an ongoing debate is raging about the effectiveness of using social media in crisis communication and how social media can be effectively utilized to mitigate the impact of crises on organizations.

Qualitative Methodology is used and a systematic review of six articles were concluded and discussed. The chosen articles were published in the period from 2015 to 2019. The outcomes of this research is managing a crisis needs some capabilities that leaders should have such as being self-confident and flexible, along with their ability to make the right decisions that are consistent with the company's visions and values. Also, social media has a great influence on crisis communication, and it should be used carefully as it greatly influences organizational image and reputation. Organizations should evaluate the situation carefully before taking any response it also should know how to utilize strategic silence.

AmirAli Moodi Ghalibaf

Application of the Artificial Intelligence in Breast Cancer Detection: past, present and future

AmirAli Moodi Ghalibaf[1], Masoud Pezeshki Rad[2], Mina AkbariRad[3], Nazanin Forghani[1], Mina Radmard[1]

1. Student Research Committee, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

2. Associate Professor of Radiology, Department of Radiology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

3. Assistant Professor of Internal Medicine, Department of Internal Medicine, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Today, breast cancer (BC) becomes the most prevalent cancer among women and the second leading cause of cancer deaths worldwide. Obviously, early detection of the BC is associated with its better outcomes; so, imaging modalities play a critical role in this way. It seems that artificial intelligence (AI) as a machine learning can potentially help us to detect breast abnormalities earlier and more accurately through imaging. Therefore, to determine how really we can applicate AI in BC detection by imaging, we have reviewed the current knowledge, limitation, and prospects of AI-based imaging in BC detection.

A comprehensive search was carried out through electronic databases including Web of Science, PubMed, Scopus, and Embase with the keywords "Breast Cancer", "Artificial Intelligence" and other related Mesh terms up to July 2021.

Computer-aided detection (CADe) and diagnosis (CADx) algorithms were introduced more than two decades ago, but their false results, driven them to the corner. Following this progression line, nowadays AI is developed through machine learning, neural networks, deep learning, and convolutional neural network, respectively. Obviously, screening and detection of breast cancer with adequate imaging modalities, especially mammography and magnetic resonance imaging (MRI), needs to become more accurate, where the integration of AI and breast imaging lead to a revolution. In detail, AI algorithms potentially can improve physicians' and radiologists' performance in early cancer diagnosis. On the other hand, limitations and falses of this valuable technology are what make applicators hesitant about it.

Based on what was stated it can be concluded that although applicating AI can improve the accuracy of screening, diagnosis, and early detection of the BC, it seems that more studies and complex algorithms are needed to resolve the current limitations and errors.

Maryna Khudiakova

Correction of Cytokine Misbalance Between Pro-inflammatory TNF-alpha and Anti-inflammatory IL-4 in Patients with Choronic Generalized Periodontitis

Maryna Khudiakova

Kharkiv Medical National University, Kharkiv, Ukraine

The purpose of study was to increase of efficiency of complex treatment the patients with CGP of initial-I degrees of severity with gel from the granules of GQ and liposomal LQLC due to the correction of cytokine levels.

The 35 patients with CGP of initial-I degrees of severity were observed in the morning were conducted of mouth liquid (ML) before treatment and through 1, 6 and 12 months after treatment for immunological researches. The patients of basic group was conduct base therapy with the local application LQLC (injection form of «Lipoflavon») as a suspension, prepared ex tempore, containing 137,5 mgs of lecithin and 3,75 mgs of Quercetinum. This suspension prepared at a premix 1/4 parts of content of small bottle with 5 ml 0,9% solution of natrium chloride, warmed-up to 380. The patients of comparison group was conduct base therapy with local application of gel from GQ with the use of individual periodontal delivery tray during 40 minutes 2 times per a day to 10 days.

The cytokine level of the patients of control group was TNF-α - 21,71 ± 2,95 pg/ml, whereas that of the anti-inflammatory was IL-4 - 243,5 ± 17,48 pg/ml.The cytokine level of the patients with initial and I degrees of severity in the basic group after treatment during one month was TNF-α - 25,46 ± 1,28 pg/ml and anti-inflammatory IL-4 - 316,2 ± 10,73 pg/ml, which was 30 % lower than that in the C groups. The patients in the comparison group after treatment during one month were determined with TNF-α - 29,36 ± 2,61 pg/ml and anti-inflammatory IL-4 - 359,9 ± 10,36 pg/ml, which was 48 % lower than in the C groups.The cytokine level of the patients with initial and I degrees of severity in the basic group before treatment was TNF-α - 44,91 ± 3,63 pg/ml, which was 107 % higher than in the C groups and anti-inflammatory IL-4 - 220,9 ± 11,89 pg/ml, .which was 9 % lower than in the C groups. The patients in the comparison group before treatment were determined with TNF-α - 45,29 ± 2,95 pg/ml, that was 109 % higher than in the C groups and anti-inflammatory IL-4 - 219,1 ± 7,74 pg/ml, that was 10 % lower than in the C groups. The cytokine level of the patients with initial and I degrees of severity in the basic group after six-month treatment was TNF-α - 27,51 ± 2,57 pg/ml, which was 107 % higher than in the C groups and anti-inflammatory IL-4 - 292,2 ± 20,77 pg/ml, which was 19 % lower than in the C groups. The cytokine level of the patients in the comparison group after six-month treatment was TNF-α - 32,72 ± 3,56 pg/ml, which was 109 % higher than in the C groups and anti-inflammatory IL-4 - 261,7 ± 16,25 pg/ml, that was 17 % lower than in the C groups. The cytokine level of the patients with initial and I degrees of severity in the basic group after twelve-month treatment was TNF-α - 24,82 ± 1,6 pg/ml, which was 10 % lower than in the C groups and anti-inflammatory IL-4 - 289,9 ± 10,91 pg/ml, which was 1 % higher than in the C groups. The cytokine level of the patients in the comparison group after twelve-month treatment was TNF-α - 31,44 ± 2,43 pg/ml, which was 4 % lower than in the C groups and anti-inflammatory IL-4 - 244,8 ± 16,53 pg/ml, which was 6 % lower than in the C groups.

Conclusion: The research in question demonstrates lipoflavon capability to normalize homeostasis of the oral cavity, normalize misbalance of cytokines in periodontal tissues, thus retarding process of inflammation and destruction of tissues and improving reparation of periodontal structures. High therapeutic efficacy of the liposomal quercetin-lecithin complex for treatment patients with chronic generalized periodontitis, especially that of initial and I degrees of severity is based on its marked anti-inflammatory, immunomodulating and periodontoprotecting effects.This allows to recommend lipoflavon for local application as pathogenetically substantiated drug in treatment of generalized periodontitis.

Navid Abedpoor

Physical activity modulated molecular signaling pathways in pathomechanism aging women

Navid Abedpoor[1], Farzaneh Taghian[2], Fatemeh Hajibabaie[2,3]
1. Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran
2. Department of Physical Education and Sport Sciences, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran
3. Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran

Physical inactivity and the modern era are significant causes of ailments of aging. While the precise pathomechanism of aging is not fully comprehended, some signaling pathways are suggested to develop aging processes, including sarcopenia, alteration of immune function, metabolism, inflammatory, and oxidative stress in sedentary older adults. These conditions can lead to progressive loss of strength and muscle mass and enhance the risk of falls and permanent disability. There is no practical treatment strategy to halt the development of aging. Notably, physical activity is a prominent approach that is able to offset these molecular mechanisms. Physical activity can ameliorate pathomechanism and increase metabolism, decrease inflammation and oxidative stress. Moreover, some causative or susceptibility genes discern in aging processes are strongly associated with cytokines storm and oxidative stress. Non-coding RNA (ncRNA) alternation levels can regulate mRNA decay and translation. In addition, non-coding mediate gene dysregulation and may play a decisive role in aging processes. The aim of this study is to identify the crucial hub genes modulate by exercise in aging processes and detect the essential non-coding RNA that regulates these hub genes by physical activity based on the in silico and bioinformatic analysis. Initially, non-coding RNA and their related genes are collected from the GEO database. Subsequently, several parameters are determined to choose several thousand genes and non-coding RNAs using the R programming language. The program output is evaluated and analyzed by several ncRNA databases. In the end, a network between selected genes and non-coding RNAs is visualized by Cytoscape software. This study found that the exercise can regulate ncRNAs function and induced the p53 signaling pathway, apoptosis, TNF-alpha signaling via NF-κB, PI3 kinase pathway, MAPK pathway in aging women. In addition, there is a strong correlation between logical gene networks and ncRNA.

mTalk Abstracts

Mohammad Khani

Pleasure and happiness

Mohammad Khani
Tabriz University of Medical Sciences, Tabriz, Iran

We have suffered a crisis in our culture and I believe it comes down to a mistake that we've made between the interpretation of two of our most important and positive emotion pleasure and happiness, a lot of people equate the two but I'm here to tell you that they are completely different. a lot of people think that It's exactly the same in fact on the internet you can find definitions that actually conflate and confused the two, as so what are the difference between pleasure and happiness and I believe there are 7:

1-pleasure is short-live happiness is long-lived

2-pleasure is visceral happiness is ethereal

3-pleause it taking. Happiness is giving

4-pleasure can be achieved with substances, happiness cannot be achieved with substances

5-pleasure is experienced alone, happiness is experienced in social groups

6-the extremes of pleasure all lead to addiction whether they be substances or behaviors, yet there is no such things as being addicted to too much happiness

7-pleasure is dopamine and happiness is serotonin:

Now these are two neurotransmitter that the brain makes and use is to communicate between one neuron brain cell and another. Now why do we care so what well turns out dopamine excites the next neuron and neurons when they are excited too much too frequently tend to die, so the neuron has a defense mechanism against death what it does is it reduces the number of receptors that are available to be stimulated in an attempt to try to mitigate the damage. So we have a name for that process it's called down regulation and a lot of different chemicals in the body do that. Now you got a hit you get a rush the receptors go down. Next time you need a bigger hit to get the same rush because there are a few receptors to occupy and you need a bigger hit until finally taking a huge hit to get nothing that's called tolerance and then when neurons start to die that's called addiction. Serotonin however is inhibitory it's not excitatory it inhibits it's receptors to provide contentment to zen out if you will so you can't over dose the serotonin neuron and what does is it mean to inhibit a receptor what it means is it binds but it doesn't activate the process the beyond the receptor so what it does if it basically slows down, these neurons instead of closing them to fire up and so by doing and doing so you end up with the process of contentment that feeling of one with the world if you will. That thing we call happiness. Now there is one thing that down regulates serotonin, dopamine. So the more pleasure you seek the more unhappy you get and las vegas, Madison avenue, wall street, silicon valley and Washington DC have very specifically and in a coordinated fashion confused and conflated the term happiness with the term pleasure. So that you can buy happiness so that they can sell you their junk. And in the process we have become most decidedly unhappy and the problem is you cannot fix a problem unless you identify what the problem is.

Samin Karimiyeganeh

Epigenetics which is study of how genes are inherited and whether they're active or inactive

Samin Karimiyeganeh

Shahid Beheshti University of Medical Sciences, Tehran, Iran

Epigenetics is a relatively new field of science that studies the genetic and non-genetic aspects related to heritable phenotypic changes, frequently caused by environmental and metabolic factors. In the host, the epigenetic machinery can regulate gene expression through a series of reversible epigenetic modifications such as DNA/RNA methylation. The coronavirus disease 19 (COVID-19) is a highly transmittable and pathogenic viral infection which caused a pandemic since January 2020. In this presentation. We will discuss the pathophysiology of the virus in addition to its structure, we also focus on epigenetic regulation of human and virus genes which can lead to discovery of effective therapeutic approaches.

Bahar Hosseini

The role of chemistry in smartphones

Bahar Hosseini

Farhangian University, Sherafat Faculty, Tehran, Iran

Today, technology is an integral part of our lives. One of the most used tools nowadays are smartphones having amazing impact on our lives. Not only these addictive devices play a very important role in our daily lives, but also, they have been able to replace computers to some extents.

If you are wondering what chemistry has to do with smartphones, just look at the periodic table. Out of 83 stable (nonradioactive) elements, at least 70 can be found in smartphones! Metals are what make smartphones "smart". An average smartphone can contain up to 62 different types of metals. One rather obscure group of metals, the rare-earth metals, plays a vital role. These elements are so important in electronics, communications, and defense industries that the U.S. Department of Energy dubbed them as the "technology metals". Also, your phone would not be able to vibrate without neodymium and dysprosium.

One of the most important roles of chemistry is to build copper roads for communication between electronic components that are used to construct motherboards.

All along, While Smartphone screens are just glasses, they are designed to be extremely tough. This toughness is actually the result of an accident. In 1952, a chemist was trying to heat a sample of glass up to 600 °C in a furnace when a faulty thermostat caused it to be heated to 900 °C. Upon opening the door, he was surprised to find that his glass sample was not a melted pile. When he took it out, he dropped it on the floor (another accident), and instead of breaking, it bounced! Companies used this formulation to manufacture smartphone screens. Yet these screens needed to be stronger. That is when the Gorilla Glasses were born. Gorilla Glass is composition of silicon and aluminum oxide along with sodium ions. Later Chemists added potassium ions to the glass, which replaced smaller sodium ions. As the larger potassium ions push against each other, the glass is compressed, and compression brings about more strength.

Chemistry has numerous roles in the world of electronics, so many roles that it can be called "The Hero".

Fatemeh Zareian

AI Breakthrough in Protein Folding AlphaFold: A solution to a 50-year-old grand challenge in biology

Fatemeh Zareian
Fasa University of Medical Sciences, Fasa, Iran

Recently, DeepMind's AlphaFold AI system ended the 50-year old struggle to predict the proteins 3D structure based on their amino-acid sequence.

The ability to accurately predict protein 3D structure only from their sequence could be a revolution in life sciences and medicine and even aid drug discovery.

The protein folding problem

 Proteins are large, complex molecules essential for body functions. What any given protein can do depends on its unique 3D structure. The proteins are comprised of chains amino-acids and are all encoded by our DNA. An error in the genetic matter may result in a malformed protein, which could result in disease or death for an organism.

Predicting how these chains will fold into the intricate 3D structure of a protein is what's known as the "protein folding problem" - a challenge that scientists have worked on for decades.

DeepMind's approach to the protein folding problem

Their method was inspired by biology, physics and machine learning, and of course the works of scientist in the past 50 years. They thought of a folded protein as a "spatial graph", in which the amino-acids are the nodes and the connections between them are the edges. They created an attention-based neural network system that interprets the structure of this graph, while reasoning over the implicit graph that it's building.

It uses evolutionary related sequences, multiple sequence alignment (MSA), and a representation of amino-acid residue pairs to refine the graph.

AlphaFold can also predict which parts of the structure are reliable using an internal confidence measure.

The Real-world impact:

AlphaFold could help unlock more proteins as potential drug targets and open up new approaches to therapies. Furthermore, easily predicting the structure of viruses can help us understand their biology and the diseases they cause. There may be significant opportunities to understand and treat neglected tropical diseases, where research is currently under-resourced.

Being able to predict structure from sequence is the first real step towards protein design: building proteins that fulfil a specific function. From protein therapeutics to biofuels or enzymes that eat plastic, the possibilities are endless.

Sara Mostafavi

A journey into sleep and lucid dream

Sara Mostafavi

Shiraz University of Medical Sciences, Shiraz, Iran

In spite of all the differences we have, we all need sleep. Lucid dreaming is a part of sleep, which has been studied and reported for many years. It is explained as a dream, which the dreamer becomes aware of dreaming. Many different theories exist around this. One of them belongs to Sigmund Freud, who argues that our dreams are our wishes. But after scientific researches, even more theories have emerged. Further developments in psychological research show that this may be utilized as a form of sleep therapy. They suggest that lucid dream therapy can treat insomnia, PTSD, nightmares and even contribute to a better motor skill. There was a research, which was conducted among 48 adults, who were suffering from insomnia and they have never experienced a lucid dream. After a duration of lucid dream therapy, their measurements of insomnia and anxiety both improved. The results suggest significant reductions in insomnia severity, anxious symptomology and depressive symptomology.

Shefan Jahan

Busting the Myths Around the COVID-19 Vaccines

Shefan Jahan
Tehran University of Medical Sciences, Tehran, Iran

Let us start with a story. And this story is set in the start of the year 2020, when the hunt for the Covid-19 vaccine was still on.

Uncle Ahmad , my neighbour , a 55 year old gentleman, was very positive towards the covid vaccines. Just like everyone, he also thought of covid vaccines as the Alladin's lamp, that had a genie inside it that would fullfill our wish of a covid free world.

Fast forward to the end of 2020, when vaccines started becoming available in my country. Uncle Ahmad started looking for the best covid vaccine available for himself. In the end he chose Pfizer. His reason : The EFFICACY of Pfizer tops the list of vaccine efficacies standing at 95% efficacy.

Fast forward the story to two months after the incident , uncle Ahmad tests covid positive. Thankfully he recovers. But now he's strongly suggesting people not to take the vaccine. His reason: "Why bother about the vaccines,when one is going to catch covid anyway. "

So there are myths about the covid vaccine's efficacy in people's heads. Let's bust them!

But first let's see what efficacy really means and how is it calculated.

A certain number of people are divided equally into two groups. One group is given the vaccine and the other, a placebo (placebos often look like the real medical treatment that is being studied except they do not contain the active medication)

Pegah Niktalab

Mental health during Covid-19: Behind the front mental battles and how to cope with them

Pegah Niktalab

Islamic Azad University, Tehran Medical Branch, Tehran, Iran

The covid-19 pandemic has affected every member of the society from healthcare workers working long and tiring shifts to every member of the society. People might feel anxious, depressed or worried for various reasons such as fear of the disease, false information, job loss, financial problems, isolation, etc. Our experience with pandemics in the past was that in the immediate wake of a traumatic experience, large numbers of affected people report distress, including new or worsening symptoms of depression, anxiety, and insomnia. Most people will recover, though that recovery can take some time. A notable fraction of people will develop chronic symptoms severe enough to meet the criteria for a mental illness, such as post-traumatic stress disorder (PTSD) or major depressive disorder. People who experience more severe stressors, such as exposure to the dead or dying, and people with more prolonged disruptions are more likely to experience enduring symptoms that would benefit from intervention. We also know that people are more likely to develop chronic or severe reactions if they have one or more risk factors, such as poor social supports, financial difficulties, food or housing instability, or a history of mental illness. Receiving economic or social supports and using coping strategies can lower these risks and maximize a person's chances for recovery. Research has shown the same thing applies to the current pandemic.

Several surveys, including those collected by the Centers for Disease Control (CDC), have shown substantial increases in self-reported behavioral health symptoms. According to one CDC report, which surveyed adults across the U.S. in late June of 2020, 31% of respondents reported symptoms of anxiety or depression, 13% reported having started or increased substance use, 26% reported stress-related symptoms, and 11% reported having serious thoughts of suicide in the past 30 days. These numbers are nearly double the rates expected before the pandemic. As in prior studies, this survey showed that risk factors for reporting anxiety symptoms or suicidal ideation included food insufficiency, financial concerns, and loneliness.

Enrolling in online courses available, reaching out to loved ones for emotional support, following news from reliable sources can be mood-elevating. Therapy should be accessible to all social groups and the media should encourage everyone suffering to go into therapy.

According to WHO half of all mental illness begins by the age of 14, meaning special care should be provided to teenagers at times like the Covid-19 pandemic when almost everyone is busy with their own problems.

Providing psychological help to those who might need it is of great importance since some mental illnesses develop slowly and reach a point where treatment is either difficult, or the patient refuses to receive it. Knowing that at this time most mental illnesses cannot be fully cured (they can usually be treated to minimize symptoms) and the patient might suffer from them for the rest of their lives, it is extremely vital to not allow the stress and sorrow resulted from the
COVID-19 pandemic develop into an illness which will probably live on way after the pandemic is over.

Leyli Shadman

No need to swallow GIANT pills anymore, as mucoadhesive patches have been made!

Leyli Shadman
Qazvin University of Medical Sciences, Qazvin, Iran

For years the human race has had problem swallowing giant pills, passing them over the acidic barrier of the stomach and filtering barrier of liver. Maintaining the medicine's concentration passing hours after usage, was another reason pharmacologists decided to invent a polymer based way of delivering a drug: mucoadhesive patches!

Among the different paths of drug delivery, the mucosal patches are one of the few ways which can pass the first hepatic metabolism pass and also the enzymatic degradation of the gastrointestinal tract. Therefore, not only the mucoadhesive patches stick to the mucosa of the mouth for hours and the adhesion gets even stronger over time, but they can also provide both systemic and localized effect only by changing the constructive polymers. In addition, they can be made in a way in which their release is slow and continuous. All these characteristics made them one of the best choices for delivering drugs.

Over the years dentists have always been looking for a way to provide immune, painless way of local anesthesia injection, especially for pediatric patients; and thanks to the mucoadhesive patches, now patches of lidocaine sulfate are available and they are used to reducing or even relieving mouth pain.

Another example to be mentioned is insulin nanoparticle patches. Doe to data of a recent research on these patches, drug release was afforded through drug diffusion along with polymer erosion.

We can name hundreds of other examples about other medicines which patches have been made but they are not being used routinely doe to their complicated manufacturing process and their expensive price.

In conclusion, we hope one day this immune, helpful path of drug delivery could be used widely even for those with lower income.

Shayan Sabeti Billandi

Medical implants and cyber medicine

Shayan Sabeti Billandi
Mazandaran University of Medical Sciences, Sari, Iran

For years, humanity have been fascinated by utility and power of computers. The upward growth trend of computer science has made specialist think that it might also interfere medicine and rehabilitation. Sci-fi authors took one step further and illustrate new visions of robotics and physiology that have addressed innovators and scientist to connect human body with computers. Measuring methods such as ECG and EEG were examples of connecting electronics to human health. Pace makers and auditory nerve amplifiers are examples for the usage of gadgets inside the body; yet the ecosystem and technology haven't been attracted so mush to hypodermal and in situ techniques.

In this speech we will talk about what science have achieved until today, what are the goals and futuristic ideas about cyber humans and what we need to get there.

Niloofar Deravi

Waist-to-height ratio is a more accurate screening tool for hypertension than waist-to-hip circumference and BMI in type 2 diabetes: A prospective study

Niloofar Deravi
Shahid Beheshti University of Medical Sciences, Tehran, Iran

To date, anthropometric measures (i.e. body mass index (BMI), waist to hip ratio (WHR) and waist to height ratio (WHtR) have shown to be associated with prediction of incident hypertension. However, the difference in accuracy of these measures has been of controversy. We aimed to determine whether WHtR is a more accurate tool for HTN than WHR and BMI in patients with type 2 diabetes.

The study population consisted of 1685 normotensive patients with T2DM. They were followed up for hypertension incidence for a mean of 4.8 years from April 2002 to January 2020. Cox regression was performed to assess the association between anthropometric measures (i.e., BMI, WHR, and WHtR) and incident hypertension during the follow-up period. Area under the ROC curve analysis was performed and optimal cutoff values were calculated using Youden index.

WHtR and BMI were significantly associated with an increased risk of hypertension (HR=3.296(0.936-12.857), $P < 0.001$ and HR:1.050 (1.030-1.070), $P < 0.001$, respectively). The discriminative powers of each anthropometric index for HTN were 0.571 (0.540–0.602) for BMI, 0.518 (0.486–0.550) for WHR, and 0.609 (0.578–0.639) for WHtR. The optimal cutoff points for predicting HTN in patients with T2DM were 26.94 (sensitivity=0.739, specificity=0.380) for BMI, 0.90 (sensitivity=0.718, specificity=0.279) for WHR and 0.59 (sensitivity=0.676, specificity=0.517) for WHtR.

In the current study WHtR was a more accurate screening tool for HTN compared to WHR and BMI in patients with type 2 diabetes.

Mohaddeseh Hasanzadeh

Low-Calorie diets and Longer Lifespan

Mohaddeseh Hasanzadeh
Tehran University of Medical Sciences, Tehran, Iran

Aging is the highest risk factor for many diseases, including cancer, dementia, diabetes, and metabolic syndrome. Caloric restriction has been shown in animal models to be one of the most effective interventions against these age-related diseases. Clive McCay discovered that rats with severely restricted diets lived up to 33% longer than previously known possible. Many studies after McCay show results just as surprising as those that McCay discovered so many years ago. Calorie restriction enters this equation because it is known that drastically reducing food intake will reduce metabolic rate. If less food is being consumed, then there is less food that the body has to process.

Moreover, since calorie restriction generally results in weight loss, less energy is needed to maintain the reduced body mass. As a result of this reduction of metabolic rate, it is hypothesized that calorie restriction could extend lifespans by decreasing the rate of free radical damage. Fruit, vegetables, whole wheat bread, oatmeal, legumes, skim milk, low-fat yogurt, cottage cheese, turkey, chicken, salmon, tempeh, tofu, eggs, herbs and spices, mustard, tamari, olive oil, balsamic vinegar, salsa, dark chocolate are foods that are recommended in the anti-aging diet.

Zohre Rajabpour

Awareness to fight sexual violence

Zohre Rajabpour
Jahrom Uninersity of Medical Sciences, Jahrom, Iran

Epidemic conditions - including quarantine, reduced mobility, increasing stress isolation, and economic insta-bility - have led to alarming leaps in domestic violence, with women and girls increasingly exposed to other forms of violence from child marriage. Put up sexual harassment

Sexual harassment
 Sexual harassment involves non-consensual physical contact such as grasping, pinching, slapping, or rubbing. It also includes non-physical items, such as teasing, sexual comments about the body with the appearance of the person, asking for sexual affections, staring with sexual temptation, harassment by chasing and showing off the person's sexual organs.

Sexual harassment in Iran
 one of the most common cases of sexual harassment, street harassment of women in public, verbal harassment and so on. There is no explicit law in this regard in Iran and it is done easily in public and without fear of pun-ishment. Traveling to other countries has serious consequences for the annoying. Among the most important reasons for the prevalence of harassment in Iranian society are the lack of educational programs during school and work, the lack of criminal laws for sexual harassment and gender segregation.
Silence in the face of rape
 One of the reasons that adult victims remain silent is the difficulty and length of the prosecution process. It can be said that for some of them, the issue is not clear and they do not know exactly what happened to them, especially because of rape by trusted family acquaintances.

Prevention
Sexual harassment in communities can be prevented with educational programs in high school, university and work environments. Studies have shown that these programs have led to permanent change in behavior in men and women. One of the most important cases is education from childhood.
1- Teach your child the private parts of the body
2- Teach children who are allowed to touch private parts of their body, such as parents and doctors
3- Teach them to leave the situation if they want to touch private parts of their body, to attract the attention of others, to refer to safe people such as parents, police teachers, etc.
4- Teach them that if sexual harassment occurs, they can safely tell it to their parents and reassure them that you can protect them from the abuser, all of which helps prevent and treat rape.

Me Too movement
It was an internet movement and hashtag that spread on social media in October 2017 and was shared many times. The hashtag was used to denounce the widespread prevalence of rape and sexual harassment, especially in the workplace.

Laila Rahmah

Body Farm: Contributing for Humanity in Afterlife

Laila Rahmah

Tehran University of Medical Sciences, Tehran, Iran

Most of us hope to be remembered after death for the ways we contributed to society during our lives. In other hand, some people also want to keep contributing even in the afterlife. Death is not stopping one being to give benefits for humanity, body donor is one of the ways. The bodies that have been donated will be used in the education and training of future healthcare professionals including medical, dental, physiotherapy, science and nursing students, or even in criminology to identify the cause of death. Located in Knoxville, Tennessee is the Forensic Anthropology Center or "Body Farm", a body decomposition farm located at the University of Tennessee. It consists of a 2.5-acre (10,000 m2) wooded plot, surrounded by a razor wire fence, where over 100 bodies are donated to the facility every year. Forensic anthropologists at the center conduct research on body decomposition to learn more about time of death and apply these lessons learned to real world scenarios. Contributing for humanity in afterlife and become a body donor is a very noble act. Not only, due to their consent to use their decease body for helping other human, but also through their passing, they taught us how to truly live.

Recent Publications about USERN

Universal Scientific Education and Research Network (USERN): Twinkling Stars Unite to Make the World Glow

Acta Medica Iranica, Vol. 56, No. 1 (2018)

Universal Scientific Education and Research Network (USERN): Twinkling Stars Unite to Make the World Glow

Nima Rezaei[1,2,3]

[1] Universal Scientific Education and Research Network (USERN), Tehran, Iran
[2] Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran
[3] Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

USERN: the twilight of the 2nd year and the dawn of the 3rd year

Universal Scientific Education and Research Network (USERN) stepped in the 3rd year of activity, this month with the resolution of New Year, 2018. USERN, officially announced two years ago, was formed to mean the science without borders via professional scientific research and education activities. USERN was established as an independent, non-governmental, non-profit organization and network for peaceful scientific executions and policy-making (1-4).

What USERN has done, during a 2-year period, was more than what expected for a 5-year period! Four hundred events in total were organized by USERN in such short period of time, all following the slogan of "Science without Borders."

Scientific communications

USERN is honored to host more than 300 members from world top 1% scientists, including fourteen Nobel and Abel Laureates, as Scientific Advisory Board in different disciplines of science (5). More than 5800 academic members from more than 60 countries, in all twenty-one fields of science, have already registered via usern.org within the first two years of the USERN inauguration. This has been hopefully a forward step in removing the age and scientific-level border in science, through gathering seniors and juniors in USERN context.

A total number of fifty MOUs have already been signed between USERN and a number of national and international academic/scientific centers.

Thirty-one offices have already been labeled as USERN offices in different countries. This was another forward step in removing the geographical borders in science through creating peaceful scientific collaborations worldwide!

Scientific research and educational activities

More than 60 interest groups have been accredited to continue their activities (6). They published more than 260 scientific papers under the affiliation of USERN with more than five hundreds of citations and h-index of 12 (Figure 1). The USERN collaborating centers for such scientific output were from Iran, USA, UK, Sweden, France, Germany, Austria, Australia, Canada, and Italy, as top 15 countries.

Considering this outstanding achievement in just 2 years, this has been absolutely possible only through teamwork and gathering all fields of science under one umbrella; and therefore removing the field border of science!

Thirty-six USERN Talks, inspirational Talks (iTalks), and miniature Talks (mTalks) have already been organized, which were highly welcomed by the delegates. USERN Talks/iTalks are part of USERN scientific activities, where scientists could share their scientific and personal experiences with USERN members. Moreover, the educational activities of USERN in 2017 included 13 scientific workshops in addition to two spring schools and one summer school (Modern Technologies in Science), which quite progressed in opening new insights for juniors.

The greatest USERN gatherings: USERN congress and prize awarding festival

USERN congresses have been recognized as unique events so far (7). The first one was held during Nov 8th-10th 2016, in Tehran, Iran. USERN is also humbled by the enormous hospitality and great organization, received during 2nd Congress and Festival in Kharkiv, Ukraine on Nov 8th-10th, 2017. USERN was proud not only because of the one-of-a-kind collaboration of Kharkiv Academia, and the huge number of students attending the fascinating lectures, or the third International Festival of Paintings for Pediatric Patients (IFPPP) festival or the incredible constellation of multidisciplinary scientists among speakers and USERN laureates, but also due to the whole will and fortune the growing USERN society in expecting for its future (8-11). The 3rd USERN congress has already been agreed to be organized in Italy in November 2018.

The USERN prize is an international award, which would be annually bestowed to top junior scientists or researchers less than 40 years of age in five scientific fields of Formal sciences, Physical sciences, Biological sciences, medical sciences and social sciences. USERN Prize awarding festival is held on November 10th, the World Science Day for Peace and Development. USERN Laureates of 2016 and 2017 have already been announced and awarded (12). USERN Laureates 2017 were 3 female scientists and 2 male scientists from USA, UK, Italy, Spain, and Slovenia (13-16).
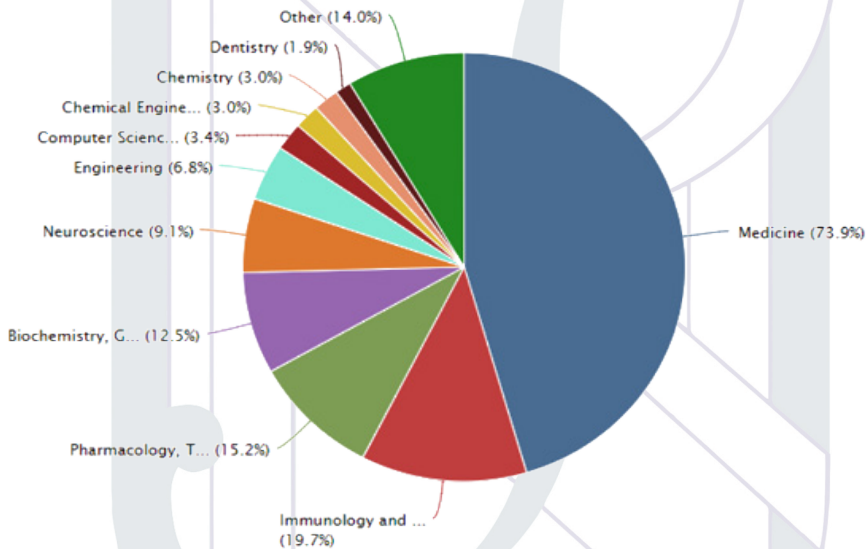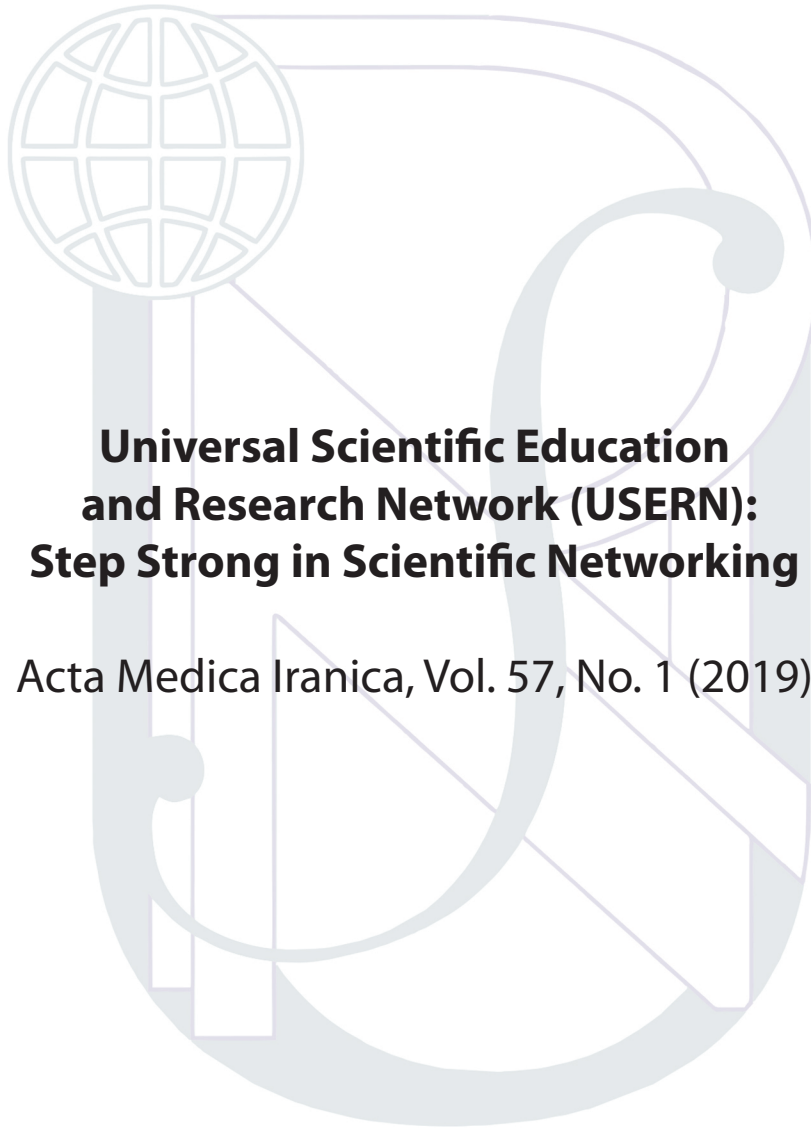
Acknowledgements

References

USERN (Accessed in Dec 31, 2017, at http://usern.org)

Rezaei N. Universal Scientific Education and Research Network (USERN): a new horizon for science. Acta Med Iran 2016;54(1):1-3.

Rezaei N. Universal Scientific Education and Research Network (USERN): to make the knowledge without borders. Acta Med Iran 2016;55(1):1-3.

USERN (Accessed in Dec 31, 2017, at https://en.wikipedia.org/wiki/USERN)

USERN Advisory Board (Accessed in Dec 31, 2017, at http://usern.tums.ac.ir/Info/Board)

USERN Interest Group (Accessed in Dec 31, 2017, at http://usern.tums.ac.ir/Group)

7. USERN Congress (Accessed in Dec 31, 2017, at https://congress.usern.org)

8. USERN Congress and Prize Festival 2017 (Accessed in Dec 31, 2017, at http://usern.tums.ac.ir/News/New?title-=Read%20Everything%20About%20the%20USERN%20Congress%20and%20Prize%20Festival%202017%20 Here)

9. V. N. Karazin Kharkiv National University (Accessed in Dec 31, 2017, at http://www.univer.kharkov.ua/en/general/univer_today/news?news_id=4368)

10. Kharkiv National Medical University (Accessed in Dec 31, 2017, at http://www.knmu.kharkov.ua/index.php?option=com_content&view=article&id=4603%3Ausern&catid=1%3Anews&Itemid=8&lang=uk)

11. Iranian National Commission for UNESCO (Accessed in Dec 31, 2017, at http://en.irunesco.org/2017/12/02/the-final-report-of-usern-2th-global-conference-ukrain/)

12. USERN Prize Festival (Accessed in Dec 31, 2017, at http://usern.tums.ac.ir/SiteContent/Show/PrizeFestival)

13. USERN Prize (Accessed in Dec 31, 2017, at https://en.wikipedia.org/wiki/USERN_Prize)

14. Miami College of Arts and Sciences (Accessed in Dec 31, 2017, at http://www.as.miami.edu/news/news-archive/university-of-miami-associate-professor-receives-recognition-from-peers-for-research-in-brain-connectivity-and-cognition-.html)

15. Univerza v Mariboru (Accessed in Dec 31, 2017, at https://www.um.si/univerza/medijsko-sredisce/novice/Strani/novice.aspx?p=2202)

16. School of Engineering and Materials Science, Queen Mary University of London (Accessed in Dec 31, 2017, at https://www.sems.qmul.ac.uk/news/4739/sems-academic-professor-magdalena-titirici-receives-2017-usern-prize-in-physical-sciences)

Universal Scientific Education and Research Network (USERN): Step Strong in Scientific Networking

Acta Medica Iranica, Vol. 57, No. 1 (2019)

Universal Scientific Education and Research Network (USERN): Step Strong in Scientific Networking

Farzaneh Rahmani, Mahsa Keshavarz-Fathi, Sara Hanaei, Arya Aminorroaya, Farnaz Delavari, Sasan Paryad-zanjani, Negar Sadat Ahmadi, Parya Akbari, Saboura Ashkevarian, Farshad Barghi, Saleheh Ebadirad, Ali Jaberipour, Mohammad Reza Kolahi, Marjan Moallemian, Ali Pourebrahimi, Alireza Samimiat, Zahra Vahedi, Seyedeh-Sanam Ladi Seyedian, Nima Rezaei

Universal Scientific Education and Research Network (USERN), Tehran, Iran

USERN: A Star is Born

January 1st 2019 marked the 3rd Universal Scientific Education and Research Network (USERN) anniversary, a non-profit scientific network to mean "science without borders" (1-4). Three years ago on January 1st 2016, US-ERN held the 1st meeting of USERN Advisory Board members, looking up to the group of about 30 of world's top 1% scientists to build the scientific network envisioned as the main goal in its statute (5, 6). Never did we think that in three years the USERN Advisory Board would reach the number 370 among them 13 Nobel Prize and 2 Abel Prize laureates (7). The annual USERN Congress and Prize Festival is a known identity among international scientific community and has been held since 2016 each year, hosted with various universities/countries, with more integrity and impact (8).

USERN: Making an Impact

USERN is a growing family of >370 members of the advisory board, >8200 members, >40 offices, and >70 active interest groups and the number are still counting (7) (Figure 1). In an attempt to realize scientific collaboration, USERN validates proposals for research interest group establishment through advisory board members with the same scientific interest (9). This is not always easy, as junior researchers often face difficulty to write practical research and educational goals.

USERN's policy in cross-validating interest group proposals, and monthly evaluation of interest group performance, has more or less payed off. More than 440 research papers with USERN affiliation and an H-index of 21 for USERN in only three years, talk themselves as a proof of this success (Figure 2). The fact that USERN is a non--profit, non-governmental organization, makes this scientific achievement even more impressive (10).

USERN: Plus Education?

USERN is by definition, an educational network. Education, as USERN defines it, is the process of receiving or giving systematic instructions to prepare individuals to be functional in learning and generating knowledge and spreading wisdom. In less than 3 years, USERN has proudly designed, organized, and conducted more than 500 scientific events in the form of USERN workshops, focused group discussions (FGD), meeting with experts (USERN Expert Express Event: UEEE), and USERN talks.

USERN Talks are inspiring presentations intended to convey critical information and cutting edge knowledge from the world's most renowned scientists, activists and leaders. USERN talks are perhaps to the oldest format of USERN scientific events, before USERN iTalks and USERN miniature talks (mTalks) were introduced. USERN mTalks are sessions of consecutive, thematic, short lectures of 12 and 6 minutes delivered by senior scientists and juniors/students, respectively, which are accompanied by art performances.

Conceived by USERN scientific education department in 2018, USERN mTalks offer junior scientists a free podium to represent topics from their life passion in science, and improve their presentation skills in the most innovative and engaging way they can. Speakers at USERN mTalks enter an annual selection process, rated by audience and experts of the topic. The finalists of USERN mTalk contest in 2018, recently held a joint performance with selected junior artists, as the opening event in USERN 3rd Anniversary celebration at the Avicenna hall of the Tehran University of Medical Sciences on January 1st 2019 (Figure 3).

the HEART held its first successful international event a year before the 1st USERN Congress and Prize Festival. Continued by the 2nd, 3rd, and 4th IFPPP festivals in Budapest, Kharkov, and Reggio Calabria, the IFPPP festivals have returned each year stronger than ever.

IFPPP is not what HEART does all through the year, the toy-sharing and book-sharing campaigns, the international village of games and art and recently the HEART band, a music group of pediatric patients, are among other significant activities of HEART (11).

USERN is dedicated to make science borderless for all and USERN Advisory Board members have been the walking-talk of this goal. The 2018 USERN Congress and Prize Festival was unique in its own way as USERN Prize Laureates each received part of their travel expenses, from USERN Advisory Board Travel Grants. Top 1% scientists, members of USERN Advisory Board delivered in a significant way to make it possible for 5 USERN Prize Laureates and 4 delegates to attend USERN Congress 2018 and post scientific Course, on November 10-14th in Reggio Calabria, Italy (12).

USERN: Struggling to Build a Network

Entering the 4th year of our activity in USERN we look back into our strengths and weaknesses. A remaining concern in USERN is to strengthen the networking element and build a self-growing platform of scientific collaborations. USERN envisions part of this goal in the hands of USERN Junior Ambassadors (UJAs). UJAs are official members of USERN Organizing Committee and are selected from potential applicants from different countries for a 1-year term. UJAs' primary mission is to realize USERN networking goals, introduce USERN platform, and propagate USERN goals within the scientific community of their home countries (13). UJAs are USERN representatives to extend USERN publicity and goals all over the world.

Final Word

USERN believes in excellence and teamwork, and continues to make a living example of scientific excellence and world-scale collaborations. Several talented, young students have joined USERN organizing committee during these years, many of whom have shown tremendous qualifications and evolved into becoming USERN Deputies, Managers, and Consultants. We look forward to the challenges that 2019 is bringing us, and to the 2019 USERN Congress in Budapest.

Acknowledgement

We would like to acknowledge all USERN Organizing Committee, former or current, for their dedication to science without borders and their magnificent job in promoting USERN over these years.

References

1. USERN. (Accessed December 2018, 30, at http://usern.org).
2. Rezaei N. Universal Scientific Education and Research Network (USERN): twinkling stars unite to make the world glow. Acta Med Iran 2018;56(1):1-3.
3. Rezaei N. Universal Scientific Education and Research Network (USERN): to make the knowledge without borders. Acta Med Iran 2017;55(1):1-5.
4. Rezaei N. Universal Scientific Education and Research Network (USERN): a new horizon for science. Acta Med Iran 2016;54(1):1-3.
5. Majdzadeh R, Rezaei N. The knowledge without border. Arch Iran Med 2016;19:307.
6. USERN. Wikipedia (Accessed December 2018, 30, at https://en.wikipedia.org/wiki/USERN).
7. USERN Board. (Accessed December 2018, 30, at http://usern.tums.ac.ir/Info/Board).
8. The Festival for awarding the USERN Prize. USERN. (Accessed December 2018, 30, at http://usern.tums.ac.ir/SiteContent/Show/PrizeFestival).
9. Interest Group. USERN. (Accessed December 2018, 30, at http://usern.tums.ac.ir/Group).
10. USERN. (Accessed December 2018, 30, at http://usern.tums.ac.ir/SiteContent/Show/Statuts).

11. Health and Art (HEART).USERN. (Accessed December 2018, 30, at https://usern.tums.ac.ir/group/info/HEART).

12. Congress. USERN. (Accessed December 2018, 30, at https://userncongress.com).

13. USERN Junior Ambassadors. USERN. (Accessed December 2018, 30, at https://usern.tums.ac.ir/Info/Executives).
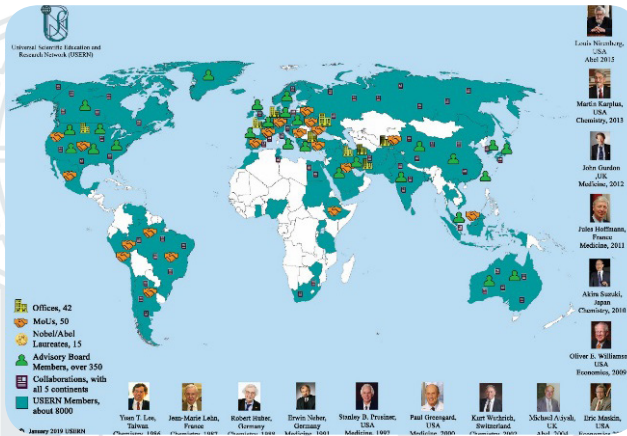
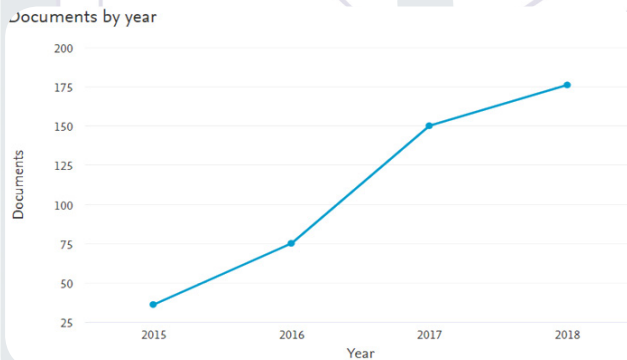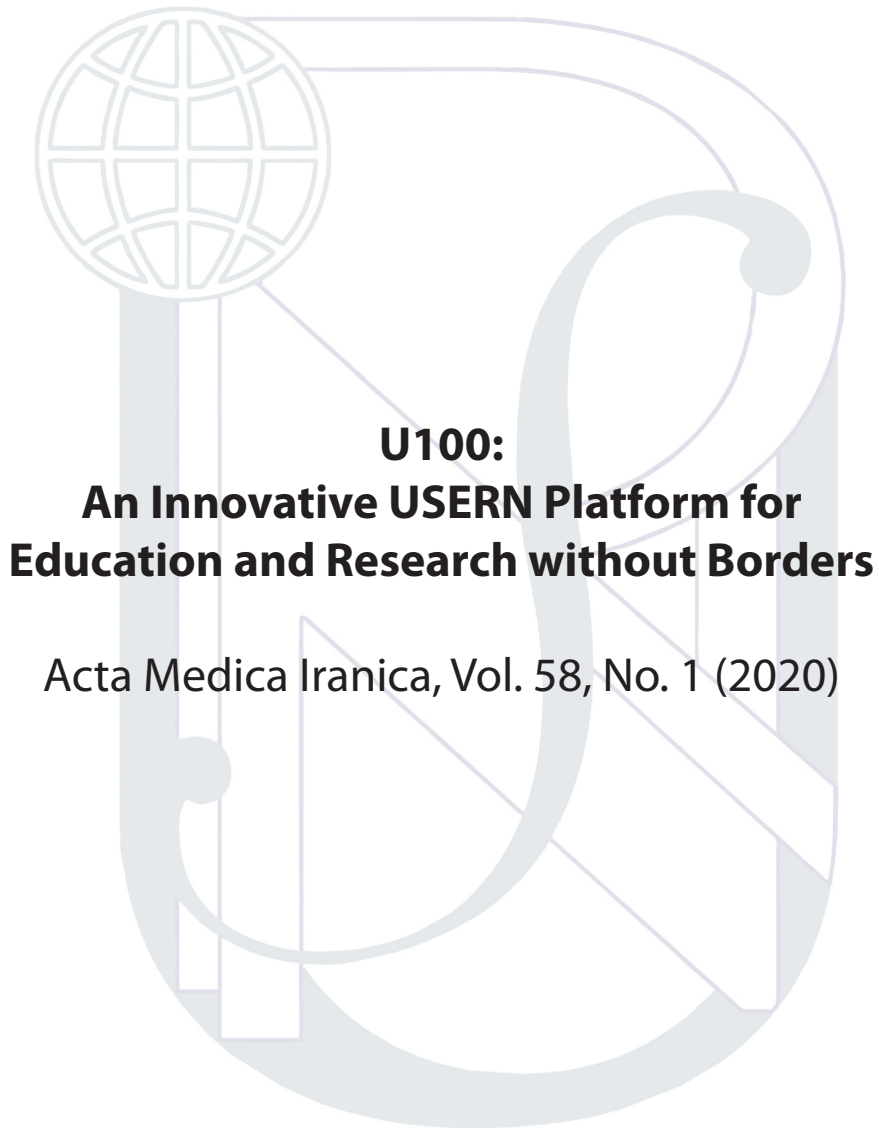**Figure 1.** USERN map, Jan 1st 2019

Figure 2. USERN scientific output

Figure 3. The group photo of 3rd USERN Anniversary, Jan 1st 2019, Avicenna Hall, Tehran University of Medical Sciences

U100:
An Innovative USERN Platform for Education and Research without Borders

Acta Medica Iranica, Vol. 58, No. 1 (2020)

U100: An Innovative USERN Platform for Education and Research without Borders

Sara Momtazmanesh[1,2], Farzaneh Rahmani[1,2], Farnaz Delavari[1,2], Zahra Vahedi[1], Saleheh Ebadirad[1], Mahsa Keshavarz-Fathi[1,2], Marjan Moallemian[1], Saboura Ashkevarian[1], Mohammad Reza Kolahi[1], Alireza Samimiat[1], Nahid Raei[1,2], Pouria Rouzrokh[1,2], Samira Alesaeidi[1,2], Ali Jaberipour[1], Sara Bakhshi[1], Sasan Paryad-Zanjani1, Matjaz Perc[1,3,4], Lucina Q. Uddin[1,6], Abdelkader Allali[1,7], Kathleen Sullivan[1,8], Abbas Taher[1,9], Safa Baris[1,10], Ahmet Ozen[1,10], Elif Karakoc-Aydiner[1,10], Juan Carlos Aldave[1,11], Amir Hamzah Abdul Latiff[1,12], Waleed Al-Herz[1,13], Prathip Phantumvanit[1,14], Anzhela Stashchak[1,15], Oleksandr Kryvenko[1,15], Mykola Stashchak[1,15], Didik Utomo[1,16],Deepak Salunke1[,17,18], Roya Kelishadi[1,19], Mojtaba Hedayati[1,20], Shahrokh MirzaHosseini[1,21], Anastasiia Bondarenko[1,22], Ekaterini Goudouris[1,23],Antonio Condino-Neto[1,24], Duarte Nuno Vieira[1,25], Timo Ulrichs[1,26], László Rosivall[1,21,27], Hans Ochs[1,28], Nima Rezaei[1,2,29];

USERN Collaborators

1. Universal Scientific Education and Research Network (USERN)
2. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Faculty of Natural Sciences and Mathematics, University of Maribor, Slovenia
4. Complexity Science Hub Vienna, Austria
5. Department of Medical Research, China Medical University Hospital, China Medical University, Taichung, Taiwan
6. Brain Connectivity and Cognition Lab, Coral Gables, Florida, USA
7. Moroccan Association Hassanian for Health and Environment (AMHES), Morocco
8. Children's Hospital Philadelphia, Philadelphia, Pennsylvania, USA
9. Naba-Alhayat Foundation for Medical Sciences and Healthcare, Najaf, Iraq
10. Division of Pediatric Allergy/Immunology, Marmara University Hospital, Marmara University, Istanbul,Turkey
11. Hospital Nacional Edgardo Rebagliati Martins, Lima, Peru
12. Allergy and Immunology Centre, Pantai Hospital Kuala Lumpur, Kuala Lumpur, Malaysia
13. Department of Pediatrics, Al-Sabah Hospital, Kuwait, Kuwait
14. Faculty of Dentistry, Thammasat University, Bangkok, Thailand
15. Kharkiv National Medical University, Kharkiv, Ukraine
16. Nusantara Institute of Science and Technology (NUSCIENTECH), Indonesia
17. Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India
18. Punjab University (PU), Chandigarh, India
19. Research Institute for Primordial Prevention of Non-communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran
20. Guilan University of Medical Sciences, Rasht, Iran
21. Avicenna International College, Budapest, Hungary
22. Pediatric Infectious Disease and Pediatric Immunology Department, Shupyk National Medical Academy for Postgraduate Education, Kiev, Ukraine
23. Pediatrics Department, Medical School, Federal University of Rio de Janeiro, São Paulo, Brazil
24. Department of Immunology, Institute of Biomedical Sciences, University of São Paulo, São Paulo, Brazil
25. Department of Forensic Medicine, Ethics and Medical Law, Faculty of Medicine, University of Coimbra, Coimbra, Portugal
26. Institute for Research in International Assistance, Akkon University for Human Sciences, Berlin, Germany
27. Institute of Translational Medicine, International Nephrology Research and Training Center, Faculty of Medicine, Semmelweis University, Budapest, Hungary
28. University of Washington and Seattle Children's Research Institute, Seattle, WA, USA
29. Research Center for Immunodeficiencies, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

"Two heads are better than one" or "too many cooks spoil the broth"! This is the old dispute of two doctrines in scientific production. Two schools that has each addressed a countless number of questions in the history

science: the collaborators and the solos. Here in the Universal Scientific Education and Research Network (USERN) we relate to the former school, introducing the "U100", a collaborative platform for research among at least 100 scientific centers around the globe (Figure 1).

Scientists can contribute to building the future by educating the talented youngsters which is made possible by networking the major role players. Modern education defends the figure of the teacher as a facilitator of the learning process. Learning should, therefore, be the result of a collaborative process between teachers and students. So must behave research too: turn into a collaborative process to build knowledge, covering all fields of cooperation, erasing borders. Collaborative research is a growing trend with outstanding merits and can entail any research-related activity, from sharing skills, techniques and knowledge, to exchange programs and cooperative projects. Collaborative research provides us with access to unique study populations and facilities, and means to publish multi-center and multi-national papers that are proved to reach higher cite scores and impact (1,2). Last but not least, learning different nationalities and the way they solve common problems can be a source for formation of novel ideas, an opportunity offered only through international interactions (3). Despite the considerable advantages of multi-national collaborative endeavors in science, there remain several challenges to tackle. To begin with, many institutions do not have the required framework to foster these collaborations (4). There might be significant challenges in establishing a clear and effective communication between collaborators and the outpouring amount of data and ideas might confuse the responsible side to integrate the results and write the final paper/report. These confusions usually result in a collaborative project taking longer than a non-collaborative one (5).

These shortages, along with the compelling need for cooperative scientific projects, highlight the need for an organization to identify, assess and allocate research resources and facilitate communications that result in multi-national and multi-center research initiatives.

USERN was established on January 1st, 2016 to promote professional scientific research and education worldwide (6-9). USERN is honored to have over 10,000 members from all five continents with thirteen Nobel and two Abel laureates and more than 350 world top 1% scientists as Advisory Board members (10). USERN members are involved in more than 80 active research interest groups and the numbers are still counting.

After four years of active scientific diplomacy and establishment of more than 50 USERN Offices and 60 USERN Memorandums of Agreement (MOU), USERN announces the inauguration of "U100", an innovative platform for scientific exchange, education and Research activities without border across the globe. U100 is USERN's next step towards the goal of making sciences borderless, this time tackling the border between countries and between academia. U100 marks the collaborative network of at least one-hundred universities and institutes from thirty-five countries under the brand name of USERN. Members of U100 have agreed on expanding collaborations in scientific programs, exchanges and training of young researchers, sharing the best-practice, and co-organizing meetings, workshops and expert committees, based upon mutual interests and benefits. U100 members are universities and institutes working

in all fields of science, including formal, physical, chemical, biological, medical, and social sciences.

U100 envisions an outstanding environment for reciprocal scientific exchange all around the world by removing the borders between countries and disciplines and focusing on junior scientists in collaborative activities. It is U100's mission to (1) ease the communication between different institutions, (2) support voluntary collaborative projects between members, (3) promote international collaborative projects, (4) advocate benefits for all collaborative members, and (5) raise awareness of the importance of international collaborations.

References

1. Chinchilla-Rodriguez Z, Sugimoto CR, Lariviere V. Follow the leader: On the relationship between leadership and scholarly impact in international collaborations. PLoS One. 2019;14(6):e0218309.
2. Breugelmans JG, Roberge G, Tippett C, Durning M, Struck DB, Makanga MM. Scientific impact increases when researchers publish in open access and international collaboration: A bibliometric analysis on poverty-related disease papers. PLoS One. 2018;13(9):e0203156.

3. Francisco JS. International Scientific Collaborations: A Key to Scientific Success. Angew Chem Int Ed Engl. 2015;54(50):14984-5.

4. Parker M, Kingori P. Good and Bad Research Collaborations: Researchers' Views on Science and Ethics in Global Health Research. PLoS One. 2016;11(10):e0163579.

5. Sushama Sivakumar JF. Collaborations: Pros and Cons Bethesda, MD: The American Society for Cell Biology (ASCB); 2016 [Available from: https://www.ascb.org/careers/41032-2/.

6. Rezaei N. Universal Scientific Education and Research Network (USERN):a New Horizon for Science. Acta Med Iran. 2016;54(1):1-3.

7. Rezaei N. Universal Scientific Education and Research Network (USERN): To Make the Knowledge Without Borders. Acta Med Iran. 2017;55(1):1-5.

8. Rezaei N. Universal Scientific Education and Research Network (USERN): Twinkling Stars Unite to Make the World Glow. Acta Med Iran. 2018;56(1):1-3.

9. Rahmani F K-FM, Hanaei S, Aminorroaya A, Delavari F, Paryad-Zanjani S, Sadat Ahmadi N, Akbari P, Ashkevarian S, Barghi F, Ebadirad S, Jaberipour A, Kolahi MR, Moallemian M, Pourebrahimi A, Samimiat A, Vahedi Z, Ladi Seyedian S-S, Rezaei N. Universal Scientific Education and Research Network (USERN): Step Strong in Scientific Networking. Acta Med Iran. 2019;57(1):1-4.

10. Universal Scientific Education and Research Network (USERN) [Available from: https://usern.tums.ac.ir/.
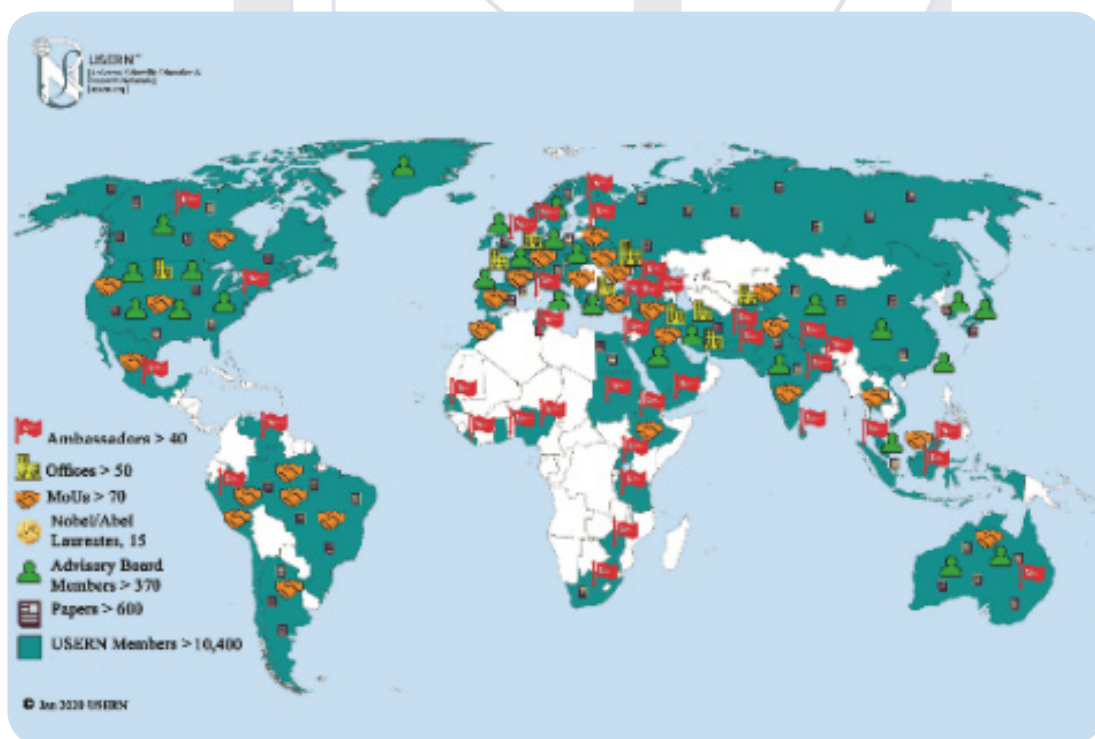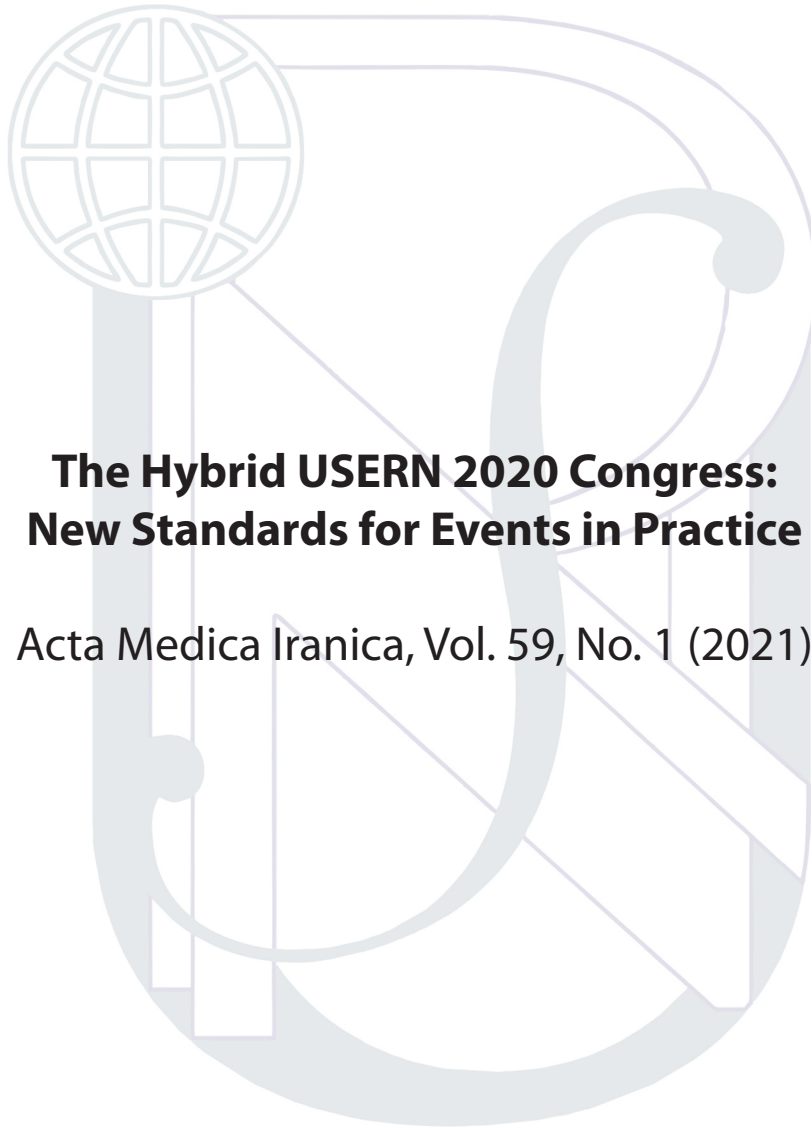
Figure 1. The map of USERN network. (2019)

The Hybrid USERN 2020 Congress: New Standards for Events in Practice

Acta Medica Iranica, Vol. 59, No. 1 (2021)

The Hybrid USERN 2020 Congress: New Standards for Events in Practice

Sara Hanaei[1,2], Mojdeh Sarzaeim[1,2], Niloufar Yazdanpanah[1,2], Zahra Rahimi Pirkoohi[1], Heliya Ziaei[1], Kawthar Mohamed[1,2], Noosha Samieefar[1,3], Mahsa Keshavarz-Fathi[1,2], Zahra Kolahchi[1,2], Negar Moradian[1,2], Sara Momtazmanesh[1,2], Simin Seyedpour[1,2], Ali Jaberipour[1], Saboura Ashkevarian[1], Nima Rezaei[1,2]

[1] Universal Scientific Education and Research Network (USERN), Tehran, Iran
[2] School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
[3] School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

USERN: A Star is Born

January 1st 2019 marked the 3rd Universal Scientific Education and Research Network (USERN) anniversary, a non-profit scientific network to mean "science without borders" (1-4). Three years ago on January 1st 2016, USERN held the 1st meeting of USERN Advisory Board members, looking up to the group of about 30 of world's top 1% scientists to build the scientific network envisioned as the main goal in its statute (5, 6). Never did we think that in three years the USERN Advisory Board would reach the number 370 among them 13 Nobel Prize and 2 Abel Prize laureates (7). The annual USERN Congress and Prize Festival is a known identity among international scientific community and has been held since 2016 each year, hosted with various universities/countries, with more integrity and impact (8).

Turning threats to opportunity

The year 2020 started with one of the most critical health threats in the 21st century; the coronavirus disease 2019 (COVID-19) pandemic, which spread throughout the world and influenced human lives and activities)1(. After a year of challenging endeavors to overcome this pandemic, it is still very far from control in many regions. Importantly, human life and activities should continue, even in such times. For this reason, along with all the restrictions, there have been new regulations for many activities; some were canceled or postponed, others were continued virtually, and a few were held to define new standards. The events of different kinds were very much influenced by this pandemic. While many of them were canceled initially, there was a trend to adjust the standards for resuming the events. Accordingly, and although the pandemic has been a threat for scientific activities and gatherings, it was also an opportunity to develop remote scientific works (e.g., publishing books or papers) or organizing scientific events with new hygienic considerations)2(.

The big family of Universal Scientific Education and Research Network (USERN) had a challenging year too. But importantly, this did not stop this network from continuing its scientific goals. As a result in this year, USERN had about 300 publications, including four international books with collaborations of scientists all over the world, and also organized scientific events (the 3rd Spring event, the 3rd USERN research week, and the 5th USERN Congress) with defining a new model for such activities. Of note, and during the first five years since its initiation, USERN has built a unique network for joint collaboration of seniors and juniors to promote scientific activities. As a consequence of this borderless scientific collaboration, USERN has established over 50 national and international offices, over 100 interest groups, organized over 550 scientific events, and published nearly 1000 research papers by the end of 2020. Proudly, this scientific networking has been highly welcomed by over 470 top 1% scientists and 18 Nobel/Abel Laureates who are among the advisory board members of USERN)3,4((Figure 1).

The backbone for a rich scientific content

Through networking and developing scientific collaborations, USERN gathered a scientific-rich society of senior scientists and youngsters. USERN advisers, senior book-collaborators, and smooth-spoken scientists were invited to join the USERN 2020 Congress's scientific content with the theme of "Science to Society." Proudly, this year, the scientific content of the Congress was built on the kind collaboration of 148 expert speakers from 35 countries in all five continents (Figure 2). The borderless scientific collaborations of USERN in the past had made them dedicated allies and friends who all made it possible together. Despite the travel restrictions, the virtual

part of this hybrid Congress made it possible to have them all in Congress.

The scientific content of the Congress included various programs, which suited every member of academic society. In brief, the keynote lectures were presented by senior expert speakers (either in-person or virtually), and the Congress was proud to host two Nobel Laureates as the honorary speakers, Prof. Jean-Marie Lehn (the Nobel Laureate in Chemistry in 1987) and Prof. Lenald Hartwell (the Nobel Laureate in Physiology or Medicine in 2001), who shared their valuable experiences in science and life. The youngsters' voices had their own place in the Congress as "Junior Talks," which were short presentations concurrent with art performances. The work-shops focused on specific topics, and "Meet the Expert" sessions provided students with friendly discussions with several senior scientists. There were also some side events focusing on a particular field of science, includ-ing InnoUSERN (focusing on innovation and entrepreneurship), U-Pharmacy (focusing on pharmacology), UT-Med (focusing on traditional medicine), and U-Debate (a scientific debate between juniors judged by seniors). Meanwhile, Congress was supported by more than 20 scientific centers and universities, and parallel events were organized as "Satellite Events," which were managed by USERN offices. USERN webinars included an eight-day program with scientific lectures of international speakers, which was highly welcomed as well. The speakers' interactive participation was an encouragement as they actively attended the other sessions and panels, too (5). Last but not least, USERN Prize Awarding Festival was held in a hybrid model as well. USERN 2020 Laureates were announced in five fields of science, including Formal sciences, Physical and Chemical Sciences, Biological Sciences, Medical Sciences, and Social sciences. As some of the international USERN Laureates could not attend in-person, H.E ambassadors of their respected countries were invited as a representative to receive their awards.

The hybrid model for the USERN 2020 congress

The USERN 2020 congress was planned on a hybrid model to be appropriate and executable in the COVID-19 situation. The in-person program included only 25% of all participants, and the hygienic protocols were met in the congress venue. The opening ceremony and the prize-awarding festival were streamed online. Thus, the other 75% of participants and the international participants could attend virtually. Moreover, various programs of the other days of the Congress were held in different parallel halls; so, the participants could choose their favorite, besides avoiding overpopulation in one hall. There were 1574 registered individuals from 48 countries in this Congress (Figure 3).

In general, the hybrid model seems to be a practical solution for organizing events in the pandemic situation, which could be continued in the non-pandemic future as well (2).

The hygienic protocol in the USERN 2020 congress

The 5th USERN Congress was planned and organized in a hybrid model, including both in-person and virtual programs. As a necessity for complying with participants' health and safety during the COVID-19 pandemic, the new standards for organizing scientific events required careful considerations of the hygienic protocols. Therefore, USERN first defined a resilient protocol for organizing a hybrid scientific event during this pandemic. After running a small pilot in the 3rd USERN research week, the protocol was valid to be successfully executed in the USERN 2020 congress. In brief, all the participants, organizers, and speakers were requested to fill a pre-de-signed self-report questionnaire about the COVID-19 infection. They were all requested to be committed to their social duty and avoid attending in-person in case of being symptomatic or testing positive for COVID-19. The hygienic protocols were met, including mandatory facial mask-wearing, providing and using hand sanitiz-ers, and social distancing (2). Nevertheless, it should also be emphasized that as the COVID-19 pandemic is a borderless health concern, a borderless effort from all over the world is required to eliminate it and again revive human activities (6,7).

References

1. Hanaei S, Rezaei N. COVID-19: Developing from an outbreak to a pandemic. Archives of Medical Research, 2020.

2. Hanaei S, Takian A, Majdzadeh R, Maboloc CR, Grossmann I, Gomes O, et al. Emerging standards and the hybrid model for organizing scientific events during and after the COVID-19 pandemic. Disaster Med Public Health Prep 2020;1-17. https://doi.org/10.1017/dmp.2020.406

3. Momtazmanesh S, Rahmani F, Delavari F, Vahedi Z, Ebadirad S, Keshavarz-Fathi M, et al. U100: An Innovative USERN Platform for Education and Research Without Borders. Acta Med Iran 2020;58:1-3.

4. Rahmani F, Keshavarz-Fathi M, Hanaei S, Aminorroaya A, Delavari F, Paryad-Zanjani S, et al. Universal scientific education and research network (USERN): step strong in scientific networking. Acta Med Iran 2019;57:1-4.

5. USERN, USERN Congress 2020: A Hybrid Event, 2020.

6. Mohamed K, Rodríguez-Román E, Rahmani F, Zhang H, Ivanovska M, Makka SA, et al. Borderless collaboration

Figure 1. The map of Universal Scientific Education and Research Network (USERN), Jan. 2021

Figure 2. The USERN 2020 congress speakers

Figure 3. USERN 2020 congress international registered individuals from 48 countries

International Scientific Collaboration Is Needed to Bridge Science to Society: USERN2020 Consensus Statement

SN Comprehensive Clinical Medicine (2021) 3:1699–1703

International Scientific Collaboration Is Needed to Bridge Science to Society: USERN2020 Consensus Statement

Sara Momtazmanesh[1,2,3], Amene Saghazadeh[1,2,3], Juan Carlos Aldave Becerra[1,4], Kiarash Aramesh[1,5], Francisco J. Barba[1,6], Federico Bella[1,7], Anna Blakney[1,8], Massimo Capaccioli[1,9], Rossella Castagna[1,10,11], Umberto Crisanti[1,12], Tigran Davtyan[1,13], Tommaso Dorigo[1,14], Julie Ealy[1,15], Mehdi Farokhnia[1,16], Giulia Grancini[1,17], Manoj Gupta[1,18], Amine Harbi[1,19], Wojciech Krysztofiak[1,20], Arutha Kulasinghe[1,21], Chi-Ming Lam[1,22], Alexander Leemans[1,22], Brian Lighthill[1,23], Vittorio Limongelli[1,24,25], Paola Lopreiato[1,26], Livio Luongo[1,27], Christopher Ryan Maboloc[1,28], Reza Malekzadeh[1,29], Orlando Costa Gomes[1,30], Milos Milosevic[1,31], Jan Nouwen[1,32], Delfín Ortega-Sánchez[1,33], John Pawelek[1,34], Surapati Pramanik[1,35], Seeram Ramakrishna[1,36], Ortwin Renn[1,37], Serena Sanseviero[1,38], Daniel Sauter[1,39], Michael Schreiber[1,40], Frank W. Sellke[1,41], Mohammad-Ali Shahbazi[1,42], Natalya Shelkovaya[1,43], Wayne H. Slater[1,44], Didier Snoeck[1,45], Slawomir Sztajer[1,46], Lucina Q. Uddin[1,47], Liz Veramendi-Espinoza[1,48], Ricardo Vinuesa[1,49], Walter C. Willett[1,50], Dongrui Wu[1,51], Karolina Żyniewicz[1,52], Nima Rezaei[1,2,3]

1. http://usern.org
2. School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Research Center for Immunodeficiencies, Children's Medical Center Hospital, Tehran University of Medical Sciences, Tehran, Iran
4. Division of Allergy and Immunology, Hospital Nacional Edgardo Rebagliati Martins Lima, Lima, Peru
5. Department of Biology and Health Sciences, College of Science and Health Professions, Edinboro University of Pennsylvania, Edinboro, USA
6. Nutrition and Food Science Area, Preventive Medicine and Public Health, Food Science, Toxicology and Forensic Medicine Department, Faculty of Pharmacy, Universitat de València, Avda. Vicent Andrés Estellés, S/n, València 46100 Burjassot, Spain
7. Department of Applied Science and Technology - DISAT, Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino, Italy
8. Department of Infectious Diseases, Imperial College London, Norfolk Place, London W2 1PG, UK
9. Physics Department "Ettore Pancini", University of Naples Federico II Monte Sant'Angelo Campus, via Cinthia 21, 80121 Naples, Italy
10. Institute for Bioengineering of Catalonia (IBEC), Barcelona Institute for Science and Technology, Barcelona 08028, Spain
11. Latvian Institute of Organic Synthesis (LIOS), Riga LV-1006, Latvia
12. Psychotherapist in Private Practice, Canterbury, Kent, England
13. Analytical Laboratory Branch, Scientific Centre of Drug and Medical Technology Expertise after Academician E. Gabrielyan CJSC, Yerevan 0051, Armenia
14. INFN Sezione di Padova, Padova, Italy
15. Penn State Lehigh Valley, 2809 Saucon Valley Road, Center Valley, PA 18034, USA
16. National Health Institutes of Health (NIH) Intramural Research Program (IRP), Bethesda, USA
17. Department of Chemistry & INSTM, University of Pavia , Via Taramelli 14, Pavia I-27100, Italy
18. Department of Mechanical Engineering, National University of Singapore, Singapore, Singapore
19. Souk Ahras University, Souk Ahras, Algeria
20. The Institute of Philosophy, University of Szczecin, Ul. Krakowska 71-79, Szczecin 71-004, Poland
21. Translational Research Institute, Woolloongabba, QLD, Australia
22. Department of International Education, Education University of Hong Kong, Hong Kong, China
23. The University of Warwick, Coventry, UK
24. Faculty of Biomedical Sciences, Università della Svizzera italiana (USI) Euler Institute, via G. Buffi 13, CH-6900 Lugano, Switzerland
25. Department of Pharmacy, University of Naples "Federico II", Via D. Montesano 49, I-80131 Naples, Italy
26. Academy of Fine Art, Carrara, Italy
27. IRCSS NEUROMED, Pozzilli, Italy
28. Ateneo de Davao University, Davao, Philippines
29. Digestive Disease Research Institute, Tehran University of Medical Sciences, Tehran, Iran

30. Lisbon Accounting and Business School, Instituto Superior de Contabilidade e Administração de Lisboa (ISCAL/IPL), Av. Miguel Bombarda 20, Lisbon 1069-035, Portugal

31. Faculty of Physical Education and Sports Management, Singidunum University, Belgrade, Serbia

32. Department of Internal Medicine and Infectious Diseases, Erasmus Medical Center, Erasmus University, Rotterdam, Netherlands

33. Department of Specific Didactics Faculty of Education, University of Burgos, Burgos 09001, Spain

34. Department of Dermatology and The Yale Cancer Center, Yale School of Medicine, New Haven, CT, USA

35. Mathematics, Nandalal Ghosh B.T. College, Kolkata, West Bengal, India

36. Center for Nanofibers and Nanotechnology, National University of Singapore, Singapore, Singapore

37. Institute for Advanced Sustainability Studies (IASS), Berliner Str. 130, Potsdam 14467, Germany

38. University G.D Annunzio, Chieti Pescara, Italy

39. Medical Virology and Epidemiology of Viral Diseases, University Hospital Tübingen, Tübingen 72076, Germany

40. Institute of Physics, Chemnitz University of Technology, Chemnitz 09107, Germany

41. Division of Cardiothoracic Surgery Department of Surgery The Warren Alpert Medical School, Brown University, Providence, RI 02903, USA

42. Drug Research Program Division of Pharmaceutical Chemistry and Technology Faculty of Pharmacy, University of Helsinki, FI-00014 Helsinki, Finland

43. Department of Philosophy, Cultural Studies and Information Activity, Volodymyr Dahl East Ukrainian National University, Severodonetsk, Ukraine

44. University of Maryland, College Park, MD, USA

45. Department of Structural Engineering and Building Materials Faculty of Engineering and Architecture Magnel-Vandepitte Laboratory for Structural Engineering and Building Materials, Ghent University, Tech Lane Ghent Science Park, Campus A, Technologiepark Zwijnaarde 60, B- 9052 Gent, Belgium

46. Department of Religious and Comparative Studies, Adam Mickiewicz University, Poznań, Poland

47. Department of Psychology, University of Miami, PO Box 248185-0751, Coral Gables, FL 33124, USA

48. Allergy and Immunology Division, Hospital Nacional Edgardo Rebagliati Martins, Lima, Peru

49. SimEx/FLOW, Engineering Mechanics, KTH Royal Institute of Technology, Stockholm SE-100 44, Sweden

50. Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston, MA, USA

51. School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan 430074, China

52. Artes Liberales Faculty, University of Warsaw, Warsaw, Poland

Abstract

Scientific collaboration has been a critical aspect of the development of all fields of science, particularly clinical medicine. It is well understood that myriads of benefits can be yielded by interdisciplinary and international collaboration. For instance, our rapidly growing knowledge on COVID-19 and vaccine development could not be attained without expanded collaborative activities. However, achieving fruitful results requires mastering specific tactics in collaborative efforts. These activities can enhance our knowledge, which ultimately benefits society. In addition to tackling the issue of the invisible border between different countries, institutes, and disciplines, the border between the scientific community and society needs to be addressed as well. International and transdisciplinary approaches can potentially be the best solution for bridging science and society. The Universal Scientific Education and Research Network (USERN) is a non-governmental, non-profit organization and network to promote professional, scientific research and education worldwide. The fifth annual congress of USERN was held in Tehran, Iran, in a hybrid manner on November 7–10, 2020, with key aims of bridging science to society and facilitating borderless science. Among speakers of the congress, a group of top scientists unanimously agreed on The USERN 2020 consensus, which is drafted with the goal of connecting society with scientific scholars and facilitating international and interdisciplinary scientific activities in all fields, including clinical medicine.

Keywords: International, Collaboration, Science, Society, Research, Policy

Introduction

Scientific collaboration has been a critical aspect of the development of all fields of science, including clinical medicine, from centuries ago; nonetheless, in recent decades, it has even drawn more attention from the academic society [1, 2]. Collaboration is defined as "the act of working with another person or group of people to create or produce something" by the Oxford English Dictionary. The core concept is achieving a common goal, which is usually to advance scientific knowledge by harmonizing knowledge, skills, tools, and resources [3, 4]. Historically, scientific research evolved through four ages: the individual, the institutional, the national, and the international [5]. Before the twentieth century, scientific efforts were mostly individual activities, and most of the scholars were working alone, which resulted in a scarce number of papers with more than one author. However, in many cases, the discoveries were not made solo, and the role of other contributors was less acknowledged in this approach [1]. From the beginning of the twentieth century, institutional and national research collaboration flourished. In recent decades, scientific research has entered its fourth era, and we are witnessing substantial growth in international collaboration [6]. In 2012, approximately a quarter of the papers indexed in the Web of Science were produced as a result of international collaboration [7].

Life sciences, including clinical medicine, are an outstanding showcase for internationally collaborative scientific efforts. A quintessential example of collaborative activities is the investigation of emerging viruses, especially SARS-CoV-2 (COVID-19). Without collaborative measures, such as the development of international registries and sharing expertise as well as technologies, we could not obtain our current rapidly growing understanding of COVID-19 [8–10]. International collaboration plays a major role in accelerating and improving vaccine development and assessment processes as well [11].

Why and How to Conduct International Collaboration?

Collaboration and internationalism can help researchers have access to expert scientists in their field, additional resources, and equipment or funds, learn different methods, gain additional knowledge, enhance productivity, and increase the visibility of their work. Borderless scientific collaboration, especially when it is formed as a mentoring program, can help substantially in nourishing and education of young students. Not only does international collaboration increase scientific achievements quantitatively, but it can also enhance our understanding of knowledge qualitatively. Many findings that are obtained through multinational research activities were impossible to attain without working together. Borderless collaboration helps us find answers for complex problems, which may seem insurmountable if we want to tackle them solo [1, 3, 12].

When we choose to pursue international collaborations, mastering the tactics for achieving fruitful results is critical. First, to have an effective collaboration, the work style of the collaborative partners should fit. That may be why many researchers choose to work with people they know and trust and why many collaborative projects start from informal interactions [12]. Second, in a successful collaboration, partners need to communicate with each other effectively. Roles, responsibilities, and the credit collaborators receive for the final product of collaboration should be stated clearly. An efficient collaboration also requires competent management, which can assign each collaborator the proper task and ensure that each collaborator meets the expectations and receives what they expect from the team.

To maintain such a fruitful project, collaborators should also avoid some actions. Many challenges to collaborative science may arise from personality differences and collaborators' urge to control their peers [13]. Additionally, we need to pay attention to avoid any collaborator's exploitation and having ghost authors in large-scale international collaborations.

However, doubtlessly, several factors may hinder international collaboration [14]. A recent study cited lack of funds, limitation in the dissemination of data, bias against researchers from specific countries (particularly countries),

and various academic standards worldwide as the most common obstructions of international scientific collaboration [15].

USERN2020 Consensus Statement

Universal Scientific Education and Research Network (USERN) is a non-governmental, non-profit organization and network, which was established on January 1, 2016, to promote professional, scientific research and education worldwide [17–20]. In 2020, the USERN established the U100 platform, including a network of at least one-hundred academic institutes worldwide with the vision of providing an ideal environment for reciprocal scientific exchange all around the world by removing the borders between countries and disciplines [21].

The fifth annual congress of USERN was held in Tehran, Iran, in a hybrid manner [22] on November 7–10, 2020, with the overall aims of bridging science to society and facilitating borderless science. Forty-eight of the speakers, including some of top 1 percent of scientists in the world, who were from fifteen countries, unanimously agreed on The USERN 2020 consensus, which is drafted with the goal of connecting society with scientific scholars and facilitating international and interdisciplinary scientific activities. Table 1 demonstrates The USERN 2020 Consensus, which is comprised of 6 articles.

Table 1. The USERN2020 consensus

1	Committing to principles of conducting a fruitful scientific collaboration, such as effective and clear communication, competent management, and properly giving credit to each collaborator for their efforts in all collaborative works is an essential part of scientific collaboration
2	Any bias based on race, nationality, gender, and academic position should be avoided in all collaborative works
3	Organizing programs making science enticing to the public and teaching young scientists how to explain science in a non-scientific language play a critical role in connecting science and society
4	The USERN must facilitate mutual sharing of information and technology to support research and educational activities yielding mutual benefits, which can result in new collaborative scientific production
5	The USERN must facilitate share of expertise and providing opportunities for education of young researchers and scientists in a format of providing opportunities for cooperation of senior and junior researchers in scientific projects, holding workshops and schools, and exchange of researchers and students
6	The USERN must facilitate planning to translate the science to understandable materials for the public and make the application of science to society

The USERN is determined to promote and facilitate international scientific collaboration and continues its efforts on its way to remove the borders between different institutions, nations, and disciplines and between the scientific community

and the society to achieve its ultimate goal, which is borderless science in all scientific fields, including clinical medicine, which is an outstanding showcase for internationally collaborative scientific efforts.
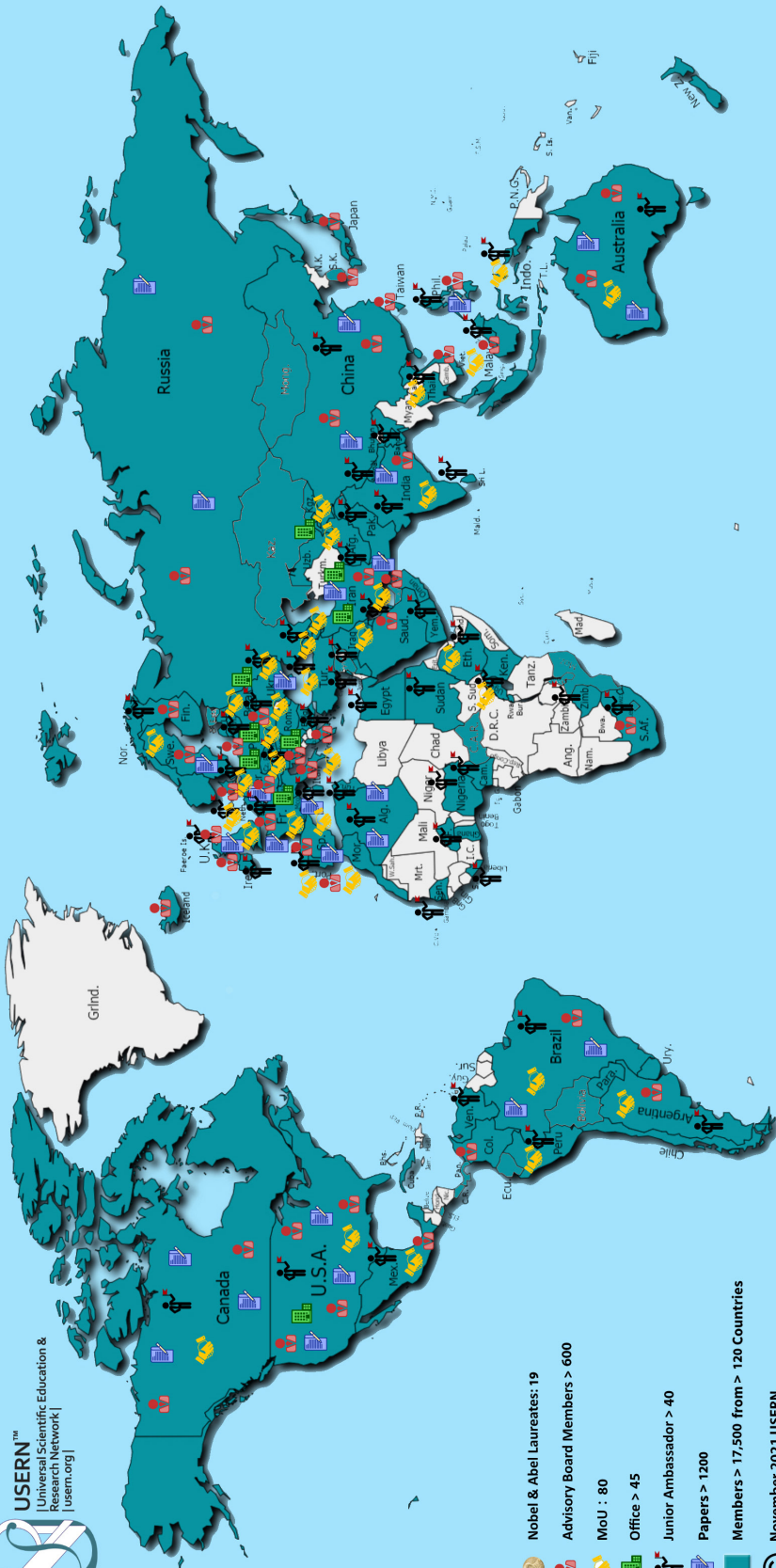
References

1. Beaver DD, Rosen R. Studies in scientific collaboration. Scientometrics. 1978;1(1):65–84.

2. Adams J. The rise of research networks. Nature. 2012;490(7420): 335–6.

3. Katz JS, Martin BR. What is research collaboration? Res Policy. 1997;26(1):1–18.

4. Olechnicka A, Ploszaj A, Celińska-Janowicz D. The Geography of Scientific Collaboration (1st ed.). Routledge. 2018. https://doi.org/10.4324/9781315471938.

5. Adams J. The fourth age of research. Nature. 2013;497(7451):557–60.

6. Coccia M, Bozeman B. Allometric models to measure and analyze the evolution of international research collaboration. Scientometrics. 2016;108(3):1065–84.

7. Mindeli LE, Markusova VA. Bibliometric studies of scientific collaboration: international trends. Autom Doc Math Ling. 2015;49(2):59–64.

8. Momtazmanesh S, Ochs HD, Uddin LQ, Perc M, Routes JM, Vieira DN, et al. All together to fight COVID-19. Am J Trop Med Hyg. 2020;102(6):1181–3.

9. Mohamed K, Rodriguez-Roman E, Rahmani F, Zhang H, Ivanovska M, Makka SA, et al. Borderless collaboration is needed for COVID-19-A disease that knows no borders. Infect Control Hosp Epidemiol. 2020;41(10):1245–6.

10. Collins A, Florin M-V, Renn O. COVID-19 risk governance: drivers, responses and lessons to be learned. J Risk Res. 2020;23(7-8):1073–82.

11. Rappuoli R, Hanon E. Sustainable vaccine development: a vaccine manufacturer's perspective. Curr Opin Immunol. 2018;53:111–8.

12. Bozeman B, Corley E. Scientists' collaboration strategies: implications for scientific and technical human capital. Res Policy. 2004;33(4):599–616.

13. Bozeman B, Gaughan M, Youtie J, Slade CP, Rimes H. Research collaboration experiences, good and bad: dispatches from the front lines. Sci Public Policy. 2016;43(2):226–44.

14. See M. 18 International collaboration: are the challenges worth the benefits? J Anim Sci. 2018;96(suppl_3):2.

15. Lund BD. Is academic research and publishing still leaving developing countries behind?. Account Res. 2021;0:0:1–9. https://doi.org/10.1080/08989621.2020.1774373.

16. Richard A, Roehrl WL, Mukherjee S. The COVID-19 pandemic: a wake-up call for better cooperation at the science–policy–society interface. In: Desa U, editor. POLICY BRIEF NO62; 2020. URL: https://www.un.org/development/desa/dpad/publication/un-desapolicy-brief-62-the-covid-19-pandemic-awake-up-call-for-bettercooperation-at-the-science-policy-society-interface/.

17. Rezaei N. Universal Scientific Education and Research Network (USERN):a new horizon for science. Acta Med Iran. 2016;54(1):1–3.

18. Rezaei N. Universal Scientific Education and Research Network (USERN): to make the knowledge without borders. Acta Med Iran. 2017;55(1):1–5.

19. Rezaei N. Universal Scientific Education and Research Network (USERN): twinkling stars unite to make the world glow. Acta Med Iran. 2018;56(1):1–3.

20. Rahmani FK-FM, Hanaei S, Aminorroaya A, Delavari F, Paryad- Zanjani S, Sadat Ahmadi N, et al. Universal Scientific Education and Research Network (USERN): step strong in scientific networking. Acta Med Iran. 2019;57(1):1–4.

21. Momtazmanesh S, Ochs HD, Uddin LQ, Perc M, Routes JM, Vieira DN, et al. All together to Fight COVID-19. Am J Trop
Med Hyg. 2020;102(6):1181–1183. https://doi.org/10.4269/ajtmh.20-0281.

22. Hanaei S, Takian A, Majdzadeh R, Maboloc CR, Grossmann I, Gomes O, et al. Emerging standards and the hybrid model for organizing scientific events during and after the COVID-19 pandemic. DisasterMed Public Health Prep. 2020:1–17. https://doi.org/10.1017/dmp.2020.406.
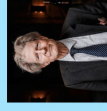
USERN Map

November 2021

USERN™
Universal Scientific Education &
Research Network
usern.org

Nobel & Abel Laureates: 19

Advisory Board Members > 600

MoU : 80

Office > 45

Junior Ambassador > 40

Papers > 1200

Members > 17,500 from > 120 Countries

© November 2021 USERN

Oliver E. Williamson
USA
Economics, 2009

Eric S. Maskin
USA
Economics, 2007
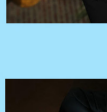
Roger D. Kornberg
USA
CHemistry, 2006

Michael Atiyah
UK
Abel, 2004

Peter J. Ratcliffe
UK
Medicine, 2019

Anthony James Leggett
USA
Physics, 2002

John Michael Kosterlitz
USA
Physics, 2016

Kurt Wuthrich
Switzerland
Chemistry, 2002

Louis Nirenberg
USA
Abel, 2015

Paul Greengard
USA
Medicine, 2000

Martin Karplus
USA
Chemistry, 2013

Stanley B. Prusiner
USA
Medicine, 1997

John B. Gurdon
UK
Medicine, 2012

Erwin Neher
Germany
Medicine, 1991

Jules Hoffmann
France
Medicine, 2011

Robert Huber
Germany
Chemistry, 1988

Akira Suzuki
Japan
Chemistry, 2010

Jean Marie Lehn
France
Chemistry, 1987

Yuan Tseh Lee
Taiwan
Chemistry, 1986

USERN Scientometrics

2021

USERN Scientometrics 2021

USERN has tried diligently to promote its scientific activities in 2021. The following charts represent the output of USERN scientific activities in these year:

	H-index	Documents
Scientometrics	52	1283

- Others 9.4%
- Materials Science 2.3%
- Chemical Engineering 2.3%
- Agricultural and Biological Sciences 2.5%
- Chemistry 2.6%
- Engineering 4.7%
- Neuroscience 5.5%
- Pharmacology, Toxicology and Pharmaceutics 7.6%
- Immunology and Microbiology 12.5%
- Biochemistry, Genetics and Molecular Biology 12.6%
- Medicine 38.0%
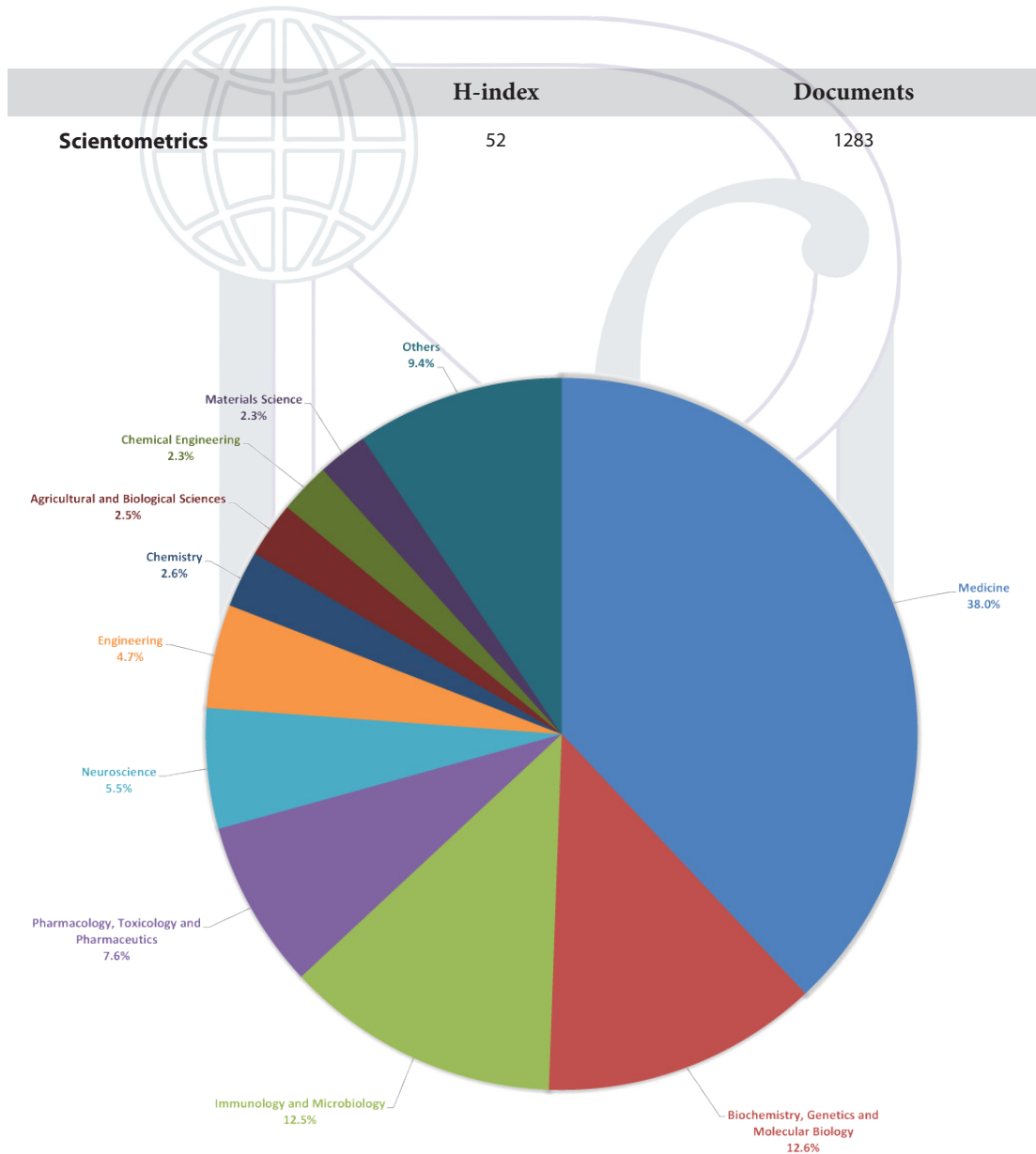
USERN Members

2021

USERN Members 2021

Members are importance to USERN; as they are the representative of USERN popularity among academic people.

Proudly, USERN has more than 17500 members from all 5 continents and over 120 countries, in 21 different branches of science. The major of expertise in the majority of USERN members is Clinical medicine. The following table shows diversity of USERN Member's major. Engineering, Biology & Biochemistry, and Molecular Biology & Genetics are the next most popular majors among USERN members:
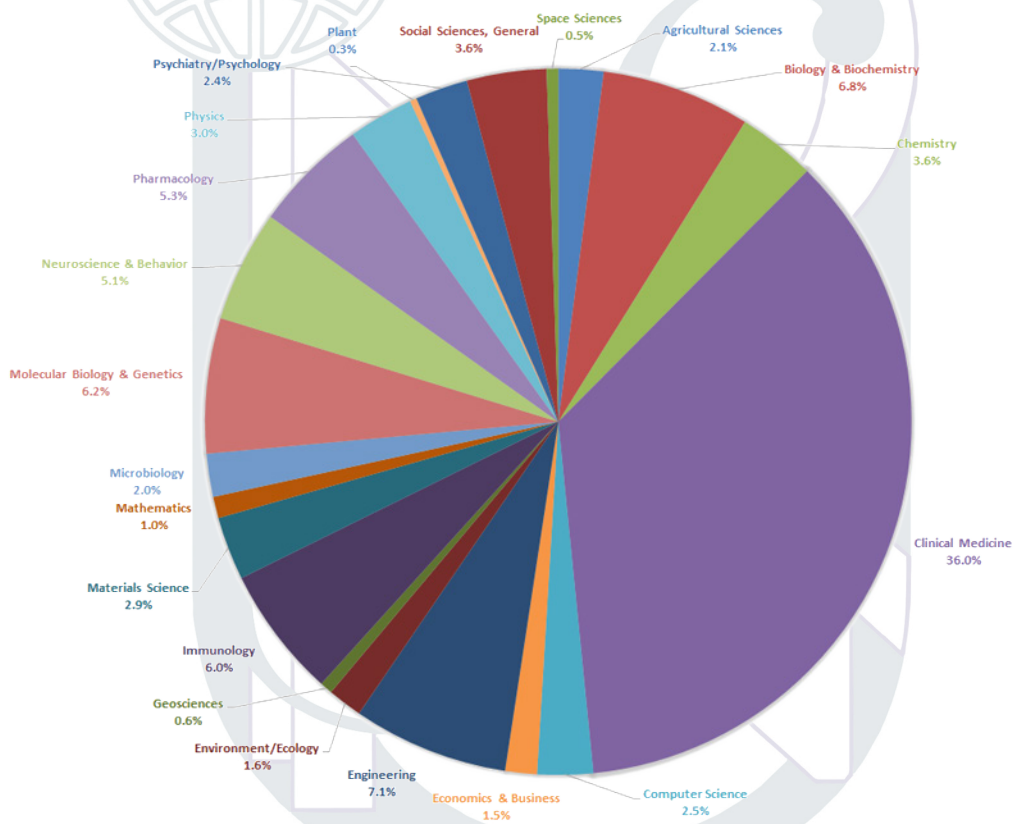
USERN Memorandum of Understanding (MoUs) and Offices Worldwide

USERN's Memorandums of Understanding (MoUs) Worldwide

To date, USERN has developed a borderless trans-disciplinary network by signing 78 MoUs with international academic institutes with the aim of promoting universal scientific education and research.

1. Marmara University, Marmara University Hospital, Division of Pediatric Allergy/Immunology Istanbul, Turkey

2. Belarusian State Medical University, Minsk, Belarus

3. Belarusian National Research Center for Pediatric Oncology, Hematology and Immunology, Minsk, Belarus

4. Tajikistan National Medical Center, Dushanbe, Tajikistan

5. University of Strasbourg, Strasbourg School of Medicine, Strasburg, France

6. Medical University of Vienna, Center for Pathophysiology, Infectiology and Immunology Vienna, Austria

7. University Children's Hospital Munich, Ludwig Maximilian University of Munich, Munich, Germany

8. Universidade de Santiago de Compostela (USC), Santiago de Compostela, Spain

9. Hannover Medical School, Department of Immunology and Rheumatology Hannover, Germany

10. Seattle Children's Research Institute, University of Washington, Seattle, USA

11. Kharkiv National Medical University, Kharkiv, Ukraine

12. Institute of Health Technology and Prevention Research, Medical University of Graz, Weiz, Austria

13. Brigham and Women's Hospital, Laboratory of Nanomedicine and Biomaterials, Laboratory of Nanomedicine and Biomaterials, Harvard Medical School, Boston, USA

14. Malaysian Society of Allergy and Immunology (MSAI), Kulalampur, Malaysia

15. Jimma University, Jimma, Ethiopia

16. Semmelweis University, International Nephrology Research & Training Center, Institute of pathophysiology, Budapest, Hungary

17. Ukrainian Association of Pediatric Immunology, Kiev, Ukraine

18. Rare Immune Disease, Kiev, Ukraine

19. Shupyk National Medical Academy of Postgraduate Education, Kiev, Ukraine

20. V. N. Karazin Kharkiv National Universit Kharkiv, Kharkiv, Ukraine

21. Necker Medical School, Laboratory of Human Genetics of Infectious Diseases, Paris, France

22. International Patient Organization for Primary Immunodeficiencies, Oxford, UK

23. University of Maribor, Faculty of Natural Sciences and Mathematics, Maribor, Slovenia

24. University of Maribor, Faculty of Medicine, Maribor, Slovenia

25. University of Maribor, Maribor, Slovenia

26. Alma Mater Europaea, International European Centre Maribor (ECM), Maribor, Slovenia

27. Ljubljana University Medical Centre, Ljubljana, Slovenia

28. European School of Genetics in Medicine, Bertinoro, Italy

29. Institute of Neurogenetics and Neuropharmacology at Institute of Genetic and Biomedical Research (IRGB), Sardinia, Italy

30. Children's hospital Philadelphia, Division of Allergy and Immunology, Philadelphia, USA

31. STEM Fellowship, Vancouver, Canada

32. The University of South Florida and University of South Florida Board of Trustees, Department of Pediatric Allergy and Immunology, South Florida, USA

33. Hospital Nacional Edgardo Rebagliati Martins, Division of Allergy and Clinical Immunology, Lima, Peru

34. Instituto de Pesquisa Pele Pequeno Principle, Curitiba, Brazil

35. Latin America Society for Immunodeficiencies (LASID), Sao Paulo, Brazil

36. Rocket Pharmaceuticals, The Alexandria Center for Life Sciences, New York, USA

37. University of São Paulo, Departamento de Imunologia Institute of Biomedical Sciences, Sao Paulo, Brazil

38. Brazilian Group for Immunodeficiency (BRAGID), Universidade Federal de Sao Paulo, Sao Paulo, Brazil

39. Sister María Ludovica Children's Hospital, Division of Pediatric Allergology and Clinical Immunology, La Plata, Argentina

40. Universidade Federal do Rio de Janeiro (UFRJ), Serviço de Alergia e Imunologia do IPPMG, Departamento de Pediatria da Faculdade de Medicina da, Rio de Janeiro, Brazil

41. Al-Sabah Hospital, Allergy and Clinical Immunology Unit, Department of Pediatrics, Kuwait City, Kuwait

42. Great Ormond Street Institute of Child Health, Programme Gene, Stem and Cellular Therapies, University College London, London, UK

43. Mexican Foundation for Girls and Boys with Immunodeficiencies, Mexico City, Mexico
44. Medical College of Wisconsin, Wisconsin, USA **45.** Brain Connectivity and Cognition Lab, Miami, USA
46. Kharkiv Polytechnic Institute, Kharkiv, Ukraine
47. Erasmus Medical Center, Rotterdam, The Netherlands
48. Russian-Armenian University, Institute of Biomedicine and Pharmacy, Yerevan, Armenia
49. Armenian Association of Molecular Immunology and Allergology, Yerevan, Armenia
50. Karolinska Institutet, Department of Laboratory Medicine, Sweden
51. University of Gothenburg, The Queen Silvia Children's Hospital, Gothenburg, Sweden
52. Monash University, Monash Clinical and Imaging Neuroscience, Melbourne, Australia
53. Ludwig Boltzmann Institute for Rare and Undiagnosed Diseases & CeRUD Vienna Center for Rare and Undiagnosed Diseases, Vienna, Austria
54. Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India
55. Pinjab University (PU), Chandigarh, India
56. Arabkir Medical Center, Yerevan, Armenia
57. Akkon University for Human Sciences, Institute for Research in International Assistance (IRIA), Berlin, Germany
58. Center for Biomedical Law at University of Coimbra, Coimbra, Portugal
59. Faculty of Medicine, University of Coimbra, Coimbra, Portugal
60. Thammasat University, Faculty of dentistry, Bangkok, Thailand
61. Astana Medical University, Nur-Sultan, Kazakhstan
62. Naba-Alhayat Foundation for Medical Sciences and Healthcare, Najaf, Iraq
63. Association of Medical Schools in Europe (AMSE), Berlin, Germany
64. Moroccan Association Hassanian for Health and Environment (AMHES), Rabat, Morocco
65. Scenarium Group, GmBH, Berlin, Germany
66. Makerere University, College of Health Sciences (MAKCHS), Kampala, Uganda
67. Azerbaijan Medical University, Baku, Azerbaijan
68. ManRos Therapeutitics, Roscoff, France
69. Care-for-Rare Institute, Munich, Germany
70. Kinderarzt Bonn, Bonn, Germany
71. Avicenna International Academy, Budapest, Hungary
72. Indonesian institute of bioinformatics, Malang, Indonesia
73. Universitas Brawijaya, Malang, Indonesia
74. University of Pavia, Pavia, Italy
75. MCM-DAV-College for Women, Chandigarh, India
76. Rhode Island Hospital, Rhode Island, USA
77. Sultan Qaboos University, Muscat, Oman
78. Baltic International Academy, Riga, Latvia

USERN Offices

Office is the symbol of identification for a persistent and mutually beneficial collaboration. USERN Offices are being established all around the world to promote expansion of scientific activities under mutual benefit and by commitment to USERN statute. USERN opens arms to new collaborations and welcomes scientific centers to open USERN Offices worldwide. We continue to establish new offices worldwide, to dialogue, and commit to operate on science, and on every scientific motion that brings us courage to move further and move forwards. Forty-six offices (46 active) have already been labelled as USERN Offices in different countries, including Iran, USA, Germany, France, Ukraine, and Tajikistan, in only less than 6 years of activity. These offices have been established in 41 cities and 8 countries.

USERN and the office host will collaborate to expand each other's science outreach efforts and concur further borders in science. Establishment of the USERN Office identifies the possibility and commitment of the host to organize educational and research events independently and/or on the ground of USERN intellectual properties and host equipment and properties.

USERN Offices have organized many international and national events. Scientific projects and workshops are among their activities. We continue to establish new offices worldwide, to dialogue, and commit to operate on science, and on every scientific motion that brings us courage to move further and move forwards.

- Organizing educational, scientific courses
- The active participation of USERN's office in domestic and foreign events
- Research Outcomes of the Office
- Introducing USERN and existing potentials

Active USERN Offices list:
1. USERN Headquarter Office, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran; December 25th 2016
2. USERN Dushanbe Office, Tajikistan National Medical Center, Dushanbe, Tajikistan; January 25th 2016
3. USERN SSRC Office, Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran; January 30th 2016
4. USERN PPNCD Office, Research Institute for Primordial Prevention of Non-Communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran; February 17th 2016
5. USERN Roscoff Office, ManRos Therapeutitics, Roscoff, France; March 25th 2016
6. USERN Munich Office, Care-for-Rare Institute, Munich, Germany; April 8th 2016
7. USERN Boston Office, Harvard Medical School, Children's Hospital-Boston, Boston, USA; August 16th 2016
8. USERN Khrakov Office, Kharkiv National Medical University, Kharkiv, Ukraine; December 16th 2016
9. USERN Tabriz Office, FAKT group, Medical Research and Development Complex, Tabriz, Iran; January 1st 2017
10. USERN AJUMS Office, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran; January 1st 2017
11. USERN SSU Office, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; January 1st 2017
12. USERN KMU Office, Kerman University of Medical Sciences, Kerman, Iran; January 1st 2017
13. USERN AUSMT Office, Amol University of Special Modern Technologies, Amol, Iran; January 1st 2017
14. USERN NRC Office, Neuroscience Research Center, Iran University of Medical Sciences, Tehran, Iran; January 1st 2017
15. USERN IUMS Office, Student Research and Technology Coordinator Center, Iran University of Medical Sciences, Tehran, Iran; January 1st 2017
16. USERN BUMS Office, Birjand University of Medical Sciences, Birjand, Iran; January 1st 2017
17. USERN SUMS Office, Shiraz University of Medical Sciences, Shiraz, Iran; January 1st 2017
18. USERN GUMS Office, Guilan University of Medical Sciences, Rasht, Iran; January 1st 2017
19. USERN Bonn Office, Wachsbleiche, Bonn, Germany; February 1st 2017
20. USERN Maribor Office, Faculty of Natural Sciences and Mathematics, University of Maribor, Maribor, Slovenia; February 28th 2017

21. USERN AIC Office, Avicenna International College, Budapest, Hungary; February 30th 2017

22. USERN IAUM office, Islamic Azad University of Mashhad, Faculty of Medicine, Mashhad, Iran; March 13th 2017

23. USERN MUI Office, Isfahan University of Medical Sciences, Isfahan, Iran; July 23rd 2017

24. USERN ZAUMS Office, Zahedan University of Medical Sciences, Sistan va Balouchestan, Iran; October 21st 2017

25. USERN ZUMS Office, Zanjan University of Medical Sciences, Zanjan, Iran; March 18th 2018

26. USERN MazUMS Office, Mazandaran University of Medical Sciences, Mazandaran, Iran; April 23rd 2018

27. USERN ArakU Office, Arak University, Arak, Iran; May 20th 2018

28. USERN UMSHA Office, Hamadan University of Medical Sciences and Health Services, Hamadan, Iran; May 21st 2018

29. USERN AUMS Office, Abadan University of Medical Sciences, Abadan, Iran; November 14th 2018

30. USERN CARE (TUMS) Office, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran; November 21st 2018

31. USERN Dentistry School (TUMS) Office, Tehran University of Medical Sciences, Tehran, Iran; December 30th 2018

32. USERN ISV Office, ISV Company, Qom, Iran; April 20th 2019

33. USERN PGBSRI Office, The Persian Gulf Biomedical Sciences Research Institute, Bushehr University of Medical Sciences, Bushehr, Iran; April 27th 2019

34. USERN Amirkabir Office, Amirkabir University of Technology, Tehran, Iran; June 12th 2019

35. USERN HUMS Office, Hormozgan University of Medical Sciences, Bandarabbas, Iran; June 20th 2019

36. USERN ABZUMS Office, Alborz University of Medical Sciences, Karaj, Iran; July 20th 2019

37. USERN ArUMS Office, Ardabil University of Medical Sciences, Ardabil, Iran; August 20th 2019

38. USERN SBMU Office, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran; October 2nd 2019

39. USERN SKUMS Office, Shahrekord University of Medical Sciences, Shahrekord, Iran; December 1st 2019

40. USERN FUMS Office, Fasa University of Medical Sciences, Fasa, Iran; September 2nd 2020

41. USERN JUMS Office, Jahrom University of Medical Sciences, Jahrom, Iran; September 21st 2020

42. USERN MUBabol Office, Babol University of Medical Sciences, Babol, Iran; December 16th 2020

43. USERN FNRC Office, Functional Neurosurgery Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran; March 13th 2021

44. USERN LUMS Office, Lorestan University of Medical Sciences, Lorestan, Iran; March 17th 2021

45. USERN KUMS Office, Kermanshah University of Medical Sciences, Kermanshah, Iran; May 11th 2021

46. USERN GoUMS Office, Golestan University of Medical Sciences, Golestan, Iran; August 21st 2021

47. USERN KAUMS Office, Kashan University of Medical Sciences, Kashan, Iran (Not Established)

USERN Prize

USERN 2016 Laureate in Formal Sciences

Lucas Jopa — **USA**

Technology for Nature

USERN 2016 Laureate in Physical and Chemical Sciences

Jamshid Aghaei — **Iran**

Evaluating Technical Benefits and Risks of Renewable Energy Sources Increasing Penetration in Electrical Networks
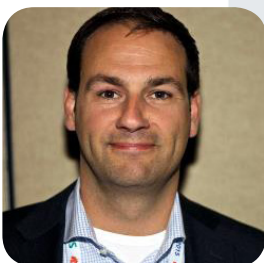

USERN 2016 Laureate in Biological Sciences

Morteza Mahmoudi — **USA**

Defining the Biological Identity of Nanotherapeutics for High Yield Cancer Therapy

USERN 2016 Laureate in Medical Sciences

Alexander Leemans — **The Netherlands**

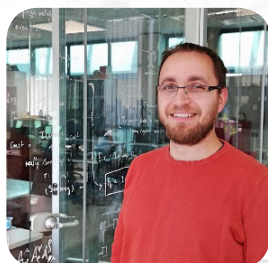*Processing and visualization in Diffusion Imaging*

USERN 2016 Laureate in Social Sciences

Floris de Longe — **Belgium**

Expectations Sharpen the Visual Response

USERN 2017 Laureate in Formal Sciences

Manlio de Domenico	Spain

Multilayer Structure and Dynamics of the Physical World: Modeling the Complexity of Systems

USERN 2017 Laureate in Physical and Chemical Sciences

Maria Magdalena Titirici	UK

The Design of Efficient and Low Cost Electrocatalysts Without the Use of Critical Metals

USERN 2017 Laureate in Biological Sciences

Valentina Cauda	Italy

Hybrid Immune-Eluding Nanocrystala as Smart and Active Theranostic Weapons Against Cancer-TorjaNanoHorse

USERN 2017 Laureate in Medical Sciences

Lucina Qazi Uddin	USA

Brain Dynamics and Flexible Behaviour in Autism and ADHD

USERN 2017 Laureate in Social Sciences

Matjaz Perc	Slovenia

Transition Towards Cooperation in Human Societies

The 6th International USERN Congress and Prize Awarding Festival
Congress Scientific Program, Abstracts and Introduction of Honorary Speakers

USERN 2018 Laureate in Formal Sciences

Jacob D. Biamonte	Russia

Quantum Enhanced Machine Learning

USERN 2018 Laureate in Physical and Chemical Sciences

Xavier Moya	UK

Barocaloric Materials foe Environment-Friendly Solid State Refrigeration

USERN 2018 Laureate in Biological Sciences

Alex Fornito	Australia

Maps, Models, and Modifiers of Brain Changes in Psychosis

USERN 2018 Laureate in Medical Sciences

Gian Paolo Fadini	Italy

Circulating Stem Cells in Diabetic Complications (Remediation)

USERN 2018 Laureate in Social Sciences

Igor Grossmann	Canada

Wisdom- Towards the Social and Behavioural Science of Sound Judgment

USERN 2019 Laureate in Formal Sciences

Lucas Lacasa	UK

Brifging Signal Processing and Network Science

USERN 2019 Laureate in Physical and Chemical Sciences

Giulia Grancini	Italy

Multidimentional Ferroelectric Hybrid Perovskites for Advanced Optoelectronics

USERN 2019 Laureate in Biological Sciences

Ajeet Kaushik	USA

Nanobiotechnology for Personalized Healthcare

USERN 2019 Laureate in Medical Sciences

Eugenia Morselli	Chile

Mechanisms of Hypothalamic Authophagy in Obesity

USERN 2019 Laureate in Social Sciences

Benjamin Sovaccol	Denmark/UK

Social Justice in an Era of Climate Change and Energy Scarcity

USERN 2020 Laureate in Formal Sciences

Dongrui Wu	China

Signal Processing and Machine Learning for Calibration-free and Secure Brain-Computer Interfaces (BCIs)

USERN 2020 Laureate in Physical and Chemical Sciences

Gregory Mark Allen Ashton	Australia

Black holes and neutron stars: enabling astrophysics with Bilb y

USERN 2020 Laureate in Biological Sciences

Daniel Sauter	Germany

Deciphering molecular determinants of coronavirus spread in the human population

USERN 2020 in Medical Sciences

Mohammad Ali Shahbazi	Finland

A Thermo-responsive Biopolymeric Microimplant for the Treatment of Autoimmune Disorders
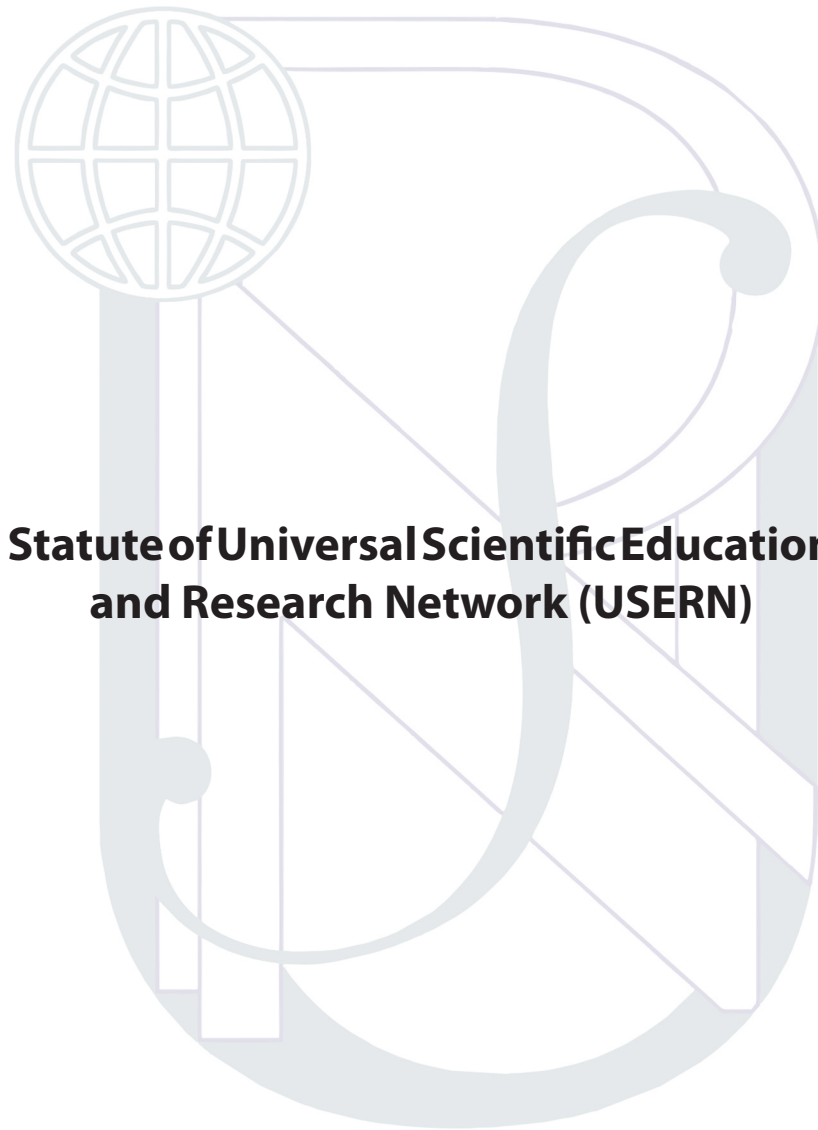
USERN 2020 Laureate in Social Sciences

Lianne Schamaal	Australia

A Global Alliance to Elucidate Neurobiological Signatures of Depression and Suicide

Statute of Universal Scientific Education and Research Network (USERN)

Article I. Name and Purpose

Section I. Name
The network shall be known as "universal scientific education and research network".The official acronym for the network shall be "USERN".

Section II. Purpose
Here by in this agreement we define USERN as follows:
USERN is organized exclusively for advancement of authentic, ethical and professional scientific research and education and consequently advancement of science for non-military purposes and public good. In this definition, "Science is a systematic study of nature and manners of an object and the natural universe that is established around measurement, experiment, observation and formulation of laws." USERN is to be established as an independent, non-governmental, non-profit organization and network for peaceful non-military scientific executions and policy making.

Section III. Vision
Members of this agreement believe that USERN will one day become a reliable network of universally validated resources including ideas, facilities, human, financial and educational resources in order to launch and facilitate authentic, ethical and professional scientific research intended to improve universal science policy making and human life.

Section IV. Mission
Our mission is to provide scientific and technical infrastructure in order to universally:

IV i. Validate and improve ideas, facilities, human, financial and educational resources and determine their scientific credibility and reliability
IV ii. Connect and share ideas, facilities, human, financial and educational resources considering their scope and their grades and establish their collaboration
IV iii. Take a leading role in the scientific world through making universal science policies that will be established and executed for the promotion of human life.

Article II. Organizational Structure

Section I. Governing structure
Governance and management shall be separated in USERN. The Policy Making Council is responsible for overall policy and direction of the network; and delegates responsibility of operations to the Executive Director and managers (staff). In addition, the Advisory Board provides non-binding strategic advice to both Policy Making Council and staff in a number of matters.

Section II. USERN initiation
The first President of USSERN would be the founder responsible for establishment of USERN statute and structure. His term of presidency would start after establishment of first Policy Making Council comprised of at least 3 members in each different sub-branches of science.

Section III. Financial structure
USERN shall be established as a non-profit network and therefore, all financial resources, including network incomes shall belong to the network and would be expended in the network in order to proceed with scientific missions. The stockholders and members of USERN shall not financially benefit from USERN as salary or any personal pension. Decision making on incomes and expenses of network shall belong to the Policy Making Council with a three-quarter vote for any decision on network expenses. The fiscal/financial year of the USERN shall start January 1st through December 31st.

Article III. Advisory Board

Section I. Role
The Advisory Board is responsible for providing non-binding strategic advice to both Policy Making Council and staff in a number of matters and dissolving disputes in the network. In addition, they can strengthen the brand name of USERN via its advertisement and dissemination. Advisory Board shall advise the Policy Making Council on strategic matters and its members have the privilege of attending all USERN Policy Making Council meetings and participating in discussions. Advisory Board members shall be categorized and sorted into one of the different fields of science and they can elect their representatives in Policy Making Council with their votes.

Section II. Composition
The Advisory Board shall have unlimited number of members who are outstanding in their field of study and met the eligibility requirements, including top 1% scientists based on the ESI, Nobel Laureates, Abel Prize Laureates, Copley Medal Recipients and USERN prize winners.
Clause I. Any scientist nominated by at least three Advisory Board members could be potentially voted by Policy Making Council (a three-quarter vote) to be included in the Advisory Board.

Section III. Resignation
Resignation from the Advisory Board must be in writing and received by the President.

Section IV. Duration of Advisory Board membership
Any renowned scientist could potentially become the member of Advisory Board at the initiation of fulfilling the Advisory Board membership criteria. The Advisory Board list would be updated in 3-year intervals to include new members of Advisory Board.

Section V. Termination of membership in Advisory Board
The membership of any Advisory Board member shall be terminated following disrespect to USERN statute and/or guiding principle at any time by a majority of the vote (a three-quarter vote) of the Policy Making Council members. The Advisory Board member would also have the right to terminate his/her membership through sending formal request to the USERN President.

Article IV. Policy Making Council

Section I. Roles
The Policy Making Council is responsible for overall policy and direction of the network, setting policy, and providing a strategic executive plan. The board shall include at least one representative of each field of science, the President, and the Executive Director as a non-voting member. They would be also responsible for nominating and electing the President.

Section II. Composition
The Policy Making Council members would be elected from among Advisory Board members who have fulfilled their membership for at least three consecutive years and have gained the majority of the vote of the Advisory Board in each major branch of science.

Section III. Term
All board members shall serve a 3-year term, but are eligible for re-election for another consecutive term. They can be re-elected after 3 years interval.

Section IV. Decision-making
The Policy Making Council has the right to and is responsible for making decisions for all issues of the

network, except for the main structure of the network including vision, mission, and the concept of Policy Making Council and Advisory Board. Issues regarding establishing a new activity shall arise from Advisory Board members, Policy Making Council members or Executive Director. These decisions should be discussed in a board meeting and be approved by the majority of the vote (50% + 1 vote) of the board members. Any issues regarding the Policy Making Council itself should be approved by the majority of the vote (50% + 1 vote) of the Advisory Board. Establishing any clause or defining a new part in the statue shall be discussed by the Policy Making Council and be approved by at least a three-quarter vote of the Advisory Board members.

Section V. Removal
The membership of a Policy Making Council member shall be terminated from the board by the majority of the vote (a three-quarter vote) of the remaining board members due to not fulfilling his/her duties or poor performance or being proven inconsistent or performing incompatible activities and operations with those of USERN at any time

Clause: In case of removal or resignation of a Policy Making Council member, the new representative of the respected field shall be elected by the Advisory Board.

Article V. President

Section I. Role
President is responsible for:
Scheduling and setting agendas of Policy Making Council meetings.
Leading discussions at meetings; Following agendas and observing all rules of order.
Coordinating any board activity outside of the meetings.
Overseeing the hiring and evaluating the performance of the Executive Director.
Ensuring the board performs its job well and evaluates its own performance.
To be the official representative of USERN.

Section II. Eligibility
A President shall be elected by the majority of the vote (50% + 1 vote) of the Policy Making Council members.
A Policy Making Council member shall be nominated for President of the Policy Making Council.

Section III. Terms
The President shall serve a 3-year term, but could be eligible for re-election for another consecutive term.
They can be re-elected after 3 years interval.

Article VI. Membership

Section I. Eligibility for membership
Application for membership shall be open to any scientist who has the following conditions:
• Supports the purpose statement, vision and mission in Article I, Sections III and IV.
• Accepts this statute and the guiding principles.
• Is not involved in any militia or terrorist groups.
• Completed the membership application.

Section II. Annual dues
The amount required for annual dues of regular membership is free.
Clause 1: In the case of other types of membership, the annual dues of the respective members would be assigned by a three-quarter vote of the members in the Policy Making Council.

Section III. Rights of members
Each member shall be eligible to use the resources available in the network according to the rules and regulations of USERN.

Section IV. Resignation
Any member may terminate his/her membership through contacting USERN authorities; and their resignation would be open through usual membership application. USERN authorities would terminate the membership of members who do not comply with principles of USERN statues; and readmission of these members would be dependent on the decision of respective authorities.

Section V. Expulsion or suspension
A member shall be suspended or removed from the network due to disrespecting USERN statute and/or guiding principle upon approval of President or Executive Director.

Article VII. Staff

Section I. Role
The basic duties of USERN staff shall be managing the entire USERN approved activities, adopt the plan of activities according to strategies developed by the Policy Making Council and is subject to the direction and control of the Policy Making Council.

Section II. Composition
It shall comprise the Executive Director, managers and the respective management divisions as follows:

II i. Support and Resource Development Division
This division is responsible for:
Providing infrastructures for communication of Policy Making Council members, Advisory Board members and staff members.
Maintenance and development of technical aspects of USERN network.
Development of all resources of USERN via advertisement, dissemination, member recruitment and fundraising.
Enforcing rules and regulations of USERN on members and other elements in the network and taking disciplinary actions.

II ii. Scientific affairs division
This division is responsible for establishing scientific steering councils for each major branch of science. Any sub-division (including associations, interest groups, networks and etc) shall be supported by at least one of the Advisory Board members and shall be approved by the majority of the vote (50% + 1 vote) of the scientific steering councils for each major branch. Members of each branches of science can be nominated to be members of the respective scientific steering council and they shall be elected by votes of the members of that branch.
Clause:The membership of scientific steering council is not limited to the Advisory Board members. The criteria for membership of scientific steering council in each major branch of science would be established by the Policy Making Council.

II.ii.1. Roles of scientific affairs
Scientific steering councils are responsible to provide:
Scientific guidelines and educational materials and to define scientific processes for each research line for different fields.
Scientific measures and guidelines for determining scientific credibility and reliability and to classify and grade elements in the network.
Establishment of random supervisory councils which are responsible for making decision about disciplinary

357

actions and supervision of educational and research projects.

Clause I: The Policy Making Council may create management committees as needed.

II iii. The Executive Director
II.iii.1. Roles

The responsibilities of Executive Director shall include carrying out the organization's goals and policies. The Executive Director will attend all board meetings, report on the progress of the network, answer questions of the board members and carry out the duties described in the job description. The board can designate other duties as necessary. Main duties of the Executive Director include:

• Hiring, firing, and supervising the staff according to the policies and strategies defined by the Policy Making Council.

• Managing and evaluating programs and operations according to the policies and strategies defined by the board.

• Identifying, acquiring, and managing resources according to the policies and strategies defined by the board.

• Preparing an annual budget according to board decisions on annual activities.

• Proposing policies and strategic initiatives to the board. Supporting the board in its work.

• Promoting the organization in the community.

• Supervising the infrastructures of staff including managing committees.

II.iii.2. Eligibility

The President could nominate an Executive Director from either the board or staff members. The Executive Director then shall be elected by the majority of the vote (50% + 1 vote) of the Policy Making Council.

II.iii.3. Term

The Executive Director shall serve a 3-year term, but could be eligible for re-election for another consecutive term.

II.iii.4. Removal

The authorities of Executive Director could be assigned to another candidate in case of board decision, not respecting USERN statute or poor performance.

Section III. Appointment

New members and current staff members shall be appointed by the Executive Director and upon approval of the President of the Policy Making Council.

Section IV. Resignation

Resignation from the staff must be in writing and received by the Executive Director.

Article VIII. Amendments and Validity

The statute and network policies would be reviewed in 3-year intervals and may be amended according to the inputs of Advisory Board and by approval of both Policy Making Council and President. The principles of statute except for vision and mission and basic structure of network may be amended when necessary by a three-quarter vote of the Advisory Board. Proposed amendments must be submitted to the President to be sent out with regular board announcements.

Article IX. USERN Prize

Section I. Definition of USERN Prize and eligibility criteria

USERN prize is an international award, established by the USERN, which would be annually bestowed to junior scientists or researchers less than 40 years of age for any novel advancement or achievement in

scientific education, research, or serving the humanity in five scientific fields including formal sciences, physical sciences, biological sciences, medical sciences, and social sciences.

The eligible candidates would either apply for the prize independently or be nominated by the Advisory Board members or any senior scientist in the respective field.

Section II. The objectives of awarding USERN prize

The USERN prize shall be awarded annually for the following purposes:

Promoting universal peace in the scientific world.

Developing international scientific communication in order to globalize the scientific world.

Introducing creative and diligent junior scientists to the scientific world.

Motivating and encouraging junior researchers and scientists in their field and promoting their universal scientific status in order to promote their scientific efforts.

Identifying powerful young minds, who could potentially cooperate in USERN scientific programs and projects in the future.

Encouraging and promoting the interdisciplinary fields in universal scale.

Promoting universal peace in the scientific world.

Developing international scientific communication in order to globalize the scientific world.

Introducing creative and diligent junior scientists to the scientific world.

Motivating and encouraging junior researchers and scientists in their field and promoting their universal scientific status in order to promote their scientific efforts.

Identifying powerful young minds, who could potentially cooperate in USERN scientific programs and projects in the future.

Encouraging and promoting the interdisciplinary fields in universal scale.

Promoting hopefulness, self-confidence, and effort-value among young scientists.

Informing the academic world about the importance of valuing science and scientific efforts.

Section I. The awards for USERN prize laureates

The prizes for the winners will include:

USERN prize statute and medal.

Financial grant for the best scientific work promotion.

The travel grant for attending the festival, including attending the meetings and conferences, flight ticket, accommodation, and attending the social programs.

The winners in each field will be offered a one week scientific visit to a number of top institutes worldwide with free accommodation, supported by the respective host which will be credited for one year.

Section II. Jury for evaluation of candidates

The jury shall comprise of at least 10 Advisory Board members in each major branch of science who would be responsible for evaluation and ranking of candidates according to defined criteria of selection and principles of ethics. The Policy Making Council members of each field shall annually nominate at least 10 Advisory Board members of each five major branches in order to form the jury. The Advisory Board members could also nominate candidates for receiving the USERN prize that would be then evaluated by the respective board.

Section III. Selection criteria

The Policy Making Council shall be responsible for establishing and announcing the selection criteria for awarding USERN prize. Any amendments in principles of evaluative criteria shall be based on a majority of the vote of Policy Making Council members (a three-quarter vote) in each major branch of science. The eligible candidates would be evaluated according to their best scientific work or achievement and their scientific resume. The proposed works would be scored according to their contribution in research, education, and serving the humanity.

III i. Evaluation of the best scientific work of each candidate

All the proposed works in each of five scientific fields would be evaluated and judged together, irrespective

of their aspect (research, education or serving the humanity). The evaluative criteria for assessment of the best scientific work would include Novelty, Significance, Rationality, Design of the project, Leadership, Teamwork, Productivity, Extent of the project, Interdisciplinarity, Multidimensionality, commitment to principles of Ethics, and Impact on human subjects.

III ii. Evaluation of the candidate's scientific resume
The scientific resumes would be evaluated in different aspects including educational, research, executive, and other backgrounds. The evaluation criteria for assessment of candidates' resume in each aspect shall include:
• Educational educational achievements in the past 10 years, number of studied academic fields, highest academic educational degree, teaching experiences, conducting educational projects or proposing new educational curriculum, and educational impact on human subjects.
• Research published articles or books and their impact on science and human life considering their citation number, the H-index of candidate, the submitted patents considering the productivity, impact on science and human life, interdisciplinarity and extent of research projects.
• Executive the number and extent of executive projects, impact of conducted projects on science and human life.

* This statute was written in 9 articles and 34 sections and overall has 5 clauses.
* This statute has been signed by more than 100 top 1% scientists on November 10th, 2016.