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24 SEPTEMBER

2024

VIRTUAL EVENT

ADVANCES IN CLINICAL AND CELLULAR IMMUNOLOGY

&

GLOBAL VIROLOGY CONGRESS

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PROGRAM-AT-A-GLANCE >>

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ADV. IMMUNOLOGY 2024 & FUTURE VIROLOGY 2024

2024
SEPTEMBER 24

Scientific Program

BST (British Summer Time)

08:25-08:40	**Opening Ceremony**

Topics: Immunology | Autoimmunity | Immune System | Cancer Immunology | Vaccines and Immunotherapy | Epidemiology | | Immunodeficiency | Immunology of Infectious Diseases | General Virology | Antiviral Research | Antiviral Drug Discovery and Development | Coronavirus Disease COVID-19 | Medical Virology | Emerging and Re-emerging Viral Diseases | AIDS Research and Therapy | Cellular Microbiology | Clinical and Diagnostic Virology | Virus-Cell, Virus-Microbe, and Virus-Host Interactions

Distinguished Speaker Talks

08:40-09:00	**Title: Signature for response to PD-L1 inhibitor in metastatic Urothelial Cancer** **Grace S. Shieh,** *Institute of Statistical Science, Academia Sinica, Taiwan*
09:00-09:20	**Title: IgG level of the third booster dose for mRNA of SARS-CoV-2 vaccines among Iraqi healthcare workers** **Waleed Salih Rasheed,** *Duhok Polytechnic University, Iraq*
09:20-09:40	**Title: Single-cell transcriptome revealed dysregulated RNA binding protein expression patterns and functions in human ankylosing spondylitis** **Yuan Ma & Zheng Ren,** *Sixth Affiliated Hospital of Xinjiang Medical University, China*
09:40-10:00	**Title: Another battlefield within the war against viruses** **Mohamed Abdelbary Wafa Mowafy,** *Imam Abdulrahman Bin Faisal University, Saudi Arabia*
10:00-10:20	**Title: A decade of CD4+ chimeric antigen receptor T-cell evolution in two chronic lymphocytic leukemia patients: were chronic lymphocytic leukemia cells present?** **Dimitrios Bouzianas,** *BReMeL, Biopharmaceutical and Regenerative Medicine Laboratories, Greece*
10:20-10:40	**Title: Delineating mechanisms underpinning the monocyte monolayer to improve transfusion safety** **Melinda Dean,** *University of the Sunshine Coast, Australia*

10:40-11:00	**Title: Polymyalgia rheumatica "the immunological puzzle": Recent updates in diagnosis and management** **Rahma Elziaty,** *Ain Shams University, Egypt*
11:00-11:05 (E-Poster)	**Title: Antimicrobial effect using air catalyst called health bright in healthcare facility: A 3-year analyzing report** **Ikuma Kasuga,** *Tohto University, Japan*
Refreshment Break 11:05-11:15	
11:15-11:35	**Title: Molecular Characterization and Phylogenetic Analysis of Lumpy Skin Disease Virus (LSDV) in Ballari and Vijayanagara District, Karnataka, India** **Krishnaveni R,** *Vijayanagara Sri Krishnadevaraya University, India*
11:35-11:55	**Title: Will stem cell-based therapy or cell-free therapy replace conventional treatments for tissue regeneration?** **Iwona Deszcz,** *Wroclaw Medical University, Poland*
11:55- 12:15	**Title: Alleviative efficiency of quercetin-PLGA loaded nanoparticles against inflammatory and oxidative toxic effects of *Cerastes cerastes* venom** **Oussedik-Oumehdi Habiba,** *University of Sciences and Technology Houari Boumediene, Algeria*
12:15-12:35	**Title: A new paradigm for the role of extrathymic AIRE in the regulation of cytoskeleton: a case for Sertoli cells** **Dominik Filipp,** *Institute of Molecular Genetics of the Czech Academy of Sciences, Czech Republic*
12:35-12:55	**Title: In-Silico Investigation: Peptidomimetic Fullerene-Based Derivatives Targeting SARS-CoV-2 M^{pro}** **Noha Ali Saleh,** *Imam Abdulrahman Bin Faisal University, Saudi Arabia*
12:55-13:15	**Title: Prevalence and antibiogram of bacteria causing urinary tract infection among patients with chronic kidney disease** **Puspa Raj Khanal,** *Sumeru Hospital Pvt Ltd., Nepal*
13:15-13:35	**Title: Assessment of Mosquito-borne diseases threat: A Molecular Xenomonitoring approach** **R. Balasubramaniyan,** *ICMR-Vector Control Research Centre, India*
13:35-13:40 (E-Poster)	**Title: Evaluation of a care bundle to support healthcare workers wearing N95 masks** **Hermione Shea,** *Monash University, Australia*

Lunch Break 13:40-13:55

13:55-14:15	**Title: Global control of unprecedented and re-emerging pandemics: Challenges and perspectives** **Ilias Elmouki,** *National School of Applied Sciences-Safi (ENSA-S), Morocco*
14:15-14:35	**Title: The effect of Alzheimeric brain homogenate on secretome of periodontal ligament stem cells spheroids: a promising neuroregenerative therapy for Alzheimer's disease** **Fariba Mohebichamkhorami,** *Shahid Beheshti University of Medical Sciences, Iran*
14:35-14:55	**Title: A clinical neurological approach to the child with adenosine deaminase deficiency** **Paula Ivarola,** *Hospital Nacional de Pediatría Prof. Dr. Juan P. Garrahan, Argentina*
14:55-15:15	**Title: Host cell factors involved in classical swine fever virus entry** **Yaneysis Lamothe Reyes,** *Universidad San Sebastián, Chile*
15:15-15:25 (E-Poster)	**Title: A new derivative of indole-3-Carboxylic Acid and it's *In Vitro* antiviral activity** **Alexander N. Narovlyansky,** *National Research Centre for Epidemiology and Microbiology named after the honorary academician N.F. Gamaleya, Ministry of Health of the Russian Federation, Russia*

Refreshment Break 15:25-15:50

15:50-16:10	**Title: Monocyte HLA-DR expression in refractory or recurring infections in the critically ill patient – a pilot study to better define late acquired immune dysfunction** **Jan-Alexis Tremblay,** *Centre de recherche de l'Hôpital Maisonneuve-Rosemont, Canada*
16:10-16:30	**Title: Therapeutic trials for long COVID-19: A call to action from the intervention's taskforce of the RECOVER initiative** **Hector Bonilla,** *Stanford University, USA*
16:30-16:50	**Title: Elimination of acquired resistance in immune checkpoint blockade therapy** **Yong Lu,** *Houston Methodist Research Institute, USA*

16:50-17:10	**Title: Antisynthetase syndrome and the lung** **Lawrence H Brent,** *Temple University Hospital, USA*
17:10-17:30	**Title: Predicting response to immunotherapy in non-small cell lung cancer- from bench to bedside** **Benjamin Spieler,** *University of Miami, USA*
17:30-17:50	**Title: Characterization of circulating macromolecular immune complexes in the serum of IgA nephropathy patients** **Rajindra Prasad Aryal,** *Harvard Medical School, USA*
17:50-18:10	**Title: NeoExpand: neoantigen-specific stimulation of T cells for effective expansion for adoptive cellular therapies** **Sanghyun (Peter) Kim,** *National Cancer Institute, USA*
18:10-18:30	**Title: Short chain fatty acids in cancer pathogenesis** **Mark A. Feitelson,** *Temple University, USA*
18:30-18:50	**Title: Anionic pulmonary surfactant Lipids antagonism against multiple respiratory viral infections and inflammation** **Mari Numata-Nakamura,** *National Jewish Health, USA*
18:50-19:10	**Title: Clinical study of anogenital condyloma acuminata treatment with photodynamic therapy including immunocompromised conditions** **María Paulina Romero Obando,** *Escuela Politécnica Nacional, Ecuador*
19:10-19:30	**Title: Condom use and drug consumption in migrants** **Cynthia Lizbeth Ruiz Bugarin,** *Universidad Autónoma de Baja California, México*
19:30-19:50	**Title: Wild rabies in the context of one health** **Paulina Fragoso-Zamora,** *Universidad Autónoma de Querétaro, Mexico*
19:50-20:10	**Title: Granulomatosis with Polyangitis (Small vessel vasculitis)** **Daram Varun Kumar,** *Gandhi Medical College, India*
20:10-20:20 (E-Poster)	**Title: Vemurafenib- and vobimetinib-associated drug reaction with eosinophilia and systemic symptoms in a patient with metastatic melanoma** **Salsabeal Al Saedy,** *Washington State University, USA*

Panel Discussion

Closing Remarks

PEERS ALLEY MEDIA

DISTINGUISHED SPEAKER TALKS

Virtual Event

Advances in Clinical and Cellular Immunology & Global Virology Congress

September 24, 2024

ADV. IMMUNOLOGY 2024

& FUTURE VIROLOGY 2024

Signature for response to PD-L1 inhibitor in metastatic Urothelial Cancer

Grace S. Shieh[1], Peter Langfelder[2] and **Shu-Ming Yang[1]**

[1]Institute of Statistical Science, Academia Sinica, Taiwan
[2]Semel Institute for Neuroscience & Human Behavior, UCLA, USA

About 90% of human cancer deaths are due to metastasis. To date, immune checkpoint inhibitors (ICIs) are one of the frontier treatments that have improved the survival of cancer patients with few side effects. However, the objective response rate for ICIs is low, only ~30% in urothelial carcinoma (UC), highlighting the need to identify signatures to predict response. Several state-of-the-art signatures have been revealed in first-tier journals, demonstrating the area's importance. As the number of genes (features; ~20,000) greatly exceeds the sample sizes of training sets (≤300), we first developed feature selection procedures to reduce features to a few hundred. Next, we trained several classifiers using Imvigor210 and the selected genes, which comprises RNA-seq and clinical data of ~298 patients with mUC, via 5-fold cross-validation (CV). In particular, our predictor based on logit regression with the revealed signature (prediction AUC of 0.75) outperforms several known signatures, which include PD-L1, PD-1, the IFNG, tGE8, T exhaust, and T inflamed. This study presents a machine learning-based method to effectively identify the signatures for predicting response to ICIs.

Biography

Grace S. Shieh received her PhD in Statistics, from Dept. of Statistics, Univ. of Wisconsin, -Madison, U.S.A. She branched into Bioinformatics in 2000. She is a full research fellow, Inst. of Statistical Science, Academia Sinica, Taiwan, and a core faculty member, TIGP-Bioinformatics program, A.S., a professor, Genome & Systems Biology program/Data Science program, A.S. and NTU.

In the past few years, her research team has focused on the prediction of response of cancer patients to immuno-, targeted, and chemo-therapies, using gene expression and clinical data. In particular, her team has revealed a 50-gene signature for Erlotinib and other targeted therapies (Yuan et al., 2023). Further, they have identified a 49(27)-gene signature to predict the response to PD-L1 inhibitors for patients with metastatic Urothelial (Renal cell) carcinoma (PCD4989g), respectively.

IgG level of the third booster dose for mRNA of SARS-CoV-2 vaccines among Iraqi healthcare workers

Waleed S. Rasheed[1] and **Alaa Noori Sarkees**[2]

[1]Department of Public Health, College of Health and Medical Technology, Duhok Polytechnic University, Iraq
[2]Department of Nursing, College of Health and Medical Technology, Duhok Polytechnic University, Iraq

Background and Objective: Mass vaccination is an effective method for controlling the outbreak of coronavirus disease 2019 (COVID-19) and limiting the consequent mortality due to severe COVID-19. After the second dose, immunity can decline in certain cases over time; therefore, a third booster dose should be administered. Therefore, the present study aimed to assess the immunogenicity of the third dose of the messenger ribonucleic acid (mRNA) BioNTech (BNT162b2) COVID-19 vaccine and determine the effect of the third booster dose of mRNA COVID-19 vaccines, specifically Oxford/AstraZeneca (ChAdOx1/AZD1222), BioNTech (BNT162b2), and Sinopharm (BBIBP-CorV) among healthcare workers.

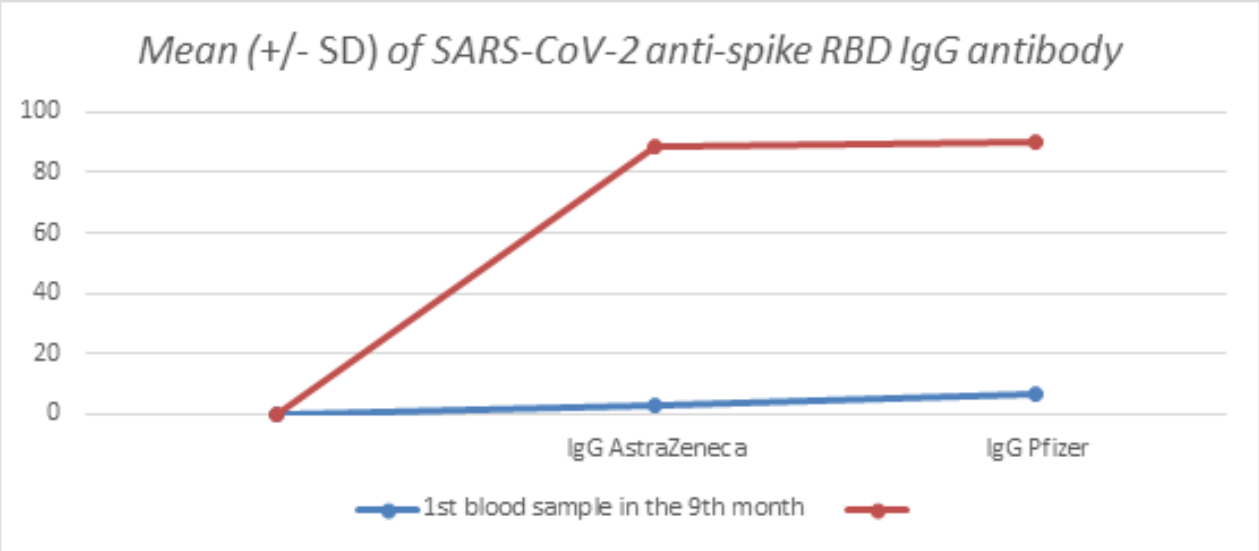
Materials: This longitudinal panel design was conducted with 256 healthcare workers in Duhok Province, Iraq, from June to October 2022.

Results: Most participants had a normal body mass index (44% and 41% in the first and second phase, respectively). In the first phase, significant associations were observed between COVID-19 vaccines and positivity (p-value ≤ 0.001), and between age groups and positivity (p-value = 0.001). The mean severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) anti-spike receptor-binding domain (RBD) immunoglobulin G (IgG) antibody level in the ninth month was the highest among those who had received the Pfizer vaccine (6.7930), followed by AstraZeneca (2.8492), and Sinopharm (0.3060). In the 12th month, all 82 participants received Pfizer as a booster dose, and the highest mean SARS-CoV-2 anti-spike RBD IgG antibody in the 12th month belonged to those whose second dose was Pfizer (46.8835), followed by AstraZeneca (36.4635), and Sinopharm (21.7815).

Conclusion: The Pfizer vaccine is highly effective in restoring SARS-CoV-2-specific immune responses and is well-tolerated. However, further investigation is required to determine the duration of disease protection of the third dose of the COVID-19 vaccine.

Table 3. The mean of SARS-CoV-2 anti-spike RBD IgG antibody among health staff after nine months from the second dose and booster dose after 12 months of COVID-19 vaccines

COVID-19 vaccine types	1st blood sample in the 9th month			2nd blood sample in the 12th month		
	Mean	N	Std. Deviation	Mean	N	Std. Deviation
IgG AstraZeneca	2.8492	86	3.70254	36.4635	17	16.49025
IgG Pfizer	6.793	83	9.88333	46.8835	31	16.051
IgG Sinopharm	0.306	87	0.6943	21.7815	34	12.22946



Biography

Dr. Waleed Salih Rasheed is a distinguished epidemiologist and healthcare researcher with a profound commitment to advancing public health. Holding a PhD in Public health, he has dedicated his career to investigating vaccine efficacy and immunogenicity. With numerous publications in the field of infectious diseases, particularly COVID-19. Currently affiliated with Duhok Polytechnic University in Iraq.

Single-cell transcriptome revealed dysregulated RNA binding protein expression patterns and functions in human ankylosing spondylitis

Yuan Ma[1], Zheng Ren[1,2] and **Jing Wang[1,2]**

[1]Xinjiang Institute of Spinal Surgery, Sixth Affiliated Hospital of Xinjiang Medical University, China
[2]Xinjiang Medical University, China

Objective: To explore the expression characteristics and regulatory patterns of RBPs in different immune cell types of AS, and to clarify the potential key role of RBPs in the occurrence and development of AS disease.

Methods: PBMC sample data from scRNA-seq (HC*29, AS*10) and bulk RNA-seq (NC*3, AS*5) were selected for correlation analysis.

Results: (1) Compared with the HC group, the numbers of B, DC (dendritic cells), CD14+Mono and CD8+ T cells were increased in AS group, while the numbers of platelet (platelets), CD8+ NKT, CD16+ Mono (non-classical monocytes), Native CD4+ T and NK were decreased. (2) Through the analysis of RBP genes in B cells, some RBPs were found to play an important role in B cell differentiation and function, such as DDX3X, SFPQ, SRRM1, UPF2. (3) It may be related to B-cell receptor, IgA immunity, NOD-like receptor and other signaling pathways; Through the analysis of RBP genes in CD8+ T cells, some RBPs that play an important role in the immune regulation of CD8+ T were found, such as EIF2S3, EIF4B, HSPA5, MSL3, PABPC1 and SRSF7; It may be related to T cell receptor, TNF, IL17 and other signaling pathways. (4) Based on bulk RNA-seq, it was found that compared with HC and AS patients, differentially expressed variable splicing genes (RASGs) may play an important role in the occurrence and development of AS by participating in transcriptional regulation, protein phosphorylation and ubiquitination, DNA replication, angiogenesis, intracellular signal transduction and other related pathways.

Conclusion: RBPs has specific expression characteristics in different immune cell types of AS patients, and has important regulatory functions. Its abnormal expression and regulation may be closely related to the occurrence and development of AS.

Biography

Yuan Ma

He is a chief physician, Associate Professor, Doctor/master supervisor, Director of Spinal Surgery Institute of Xinjiang Uygur Autonomous Region.

Specialty: idiopathic scoliosis, tonic scoliosis, tuberculous kyphosis and other spinal deformity orthopaedic surgery and a variety of cervical, thoracic and lumbar surgery treatment.

Academic positions: Deputy Chairman of the Chinese Branch of Spinal Cord Injury, International Society of Spinal Cord; Executive Director, Spine Branch, Chinese Orthopaedic Society, Chinese Medical Association; Standing Member of Chinese Society of Bone Tuberculosis; Member of Spine deformities Working Group, Orthopedic Surgeons Branch, Chinese Medical Doctor Association; Member of spine Working Committee, Orthopedic Branch, Chinese Medical Doctor Association

Scientific research achievements: edited 16 monographs and published more than 10 SCI papers. Presided over 3 National Natural Science Foundation projects, with a total research funding of more than one million yuan; He won the first prize of Science and Technology Progress Award in Yunnan Province.

Zheng Ren

Research interests: Orthopedics basic research, stem cell implantation repair, bone and cartilage injury; Spinal related diseases, cervical spondylosis, adolescent scoliosis, ankylosing spondylitis, intervertebral disc herniation, spinal minimally invasive treatment.

Scientific research achievements:4 SCI papers; 16 core journal papers; 7 utility model patents; Participated in the compilation of 1 book as editorial board member, participated in the compilation of 1 book as deputy editor, participated in the compilation of 1 textbook as deputy editor; Presided over and participated in a total of 6 national, autonomous region and university level scientific research projects.

Another battlefield within the war against viruses

Mohamed Abdelbary Wafa Mowafy

Imam Abdulrahman Bin Faisal University, Saudi Arabia

Many governments all over the world, imposed curfews on their citizens between 2020 and 2022, among their war against Covid-19 spread worldwide. Unfortunately, from the architectural point of view, another battlefield within the war against viruses has emerged, as staying at certain places for longer times is supposed to have implications on humans' physical and mental health. Whereas influences in some closed spaces have a beneficial effect on humans, unlike some bad influences in other spaces.

Through literature review and from an architectural perspective, the objective of this research is to present a framework to deal with similar cases in the future. This is descriptive research, as this paper demonstrates the possibility of the impact of the place on its occupant's health. It is known that human bodies contain both physical and energetic natures, similar to the earth in which we live. The research results showed that there is a certain impact of the place on both humans' physical and mental health, which results from one or both, the natural earth's electromagnetic field, and the buildings' designs and proportions.

In conclusion, there are many methods and theories to deal with the energies of the place that have a negative impact on humans. One strategy could be followed by establishing new adequate buildings, or another by just making some modifications to the existing ones. Following the science of BioGeometry design criteria, provides a way to apply a regulatory energy that eliminates the negative impact of the existing energies, whether their sources are natural or artificial.

Biography

Mohamed Mowafy is an Assistant Professor of Architecture in Imam Abdulrahman Bin Faisal University (IAU) in Saudi Arabia. Before IAU, he was a lecturer at the Faculty of Fine Arts; Alexandria University in Egypt, where he gained his master's degree and his Ph.D from . As the Architecture devoted to humans, the main concern for him was to search in every field may affect humans related to the designed buildings. He consulted and trying to establish a multi-disciplinary research thread to build greater specialist diverse research. For instance, his research combines physics, medicine, and spirituality along with architecture. Over time this work of connecting dots combined with his own commitment to complete the puzzle, led to a more focused expertise in design healthier spaces. As continuous searching in a diverse, inclusive environment leads to increased professional and personal satisfaction.

A decade of CD4+ chimeric antigen receptor T-cell evolution in two chronic lymphocytic leukemia patients: were chronic lymphocytic leukemia cells present?

Dimitrios Bouzianas[1] and **Stella Bouziana**[2]

[1]BReMeL, Biopharmaceutical and Regenerative Medicine Laboratories, Greece
[2]Department of Hematology, King's College Hospital, UK

Chimeric antigen receptor (CAR) T-cell therapy represents one of the most promising cancer immunotherapies. Since 2017, six CAR T-cell products have been approved by the FDA against refractory hematological malignancies. However, prolonged complete disease remissions (CR) are rarely achieved and the usual outcome is relapse, at best after a few years remission.

This article comments on a paper entitled "*Decade-long leukemia remissions with the persistence of CD4+ CAR T-cells*" published in *Nature*, Feb 2022; 602:503-509. We provide arguments for the potential cure of two chronic lymphocytic leukemia (CLL) patients within the first six months after anti-CD19 CAR T-cell infusion, back in 2010. The authors brought to light the surprising finding of descendent cells of the initially CAR T-cells to circulate in the patient's blood, accompanied by minimal residual disease negative CR. Leukemia symptoms disappeared for more than a decade correlated with severe B-cell aplasia. It's the first time such a long-term "remission" has been observed and researchers declared that both patients were deemed cured. However, the actual disease status of both patients still remains unclear: (1) Did CAR T-cells kill all leukemia cells during the initial anti-leukemic response phase, soon after CAR T-cell infusion? (2) Did few CLL cells survive, but persistent CAR T-cells destroyed any leukemia cells before they reach detectable levels? In the first case, both patients could be considered definitely cured; in the second not and their decade-prolonged deep remission could be a consequence of the cytotoxic activity of the functionally active CD4+ CAR T-cells. The first version appears to be stronger and our supporting arguments have been included in a comprehensive commentary article. A new therapeutic intervention may emerge with the potential to fully improve the quality of life of both patients and in addition, ongoing research into CAR T-cells may turn in a new, more effective direction.

Biography

Pharmacist - Biologist - PhD in Medicine, Aristotle University of Thessaloniki (AUTH), Greece - Teaching Qualifications from SELETE, Thessaloniki

Specialist in Cell Culture techniques:

- Visiting scientist in the Paterson Institute/Christie Hospital, Manchester/England.
- Organization of Cell Culture Dpt / Lab Histology-Embryology, Medical Faculty, AUTH.
- Lectures and advisory scientific collaborations.
- Holder of a Patent on human bone marrow hematopoietic stem cell cultures (search in Hague/Holland Office).

Anthrax bioterrorism:

- Invited speaker at 100th Anniversary of the Nobel Prize awarded to Paul Ehrlich, Nurnberg, Germany about medical countermeasures to protect humans from anthrax bioterrorism).
- http://pubs.acs.org/doi/citedby/10.1021/jm901024b Paper chosen by the American Chemical Society for the weekly PressPac of June 23, 2010 on “New medical weapons to protect against anthrax attacks”.
- Impact on the USA public awareness: *Why is Dimitrios Bouzianas an expert in Anthrax*?

Therapeutic use of omega-3 fatty acids in the metabolic syndrome.

CAR-T cells:

- Development of a new method with CAR-T cells against B-cell hematological malignancies (transition to chronically controlled diseases).
- Educational video https://www.youtube.com/watch?v=ZCsjT_P80CM

Teaching experience:

- Eight years in International Hellenic University.
- Authorship of Pharmacology textbook distributed at the Athens Agricultural University.

Copyright holder of a monograph on an innovative retinal pigment epithelial cell implant for AMD patients.

Inclusion in the 26th American edition of 2009 of "Who's Who in the World".

Twenty years' professional experience as a Pharmacist Officer/Greek Army.

Current establishment of BReMeL (bremel.gr) biotechnological company.

Delineating mechanisms underpinning the monocyte monolayer to improve transfusion safety

Melinda M Dean[1,2,3], Thu V Tran[1], Jamie M Bryant[1,2], Isabelle Lightbody[1,2], John-Paul Tung[1,2], Helen M Faddy[1,2] and **Robert L Flower[1]**

[1]School of Health, University of the Sunshine Coast, Australia
[2]Australian Red Cross Lifeblood, Kelvin Grove, Australia
[3]Centre for Bioinnovation, Sippy Downs, Australia

A complication of pregnancy and/or transfusion is development of antibodies to red blood cell (RBC) antigens. Clinically significant antibodies can result in serious and often-life threatening transfusion reactions. The monocyte monolayer assay (MMA) is a functional *in vitro* assay used to predict whether a recipient with anti-RBC antibodies can safely receive RBC with the corresponding antigen when antigen negative blood is not available. However, the assay is time consuming, technically demanding and is only performed in a small number of specialised laboratories. The current read out of the assay is a monocyte index which is determined microscopically by quantification of RBC that were bound to or phagocyted by monocytes. RBC clearance is an active process involving receptor binding, cell activation, cytoskeletal rearrangement and cytokine production. Our work has focussed on better understanding of the cellular changes in monocytes following exposure to clinically significant antibodies in order to develop standardised assays with a reduced turn around time that can be implemented in more laboratories. The work presented will outline our current understanding of changed gene expression, cell activation and cytokine profiles in classical monocytes following exposure to clinically significant antibodies and further describe our advances in developing an assay based on immortal monocytic cell lines.

Biography

Dr Dean is a Senior Lecturer and Higher Degrees Research Coordinator in the School of Health at the University of the Sunshine Coast (Moreton Bay, Queensland, Australia). She is an award-winning mid-career researcher with a strong track record of research collaboration and scientific communication. Dr Dean's research is focussed on understanding the pathogenesis of immune mediated adverse transfusion reaction and identifying factors leading to failure of RBC structure and function. Dr Dean is passionate about advancing our knowledge and understanding of immunology and haematology in order to improve patient outcomes. She is also dedicated to providing the highest level of education and training to the next generation of scientists. Dr Dean is currently the Queensland convenor for the Australian Society of Medical Research and holds adjunct positions of Associate Professor (Queensland University of Technology) and Research Fellow (Australian Red Cross Lifeblood).

Polymyalgia rheumatica “the immunological puzzle”: Recent updates in diagnosis and management

Rahma Elziaty

Ain Shams University, Egypt

Polymyalgia rheumatica (PMR) is a frequent rheumatic condition among people over 50 years of age. Despite its frequent association with giant cell arteritis (GCA), PMR can be isolated. Its pathophysiology is poorly understood. Many studies are ongoing; 98 studies are currently referenced in ClinicalTrials.org involving several conventional and targeted therapies. PMR remains difficult to classify.

Several additional studies confirmed the association between HLA-DRB1 and PMR/GCA, limiting this association to the HLA-DRB1*0401 and HLA-DRB1*0404 alleles or distinguishing between HLA-DRB1*01 in PMR and rheumatoid arthritis patients versus HLA-DRB1*04 in rheumatoid arthritis patients only.

Should we refer to PMR as vasculitis, an autoimmune disease or an inflammatory disease? PMR occurs in patients over 50 years of age, with a peak incidence at approximately 75 years of age, suggesting that aging plays a role in its pathophysiology. Accurate diagnosis is difficult in PMR; because proximal pain and stiffness syndrome, a commonly accepted phenotype of PMR, can occur in many other rheumatologic and inflammatory illnesses.

Glucocorticoids are the cornerstone of PMR treatment and, despite the availability of new and sophisticated drugs, they remain unsurpassed in terms of resolution of symptoms and control of infammation. Therapy for polymyalgia rheumatica(PMR) varies widely in clinical practice as international recommendations for PMR treatment established according to European League Against Rheumatism (EULAR)/American College of Rheumatology (ACR) recommendations for the management of PMR.

Biography

Lecturer of internal medicine “Rheumatology division”, she has been engaged in adult clinical rheumatology for 13 years. One of the Ain Shams Uveitis team and rheumatology consultant of uveitis clinic at Ain Shams University hospital “El Demerdash hospital” for 3 years now. Interested in Capillaroscopy and a member of the Capillaroscopy team in her department. Participated as speaker and tutor in Capillaroscopy workshop in Egypt and Competed the EULAR course of Capillaroscopy in Vienna 2024. Teaching coordinator in her department. Author of 1st edition Rheumatology handout for 5th year medical student at Modern University for Technology & Information (MTI), Faculty of Medicine. Interested in education, research and have many publications.

Antimicrobial effect using air catalyst called health bright in healthcare facility: A 3-year analyzing report

Ikuma Kasuga[1,2,3,4], Yoshimi Yokoe[1], Sanae Gamo[1], Tomoko Sugiyama[1], Maiko Noguchi[1], Michiyo Tokura[1], Mayumi Okayama[1], Nariko Ohmori[1], Yoshitsugu Takeda[5], Takeshi Sato[6], Itto Nakashima[7], Kazuyo Wakabayashi[7], Shigeru Yamamoto[7] and **Osamu Ohtsubo[2,8]**

[1]Healthcare Center, Shinjuku Oiwake Clinic and Ladies Branch, Seikokai, Japan
[2]Department of Nursing, Faculty of Human Care, Tohto University, Saitama, Japan
[3]Department of Internal Medicine, Faculty of Medicine, Tokyo Medical University, Japan
[4]Life Redesign College, Waseda University, Japan
[5]Healthcare Center, Shinjuku Oiwake Clinic Itabashi Branch, Seikokai, Japan
[6]Healthcare Center, Healthport Clinic, Seikokai, Japan
[7]Seikokai Healthcare Center, Japan
[8]Kenkoigaku Association, Japan

Background: Air catalyst is a new antiviral, antibacterial and antifungal technology and has recently been used widely in our country. However, it is unclear whether they are actually effective in the facilities and is also unclear the duration of its effect.

Material and Method: In our healthcare facility, we used air catalyst called Health Bright® and this liquid substance was sprayed to coat every part of the facility. After that, we measured and monitored the amount of adenosine triphosphate (ATP) in each coated place for a 3-year period.

Results: The ATP amount in each room before air catalyst coating showed approximately 2000 – 8000 relative light unit (RLU). However, its amount decreased the day after the coating in all room. The ATP amount still keep low after 6 months, 1 year, 2 years and 3 years compared to that of before treatment. Of note is it showed less than 500 RLU in endoscopy room.

Conclusion: Our current data demonstrated the possible efficacy of air catalyst against virus, bacteria and fungus in the healthcare facilities. We also showed its effect to maintain at least 3 years after coating.

Recommendation: Another assay for the measurement of microbial amount will be recommended to confirm our current data.

Biography

Dr. Ikuma Kasuga is a director of Healthcare Center, Shinjuku Oiwake Clinic and Ladies Branch, and is also a guest professor at Tokyo Medical University and Tohto University. After he got Ph.D. in April 1997 in First Department of Internal Medicine, Tokyo Medical University, and he went to do a visiting scientist at iCAPTURE Centre, St Paul's Hospital, University of British Columbia, Vancouver, BC, Canada. The major research focus is the genetic and clinical approach to pulmonary disease especially lung cancer and mediastinal tumors.

Molecular Characterization and Phylogenetic Analysis of Lumpy Skin Disease Virus (LSDV) in Ballari and Vijayanagara District, Karnataka, India

Krishnaveni R and **Rajasekhar N**

Veterinary Department, Vijayanagara Sri Krishnadevaraya University, India

Lumpy skin disease (LSD) is a transboundary disease of cattle, caused by Lumpy skin Disease virus (LSDV). In 2020, Ballari and Hospet districts were recorded the severe outbreak and hence the molecular epidemiology studies based on the conventional data collected from Veterinary department and symptoms of diseased cattle in different taluks and villages of Ballari and Hospet Districts.

In this study, a total of 44 blood samples collected randomly from various cattle only 3 samples from Vannenur and Bobbukunte villages of Ballari District showed positive with RPO gene (800 bp) and P32 gene (237 bp) amplification by PCR method. Up on sequencing RPO gene of Vannenur sample showed 99.86% and Bobbukunte samples showed 97.03% and similarity with Kenya strains with Accession No: MN072619, Russia strain with Accession No: MT134042, and Indian Ranchi 2019 strain with Accession No: OK422493. The phylogenetic analysis indicated that the identified LSDV of Ballari region were genetically, related to Neethling Strain from Africa which might be speeded to Bangladesh and then circulated to India. This finding strongly supports the transboundary spreading of LSDVs throughout Asian and African countries. For the first time molecular characterization and phylogenetic analysis of LSDV circulating in northern Karnataka especially from Ballari and Hospet region was reported, will contribute to the existing efforts of the government of Karnataka, India in developing effective control strategies, for vaccine development to reduce the LSD.

Biography

Dr. krishnaveni R passionate about research and innovations. Interested in understanding diversity and bacterial and viral interactions, biomolecules interactions, molecular biology of microorganisms. Working as Assistant professor from 6 years and designated as Chairman. Department of Microbiology, Vijayanagara srikrishnadevaraya University Ballari-583105. She has 13-year experience in research. She is a Hardworking, research oriented and established the Department of Microbiology during 2019 and handling MSc. PhD courses being Chairman, BOE, BOS member. She has completed her PhD in 2010, did her Post doctoral research associateship from MBU, IISc, later did her post-doctoral research from Department of Microbiology, UAS Dharwad. She worked with various research grants and published the work in reputed journals. She Received Research excellence award, Prosper Foundation and Agri Amigos Pvt Ltd Teaching and Research awards 2023 held at Kanyakumari and also Received Dr. Sarvepalli Radha Krishna Teachers Award from Solet, Vijayawada in 2023.

Will stem cell-based therapy or cell-free therapy replace conventional treatments for tissue regeneration?

Iwona Deszcz

Department of Immunopathology and Molecular Biology, Wroclaw Medical University, Poland

Growing evidence reveals the regenerative capability of mesenchymal stem cells from different sources, attributed to their self-renewal capacity, differentiation potential, immunosuppressive properties, and lack of immunogenicity. These unique cells have been isolated from various tissues, including bone marrow, adipose tissue, the umbilical cord, dental tissues, skeletal muscles, and cardiac tissue. However, it is still controversial which type of tissue is most suitable as a cell source for regenerative medicine.

Physiologically, stem cells reside in a specific environment known as a niche, which plays a crucial role in maintaining their stemness. In response to tissue damage, the cells are stimulated by various immune factors such as cytokines and growth factors, enhancing their proliferation and migration to the injury site. Unfortunately, the limited number of stem cells in the adult tissue is insufficient for regenerating cartilage or heart tissue. Thanks to the possibility of increasing the number of stem cells *in vitro* and their differentiation potential, cell-based therapies enable the precise delivery of a large number of cells to the site of damage. However, these therapies have limitations, prompting scientists to look for alternative approaches. Research indicates that stem cells secrete various cytokines, chemokines, growth factors, anti-inflammatory factors, and other components into their culture media. These bioactive factors promote angiogenesis, provide neuroprotective functions, and exhibit antiapoptotic, antioxidative effects. Cell-free therapies emerge as a promising alternative, devoid of live cells, thereby minimizing concerns related to immune rejection and ethical considerations. Moreover, stem cells and their secretomes have garnered significant attention for their immunomodulatory potential effects, particularly in autoimmune diseases such as rheumatoid arthritis, Crohn's disease, and multiple sclerosis.

In this presentation, I will discuss the current state of research and anticipate future developments to shed light on whether stem cell-based or cell-free therapy is poised to revolutionize tissue regeneration treatments.

Biography

Iwona Deszcz scientific journey began with her work for master thesis about application of electrochemotherapy and photodynamic therapy for breast cancer at Wroclaw Technical University. She continued her cancer research at Wroclaw Medical University, where during her PhD studies. She was looking for targeted therapies and personalized medicine for patients with ovarian cancer. Few years ago, in Department of Immunopathology and Molecular Biology. She began researches focusing at innovative solutions for tissue regeneration - cell therapies, stem cells therapies, and bioimplants.

Alleviative efficiency of quercetin-PLGA loaded nanoparticles against inflammatory and oxidative toxic effects of *Cerastes cerastes* venom

Habiba Oussedik-Oumehdi, Kahina Kiouas and **Fatima Laraba-Djebari**

Laboratory of Cellular and Molecular Biology, Faculty of Biological Sciences, University of Sciences and Technology Houari Boumediene, Algeria

Background and aim: Viper venoms contain a diverse array of biologically active compounds yielding various clinical effects, spanning from local tissue damage to severe systemic complications. Inflammation and oxidative stress are widely recognized to be closely associated with the onset and propagation of local and systemic toxicity caused by viper venoms, emphasizing the potential advantages of antioxidant therapy in addressing this challenge. This study aimed to assess the potential of quercetin (QT) and quercetin-loaded PLGA nanoparticles (QT-NPs) in mitigating the inflammatory and oxidative toxic effects of C. cerastes venom.

Methods: QT was encapsulated into PLGA nanoparticles by the nanoprecipitation method. The developed QT-NPs underwent physicochemical characterization and were then evaluated in the 'challenge then treat' model of envenoming. Indeed, the animals were i.p. envenomed and, 30 min later administered with QT or QT-NPs. The efficiency of QT-NPs was assessed by histopathological and immunohistochemical analysis of liver and kidney biopsies and, by evaluation of inflammation and redox status markers.

Results: The results indicated that both QT and QT-NPs treatments effectively ameliorated hepatic and renal tissue damage, characterized by reduced hemorrhage, edema, and inflammatory cell infiltration. Immunohistochemistry analysis further revealed a notable reduction in macrophage and T lymphocyte infiltration. Additionally, the treatments reduced oxidative stress and inflammation, with a significant decrease in MDA and NO levels, along with a notable increase in SOD activity in hepatic and renal homogenates. Furthermore, the treatments led to a significant reduction in MPO activity and serum TNF-α levels. Remarkably, QT-NPs exhibited superior efficacy compared to free quercetin, particularly at 24 hours within envenomation.

Conclusion: These findings highlighted the therapeutic potential of QT-NPs on venom-induced toxicity, and opens up the avenue for their use in the management of snakebite envenoming.

Biography

Professor Oussedik-Oumehdi Habiba obtained the doctorate in Biochemistry-Immunology in 2007. She is a Research Director within the team « Biomolecules: Mode of Action, Immunotherapy and Immunodiagnosis » and the Director of Excellence Laboratory (Tamayouz) of Cellular and Molecular Biology, at the University of Science and Technology Houari Boumediene. She has supervised seven PhD since 2016. She teaches many courses, including Cellular and Molecular Signalling, the Molecular Basis of Pathogenesis and Pharmacotechny. She has several research projects on the elucidation of the mechanisms underlying tissue damage and necrosis induced after viper envenomation, and the application of Immunotherapy and Biotherapy and, currently has a project focusing on the evaluation of biotherapy using nanotechnology in the treatment of the diabetic foot.

A new paradigm for the role of extrathymic AIRE in the regulation of cytoskeleton: a case for Sertoli cells

Dominik Filipp, Jana Petrusová and **Jasper Manning**

Laboratory of Immunobiology, Institute of Molecular Genetics of the Czech Academy of Sciences, Czech Republic

Autoimmune regulator (Aire), one of the most studied transcription factors, is well known for its critical contribution to the establishment of immunological tolerance, a phenomenon that takes place in the thymus. Since Aire loss-of function mutations can lead to the onset of multi-organ autoimmunity, Aire has been studied for nearly three decades almost exclusively in the context of medullary thymic epithelial cell (mTEC) function where it regulates mechanisms involved in the prevention of autoimmunity. Recently, we and others have shown that Aire also fulfils an analogous immune function in a rare subset of lymph node cells. In addition, accumulating evidence suggests that Aire is also expressed in other non-immune cell types and tissues. Our newly acquired data now provides unambiguous proof of the novel role of Aire in testes. In the absence of Aire, the process of spermatogenesis is spatially disordered resulting in markedly reduced and malformed sperm leading to sterility. This aberrant phenotype is not only caused by transcriptional deregulation but also a previously undescribed cytoplasmic function of Aire in relation to essential microtubule cytoskeleton regulation. Importantly, we have evidence that AIRE is also associated with microtubules in autoimmunitypreventing mTECs as well as rapidly dividing cancer cells. This strongly suggests that AIRE could have a much broader spectrum of activities implicated in the modulation of physiological as well as pathological processes. We believe that this data invites for a revised view on the function of the Aire protein and could provide novel approaches for therapeutic interventions in processes linked to sterility, autoimmunity, and malignancy.

Biography

Dominik Filipp, Phd., graduated from the Faculty of Natural Sciences of the Comenius University in Bratislava, Slovakia. He completed a postdoctoral stay in Marseille (1992-1993) and in Toronto (1994-2007). Since 2007, he has been working at the Institute of Molecular Genetics of the Academy of Sciences of the Czech Republic as head of the Department of Immunobiology, where he studies the mechanisms of immune responses and immune tolerance. He lectures immunology at the Faculty of Science of the Charles University in Prague.

In-Silico Investigation: Peptidomimetic Fullerene-Based Derivatives Targeting SARS-CoV-2 M^{pro}

Noha A. Saleh

Imam Abdulrahman Bin Faisal University, Saudi Arabia

The global pandemic COVID-19 is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), resulting in significant morbidity and mortality. This study introduces 12 novel peptidomimetic fullerene-based derivatives organized into three groups (Figure 1), which are theoretically explored as inhibitors of SARS-CoV-2 M^{pro} to enhance potential COVID-19 treatment strategies. The design and optimization of these compounds performs at the B88-LYP/DZVP method. Molecular descriptor results underscore the stability and reactivity of the compounds, particularly within the 3rd group (Ser compounds). However, Lipinski's Rule of Five values suggest that these compounds may not be suitable for oral drug administration. Additionally, molecular docking simulations investigate the binding affinity and interaction modes of the top five compounds (compounds 1, 9, 11, 2, and 10) with M^{pro}, revealing their lowest binding energy. Molecular dynamics simulations over a duration of 100 ns further assess the stability of protein-ligand complexes involving compounds 1 and 9, comparing them with interactions with the natural substrate. Analysis of RMSD, H-bonds, Rg, and SASA indicates that both compounds 1 (Gly-α acid) and 9 (Ser-α acid) exhibit commendable stability and strong binding affinity with the Mpro protein. Nevertheless, compound 9 demonstrates slightly superior stability and binding affinity compared to compound 1.

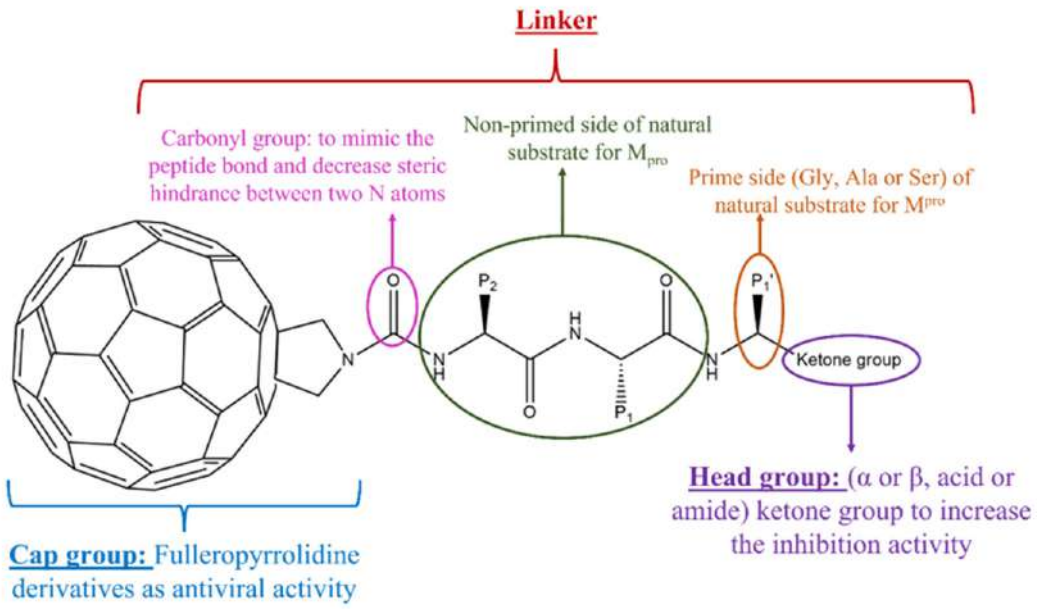


Figure 1: Schematic illustration of SAR (Structure-Activity Relationship) map for suggested compounds.

Biography

Dr. Noha Saleh holds a Ph.D. in biophysics and serves as a devoted Associate Professor in the Biophysics Department at the Faculty of Science, Cairo University. Concurrently, she is affiliated with the Physics Department at the Faculty of Science, Imam Abdulrahman Bin Faisal University. Additionally, Dr. Saleh serves as a scientific research member at the Basic and Applied Scientific Research Centre, Imam Abdulrahman Bin Faisal University. Dr. Saleh's expertise lies in computational biophysics and Computer-Aided Drug Design, encompassing areas such as molecular modeling, Quantitative Structure-Activity Relationship (QSAR), Structural Bioinformatics, and Molecular Dynamic Simulation (MDS) calculations. With a prolific academic record, she has authored over 30 scientific papers, contributed to two chapters in scientific books, and actively participated in funded scientific projects. Dr. Saleh has been recognized for her contributions with awards for Scientific Publication from both Cairo University and Imam Abdulrahman bin Faisal University.

Prevalence and antibiogram of bacteria causing urinary tract infection among patients with chronic kidney disease

Puspa Raj Khanal[2], Tika Bahadur Thapa[1,2], Sushant Pokhrel[1], Anit Lamichhane[1,2], Vinay Kumar Singh[2], Ojaswee Shrestha[2] and **Manisha Sapkota[1]**

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[2]Department of Pathology, Sumeru Hospital Pvt Ltd, Nepal

Urinary tract infection (UTI) is the most frequent bacterial infection in clinical practice worldwide. Identifying and appropriately managing urinary tract infections (UTIs) among chronic kidney disease (CKD) patients is crucial to reduce further disease complications and economic burden. Hence, this study aimed to determine the prevalence of UTIs among CKD patients and study the antibiogram of the bacterial isolates. Four hundred eighty-two clean catch mid-stream urine samples were collected from CKD patients during the study period. The samples were cultured, and bacteria were isolated using standard microbiological techniques. Antibiotic susceptibility testing was performed by the Kirby–Bauer disc diffusion method following the Clinical and Laboratory Standards Institute guidelines. Of the 482 CKD patients,15.8% were bacterial culture-positive, and the majority of patients were from the elderly group population. Most bacterial isolates were *Escherichia coli* 50%, followed by Pseudomonas aeruginosa 15.80%, *Enterococcus species* 15.80%, and *Klebsiella pneumoniae* 11.84%. Overall, majority of bacteria were found to be resistant to beta-lactam antibiotics, ampicillin (94.67%), ceftriaxone (89.04%), cefotaxime (87.5%), and ceftazidime (84.0%), while polymyxin, colistin, vancomycin, meropenem, and imipenem were the most sensitive antibiotics. In gram-positive bacteria nitrofurantoin, imipenem and meropenem were the most sensitive antibiotics whereas in gram-negative bacteria majority of isolates were sensitive to imipenem, meropenem, and amikacin. In conclusion, our present study found a significant association between the elderly age group, CKD severity, and growth positivity for UTIs. The majority of isolates showed higher resistance to commonly prescribed antibiotics. So, this study highlighted the importance of routine bacterial diagnosis and their antibiogram to reduce the complicated infections and economic burden to CKD patients. In addition, findings from our study could be used for choosing appropriate antibiotic options to treat UTIs among CKD patients.

Biography

Puspa Raj Khanal was born in the place where Lord Buddha was born, i.e., Banganga Municipality of Kapilvastu district in Lumbini Province, Nepal. Having grown up surrounded by educators in his family, he learned about the rewards and achievements to be found in guiding the people of our community. He believes he would pursue this path. However, as he was growing up and receiving his school-level education, he developed a passion for biological science and became fascinated with the diverse biological phenomena around us. Choosing the science stream as his major during high school, he developed a strong inclination toward the subject of human biology and the pathogenic mechanisms of various human diseases. He graduated in clinical laboratory medicine, encompassing various aspects of pathology and applied medicine, with outstanding academic performance. Subsequently, He was selected for postgraduate studies in Immuno-pathology at the prestigious government institution, PGIMER, Chandigarh, India. Currently, he is working as a laboratory practitioner involved in teaching, learning, and research.

Assessment of Mosquito-borne diseases threat: A Molecular Xenomonitoring approach

R. Balasubramaniyan[1], Manju Rahi[2] and **V. Vasuki[3]**

ICMR-Vector Control Research Centre, India

Mosquito-borne diseases (MBDs) are a major global threat to human health. The worldwide highly deadliest diseases of MBDs are dengue and malaria caused by viruses and parasites respectively. These diseases affected many tropical and sub-tropical countries with deprived populations. Overall death accounted for 40,000 and 4,00,000 respective viral and parasite pathogens. In the current global threat of MBDs such as Dengue, Chikungunya, Zika, West Nile virus (WNV), Yellow fever, Japanese encephalitis, malaria, and filaria transmitted by various mosquito genera of Aedes, Anopheles, Culex from human, animal or accidental host reservoirs. Molecular xenomonitoring (MX) is a highly sensitive tool for the detection of viral RNAs/DNAs and parasites DNAs in mosquitoes. Mosquitoes are representative samples for assessment of viral/parasite infection. It could have been collected by using various collection methods and devices for sampling mosquito species. MX is used for cost-effective surveillance of filarial parasites in mosquitoes through a simple DNA extraction method. This technique, developed by ICMR-VCRC, is implemented in India and demonstrated to other countries also.

MX is a complementary tool advocated by WHO for surveillance of Lymphatic filariasis. MX can be utilized for the assessment and monitoring of viral infection in seasonal local vector mosquitoes. It could be a proxy indicator of circulation or resurgence of the threat of the organism in the community through non-invasively without ethical consideration of human samples in a cost-effective manner. The increasing threat of mosquito-borne diseases due to the alteration of the ecosystem for modernization, geo-climatic conditions, vector density, human migration/ travel endemic to non-endemic or eliminated areas, and vector migration from one place to another place are playing a major role. MX is an effective tool for monitoring viral vectors for the prevention of viral diseases. In the current scenario, research often concentrates on primary vector species to detect threat organisms. However, further research is needed to understand the biology and transmission dynamics of both vector and local non-vector mosquitoes. Enhancing our knowledge in these areas will improve surveillance, monitoring tools, and vector control strategies, which are helpful for prevention of mosquito-borne diseases.

Biography

Shri. R. Balasubramaniyan is a Zoologist working as a Technical Officer-C in the ICMR-Vector Control Research Centre, Puducherry with 25 years of experience in molecular and immunological diagnostics of filariasis. He has significantly contributed to the development of molecular tools, including a simple and cost-effective DNA extraction method for detecting filarial parasites in vectors and a stage-specific RT-PCR assay for identifying infective larvae in vectors. These tools aid in assessing ongoing transmission of filariasis. Additionally, he has involved in development of immunological tools for detecting filarial infections in human blood samples. Currently, he is engaged in Molecular Xenomonitoring of filariasis and recognized as a member of National Joint Outbreak Response Team (NJORT) of ICMR and serves as a faculty member for the M.Sc. Public Health Entomology program at ICMR-VCRC, Puducherry, where he has guided five M.Sc. internship students and He has contributed as a corresponding and co-author in various publications. He holds life memberships in professional society and academy, and serves as a reviewer for scientific journals.

Evaluation of a care bundle to support healthcare workers wearing N95 masks

Hermione Shea[1,2], Kathren Puyk[1,3], Michelle Tuck[1], Marcus Kusiak[4], Jaspreet Sidhu[4] and **Tracey Bucknall[4,5]**

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[2]School of Clinical Sciences, Monash University, Australia
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[4]Alfred Health, Australia
[5]School of Nursing & Midwifery, Deakin University, Australia

N95 masks are required to protect healthcare workers from COVID-19, however, they are known to increase the risk of facial skin injuries.

Aim: This study aims to assess adverse outcomes, staff knowledge and behaviour in relation to a care bundle, designed to prevent and manage facial skin injury in healthcare workers wearing N95 masks.

Method: A quasi-experimental study design was used to compare outcomes for staff who were required to wear N95 masks and had access to a care bundle at a major metropolitan health service during the COVID-19 pandemic, compared to those who did not. Staff were invited to participate in an anonymous survey.

Results: The convenience sample included 758 participants and of these 31.3% accessed the care bundle. Post introduction of the care bundle, 59.8% developed facial injury compared to 72.7% who did not use the care bundle ($p = 0.03$). Of staff who accessed the care bundle, 28.7% developed acne, compared to 49.5% who did not access the care bundle ($p = 0.001$). Statistically significant improvements in uptake of prevention and treatment strategies were found in those who accessed the care bundle, compared to those who did not.

Discussion: This study has demonstrated the benefits of a care bundle to support healthcare workers wearing N95 masks. The bundle improved staff knowledge and reduced minor facial skin injuries.

Conclusion: Ongoing COVID-19 cases necessitates that healthcare workers continue to wear N95 masks for long and indefinite periods and as such the field remains an area for future research.

Biography

Hermione Shea is a Wound Clinical Nurse Consultant at Alfred Health in Victoria Australia, and a Unit Advisor at Monash University in Australia. She has received a Bachelor of Science degree (nursing) through Curtin University, Western Australia and a Master's degree in Wound Management through Monash University in Victoria, Australia. Her current role is focussed on pressure injury prevention and the management of acute and chronic wounds within the public healthcare system. Hermione is passionate about minimising the impacts of N95 masks on healthcare workers.

Global control of unprecedented and re-emerging pandemics: Challenges and perspectives

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[2]Department of Economics, Cheung Kong Graduate School of Business, China
[3]Department of Computer Science, FST, Cadi Ayyad University, Morocco

In this talk, we discuss the most recent control strategies devised to manage re-emerging global epidemics and the ones that could emerge without precedent warning. Relying on our results and analysis of other multidisciplinary research conducted in this context as well as in the topic of infodemiology, we conclude that reaching a global control would need a redesign of health education systems worldwide and that should take precedence over any type of actions in the future, since there would always be races between viral variations and vaccine research. As many doctors reported issues related to the limitations of medical resources in the time of the past pandemic even in developed countries, it is also very important to think about policies that could reduce the global health inequity.

Biography

Ilias Elmouki is a Ph.D. in applied mathematics from Hassan II University of Casablanca in Morocco. His research until 2022 focused on control and systems theories with applications to global epidemics, cancers, environmental sustainability, bioeconomy and finance.

The effect of Alzheimeric brain homogenate on secretome of periodontal ligament stem cells spheroids: a promising neuroregenerative therapy for Alzheimer's disease

Fariba Mohebichamkhorami[1,2], Hakimeh Zali[1] and **Mehrdad Faizi[3]**

[1]Department of Tissue Engineering and Applied Cell Sciences, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Iran
[2]Department of Food Science and Technology, University of California Davis, USA
[3]Department of Pharmacology and Toxicology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Iran

Background: Alzheimer's disease (AD) is a debilitating neurodegenerative condition characterized by neuronal death, cognitive impairment, and behavioral disturbances. Among various therapeutic candidates, Mesenchymal Stem Cells (MSCs) have shown promise in fostering neuroregeneration and halting disease progression. Enhancing the MSC secretome through optimized culturing techniques is critical for maximizing its therapeutic efficacy.

Objectives and scope: This study aims to explore the impact of adding brain homogenate from an Alzheimer's rat model (BH-AD) to the culture of periodontal ligament stem cells (PDLSCs) in a three-dimensional (3D) setting. The focus is on assessing whether this method enhances the protein content of the PDLSC secretome and examining its effects on neural cells, particularly in terms of regenerative stimulation or immunomodulatory actions in AD.

Methods: PDLSCs were first isolated and characterized, followed by the formation of spheroids within a specially designed 3D culture plate. The study involved preparing conditioned media (CM) both with and without the induction of the CM with BH-AD to collect PDLSCs-HCM and PDLSCs-CM, respectively. The impact of these CMs on C6 glioma cell viability was evaluated across various concentrations. Additionally, a proteomic analysis of the CMs was conducted.

Results: Successful isolation of PDLSCs was confirmed through adipogenic differentiation and the expression of key MSC markers. The PDLSC spheroids, formed after seven days in 3D culture, demonstrated sustained viability. Examination of CMs on C6 glioma cell viability indicated that both types of CM, especially at lower concentrations, were non-toxic to neural cells. Notably, PDLSCs-HCM exhibited a higher protein concentration than PDLSCs-CM, including proteins like Src-homology 2 domain-containing protein tyrosine phosphatases (SHP-1) with a

vital role in nerve regeneration and muscle glycogen phosphorylase (PYGM), involved glycogen metabolism.

Conclusion: The enhanced secretome from 3D-cultured PDLSC spheroids, treated with BH-AD, emerges as a promising source of neural regenerative factors and offers potential therapeutic avenues for treating Alzheimer's disease.

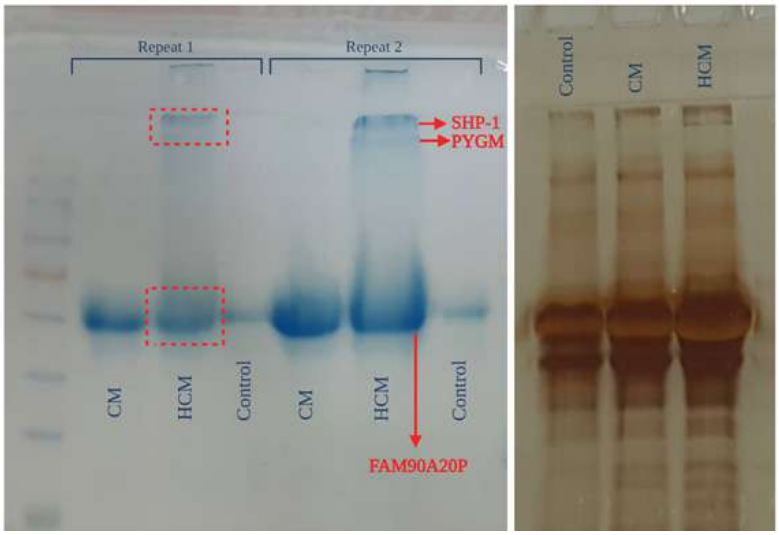

Figure 1. SDS-polyacrylamide gel electrophoresis of the two types of conditioned medium stained with 2 dyes: Coomassie blue and silver nitrate.

Table 1. Gene Ontology and KEGG Pathway Analysis of Detected Proteins

Protein name	Gene Ontology-Biological Process	KEGG Pathway	Disease
PTPN6 or SHP-1	Participating in the differentiation of hematopoietic progenitor cells, inhibiting the humoral immune response governed by circulating immunoglobulins, dephosphorylating proteins, engaging in G protein-coupled receptor signaling pathways, and fostering the growth and proliferation of cell populations.	Adherent junction,-JAK-STAT signaling pathway, natural killer cell-mediated cytotoxicity, T cell receptor signaling pathway, B cell receptor signaling pathway, proteoglycans in cancer, PD-L1 expression, and PD-1 checkpoint pathway in cancer	Deficiency in CD45, various forms of polycythemia including polycythemia vera, subcorneal pustular dermatosis, conditions related to myeloproliferation, and types of neoplastic diseases.

PYGM	Engaged in the metabolism of carbohydrates, the management of glycogen, the breakdown of glycogen, and various other metabolic processes.	-	Conditions including Glycogen Storage Disease type V, Glycogen Storage Disease type VII, muscle wasting, and the presence of myoglobin in urine.

Biography

Fariba Mohebichamkhorami is a distinguished researcher with a strong academic and professional background in tissue engineering and genetics. She completed her PhD in Tissue Engineering and Applied Cell Sciences at Shahid Beheshti University of Medical Sciences in Tehran, Iran. Her Master of Science degree in Genetics was also attained at Shahid Beheshti University and her undergraduate studies in genetics were completed at Shahrekord University in Iran. Currently, she holds a postdoctoral scholar position at the University of California, Davis, since June 2023. Her research focuses on the therapeutic potential of mesenchymal stem cells, particularly in the context of neuroregenerative therapies for Alzheimer's disease. Fariba has contributed significantly to her field, as evidenced by her numerous publications in respected scientific journals. Her work is characterized by a deep commitment to advancing the understanding and application of stem cell technology in medicine.

A clinical neurological approach to the child with adenosine deaminase deficiency

Ivarola Paula[1], Urdinez Luciano[2], Oleastro Matias[2], Labonia Danila[3], Roizen Mariana[3], Caraballo Roberto[1] and **Tenembaum Silvia[1]**

[1]Department of Neurology, Hospital Nacional de Pediatría Prof. Dr. Juan P. Garrahan, Argentina
[2]Department of Immunology and Rheumatology, Hospital Nacional de Pediatría Prof. Dr. Juan P. Garrahan, Argentina
[3]Unit of Bone Marrow Transplantation, Hospital Nacional de Pediatría Prof. Dr. Juan P. Garrahan, Argentina

Introduction: Severe combined immunodeficiency secondary to adenosine deaminase (ADA) deficiency is rare. The deficiency of this enzyme results in an accumulation of substrates in the tissues, including the brain. Clinical signs of neurological involvement may include seizures, neurodevelopmental disorders, hypotonia, and sensorineural hearing loss. Hematopoietic stem cell transplantation corrects the failure of the immune system but not the neurological involvement.

Objectives: To describe the spectrum of neurological complications identified in children with severe combined immunodeficiency due to ADA deficiency, and propose a neurological assessment approach to address this group of children in an efficient and timely manner.

Material and Methods: A descriptive, observational, retro- and prospective analysis of patients with a confirmed immunological diagnosis seen between 1996 and 2021 and referred to the Department of Neurology for neurological evaluation was conducted.

Results: Ten patients met the inclusion criteria. The median age was 4 months (range, 1 - 36 months). All patients had neurodevelopmental delay with hypotonia in six, language delay in three, sensorineural hearing loss in four, and spastic paraparesis in one patient. Two children developed epilepsy. Neuroimaging showed brain calcifications in the basal ganglia and/or central semiovale in four patients and enlarged subarachnoid spaces in two.

Conclusion: In our patients, the rate of neurological involvement was high. While this could be related to accumulation of adenosine metabolites in the CNS, the possibility of associated chronic infections should be ruled out. Given the neurological manifestations, it is important to involve the pediatric neurologist in the multidisciplinary follow-up team.

Biography

Paula Ivarola is a pediatrician and specialist in Child Neurology, trained at the University of Buenos Aires. She works at the Juan P. Garrahan Pediatric Hospital in Buenos Aires Argentina and she is in charge of the consultations of oncologic patients and patients with immunity disorders, who attend their check-ups at the day hospital for hemato-oncologic diseases. She is not only in charge of the follow-up of patients with brain tumors, but also of all patients with neurological complications in the context of oncologic treatment and of those patients with neurological complications in the context of oncologic treatment, as well as those patients with neurological complications in the context of oncologic treatment.

Host cell factors involved in classical swine fever virus entry

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[3]Univesidad de Concepción, Chile

Classical swine fever virus (CSFV) is an ancient pathogen that continues to pose a threat to animal agriculture worldwide. The virus belongs to the genus *Pestivirus* and the family *Flaviviridae*. It causes a multisystemic disease that affects only pigs and is responsible for significant economic losses. CSFV infection is probably a multistep process that involves the proteins in the virus envelope and more than one receptor in the membrane of permissive cells. To date, the cellular receptors essential for CSFV entry and their detailed functions during this process remains unknown. All the viral envelope proteins Erns, E1 and E2 are involved in the entry process to some extent and the experimental approaches conducted until now have helped to unveil their contributions. This review aims to provide an overview of current knowledge on cellular molecules described to be involved in CSFV entry, including complement regulatory protein 46 (CD46), heparan sulphate (HS), Laminin receptor, Integrin ß3, Annexin II, MERKT and ADAM17. This knowl- edge would not only help to understand the molecular mechanisms involved in pestivirus infection, but also provide a rational basis for the development of nonvaccinal alternatives for CSFV control.

Biography

She is a researcher passionate about life sciences. She has a BS in Chemistry and Pharmacy and a PhD in Cellular and Molecular Biology. For the past 7 years she has been involved in designing, producing, and purifying recombinant proteins that can be used for therapeutic or diagnostic purposes. Her work has also involved evaluating the mechanisms of infection of pathogens such as Classical Swine Fever Virus, which is a threat to the global pig industry. She combines her research work with the teaching of pharmacology at the University of San Sebastián in Concepción, Chile.

A new derivative of indole-3-Carboxylic Acid and it's *In Vitro* antiviral activity

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Recent events related to the emergence and pandemic spread of the SARS-CoV-2 virus have once again confirmed that viral infections continue to be poorly controlled [1]. The list of viral infections capable of epidemic spread is steadily expanding – such potential remains for a number of pathogens that pose a danger to humans, such as: SARS and MERS CoV, Ebolavirus, Marburg virus, Zika virus, avian influenza virus, Nipah virus, and Machupo virus [2].

Therefore, the development of new therapeutic agents and strategies to prevent the spread of emerging viral infections remains an urgent practical task. Early antiviral treatment is shown to reduce the incidence of severe and chronic forms of the disease. However, effective low-molecular-weight oral antiviral drugs for outpatient treatment have not been practically developed.

Previously, a group of newly synthesized water-soluble compounds based on aminoalkyl esters of 5-methoxyindole-3-carboxylic acid was studied as antiviral agents [3]. Some of these compounds were selected based on their ability to induce IFN activity *in vitro*, as well as to suppress reproduction of encephalomyocarditis (EMCV) and herpes simplex viruses (HSV-1). This group of compounds was also characterized by low toxicity, good water solubility and high bioavailability. One of these compounds, designated XXV, had high specific activity against HSV-1.

Here we studied antiviral activity of XXV compound *in vitro* against bovine coronavirus (BCV), SARS-CoV-2 and influenza A virus.

At a concentration of 5 mcg/ml, the compound suppressed BCV reproduction by 4 lg TCID50/ml. In addition, it exerted a significant dose-dependent antiviral effect against SARS-Cov-2 *in vitro*. At a concentration of 25 mcg/ml, a decrease in infectious activity of SARS-Cov-2 was more than 5.5 lg TCID50/ml, while the inhibition coefficient (CI) was 99.9997%. At a concentration of 12.5 mcg/ml, Δlg TCID50 was 3.55, with a CI of 99.97182%.

Antiviral activity of XXV *in vitro* against influenza A/California/07/2009 pdm09/ virus in MDCK cell culture was studied. Here also the dose-dependent effect has been revealed. The compound XXV at a dose of 30 mcg/ml suppressed the reproduction of the virus by 3.5 lg TCID50/ml.

Also, we studied the ability of the XXV to suppress syncytium formation mediated by the spike protein (S-glycoprotein) of the SARS-CoV-2 virus. For this purpose, 293T cells were cotransfected with a plasmid containing S-glycoprotein and a plasmid encoding GFP, after which substance XXV and a suspension of 293T-S-GFP effector cells were introduced into the monolayer of Vero E6 cells at a ratio of 3:1. After two hours, the number of syncytia formed was evaluated using fluorescence microscopy. As a result, we found that compound XXV inhibited syncytia formation induced by the S-glycoprotein of the SARS-CoV-2 by 89%.

Currently we test the possible protective activity of compound XXV against a number of other experimental viral infections. It is assumed that this compound can be used as a candidate for the creation of an etiotropic drug for the treatment of coronaviral and other respiratory viral infections.

Biography

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Monocyte HLA-DR expression in refractory or recurring infections in the critically ill patient – a pilot study to better define late acquired immune dysfunction

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Background: Critical illness leads to widespread immune perturbations, often resulting in significant acquired immune dysfunction. Even though multiple immune biomarkers have been assessed in this context, there is currently no accepted clinical phenotypic definition of these patients. We thus developed a new clinical definition of late acquired immune dysfunction and aimed to assess the proportion of these patients with low monocytic HLA-DR (mHLA-DR).

Methods: This is an observational, prospective, single-center study, in which patients with longer ICU stays (beyond 7 days) and either refractory or recurring infections were included to have their mHLA-DR expression assessed.

Results: Twelve (12) ICU patients with refractory and/or recurring infections were included in the study. 7 had refractory infection while 9 had recurring infections and 4 had both. Out of 12 patients, 11 (92%) had low m-HLA DR expression (< 8000 antibodies/cell) compatible with acquired immune dysfunction. The median number of ICU-free days at day 90 was 49 and hospital mortality was 58%.

Conclusion: In this small pilot study, critically ill patients with longer ICU stays and refractory or recurring infection had low levels of monocyte HLA-DR, as clinically expected, suggesting late acquired immune dysfunction. In a pragmatic and personalized approach, this study lays the groundwork for future randomized controlled studies exploring immune-adjuvant strategies in these most fragile patients.

Biography

Dr Tremblay is a critical care physician based in Montreal, Québec, Canada. He has pursued research training in Lyon, France, on the theme of immune dysfunction in critical illness. He is an active researcher in the field of immune monitoring and novel immune-adjuvant therapies in critically ill patients with life-threatening infections.

Therapeutic trials for long COVID-19: A call to action from the intervention's taskforce of the RECOVER initiative

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Since the first cases of SARS-CoV-2 in Wuhan, China, at the end of 2019, a lot of progress has been accomplished in the understanding the pathobiology of acute infection, use of therapeutic interventions (oxygen, dexamethasone, antiviral and immunomodulatory drugs) and preventive measurements (mask, isolation, and vaccination). However, there is still a lack of a clear understanding of the pathobiology of this post-infectious process and therapeutic and preventive interventions on the consequences of this infection called Long COVID or post-acute sequelae of SARS-CoV-2 (PASC). However, the definition is still evolving; it estimates it occurs in 1:10 post-infected individuals develops these conditions. More than 200 symptoms have been reported associated with this illness and several post-COVID incapacitated syndromes such as ME/CFS, POTS, dysautonomia changes, and others. Several hypotheses have been proposed to explain those clinical symptoms from persistent virus, haywire immune system, micro-clots, mitochondria dysfunction, and dysbiosis. Therefore, therapeutic interventions are urgently needed to mitigate the devastating effects of PASC development of therapeutic agents, and clinical trials are slow processes. Thus, another approach to the problem is repurposing drugs that fit the proposed mechanism with an acceptable safety profile. While we endorse clinical trials, especially those that prioritize including the diverse populations most affected by COVID-19 and long COVID-19, we discourage off-label experimentation in uncontrolled and unsupervised settings. This review aims to focus on clinical, pharmacological, and feasibility data, with the goal of informing future interventional research studies.

Elimination of acquired resistance in immune checkpoint blockade therapy

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The reinvigoration of tumor-specific T cells by immune checkpoint blockade (ICB) has recently demonstrated remarkable clinical efficacy across tumor types[1,2]. With higher activity and broader use of ICB immunotherapies, the denominator of patients with a tumor response has increased and the chances of finding patients who responded for a period of time and then progressed, termed acquired resistance, increases[9]. One explanation for the low response rate is that the effects of ICB are negated by the presence of other immune tolerance mechanisms that keep the immune system in check in the tumor microenvironment (TME)[10]. Further, this immunosuppressive phenotype is not abolished by ICB when tumors fail to respond or acquire resistance to ICB therapy[11–16]. However, the contribution of immunosuppressive cells in TME to acquired resistance of ICB immunotherapy is still elusive.

To address this acquired resistance, we identified CD73 as a common marker that is highly expressed by most types of immunosuppressive cells [e.g. regulatory T cells (Treg cells), M2-like tumor-associated macrophages (TAM.M2) cells, and myeloid-derived suppressor cells (MDSCs)] as well as by tumor cells, but not by anti-tumor immune cells, e.g. effector $CD4^+$ T cells or tumor-specific $CD8^+$ T cells. We thus hypothesized that the killing of $CD73^+$ cells in tumor may simultaneously deplete tumor cells and major types of immunosuppressive cells in TME, which may subsequently break the immune tolerance in tumor and overcomes the acquired resistance to ICB.

To achieve this goal, we take advantage of an existing approach for NIR-activated photo-depletion of the target cells[22–24] and create a novel IR-700 dye-conjugated anti-CD73 mAbs (aCD73-Dye). aCD73-Dye conjugates are able to specifically bind to $CD73^+$ cells, and induces highly selective, necrotic cell death of $CD73^+$ cells, without damaging adjoining cells after near-infrared (NIR 690 nm) exposure. When administered intravenously *in vivo*, local NIR exposure eradicated advanced murine tumors (4T1.2 and MMTV-PyMT spontaneous TNBCs and Pan02 PDAC)

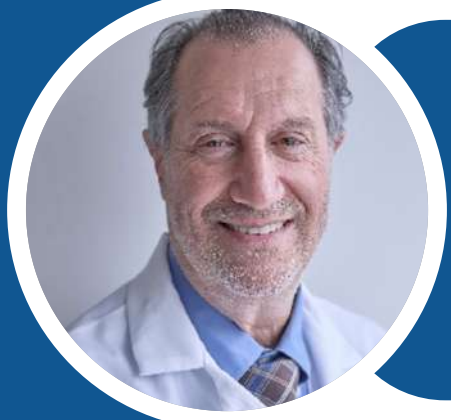
and together with aPD-1 mAb treatment, was associated with ~3 months of tumor-free survival in mice with both local tumors (NIR exposure) and remote tumors (no NIR exposure; serving as metastatic tumors). Furthermore, eradication of $CD73^+$ cells also sensitized human PDAC patient-derived organotypic tumor spheroids to aPD-1 mAb therapy. Therefore, this study revealed a mechanism underlying acquired resistance of ICB immunotherapy and suggested a new strategy for overcoming acquired resistance by local removing all major types of immunosuppressive cells.

Biography

Dr. Yong Lu is an awardee of the 2021 Cancer Prevention & Research Institute of Texas Rising Stars who have demonstrated the promise for continued and enhanced contributions to cancer research. During 2019-2021, he was a member of NCI's cell-based immunotherapy network to: (A) provide NCI with advice on the research gaps in cancer adoptive cell therapy; (B) advise the NCI on future directions of cancer adoptive cell therapy. Dr. Lu's work focuses on translational T cell-based adoptive cell immunotherapy, targeting lung cancer, liver cancer, and other cancers.

Since 2021, Dr. Lu has been awarded, as the PI, 6 R01s from NCI, 1 ACS research scholar grant, 3 cancer foundation grants, and numerous intramural and industry grants.

Recent representative corresponding-authored publications include: Cancer Cell 2024 (In Press); Cancer Cell 2023 (PMID: 36027915); Cancer Cell 2022 (PMID: 34678150); Nature Biomedical Engineering 2021 (PMID: 34725506); Cancer Cell 2018 (PMID: 29894691).



Antisynthetase syndrome and the lung

Lawrence H Brent and **Puja Patel**

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Antisynthetase syndrome is an uncommon autoimmune disease with heterogenous clinical presentations and manifestations. The clinical hallmark is the presence of autoantibodies against an aminoacyl-tRNA synthetases. The clinical manifested include myositis, fever, inflammatory arthritis, Raynaud's phenomenon, mechanics hands, and interstitial lung disease (ILD). The muscle involvement is typically polymyositis or dermatomyositis although the severity varies considerably. The most serious complication of antisynthetase syndrome is interstitial lung disease which may be the initial or only manifestation and may present with rapid progression. While there are 20 different aminoacyl-tRNA synthetases, there are antibodies to only eight some of which are very rare. The exact role of the autoantibodies in the pathogenesis of antisynthetase syndrome, the clinical phenotypes associated with specific autoantibodies including the myositis and interstitial lung disease is variable. This includes the frequency of interstitial lung disease and its severity. Besides, the aminoacyl-tRNA synthetase antibodies, other antibodies are associated with certain clinical phenotypes such as anti-Ro52 being associated with more frequent and severe interstitial lung disease. There are few good clinical trials for the treatment of antisynthetase syndrome associated interstitial lung disease. There are general guidelines from the American College of Rheumatology for the treatment of connective tissue disease associated interstitial lung disease (CTD-ILD). Treatments including glucocorticoids, mycophenlate mofetil, azathioprine, calcineurin inhibitors, rituximab, cyclophosphamide, IVIG, and even CD19 targeted CAR T cell therapy. In patients with more advanced lung disease, antifibrotics can be used. In this discussion, I review the pathogenesis, classification criteria, antibody profiles, clinical features, and treatment options focusing on antisynthetase syndrome associated interstitial lung disease.

Biography

Lawrence H. Brent, MD, is Professor of Medicine at the Lewis Katz School of Medicine, Temple University in Philadelphia, Pennsylvania and a member of the Section of Rheumatology.

Dr. Brent earned his medical degree from Jefferson Medical College. He trained in Internal Medicine at West Virginia University Hospital and Thomas Jefferson University Hospital and then a Rheumatology fellowship at Thomas Jefferson University Hospital. He was a faculty member in Rheumatology at Hahnemann University, then for many years a faculty member, Division Head, and Rheumatology Fellowship Program Director in the Division of Rheumatology at Einstein Medical Center in Philadelphia, PA before coming to Temple University in 2017.

He is a managing editor for the Rheumatology section of *StatPearls*, an online textbook of medicine. He is a manuscript referee for a number of peer-reviewed journals, including *Journal of Clinical Rheumatology, Clinical Rheumatology, Journal of Rheumatology, and Lupus*.

Predicting response to immunotherapy in non-small cell lung cancer- from bench to bedside

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Background: Immune checkpoint inhibitor (ICI) therapy is first-line treatment for many advanced non-small cell lung cancer (aNSCLC) patients. Predicting response could help guide selection of intensified or alternative anti-cancer regimens. We hypothesized that radiomics and laboratory variables predictive of ICI response in a murine model would also predict response in aNSCLC patients.

Methods: Fifteen mice with lung carcinoma tumors implanted in bilateral flanks received ICI. Pre-ICI laboratory and computed tomography (CT) data were evaluated for association with systemic ICI response. Baseline clinical and CT data for 117 aNSCLC patients treated with nivolumab were correlated with overall survival (OS). Models for predicting treatment response were created and subjected to internal cross-validation, with the human model further tested on 42 aNSCLC patients who received pembrolizumab.

Results: Models incorporating baseline NLR and identical radiomics (surface-to-mass ratio, average Gray, and 2D kurtosis) predicted ICI response in mice and OS in humans with AUCs of 0.91 and 0.75, respectively. The human model successfully sorted pembrolizumab patients by longer vs. shorter predicted OS (median 35 months vs. 6 months, p=0.026 by log-rank).

Discussion: This study advances precision oncology by non-invasively classifying aNSCLC patients according to ICI response using pre-treatment data only. Interestingly, identical radiomics features and NLR correlated with outcomes in the preclinical study and with ICI response

in 2 independent patient cohorts, suggesting translatability of the findings. Future directions include using a radiogenomic approach to optimize modeling of ICI response.

Biography

Dr. Benjamin Spieler is a board-certified radiation oncologist at the University of Miami (University) Sylvester Comprehensive Cancer Center (Sylvester), where he serves as an Assistant Professor in the Department of Radiation Oncology.

Dr. Spieler's overarching research interests are in applying the latest in intensity-modulated radiation therapy, stereotactic radiotherapy, and stereotactic radiosurgery. Dr. Spieler's contributions to science and medicine include discovering new applications of quantitative MR and CT radiomic features to predict tumor aggressiveness and treatment response in localized and metastatic disease.

Dr. Spieler graduated summa cum laude from Princeton University, completed his post-baccalaureate degree in Premedical Sciences at the Harvard University Extension School, and graduated with Distinction in Research from the Mount Sinai School of Medicine, New York. During his residency in Radiation Oncology at the University of Miami, Dr. Spieler served as Chief Resident and was awarded the Roentgen Prize for excellence in research.

Characterization of circulating macromolecular immune complexes in the serum of IgA nephropathy patients

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IgA nephropathy (IgAN) is the most prevalent kidney disease worldwide, often leading to terminal renal failure in ~30-40% of affected individuals within a decade or two. The disease advancement is proposed to be driven by the formation and the deposition within the glomerular mesangium of circulating immune complexes (CICs) containing autoantibodies against galactose-deficient IgA1 (the Tn antigen GalNAcα1-Ser/Thr). However, the nature of these CICs remains largely elusive. Using a unique biochemical approach, we have identified novel anti-Tn circulating immune complexes (CICs), which are predominantly composed of anti-Tn IgM, galactose deficient IgA1, and IgG in the serum of IgAN patients. These complexes were significantly elevated in IgAN patient serum and contained complement C3. Importantly, they demonstrated dose dependent ability to bind to and stimulate human renal mesangial cell proliferation. Additionally, we also found that a glycomimetic compound (DiαGalNAc, GalNAc dimer) that mimics the Tn antigen efficiently dissociates these CICs, releasing IgA1 and significantly inhibiting human renal mesangial cell proliferation. Through immunodepletion studies together with native complex analysis, we confirmed that IgM, IgG, and IgA1 are together within anti-Tn CICs. Furthermore, we showed IgM interacts with galactose-deficient IgA1. These new findings provide unique insight into anti-Tn CICs of IgAN and suggest a potential treatment option for treating the disease.

Biography

Dr. Aryal is an instructor in the Department of Surgery at Harvard Medical School (HMS) and Beth Israel Deaconess Medical Center. He holds a PhD in biochemistry, cell biology, and developmental biology from Emory University School of Medicine. Following this, he conducted postdoctoral research at HMS focusing on circadian rhythm. Dr. Aryal's research at the Department of Surgery at HMS integrates biochemistry, glycobiology, and cell biology. One of his interests is to investigate the impact of glycosylation on human health and diseases.

NeoExpand: neoantigen-specific stimulation of T cells for effective expansion for adoptive cellular therapies

Sanghyun P Kim, Noam Levin, Charles Marquardt and **Steven A Rosenberg**

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Adoptive cell therapies targeting neoantigens can effectively treat certain metastatic solid cancers. However, neoantigen-reactive tumor-infiltrating lymphocytes (TILs) are often rare and exhausted, complicating the identification of neoantigen-reactive T-cell receptors (TCRs) and the development of highly reactive TIL products for patient treatment. TCR engineering of peripheral blood lymphocytes by virus can initially achieve high frequencies of reactive (i.e., TCR-engineered) T cells, but further expansion can decrease frequencies of these cells. We investigated whether TILs or TCR-engineered T cells could be stimulated *in vitro* against neoantigens to selectively expand neoantigen-reactive T cells. Mutant p53 and RAS, the two most common human neoantigens, were used as models. We developed an *in vitro* stimulation method, termed "NeoExpand," to provide specific stimulation to TILs and TCR-engineered T cells. Among 25 consecutive TIL samples from tumors with p53 or RAS mutations, neoantigenic stimulation selectively expanded neoantigen-reactive TILs and broadened the neoantigen-reactive CD4+ and CD8+ TIL clonal repertoire, allowing effective isolation of novel neoantigen-reactive TCRs. NeoExpand enabled the identification of 16 unique reactivities and 42 TCRs, compared to 9 reactivities and 14 TCRs with conventional TIL expansion. Single-cell transcriptome analysis showed that NeoExpand increased neoantigen-reactive TILs with stem-like memory phenotypes expressing IL-7R, CD62L, and KLF2. Furthermore, NeoExpand improved the in vivo antitumor efficacy of TILs relative to conventional OKT3-induced rapid TIL expansion (REP) in p53-mutated or KRAS-mutated xenograft mouse models. In parallel, in an experiment testing NeoExpand to selectively expand TCR-engineered T cells, NeoExpand improved the expansion of TCR-engineered T cells relative to REP, resulting in higher frequencies of TCR+ cells and increased stem-like memory phenotypes. In summary, neoantigenic stimulation selectively expands neoantigen-reactive T cells in both frequency and clonal repertoire. NeoExpand led to improved phenotypes and functions of neoantigen-reactive TILs, warranting its clinical evaluation.

Biography

Dr. Sanghyun (Peter) Kim earned his B.S. from Pusan National University (South Korea), his M.S. from Seoul National University (South Korea), and his Ph.D. from Washington University (USA). He began his postdoctoral training under Dr. Steven Rosenberg at the National Cancer Institute (USA) and now serves as a staff scientist in the same laboratory. Since joining the Rosenberg laboratory, Dr. Kim has focused on the investigation of the immunogenicity of frequent p53 mutations in solid cancers. He has established a comprehensive library of T-cell receptors (TCRs) capable of targeting p53-mutated cancers for adoptive cell therapies. Utilizing this TCR library, the Rosenberg laboratory has initiated a clinical trial aimed at treating patients with advanced cancers using these mutant p53-specific TCRs. Dr. Kim's current research endeavors are dedicated to enhancing cellular immunotherapies. His work includes selectively expanding tumor-reactive T cells and arming T cells with cytokines to improve their efficacy.

Short chain fatty acids in cancer pathogenesis

Mark A. Feitelson

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Cancer is a multi-step process that can be viewed as a cellular and immunological shift away from homeostasis in response to selected infectious agents, mutations, diet, and environmental carcinogens. Homeostasis, which contributes importantly to the definition of "health," is maintained, in part by the production of short-chain fatty acids (SCFAs), which are metabolites of specific gut bacteria. Alteration in the composition of gut bacteria, or dysbiosis, is often a major risk factor for some two dozen tumor types. Dysbiosis is often characterized by diminished levels of SCFAs in the stool, and the presence of a "leaky gut," permitting the penetration of microbes and microbial derived molecules (e.g., lipopolysaccharides) through the gut wall, thereby triggering chronic inflammation. SCFAs attenuate inflammation by inhibiting the activation of nuclear factor kappa B, by decreasing the expression of pro-inflammatory cytokines such as tumor necrosis factor alpha, by stimulating the expression of anti-inflammatory cytokines such as interleukin-10 and transforming growth factor beta, and by promoting the differentiation of naïve T cells into T regulatory cells, which down-regulate immune responses by immunomodulation. SCFA function epigenetically by inhibiting selected histone acetyltransferases that alter the expression of multiple genes and the activity of many signaling pathways (e.g., Wnt, Hedgehog, Hippo, and Notch) that contribute to the pathogenesis of cancer. SCFAs block cancer stem cell proliferation, thereby potentially delaying or inhibiting cancer development or relapse by targeting genes and pathways that are mutated in tumors (e.g., epidermal growth factor receptor, hepatocyte growth factor, and MET) and by promoting the expression of tumor suppressors (e.g., by up-regulating PTEN and p53). When administered properly, SCFAs have many advantages compared to probiotic bacteria and fecal transplants. In carcinogenesis, SCFAs are toxic against tumor cells but not to surrounding tissue due to differences in their metabolic fate. Multiple hallmarks of cancer are also targets of SCFAs. These data suggest that SCFAs may re-establish homeostasis without overt toxicity and either delay or prevent the development of various tumor types.

Biography

Mark Feitelson received his bachelor's degree in biology from UC Irvine in 1974, and his Ph.D. in Microbiology and Immunology in 1979 from the UCLA School of Medicine. He began his work with hepatitis B as an American Cancer Society postdoctoral fellow at Stanford University from 1980-82, and was then recruited to the Fox Chase Cancer Center by Dr. Baruch Blumberg (Nobel laureate). In Dr. Blumberg's group, Dr. Feitelson gained skills ranging from molecular and cell biology to molecular epidemiology and creation of animal models to study chronic hepatitis B infection. In 1991, Dr. Feitelson became Associate Professor of Pathology and Cell Biology and head of the Molecular Diagnostics Lab in Microbiology at Thomas Jefferson University. In 2007, Dr. Feitelson moved to Temple University, where he is now Professor of Biology. His research has been supported by NIH, industry and foundations for more than 35 years, has more than 150 publications, including two books, 185 abstracts presented as posters and/or oral presentations at national and international scientific meetings, and was the founding director of the Professional Science Master's program in Biotechnology at Temple University. Recently, he has shown that molecules isolated from the gut microbiome delay the onset of hepatocellular carcinoma in transgenic mice expressing the hepatitis B oncoprotein and attenuate the growth of established tumors. This therapeutic approach has also been demonstrated in other diseases characterized by chronic inflammation. He is also CSO of SFA Therapeutics, which is a Temple University spin-out of the work in Dr. Feitelson's lab. SFA has won many awards for innovation and excellence and is currently in human clinical trials for gut microbiome-based treatments for autoimmune diseases and cancer.

In addition to research, Dr. Feitelson has been teaching a number of undergraduate and graduate courses including microbiology, virology, critical thinking in biology (undergraduate), and microbial biotechnology (graduate). He has been a consultant for 13 companies since 1995 and has authored 13 patents. In the lab, he has mentored over 130 students since the mid-1980s, including 24 MS students in Biology, 8 Ph.D. students in Biology, and 13 postdoctoral fellows.

Anionic pulmonary surfactant Lipids antagonism against multiple respiratory viral infections and inflammation

Mari Numata-Nakamura

National Jewish Health, Department of Medicine, USA

Pulmonary surfactant is a mixture of lipids and proteins in the lung, consisting of 90% phospholipid, and 10% protein by weight. Phosphatidylcholine (PC) is the major phospholipid that plays a critical role to regulate surface tension and prevent lung collapse. There are two minor phospholipids, phosphatidylglycerol (PG) and phosphatidylinositol (PI), that exist in the alveolar compartment at a very high concentration compared to other organs.

We have kept accumulating evidences that one of major molecular class of PG, Palmitoyl-oleoyl phosphatidylglycerol (POPG) and PI have very potent antiviral and anti-inflammatory effects against several enveloped respiratory RNA viruses, such as respiratory syncytial viruses (RSV), influenza A viruses (e.g., pH1N1-IAV (H1N1 A/California/07/2009, H1N1-PR8 (H1N1 influenza A/PR/8/34), and H3N2-IAV (H3N2/Philippines 82)), *in vitro* and in several *in vivo* animal models. These lipids directly bind to these viruses and disrupt viral attachments to the host cells. As a result of these interactions, POPG and PI inhibit infections and inflammation induced by these viruses.

We reported that POPG and PI markedly inhibited SARS-CoV-2 infection and its replication in primary differentiated human airway epithelial cells from multiple donors at dose dependent manner. We additionally determined the antiviral potencies of POPG and PI against SARS-CoV-2 variant replication (delta: B.1.617.2, omicron: B.1.1.529) in human bronchial epithelial of healthy participants differentiated in ALI cultures. Especially noteworthy, these lipids significantly reduced viral mRNA expression by 80% with POPG and 85% with PI against B.1.617.2 , and by 99% with POPG and 97% with PI against B.1.1.529.

In conclusion, POPG and PI have broad antiviral effects against problematic respiratory viruses. These lipids have strong potential to be novel interventions as antivirals and anti-inflammatory compounds for patients with chronic lung diseases (e.g., asthma, COPD) who are suffering from exacerbations induced by viral infections.

Biography

Mari Numata-Nakamura, M.D., Ph.D., has got trained and practiced medicine as a clinical pulmonologist in Japan. She currently focuses on research investigating the role of pulmonary surfactant in regulating innate immunity in the lung, with special emphasis upon surfactant lipid antagonism of inflammation and viral infection. She discovered the anti-viral properties of the surfactant lipids palmitoyl-oleoyl-phosphatidylglycerol (POPG) and phosphatidylinositol (PI). The long-term goals of her research are to bring basic research observations to treatment of patients.

Clinical study of anogenital condyloma acuminata treatment with photodynamic therapy including immunocompromised conditions

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Human Papillomavirus (HPV) infection is highly prevalent worldwide, and one of its consequences is the external genital wart, or Condyloma Acuminata (CA). The present study used Photodynamic Therapy (PDT) to treat CA lesions. PDT treated 23 patients with a clinical diagnosis of multifocal and unifocal CA. Patients were divided into Group 1 (G1, Patients without pathologies associated with immunodeficiency) and Group 2 (G2, patients associated with immunodeficiency). In the G1 group (19 patients), PDT resulted in a Complete Response in 68.4% (average 5 PDT cycles), Partial Response in 26.3% (average 10 PDT cycles), and No Response in 5.3% (average 6 PDT cycles). In the G2 group (4 patients), 100% of subjects showed a partial response (8 PDT cycles). These patients in the G2 and with partial response had associated pathologies, such as renal failure, breast cancer, and HIV. There was a slight decrease in lesions (20-40%) post-treatment in these cases. Four months after treatment, no new lesions or recurrence were observed in the entire area treated with PDT using low doses of PDT. Eighty-six percent of the patients tolerated the treatments well. We conclude that PDT is a more promising and safe treatment for CA lesions than traditional treatments.

Biography

In 2015, she collaborated on the Brazilian project: "Brazil Photodynamic Therapy". 200 patients with non-melanoma skin cancer were treated by Photodynamic Therapy, whose treatment efficiency (complete cure) was 94%. To date, the patients treated have been followed up with a recurrence rate of 10% (5 years of follow-up).

Treatments for condylomata acuminata were also performed in 30 female patients. These treatments were carried out in collaboration with the University of Sao Paulo-Sao Carlos- Brazil and the Hospital "Carlos Andrade Marín" of the City of Quito-Ecuador.

From 2015 to the present, she has been an associate professor in the Department of Materials of the National Polytechnic School Quito-Ecuador.

From 2017 to 2019, she did a post-doctorate at the University of Sao Paulo- Sao Carlos- Brazil, where he developed the project: "Nanomaterials for bioapplications." Actually, she developed research about Nanomedicine, Photodynamic Therapy, and Materials for bioapplications.

Condom use and drug consumption in migrants

Ruiz-Bugarin, Cynthia[1,2,3], Lopez-Sánchez Ulises[1,2], Aranda-Ibarra Jesús Ramón[1,2], Hernández-Vergara Carmen Ivette[1,2], Caro-Jimenez Jocelyn[1,2], Sánchez-Rojas Mario Alberto[1,2] and **Cruz-González Anzony Arturo[1,2]**

[1]Universidad Autónoma de Baja California, México
[2]Colegio de Profesionales de la Enfermería de Baja California A. C., México
[3]Insiuto Mexicano del Seguro Social, México

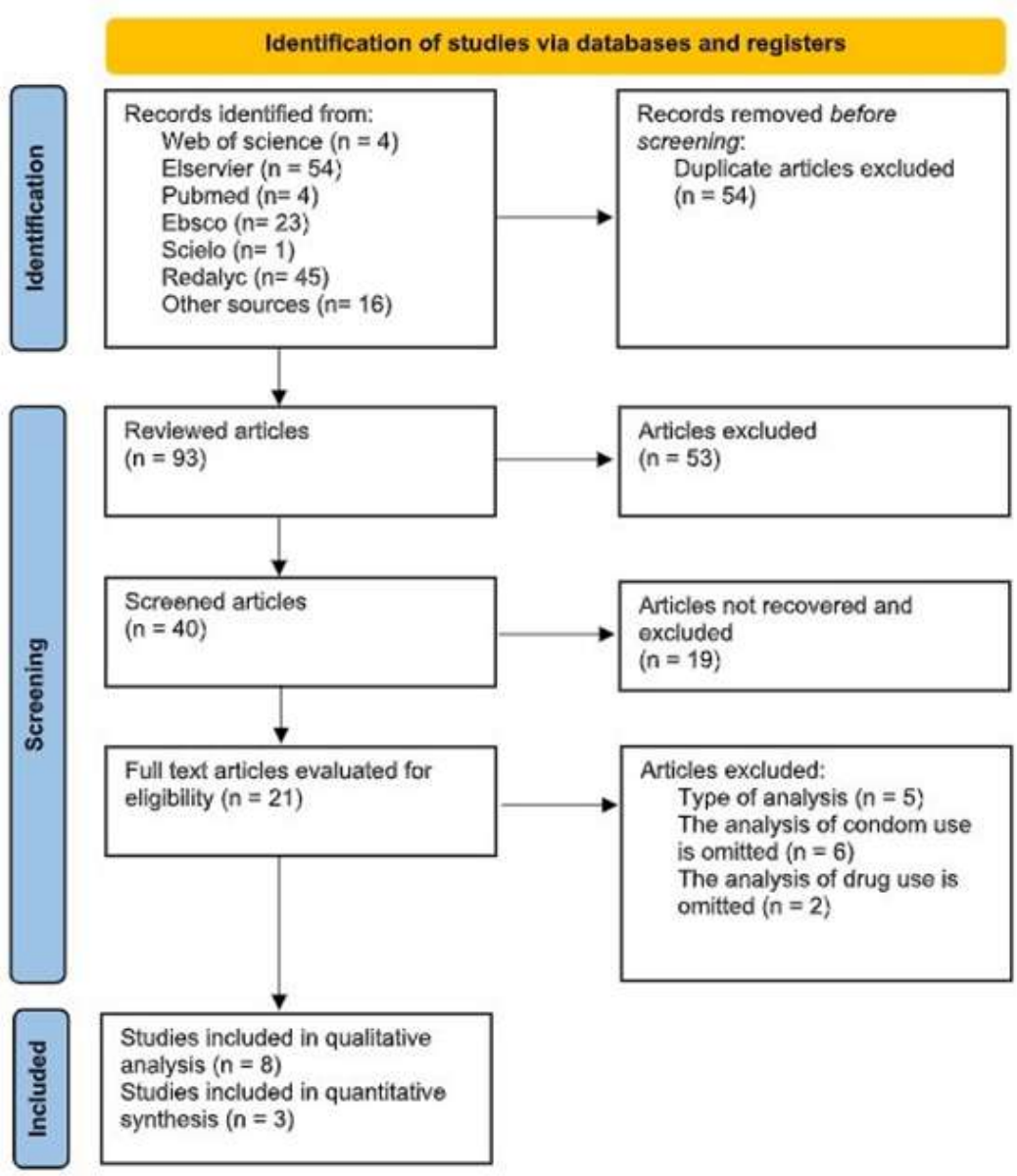
The objective was to identify condom use and drug consumption in migrants, as well as the association between these variables.

Method: A systematic search was carried out for articles published in Spanish and English (2017-2022), in PubMed, EBSCO, WEB of SCIENCE, Elsevier, Scielo, Redalyc, with eligible studies reporting on condom use and drug consumption, and their association.

Results: The search strategy found 147 articles with the combination of terms and other sources. After excluding articles by title, abstract, and finding that they had the study variables, eight articles were included for qualitative analysis and only three met the criteria for quantitative analysis.

Conclusion: Drug consumption favors inconsistent condom use, increasing the risk of acquiring an STI, and can lead to other mental health issues derived from the use of these substances.

Figure 1 - Diagram of the search strategy and selection of articles for systematic reviews PRISMA – Tijuana, BC, Mexico, 2022.



Biography

Professor at the Faculty of Health Sciences, Valle las Palmas, at the Autonomous University of Baja California. He completed Doctorate studies in Nursing Sciences at the Autonomous University of Nuevo León, in the period 2018-2021. General Nurse at Regional General Hospital No. 20, of the Mexican Social Security Institute. Coordinator of the Bachelor of Nursing Program at the Faculty of Health Sciences, Valle las Palmas. And Evaluator of Bachelor's Degree Programs in Nursing. Leader of the Academy of Nursing Research, and Member of the Sigma Theta Tau International Nursing Honor Society, Tau Alpha Chapter. Author and co-author of scientific research articles and books.

Wild rabies in the context of One Health

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[2]National Center for Diagnostic Services in Animal Health (CENASA) [WOHA Reference Laboratory for Rabies]
[3]Av. Centenario de la Educación s/n (Km 37.5 Carretera Federal México-Pachuca), Mexico

Objective: To describe the importance of monitoring wild rabies once a country is declared free of canine rabies.

Scope: As a model zoonosis for the One Health approach, rabies monitoring must involve the study of viruses, reservoirs and the environment.

Methods: Analysis of the updated data contributed by CENASA to the Dossier of Verification of Free of Canine Rabies (Variant 1) (not published) that the Mexican Ministry of Health will present to PAHO/WHO.

Results: In 1983, Latin American countries, under the direction of PAHO/WHO, initiated a program for the elimination of canine rabies. In 2019, PAHO/WHO recognized Mexico as the first country to be free of human rabies transmitted by dogs.

Conclusions: Wild rabies is a growing public health problem, influenced by the diversity of wild reservoirs. It is necessary to investigate the role of wildlife in the maintenance of the virus in nature, and to develop a diagnostic technique that can easily differentiate the canine variant from other wildlife rabies viruses.

In Latin America, deforestation and livestock intensification have led to an increase of vampire bats attacks in rural communities. Affectations caused by the modernization of the Mexican southeast, represent opportunities for the transmission of rabies and the emergence of new diseases.

Countering disinformation and misinformation in animal health is another requirement in fighting rabies. A popular disinformation (inaccurate information) belief, for instance, states that rats, mice and squirrels, as well as all bats, are rabies-infected and can transmit the virus to humans. On the other hand, there are people who spread the misinformation (deliberately misleading information) that it is a lie from the government that Mexico is free of the canine variant of the rabies virus. Disinformation or misinformation, although they are not the same, when it comes to rabies, both can be a matter of life or death.

Biography

Paulina is a Veterinary Doctor and Zootechnician from the Faculty of Veterinary Medicine and Zootechnics (FMVZ) of the UNAM (National Autonomous University of Mexico)

Currently she is a student of the Master's Degree in Sustainable Animal Health and Production at the Faculty of Natural Sciences of the UAQ (Autonomous University of Querétaro State)

Winner of the Constantino Ordoñez Award for the best thesis in applied sciences of 2020 from the FMVZ-UNAM

4 years of experience in the Rabies Laboratory of the National Centre for Diagnostic Services in Animal Health as a Reference Centre for WOAH in Rabies.

Vemurafenib- and Cobimetinib-Associated Drug reaction with eosinophilia and systemic symptoms in a patient with metastatic melanoma

Salsabeal Al Saedy[2], Miriam Al-Saedy[1] and **Chad Rieck[3]**

[1]Washington State University Elson S. Floyd College of Medicine, USA
[2]Washington State University Elson S. Floyd College of Medicine, USA
[3]Internal Medicine, Providence Regional Medical Center, Washington State University, Elson S. Floyd College of Medicine, USA

Drug reaction with eosinophilia and systemic symptoms (DRESS) is a severe hypersensitivity reaction associated with drug exposure. Recognizing signs of DRESS and stopping the offending agent is essential for proper treatment. In this case report, we present an interesting case of DRESS following the recent initiation of vemurafenib and cobimetinib for the treatment of metastatic melanoma in a patient who previously had been on pembrolizumab without adverse skin reactions. In this case report, we highlight the ambiguity of using the Registry of Severe Cutaneous Adverse Reactions (RegiSCAR) scoring criteria in the hospital setting for recognizing DRESS in patients with toxic epidermal necrolysis (TEN)-type presentation of DRESS.

Introduction: Diagnosing DRESS relies on clinical suspicion and RegiSCAR criteria, given its similarity to other severe cutaneous reactions like SJS/TEN. Recognition entails excluding other causes and promptly discontinuing the offending drug. We illustrate a case where DRESS emerged with vemurafenib and cobimetinib treatment for metastatic melanoma, despite previous uneventful use of pembrolizumab.

Discussion and Conclusion: Unusual case: A 61-year-old with metastatic melanoma developed TEN-like DRESS upon starting vemurafenib and cobimetinib. Prompt discontinuation and IV steroid treatment led to rapid improvement. Pembrolizumab prior use lacked similar reactions. Skin biopsy supported DRESS diagnosis, but its specificity varies. Histopathology descriptions are ambiguous.

Vemurafenib may induce DRESS with melanoma regression, warranting increased awareness for timely intervention as DRESS is potentially life-threatening and requires timely diagnosis.

Biography

Salsabeal Al Saedy is a second-year medical student at the Washington State University Elson S. Floyd College of Medicine. She grew up in the Greater Seattle region and attended the University of Washington where she earned a Bachelor's of Science degree in Biochemistry. Some fun facts about her are that she has never been to another state but have been out of the country, she trains birds, and She had 13 birds simultaneously.

PEERS ALLEY MEDIA

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Breast Cancer Macrophage Heterogeneity and Self-renewal are Determined by Spatial Localization

Nir Ben-Chetrit[1,2], Xiang Niu[1,2,13], Jesus Sotelo[1,2], Ariel D. Swett[1,2], Vinagolu K. Rajasekhar[3], Maria S. Jiao[4], Caitlin M. Stewart[1,2], Priya Bhardwaj[5], Sanjay Kottapalli[1,2], Saravanan Ganesan[1,2], Pierre-Louis Loyher[6], Catherine Potenski[1,2], Assaf Hannuna[7], Kristy A. Brown[5], Neil M. Iyengar[5,8], Dilip D. Giri[9], Scott W. Lowe[10,11], John H. Healey[4], Frederic Geissmann[6], Irit Sagi[7], Johanna A. Joyce[1,2] and **Dan A. Landau[1,2]**

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[4]Center of Comparative Medicine and Pathology, Memorial Sloan Kettering Cancer Center, USA
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[7]Department of Biological Regulation, Weizmann Institute of Science, Israel
[8]Department of Medicine, Memorial Sloan Kettering Cancer Center, USA
[9]Department of Pathology, Memorial Sloan Kettering Cancer Center, USA
[10]Cancer Biology and Genetics Program, Memorial Sloan Kettering Cancer Center, USA
[11]Howard Hughes Medical Institute, Chevy Chase, MD 20815, USA
[12]Department of Oncology and Ludwig Institute for Cancer Research, University of Lausanne, Switzerland

Tumor-infiltrating macrophages support critical steps in tumor progression, and their accumulation in the tumor microenvironment (TME) is associated with adverse outcomes and therapeutic resistance across human cancers. In the TME, macrophages adopt diverse phenotypic alterations, giving rise to heterogeneous immune activation states and induction of cell cycle. While the transcriptional profiles of these activation states are well-annotated across human cancers, the underlying signals that regulate macrophage heterogeneity and accumulation remain incompletely understood. Here, we leveraged a novel ex vivo organotypic TME (oTME) model of breast cancer, in vivo murine models, and human samples to map the determinants of functional heterogeneity of TME macrophages. We identified a subset of F4/80high Sca-1+ self-renewing macrophages maintained by type-I interferon (IFN) signaling and requiring physical contact with cancer-associated fibroblasts. We discovered that the contact-dependent self-renewal of TME macrophages is mediated via Notch4, and its inhibition abrogated tumor growth of breast and ovarian carcinomas in vivo, as well as lung dissemination in a PDX model of triple-negative breast cancer (TNBC). Through spatial multi-omic profiling of protein markers and transcriptomes, we found that the localization of macrophages further dictates functionally distinct but reversible phenotypes, regardless of their ontogeny. Whereas immune-stimulatory macrophages (CD11C+CD86+) populated the tumor epithelial nests, the stroma-associated macrophages (SAMs) were proliferative, immunosuppressive (Sca-

1+CD206+PD-L1+), resistant to CSF-1R depletion, and associated with worse patient outcomes. Notably, following cessation of CSF-1R depletion, macrophages rebounded primarily to the SAM phenotype, which was associated with accelerated growth of mammary tumors. Our work reveals the spatial determinants of macrophage heterogeneity in breast cancer and highlights the disruption of macrophage self-renewal as a potential new therapeutic strategy.

Biography

Nir Ben Chetrit, PhD

Research Associate in Medicine

Weill Cornell Medicine

Department of Medicine

Division of Hematology and Medical Oncology

The New York Genome Center

Nir is a Research Associate at Weill Cornell Medicine and the New York Genome Center. His research interests are geared toward developing novel frameworks for cancer vaccines and harnessing innate immunity for cancer immunotherapies through genetic reprogramming of tumor-associated macrophages (TAMs).

He earned his Ph.D. at the Weizmann Institute of Science with Prof. Yosef Yarden, studying and blocking the cell-intrinsic mechanisms that propel breast cancer metastasis in patients with triple-negative tumors. He continued his training in tumor immunology at Memorial Sloan Kettering Cancer Center and Weill Cornell Medicine (WCM), studying cell-extrinsic tumor microenvironmental (TME) signals that foster tumor progression of mammary carcinomas.

At WCM, he developed a scalable TME platform to screen for genes that convert immunosuppressive TAMs into immunostimulatory macrophages. In addition, he developed a multi-omic spatial profiling method that integrates spatial transcriptomics and protein markers to untangle complex interactions and immune evasion mechanisms in the TME in a spatially informed manner.

Infection prevention and Evidence for laterality biases in handwashing manipulations via multi-sensor based real-time imaging and AI Machine Learning

Max Simonovsky
Soapy USA Inc, United States

Imaging based technologies such as video imaging, sonar and thermal imaging, when coupled with machine learning can be used to gain information on the movement behaviors of individuals during activity. When applied to handwashing, the technique can be used to determine the degree of compliance versus recommended handwashing manipulations such as the WHO 6-step procedure. Using such a technique, we have generated evidence of a distinct laterality bias within the within the handwashing compliance of washroom users in a manufacturing setting. In this context, with a majority right-handed population it is observed that laterality specific manipulation tasks are not completed equally. Thus this majority right-handed population demonstrates the left hand being washed more successfully that the right, with implications for hygiene in multiple sectors.

Allergen immunotherapy in asthma: clinical outcomes

Jasper Kappen

Department of Pulmonology, STZ Centre of Excellence for Asthma, COPD and Respiratory Allergy, The Netherlands

Asthma is a heterogenic disease affecting approximately 350 million patients globally, with a projected increase to 400 million within the next 30 years. The pathogenesis is complex and still not completely unravelled, however a T2 driven inflammatory pathway is present in the majority of the cases. Allergic asthma is one of the more common phenotypes with allergic rhinitis, atopic dermatitis and/or food allergy as frequent comorbidities. Treatment of asthma in a personalised manor focusses on the optimalisation of all treatable traits that drive the disease, this varies between patients. Both allergy and allergic rhinitis are widely considered as treatable traits in allergic asthma, therefore treatment and reducing symptoms is strongly advised.

Allergen immunotherapy is an effective and disease modifying treatment for allergic rhinitis with or without asthma with most common administration routes are subcutaneous route (SCIT) or sublingually (SLIT). Allergen immunotherapy has disease modifying properties and therefore confers long-term clinical benefit after cessation of treatment. The Global Initiative for Asthma (GINA) update of 2017 included HDM SLIT tablets as a recommendation for patients with HDM-allergic asthma who remain inadequately controlled with pharmacotherapy. This recommendation remained unchanged in the consecutive updates. Also, the EAACI guidelines recommend AIT in patients with HDM-driven allergic asthma.

While recommendations for the standardisation of clinical outcomes used in AIT trials for AR have been defined, to date, there is no consensus on how to quantify clinical outcomes of AIT on asthma. For proper reviewing of the effectiveness of AIT in patients with allergic asthma, as well as planning future trials for the development of novel products for AIT, a consensus on quantification of clinical outcome of AIT on asthma control is crucial. In clinical practice such a consented position can be used in patient selection, identification of responders and criteria to continue or stop treatment.

After reviewing outcomes divided in different domains, we believe that exacerbation rate can be used as a reliable objective primary outcome, although there is limited evidence due to different definitions of exacerbation. Furthermore, the endpoints for allergic asthma and AIT

are often more subtle. It is therefore advised that symptom scores and medication use (ICS and reliever medication reduction) are used as clinical outcomes in AIT in asthma patients. All are clinical applicable and easy to use, there is however the urgent need for standardization for use in clinical trials. ACQ5/ AQLQ and CARAT are well established PROMs questionnaires, however, validation addressing asthma control in relation to AIT is an unmet need. After ICS withdrawal the time to first exacerbation can be captured as primary outcome measure.

FeNO and eosinophil levels (evaluated in clinical context) have the potential to become surrogate biomarkers of clinical response. Additional studies are needed to confirm and to interpret their association with the clinical response to immunotherapy.

To analyze the suggested outcome measures future systemic RWE data is definitely needed to analyze, novel eHealth tools can support these evaluations.

A full exploration and overview of this topic, including the unmed needs and clinical applicability was prepared by the EAACI Task Force on the standardization of clinical outcomes used in allergen immunotherapy in allergic asthma in our Position Paper which was published recently Allergy[1]

[1]Kappen, J, Diamant, Z, Agache, I, et al. Standardization of clinical outcomes used in allergen immunotherapy in allergic asthma: An EAACI position paper. Allergy. 2023; 78: 2835-2850. doi:10.1111/all.15817

Biography

Jasper Kappen, MD, PhD, MSc

Born on January 29th 1971 in Eindhoven, The Netherlands

Education

- Chemical engineering, Technical University Delft, 1990- 1995

- Medical school, Erasmus Medical Centre Rotterdam 2004-2010

- Specialist Pulmonary Medicine 2010- 2016

Positions

- Franciscus Gasthuis & Vlietland Rotterdam The Netherlands; department of pulmonology, Chest Physician, special interest in respiratory allergy and severe asthma.

- Imperial College Londen, Allergy and Clinical Immunology, National Heart and Lung Institute, Allergy and Clinical Immunology, Immunomodulation and Tolerance group. Honorary staff member, focus on research in allergen immunotherapy

Appointments

Member of EAACI, NVALT, ERS

EAACI:

- Secretary of science committee

- ask Force Chair: Recommendation for the standardization of clinical outcomes used in allergen immunotherapy in asthma

- Task Force Member: Biomarkers in Immunotherapy

- Task Force altitude treatment for severe asthma

Past Council member: International Society of Behçet's Disease

Scientific carrier

In 2008 he has started his scientific work doing a genetic research project in patients with Behçhet's disease. This work was the start of my PhD project in immunology. The focus of the PhD is on genetic predisposition of the disease, from a candidate gene approach to a whole genome sequence. He is also focussed of new treatment modalities, mainly biologicals.

In 2015 a research internship at Imperial College in London was the start of several research initiatives in allergen immunotherapy in relation with Asthma. To date his research activities are focussed on immunotherapy and asthma.

Overview of F18-FDG uptake patterns in retroperitoneal pathologies: imaging findings, pitfalls

Laith Abandeh[2], Priya Pathak[1], Hassan Aboughalia[3], Atefe Pooyan[2] and **Bahar Mansoori[2]**

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[2]University of Washington, USA
[3]University School of Medicine and Health Sciences, USA

Objectives: Review retroperitoneal anatomy and normal F18-FDG biodistribution in the retroperitoneum.

Familiarize with F18-FDG PET pitfalls and imaging artifacts encountered in the retroperitoneum.

Illustrate F18-FDG uptake patterns in primary and secondary retroperitoneal pathologies with the development of a structured approach to narrow the differential diagnosis.

Review the correlation between PET findings and anatomic imaging.

Brief review of pediatric retroperitoneal tumors

Introduction: Retroperitoneum can be the origin of a wide variety of pathologic conditions and potential space for disease spread to other compartments of the abdomen and pelvis. Computed tomography (CT) and magnetic resonance imaging (MRI) are often the initial imaging modalities to evaluate retroperitoneal pathologies however given the intrinsic limitations, F18-FDG PET/CT provides additional valuable metabolic information that can change patient management and clinical outcomes. We highlight the features of retroperitoneal pathologies on F18-FDG PET/CT and the commonly encountered imaging artifacts and pitfalls. The aim of this review is to characterize primary and secondary retroperitoneal pathologies based on their metabolic features and correlate PET findings with anatomic imaging.

Conclusion: Retroperitoneal pathologies can be complex, ranging from oncologic to a spectrum of non-oncologic disorders. While cross-sectional imaging (CT and MRI) are often the initial imaging modalities to localize and characterize pathologies, metabolic information provided by F18-FDG PET/CT can change the management and clinical outcome in many cases.

Cancer Treatment Decision-Making for People Living With HIV: Physician-Reported Barriers, Facilitators, and Recommendations

Ashley Khouri[1], Maya J Stephens[2], Jeanette Young[3], Patrick Galyean[3], Brandon A Knettel[4,5], Emily M Cherenack[6], Susan Zickmund[3], Melissa H Watt[7], John Bartlett[4], Kathryn I Pollak[8,9], Peter A Ubel[10], Angela Fagerlin[7,11] and **Gita Suneja[2,7]**

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[3]Division of Epidemiology, University of Utah, USA
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[5]Duke University School of Nursing, Duke University, USA
[6]Department of Psychology and Neuroscience, Duke University, USA
[7]Department of Population Health Sciences, University of Utah, USA
[8]Department of Population Health Sciences, Duke University School of Medicine, USA
[9]Cancer Prevention and Control, Duke Cancer Institute, Duke University School of Medicine, USA
[10]Fuqua School of Business, Duke University, USA
[11]Salt Lake City VA Center for Informatics, Decision Enhancement and Surveillance, USA

Background: Compared with the general cancer population, people living with HIV (PLWH) and cancer are less likely to receive treatment and have significantly elevated cancer-specific mortality for many common cancer types. Physician recommendations drive the cancer therapy that patients receive, yet there is limited information assessing how cancer treatment decisions are made for people living with HIV and cancer. We sought to understand oncologist decision-making in PLWH and cancer by eliciting barriers, facilitators, and recommendations for enhancing care delivery.

Setting: Participants were recruited between May 2019 and May 2021 from one academic medical center in the western United States (n = 13), another in the southeastern United States (n = 7), and community practices nationwide (n = 5).

Methods: Using an inductive qualitative approach, we conducted in-depth interviews with 25 oncologists from two academic medical centers and community practices.

Results: Facilitators of cancer care delivery included readily available information regarding HIV status and stage, interdepartmental communication, and antiviral therapy adherence. Barriers included a lack of formal education on HIV malignancies, perceptions of decreased life expectancy, fear of inadvertent disclosure, and drug-drug interactions. Recommendations included improved provider communication, patient social and mental health resources, and continuing education opportunities.

Conclusion: The study revealed drivers of cancer treatment decision-making, highlighting physician-reported barriers and facilitators, and recommendations to support treatment decision-making. This is the first known study examining oncologists' perceptions of caring for PLWH. Given that cancer is a leading cause of death among PLWH, there is an urgent need to improve care and outcomes.

Biography

Dr. Ashley Khouri is a recent graduate of the University of Utah School of Medicine in Salt Lake City, Utah where she earned her Doctor of Medicine. Prior to medical school, Dr. Khouri earned a bachelor's degree in Biology at Duke University in Durham, North Carolina. Dr. Khouri is currently in her intern year of residency, and will be pursuing a Dermatology residency thereafter. At the University of Utah, her research focused on studying cancer treatment and outcomes of people living with HIV and cancer, both in the United States and in global resource-limited settings. She is an avid clinician, researcher, and teacher.

Clinical and Immunopathological Feature of Cardiovascular Immunoglobulin G4-related Diseases and their Therapeutic Outcome

Yasushi Matsumoto[1], Satomi Kasashima[2] and **Fuminori Kasashima[2]**

[1]Department of Cardiovascular Surgery, NHO Kanazawa Medical Center, Japan
[2]Department of Clinical Laboratory Science, Kanazawa University, Japan

Background: Immunoglobulin G4–related disease (IgG4-RD) is chronic inflammatory and sclerosing fibrous disease characterized by serum IgG4 elevation and lesions with numerous IgG4 positive lymphoplasmacytic infiltration. IgG4-RD can manifest in the cardiovascular system. Basic study of cardiovascular IgG4-RD: (1) prevalent in elderly men and shows dramatic response to corticosteroid. (2) Adventitial vasculitis with predominant T follicular regulatory and T follicular helper cells. (3)Serum IL-10 levels elevation induces IgG4 production, and serum TGF-beta, which is a strong fibrogenic cytokine, might participate in fibroplasia. (4) Serum IL-6 level was significantly higher in cardiovascular IgG4-RD. IL-6 induces matrix metalloproteinases that directly degrade the elastic fibers causing arterial wall destruction. Clinical study of cardiac IgG4-RD(IgG4-CD): To estimate the preferable surgical and/or medical approach by the long-term results.

Patients and method: 11patients (Constrictive pericarditis=IgG4-CP, Coronary disease= IgG4-CA) were retrospectively reviewed. The mean serum IgG4 level were 636.5mg/dl. Two patients of IgG4-CP underwent pericardiotomy, and three patients of IgG4-CA underwent resection of aneurysm (with CABG) and the others were treated by the corticosteroid. In the steroid therapy cases, Two were treated with high dose steroid therapy, and the others were low dose.

Results: The mean follow-up period was 9.2 year. IgG4-CP cases recognized no recurrence up to 7 years. In cases of IgG4-CA, the 3cases underwent aneurysm resection were survived without a re-rising of serum IgG4 levels. Two cases that gave high dose steroid were both recognized sudden aneurysmal rupture death. The others are all surviving with decrease of serum IgG4 levels.

Conclusion: The surgical removal of IgG4 lesion was regarded as acceptable option. However, high dose steroid might be risky because it can cause thinning of the arterial wall and leading to aneurysmal rupture. We recommend the reduced dose administration to improve the steroid effect on IgG4-CA. During the steroid therapy, IgG4-CA should be carefully monitored with serum IgG4 levels, activity of inflammation, mass volume.

Biography

Dr Yasushi Matsumoto works as a cardiovascular surgeon at NHO Kanazawa Medical Center. He holds a PhD degree in electrophysiology from Kanazawa University and is concurrently a clinical professor of Kanazawa University school of medicine (Kanazawa, Japan). His research has been focused on clinicopathological study about the IgG4-related cardiovascular disease even though he is a surgeon, and he discovered the first case involving a coronary artery. Additionally, Dr Matsumoto was elected as a member of the research group of the Japanese Ministry of Health, Labor and Welfare (MHLW) and served as a member of the cardiovascular subcommittee and played a central role in formulating the organ specific diagnostic criteria. He is now aiming to establish a treatment strategy for IgG4-related disease.

The dual role and mutual dependence of heme/HO 1/Bach1 axis in the carcinogenic and anti carcinogenic intersection

Jinjing Xu, Kuiyang Zhu, Yali Wang, and Jing Chen
Institute of Translational Medicine, Medical College, Yangzhou University, Yangzhou 225009, China

Introduction: In physiological concentrations, heme is nontoxic to the cell and is essential for cell survival and proliferation. Increasing intracellular heme concentrations beyond normal levels, however, will lead to carcinogenesis and facilitate the survival of tumor cells. Simultaneously, heme in an abnormally high quantity is also a potent inducer of tumor cell death, contributing to its ability to generate oxidative stress on the cells by boosting oxidative phosphorylation and suppressing tumors through ferroptosis. During tumorigenesis and progression, therefore, heme works as a double-edged sword. Heme oxygenase 1 (HO-1) is the rate-limiting enzyme in heme catabolism, which converts heme into physiologically active catabolites of carbon monoxide (CO), biliverdin, and ferrous iron (Fe2+). HO-1 maintains redox equilibrium in healthy cells and functions as a carcinogenesis inhibitor. It is widely recognized that HO-1 is involved in the adaptive response to cellular stress and the anti-inflammation effect. Notably, its expression level in cancer cells corresponds with tumor growth, aggressiveness, metastasis, and angiogenesis. Besides, heme-binding transcription factor BTB and CNC homology 1 (Bach1) play a critical regulatory role in heme homeostasis, oxidative stress and senescence, cell cycle, angiogenesis, immune cell differentiation, and autoimmune disorders. Moreover, it was found that Bach1 influences cancer cells' metabolism and metastatic capacity. Bach1 controls heme level by adjusting HO-1 expression, establishing a negative feedback loop.

Materials and methods: Herein, the authors review recent studies on heme, HO-1, and Bach1 in cancer. Specifically, they cover the following areas: (1) the carcinogenic and anticarcinogenic aspects of heme; (2) the carcinogenic and anticarcinogenic aspects of HO-1; (3) the carcinogenic and anticarcinogenic aspects of Bach1; (4) the interactions of the heme/HO-1/ Bach1 axis involved in tumor progression.

Conclusion: This review summarized the literature about the dual role of the heme/HO-1/Bach1 axis and their mutual dependence in the carcinogenesis and anti-carcinogenesis intersection.

Biography

Jinjing Xu is an MD student with a strong background in oncology. From 2014 to 2017, she pursued a Master of Science in Oncology at the Institute of Oncology, Xuzhou Medical University, under the guidance of Prof. Junian Zheng. Her research focused on the combination of tumor biotherapy and chemotherapy. Currently, since 2021, Jinjing is pursuing a PhD in Internal Medicine at Yangzhou University under the supervision of Prof. Jing Chen, concentrating on the mechanisms of drug resistance in tumors. Jinjing has published multiple papers in SCI journals, including five where they were the first author.

ACE2-hAMSCs improve pulmonary vascular remodeling in pulmonary hypertension rats by promoting angiogenesis and anti-inflammation

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[2]Department of Cardiology, the Seventh Affiliated Hospital of Southern Medical University, China
[3]the Graduate School, Guizhou Medical University, China

Objectives: Human Amniotic Mesenchymal Stem Cells (hAMSCs) have strong multidirectional differentiation ability. Studies found that transfection of target genes into target cells by lentivirus can enhance the differentiation potential of the cells. Angiotensin-Converting Enzyme 2 (ACE2) was found to improve vascular remodeling. But ACE2-hAMSCs is still lacking research.

Scopes: This study aimed to investigate the ability to potentially improve pulmonary arterial hypertension of ACE2-hAMSCs.

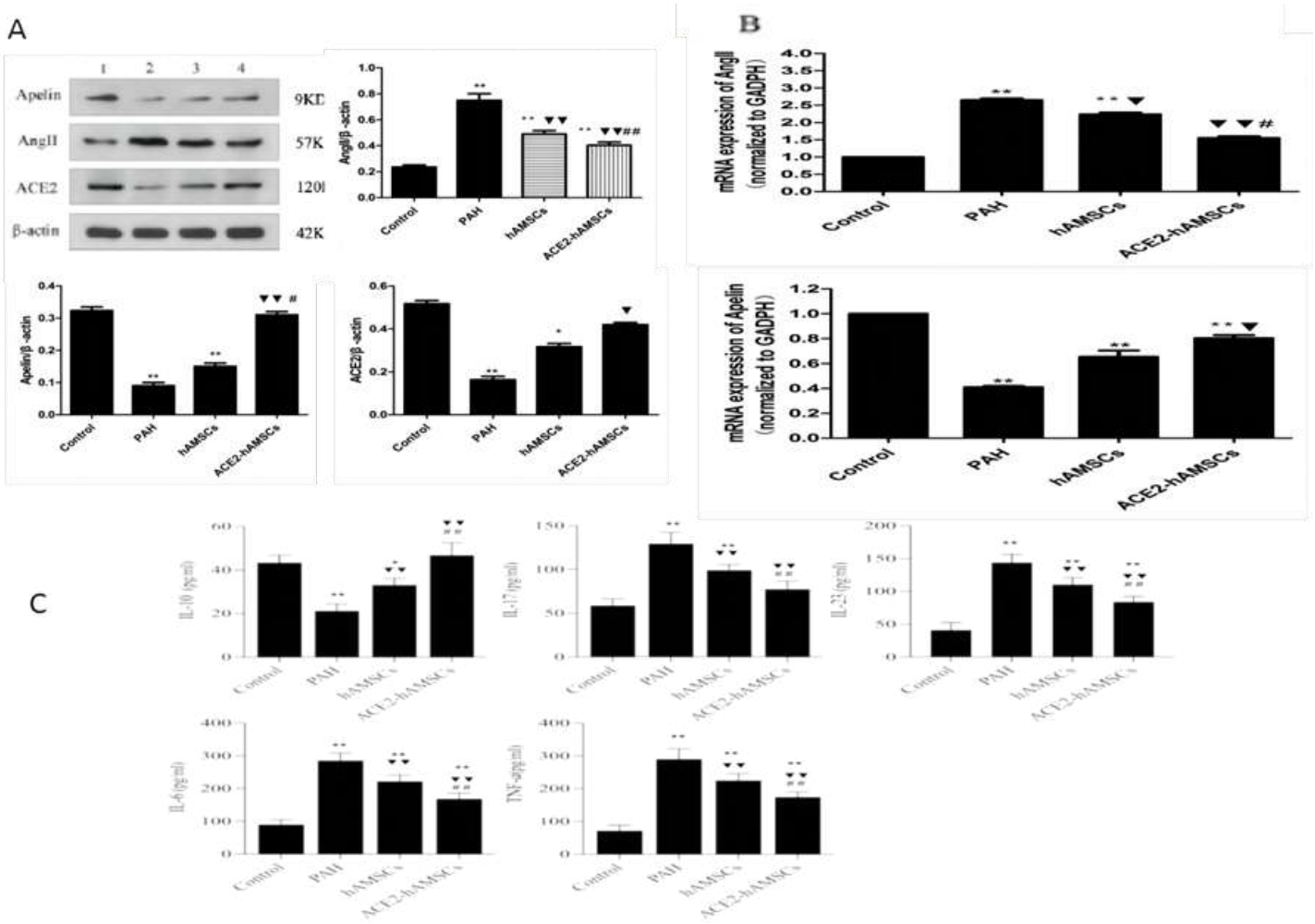
Methods used: Lentiviruses overexpression ACE2 were mixed with hAMSCs. Then, ACE2-hAMSCs and hAMSCs with good growth in logarithmic growth phase wers collected, detected their migration and angiogenesis. RT-qPCR technology was used to detect the expression levels of genes related to angiogenesis, inflammation in the two cells, and Western-blotting was used to detect the expression levels of ACE2.

Animal study, 21 rats were randomly divided into four different measuring groups. Right heart hypertrophy, pulmonary angiogenesis and serum inflammatory factors were measured before dissection. HE staining was used to observe the inflammatory infiltration of lung tissues.

Results: The migration and angiogenesis of ACE2-hAMSCs were stronger. The expression of genes in ACE2-hAMSCs were higher, and the expression of ACE2 protein in ACE2-hAMSCs were lighter. HE staining showed that the inflammatory infilration of lung tissue in ACE2-hAMSCs groups was significantly improved. In addition, the ACE2-hAMSCs group had stronger pro-angiogenesis and anti-inflammatory effects.

Conclusion:

These results suggest the ACE2-hAMSCs can repair pulmonary vascular endothelial cell injury caused by pulmonary hypertension by promoting angiogenesis and anti-inflammatory ability. This shows that ACE2-hAMSCs have stronger ability to improve pulmonary vascular remodeling than hAMSCs alone.



Biography

He has been engaged in cardiovascular coronary interventional surgery for 20 years, and has rich experience in cardiovascular interventional surgery, including surgery for various complex lesions, laminating stent implantation for aortic dissection, interventional treatment for pulmonary embolism, filter implantation for lower limb venous thrombosis, temporary and permanent pacemaker implantation, etc., with a total of more than 10,000 operations completed. Carry out a new project: atrial fibrillation radiofrequency ablation + left atrial appendage occlusion "one-stop" surgery reached the international level.

Modelling *in vitro* gametogenesis using induced pluripotent stem cells: a review

Maria Victoria Romualdez-Tan[1,2]

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[2]*Cebu Doctors University Hospital, Philippines*

In vitro gametogenesis (IVG) has been a topic of great interest in recent years not only because it allows for further exploration of mechanisms of germ cell development, but also because of its prospect for innovative medical applications especially for the treatment of infertility. Elucidation of the mechanisms underlying gamete development in vivo has inspired scientists to attempt to recapitulate the entire process of gametogenesis in vitro. While earlier studies have established IVG methods largely using pluripotent stem cells of embryonic origin, the scarcity of sources for these cells and the ethical issues involved in their use are serious limitations to the progress of IVG research especially in humans. However, with the emergence of induced pluripotent stem cells (iPSCs) due to the revolutionary discovery of dedifferentiation and reprogramming factors, IVG research has progressed remarkably in the last decade. This paper extensively reviews developments in IVG using iPSCs. First, the paper presents key concepts from groundwork studies on IVG including earlier researches demonstrating that IVG methods using embryonic stem cells (ESCs) also apply when using iPSCs. Techniques for the derivation of iPSCs are briefly discussed, highlighting the importance of generating transgene-free iPSCs with a high capacity for germline transmission to improve efficacy when used for IVG. The main part of the paper discusses recent advances in IVG research using iPSCs in various stages of gametogenesis. In addition, current clinical applications of IVG are presented, and potential future applications are discussed. Although IVG is still faced with many challenges in terms of technical issues, as well as efficacy and safety, novel IVG methodologies are emerging, and IVG using iPSCs may usher in the next era of reproductive medicine sooner than expected. This raises both ethical and social concerns and calls for the scientific community to cautiously develop IVG technology to ensure it is not only efficacious but also safe and adheres to social and ethical norms.

Biography

Dr. Maria Victoria Romualdez-Tan is a medical graduate of the University of the Philippines-Philippine General Hospital, obtaining residency and fellowship training in Obstetrics and Gynecology and Reproductive Medicine, respectively, in the same institution. She completed her Master's Degree in Biotechnology of Human Assisted Reproduction (MBHARE) at the University of Valencia (IVI-RMA), Spain. She obtained a Certificate of Achievement on the courses HMX Genetics-Essentials and HMX Gene Therapy from the Harvard Medical School Office of Online Learning and External Education. She is currently an Associate Professor at the Cebu Doctors' University Hospital and the Medical Director and Chief ART Clinician at Repro Optima Center for Reproductive Health, Inc., Cebu City, Philippines.

BCKDK Modification Enhances the Antitumor Efficacy of CAR-T Cells by Reprogramming Branched Chain Amino Acid Metabolism

Quanjun Yang1, Xinting Zhu[1], Ping Huang[2]. Chunyan Li[3], Leng Han[1], Yonglong Han[1], Run Gan[1], Bo Xin[1], Yixing Tu[1], Shumin Zhou[4], Ting Yuan[5], Juan Hao[6], Chunqiong Li[7], Li Zhang[7] and **Cheng Guo**

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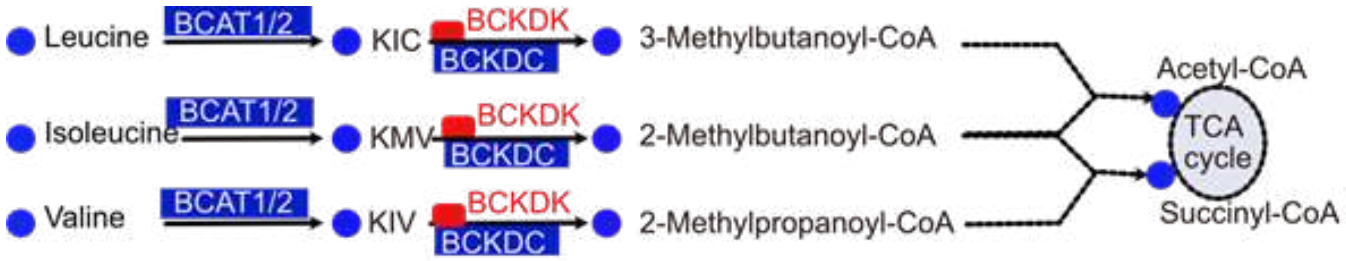
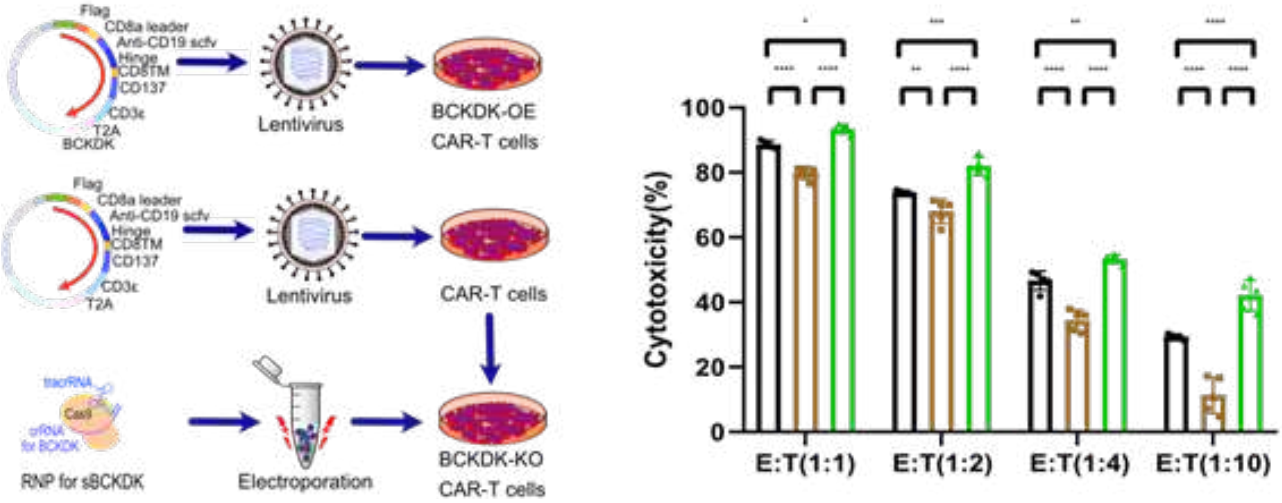
[4]Institution of Microsurgery on Extremities, Shanghai Sixth People's Hospital Affiliated Shanghai Jiao Tong University School of Medicine, China
[5]Department of Bone Oncology, Shanghai Jiao Tong University, affiliated Sixth People's Hospital, Shanghai, China
[6]Department of Endocrinology, Shanghai Traditional Chinese Medicine-Integrated Hospital, Shanghai University of Traditional Chinese Medicine, China
[7]Chinese Institute for Brain Research, China

Altered Branched Chain Amino Acids (BCAAs), including leucine, isoleucine and valine, are common in patients with advanced cancer. BCAA metabolic reprogramming resulted in distinct functional characteristics of mTOR in T lymphocytes. We then investigated the effect of BCAA supplementation on the regulation of T-cell proliferation, differentiation and function. BCAA supplementation improved cancer cell killing efficacy, while inhibitors of BCAA decreased cancer cell lysis activity. We thus designed CAR-T cells coupled with an immunoregulatory kinase BCKDK as a technological solution to reprogramme BCAA metabolic dysfunction in the tumor microenvironment. BCKDK-modified CAR-T cells reprogrammed BCAA metabolism and altered T-cell proliferation, differentiation and cancer cell killing ability. BCKDK-OE CAR-T cells enhance the efficacy of cancer cell lysis. However, BCKDK-KO CAR-T cells showed a distinct phenotype and reduced cancer cell lysis potential. The in vivo experiment showed that BCKDK-OE CAR-T cells significantly improved the survival of mice bearing NALM6-GL cancer cells, while BCKDK-KO CAR-T cells treatment resulted in shorter survival. The superior cancer cell lysis ability of BCKDK-OE CAR-T cells was associated with the differentiation of central memory cells and the percentage of CAR-T cells in the peripheral circulation.





Biography

He is mainly engaged in the study of metabolic mechanisms of advanced tumours and advanced anti-tumour immunotherapy, using a variety of tools to reveal the metabolic alterations in tumours to mediate the study of immune tolerance and drug intervention strategies, as well as exploring and evaluating metabolic immunoanalysis strategies based on gene and cell therapies. He has published more than 60 papers, including Journal of Cachexia, Sarcopenia and Muscle, Molecular Therapy, Cell Metabolism, Nature Biotechnology, Cancer Immunology Research, Pharmacological Research, etc., with more than 1000 citations. He has been selected as Shanghai Pujiang Talents (Class A), Excellent Young Medical Talents of Shanghai Healthcare System, and Young Top Talents of Hospital Pharmacy Committee of Chinese Pharmaceutical Society, etc. He was awarded the Third Prize of Shanghai Science and Technology Progress Award, and the First Prize of Beijing Medical Science and Technology Progress Award. His academic positions include Deputy Group Leader of Drug R&D and Translation Group of Shanghai Pharmaceutical Society; Deputy Group Leader of Anti-tumour Pharmaceutical Management Specialty Group of Clinical Pharmaceutical Management Specialty Committee of Shanghai Hospital Association, Youth Committee of Hospital Pharmacy Specialty Committee of Cross-Strait Pharmaceutical and Healthcare Exchange Association, Youth Committee of Clinical Pharmaceutical Management Specialty Committee of Shanghai Hospital Association, and Secretary; and Youth Committee Member of Clinical Pharmacy Specialty Branch of Shanghai Municipal Medical Association. He has presided over and participated in 10 projects of the National Natural Science Foundation of China. He has applied for 3 patents.

Relationship between Multiple Autoimmune Diseases: Rare Cases from Saudi Arabia

Faris Q.B. Alenzi

Department of Medical Laboratories, College of Applied Medical Sciences, Prince Sattam bin Abdulaziz University (Al-Kharj), Saudi Arabia

A case-control study was conducted on 20 patients suffering from any one out of the following three autoimmune diseases: systemic lupus erythematosus (SLE), alopecia areata (AA), or Hashimoto's disease (HD). Hematological and immunological measurements and the history of each patient were investigated. These measurements were compared with those found in 20 patients and 20 healthy controls in terms of concentrations, standard blood counts, HgB, white blood cells (WBCs), and red blood cells (RBCs). It was found that WBCs and platelet counts in patients with autoimmune diseases were statistically lower compared to healthy controls. The major common hematologic manifestations in patients with autoimmune diseases compared to controls were the presence of anemia, leukopenia, and thrombocytopenia, due to the use of immunosuppressive drugs, which causes low white cell count. Neutropenia, as well as lymphopenia, occurred in the majority of patients with autoimmune disease.

New Insights into the Mechanism of *Ulva pertusa* on Colitis in Mice: Modulation of the Pain and Immune System

Alessio Ardizzone, Anna Paola Capra, Deborah Mannino, Alberto Repici, Irene Paterniti, Michela Campolo and **Emanuela Esposito**

Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Viale Ferdinando Stagno d'Alcontres, Italy

Inflammatory bowel diseases (IBDs) involving Crohn's disease (CD) and ulcerative colitis (UC) are gastrointestinal (GI) disorders in which abdominal pain, discomfort, and diarrhea are the major symptoms. The immune system plays an important role in the pathogenesis of IBD and, as indicated by several clinical studies, both innate and adaptative immune response has the faculty to induce gut inflammation in UC patients. An inappropriate mucosal immune response to normal intestinal constituents is a main feature of UC, thus leading to an imbalance in local pro- and anti- inflammatory species. Ulva pertusa, a marine green alga, is known for its important biological properties, which could represent a source of beneficial effects in various human pathologies. We have already demonstrated the anti-inflammatory, antioxidant, and antiapoptotic effects of an Ulva pertusa extract in a murine model of colitis. In this study, we aimed to examine thoroughly Ulva pertusa immunomodulatory and pain-relieving properties. Colitis was induced by using the DNBS model (4 mg in 100 µL of 50% ethanol), whereas Ulva pertusa was administered daily at the dosage of 50 and 100 mg/kg by oral gavage. Ulva pertusa treatments have been shown to relieve abdominal pain while modulating innate and adaptative immune-inflammatory responses. This powerful immunomodulatory activity was specifically linked with TLR4 and NLRP3 inflammasome modulation. In conclusion, our data suggest Ulva pertusa as a valid approach to counteract immune dysregulation and abdominal discomfort in IBD.

Biography

Alessio Ardizzone is an academic researcher from the Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy. He received his Ph.D. in Applied Biology and Experimental Medicine at the University of Messina working in the field of neuroinflammation and local inflammation, searching for therapeutic target and valuable clinical biomarkers.

Serum Pentraxin 3 as Promising Biormarker for the Long-Lasting Inflammatory Response of COVID-19

Anna Paola Capra[1], Lelio Crupi[1], Giuseppe Pantò[2], Alberto Repici[1], Fabrizio Calapai[1,3], Raffaele Squeri[2], Alessio Ardizzone[1] and **Emanuela Esposito[1]**

[1]Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Viale Ferdinando Stagno d'Alcontres, Italy
[2]Department of Biomedical and Dental Sciences and Morphofunctional Imaging, University of Messina, Via Consolare Valeria 1, Italy
[3]Department of Clinical and Experimental Medicine, University of Messina, Via Consolare Valeria 1, Italy

Currently, biological markers for COVID-19 disease severity still constitute the main goal of enhancing an efficient treatment to reduce critical consequences such as an abnormal systemic inflammatory response. In this regard, the latest research has shown that Pentraxin 3 (PTX3), a highly conserved innate immunity protein, may serve as a valuable biochemical marker. Based on this evidence, we conducted a case-control study to compare the PTX3 serum levels and several immune-inflammatory mediators of 80 healthcare workers who were subdivided into subjects who were previously infected with SARS-CoV-2 (n = 40) and individuals who were never infected (n = 40). Using a commercially available Enzyme-Linked Immunosorbent Assay (ELISA), PTX3 and various immune-inflammatory protein levels were assessed in serum samples, while also considering possible variables (e.g., gender-related differences). We have shown elevated levels of PTX3 and other inflammatory proteins in previously infected COVID-19-positive subjects ($p < 0.001$). Moreover, the obtained data also indicate a degree of severity influenced by gender, as shown by the subgroup analysis, in which PTX3 expression was more pronounced in previously COVID-19-positive males ($p < 0.001$) than in females ($p < 0.05$) compared to the respective controls. In addition, our data further validate, through a direct comparison of previously COVID-19-positive subjects, greater pro-inflammatory levels in males than in females. Overall, our results may support the validity of PTX3 as a systemic biomarker in prolonged systemic inflammatory responses in the context of COVID-19. Thus, PTX3 modulation could constitute an effective therapeutic strategy for improving the recovery from COVID-19 and its systemic long-term consequences.

Biography

Dr. Anna Paola Capra works at the Department of Chemical, Biological, Pharmaceutical, and Environmental Sciences, University of Messina in Messina, Italy. Dr. Capra's research interests mainly focus on genetics, pharmacogenetics, and molecular biology. Dr. Capra's scientific output includes 36 publications in various journals with an h-index of 5 (Scopus, January 2024).

Analysis of COVID-19 Vaccinations and Symptom Mapping Diagnostic Technique for Viral Diseases: Using Data Analytics, Machine Learning and Artificial Intelligence

Chikezie K. Kalu
Jiangsu University, China

Background – The increasing challenge of modern medicine to continually improve to meet up with the evolving viruses, viral diseases and other forms of human diseases; requires urgent and a thorough approach for the good of humanity. Therefore, innovative measures must be applied in vaccination production and distributions, which have been identified as a most potent method to curb viral diseases and of current interest, the Corona Virus.

Objective – To analyse and measure the COVID-19 vaccination outlook in a developing country as Nigeria; and the non-clinical analysis, diagnosis, treatment and management of COVID-19 and other viral diseases, using Data/Machine Learning(ML)/Artificial Intelligence (AI) tools and Methodologies.

Methods– Using current and historical data from validated open source data stores, analysis was carried out on COVID-19 vaccination and related economic, demographic and geo-climatic data for a developing country, Nigeria and selected countries from all Continents of the World. The methodical and data-driven analyses were carried out using the following Data/Artificial Intelligence (AI) methodologies and algorithms: Multivariate Regression Analysis, Symptom Mapping Analysis, and Grey System Analysis.

Results – The COVID-19 vaccinations expectedly does reduce the number of active covid cases and the amount or number of vaccinations for a developing country as Nigeria is affected by a good number of economic, demographic and geo-climatic factors; and so COVID-19 vaccinations strategies must be unique to a Country and take into account influencing factors not only limited to number of active covid cases.

Conclusion – Medical practitioners can provide even more efficient diagnosis and treatment of viral diseases; and also patients can carry out personalised cost effective diagnosis and treatment/management of viral diseases, with also the advises of medical practitioners.

Biography

Biography

Mr. Chikezie Kennedy Kalu is currently a PhD Student at the Department of Management Science and Engineering, School of Management; Jiangsu University, China. His field of research is Technology and Innovation Management. He is from Nigeria and has a B.Eng. in Electronics Engineering from The University of Nigeria Nsukka; Enugu State, Nigeria (UNN) and a Masters (with Distinction) in Communication Engineering from The University of Manchester, UK. He has also had professional work experiences cutting across the Industries of: Telecom Engineering, Retail, Education, Oil and Gas, ICT and Logistics.

His research interests includes AI, Data Science/Analytics, Mathematical and Algorithms designs, Wireless Communications Systems and Electronics Engineering research and applications in various fields(including Health) for the good of humanity.

MTADV 5-MER peptide suppresses lung fibrosis ,RA, IBD and MS mouse models and inhibits human fibroblasts biological functions by targeting SAA, which fuels fibrosis

David Naor

The Lautenberg Center of Immunology and Cancer Research, Faculty of Medicine, Hebrew University of Jerusalem, Israel

The 5-MER peptide (5-MP) is N-acetylated C-amidated to improve its survival in the blood, thus allowing its therapeutic effects. 5-MP inhibits human Serum Amyloid A (SAA) activity, that fuels chronic inflammation and fibrosis by interfering with the formation of SAA oligomers and SAA-aggregated fibrils. Both are responsible for chronic inflammations and fibrosis in vivo and in vitro release of pro-inflammatory cytokines from human SAA-activated monocytes and fibroblasts. Uncontrolled fibroblast repair mechanism of injury generates fibrosis. Similarly, uncontrolled inflammation-induced activities of fibroblasts and monocytes in chronic inflammation induce fibrosis, stressing the linkage between inflammation and fibrosis. The last (fibrosis) is much less responsive to medical intervention than inflammation. However, we found, using ELISA at the protein level and qRT-PCR at the transcriptomic level, that 5-MP inhibits the activity of pro-inflammatory cytokines (IL-6 IL-1B, TNFB) in human fibroblasts and monocyte, both cell types are associated with inflammation and fibrosis. Furthermore, the in vitro proliferation potential of human fibroblasts was suppressed following their incubation with 5-MP, which explains the ability of the peptide to suppress the accumulation of fibroblasts in vivo, leading to fibrosis. In conclusion 5-MP displays therapeutic potential in models of lung fibrosis, thus extending the anti-inflammatory potential of this peptide to fibrotic maladies, which are included in the category of “drugs unmet diseases”.

The research status and prospects of nanomaterials in wound healing: a scientometric study

Dr. Songxia Xia[1], Dr. Li Teng[1], Dr. Liya Yang[1] and **PhD. Renxian Wang[2]**

[1]Plastic Surgery Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, China
[2]Laboratory of Bone Tissue Engineering, Beijing Laboratory of Biomedical Materials, National Center for Orthopaedics, Beijing Research Institute of Traumatology and Orthopaedics, JST sarcopenia Research Centre, Beijing Jishuitan Hospital, Capital Medical University, China

Background: In recent years, research achievements in nanotechnology and nanomaterials have rapidly been applied in the field of wound healing, promoting the research and development of wound-healing nanomaterials. Therefore, it is necessary to summarize the main countries, authors, journals, and collaborations in this field. Most importantly, the main research directions and related frontiers of wound healing and nanomaterials must be identified. This will contribute to a comprehensive understanding of the current state of research and promote further advancements in this field.

Methods: Publications related to nanomaterials and wound healing from 2013 to 2022 were retrieved from the Web of Science Core Collection, and were analyzed for co-authorship, co-citation, and co-occurrence analysis of countries, institutions, authors, references and keywords in this field through bibliometric visualization tools such as CiteSpace, VOSviewer, and Bibliometrics Online Analysis Platform.

Results: A total of 838 relevant papers were included, the number of studies has been increasing annually, with 610 articles and 228 reviews from 65 countries and regions, 1,284 affiliations, 279 journals, and 4,642 authors. China, India, and the United States are the main countries that produce articles in this field. Zangeneh, Akram is the most prolific author, and Grumezescu, Alexandru Mihai is the most highly cited author. The most productive institution was Chinese Academy of Sciences, the journal with the most publications was Nanomaterials. The keyword "antibacterial" highlights the current and future trends in this field.

Conclusions: This study represents the first bibliometric cluster analysis and visualization related to nanomaterials in the field of wound healing, and provides a clear and intuitive understanding of the distribution of research hotspots and development trends in the field. Over the past decade, there has been a growing interest in nanomaterials for wound healing research, with a promising outlook for future studies.

Biography

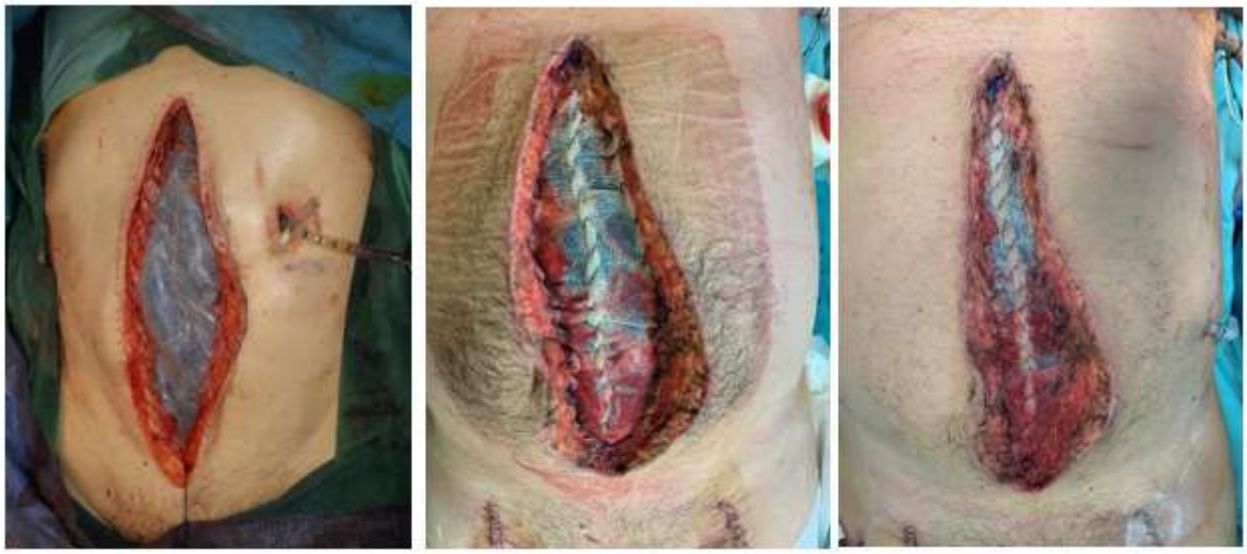
Songxia Xia is doctor in Plastic Surgery Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Tsinghua University. Xia's main research interests are in the areas of wound healing, particularly interested in exploring the potential of nanomaterials on wound healing. As a scholar and an indication of the global impact of research work, Xia's works have been submitted in several refereed international top-tier journals, one named "Progress on the Application of Augmented Reality Technology Surgical Navigation in the Maxillofacial Surgery" has been published in Chinese Journal of Plastic Surgery. Xia participated in the writing of "Advanced Textbook of Plastic Surgery" and "Training Textbook for Attending Clinicians in Aesthetic Medicine - Plastic and Aesthetic Surgery." Xia also participated in the translation of "Plastic Surgery" (ISBN: 978-0-323-35630-5).

Open abdomen and negative pressure wound therapy for acute peritonitis especially in the presence of anastomoses and ostomies

Orestis Ioannidis

4th Department of Surgery, Medical School, Aristotle University of Thessaloniki, General Hospital "George Papanikolaou", Greece

Acute peritonitis is a relatively common intra-abdominal infection that a general surgeon will have to manage many times in his surgical carrier. Usually it is a secondary peritonitis caused either by direct peritoneal invasion from an inflamed infected viscera or by gastrointestinal tract integrity loss. The mainstay of treatment is source control of the infection which is in most cases surgical. In the physiologically deranged patient there is indication for source control surgery in order to restore the patient's physiology and not the patient anatomy utilizing a step approach and allowing the patient to resuscitate in the intensive care unit. In such cases there is a clear indication for relaparotomy and the most common strategy applied is open abdomen. In the open abdomen technique the fascial edges are not approximated and a temporarily closure technique is used. In such cases the negative pressure wound therapy seems to be the most favourable technique, as especially in combination with fascial traction either by sutures or by mesh gives the best results regarding delayed definite fascial closure, and morbidity and mortality. In our surgical practice we utilize in most cases the use of negative pressure wound therapy with a temporary mesh placement. In the initial laparotomy the mesh is placed to approximate the fascial edges as much as possible without whoever causing abdominal hypertension and in every relaparotomy the mesh is divided in the middle and, after the end of the relaparotomy and dressing change, is approximated as much as possible in order for the fascial edges to be further approximated. In every relaparotomy the mesh is further reduced to finally allow definite closure of the aponeurosis. In the presence of ostomies the negative pressure wound therapy can be applied as usual taking care just to place the dressing around the stoma and the negative pressure can be the standard of -125 mmHg. However, in the presence of anastomosis the available date are scarce and the possible strategies are to differ the anastomosis for the relaparotomy with definitive closure and no further need of negative pressure wound therapy, to low the pressure to -25 mmHg in order to protect the anastomosis and to place the anastomosis with omentum in order to avoid direct contact to the dressing. The objective should be early closure, within 7 days, of the open abdomen to reduce mortality and complications.



What will audience learn from your presentation?

- Open abdomen should be carefully tailored to each single patient taking care to not overuse this effective tool
- Every effort should be exerted to attempt abdominal closure as soon as the patient can physiologically tolerate it
- All the precautions should be considered to minimize the complication rate
- Negative pressure wound therapy in peritonitis seems to improve results in terms of morbidity and mortality and definitive abdominal closure
- When an ostomy is present there are only subtle differences in management
- When an anastomosis is present consider:
- Placing the anastomosis remotely to visceral protective layer and thus the negative pressure
- Place the omentum over the anastomosis
- Decrease the negative pressure to even as low as -25 mmHg
- Perform a sutured anastomosis rather than a stapled one

Biography

Dr. Ioannidis is currently an Assistant Professor of Surgery in the Medical School of Aristotle University of Thessaloniki. He studied medicine in the Aristotle University of Thessaloniki and graduated at 2005. He received his MSC in "Medical Research Methodology" in 2008 from Aristotle University of Thessaloniki and in "Surgery of Liver, Biliary Tree and Pancreas" from the Democritus University of Thrace in 2016. He received his PhD degree in 2014 from the Aristotle University of Thessaloniki as valedictorian for his thesis "The effect of combined administration of omega-3 and omega-6 fatty acids in ulcerative colitis. Experimental study in rats." He is a General Surgeon with special interest in laparoscopic surgery and surgical oncology and also in surgical infections, acute care surgery, nutrition and ERAS and vascular access. He has received fellowships for EAES, ESSO, EPC, ESCP and ACS and has published more than 180 articles with more than 3000 citations and an H-index of 28

Lysophosphatidylcholine acyltransferase level predicts the severity and prognosis of patients with community-acquired pneumonia

Li Chen[1,2], Jianbo Xue[2], Lili Zhao[2], Yukun He[2], Shining Fu[3], Xinqian Ma[2], Wenyi Yu[2], Yanfen Tang[1], Yu Wang[1] and **Zhancheng Gao[2]**

[1]Department of Respiratory, Beijing Ditan Hospital Capital Medical University, China
[2]Department of Respiratory & Critical Care Medicine, Peking University People's Hospital, China
[3]Department of Respiratory and Critical Care Medicine, Beijing Jishuitan Hospital, the Fourth Medical College of Peking University, China

Background and objectives: Early diagnosis and prognosis of patients with community-acquired pneumonia (CAP) are still difficult clinical challenges. We aimed to identify the role of lysophosphatidylcholine acyl-transferase (LPCAT) for CAP along with assessing this protein's effectiveness as a biomarker for severity of disease and mortality.Methods: Prospective multicenter research study was carried out among hospitalized patients. A total of 299 CAP patients (including 97 severe CAP patients [SCAP]) and 20 healthy controls (HC) were included. The demographic and clinical characteristics were recorded for all participants. A quantitative enzyme-linked immunosorbent test kit was employed for detecting the LPCAT level in plasma. We developed a deep-learning-based binary classification (SCAP or non-severe CAP [NSCAP]) model to process LPCAT levels and other laboratory test results. Results: Admission levels of LPCAT in patients with SCAP were significantly higher, particularly in non-survivors and were not affected by the causative etiology. Furthermore, when the patients were stratified according to PSI and CURB-65 scores, the patients with high severity scores had higher LPCAT levels upon admission than patients with low severity scores. LPCAT showed the highest predictive value for SCAP. LPCAT was able to predict 30-day mortality among patients with CAP, combining LPCAT values with PSI scores or CURB-65 further enhance mortality prediction accuracy. Conclusion: The on admission level of LPCAT found significantly raised among SCAP patients and strongly predicted SCAP patients but with no correlation to etiology. Combining the LPCAT value with CURB-65 or PSI improved the 30-day mortality forecast significantly.

Biography

Dr. Li Chen graduated from Peking University Health Science Center in 2021 with the degree of doctor of philosophy. During the postgraduate period, she was mainly engaged in the immune response of pulmonary infectious diseases and related research on metabolomics and lipidomics. Subsequently, she worked in the Respiratory Department of the National Center for Infectious Diseases and Beijing Ditan Hospital, Capital Medical University, and has been engaged in the diagnosis and treatment of respiratory related diseases. She was proficient in basic theories and advanced techniques in the field of respiratory and critical care medicine, and has published a number of high-level papers in Frontiers in immunology, Emerg Microbes Infect, etc. Her research results have been widely recognized by international and domestic experts.

Identification of a predictive model and potential agents for immunotherapy of colorectal cancer based on novel immune subtypes

Dingchang Li, Xianqiang Liu and **Wenxing Gao**
Department of General Surgery, The First Medical Centre, Chinese PLA General Hospital, China

Objectives: To construct a predictive model to assess colorectal cancer (CRC) patients' susceptibility to immunotherapy and develop more efficacious immunotherapeutic sensitization strategies for the advancement of CRC treatment.

Scope: This study aims to build a predictive model to evaluate individual sensitivity to immunotherapy and develop more efficacious immunotherapeutic sensitization strategies for CRC patients.

Results: Validation of this model across public and in-house cohort confirmed its high precision and reliability. Furthermore, the IGF-1R inhibitor I-OMe-AG-538 (AG-538) was identified as a potent enhancer of antitumor immunity. In vitro and in vivo experiments indicated that AG-538 could promote the infiltration of multiple types of immune cells, activation of cytotoxic CD8+ T cells, and release of a series of cytokines and chemokines. Mechanistic investigations revealed it impairs DNA damage repair, triggering cGAS/STING-mediated IFN-I signaling within tumor cells. This signaling cascade increases tumor immunogenicity and refines the tumor immune microenvironment, thereby enhancing ICB treatment efficacy.

Methods: In this study, we introduced three immune subtypes based on 45 immune-related signatures from diverse immune cells and pathways. Subsequently, a robust predictive model was constructed through machine learning according to differentially expressed genes between high- and low-immune infiltration groups. The public and in-house cohort was used to validate the precision of the predictive model. Eventually, we performed drug screening using Connectivity map (CMap) database, and a series of in vivo and in vitro experiments was used to validate the positive effect of potential drug on anti-tumor immunity.

Conclusion: In summary, these findings present a novel predictive model for immune response and highlight the potential of AG-538 combined with anti-PD1 antibodies as a chemoimmunotherapeutic strategy. Assessing intratumoral IGF-1R expression may facilitate the prediction of the responses of patients with CRC to such therapies, paving the way for personalized treatment approaches.

Biography

Dr. Dingchang Li is a distinguished medical professional with a Ph.D. in General Surgery. His expertise is anchored in the critical areas of early diagnosis and immunotherapy for colorectal cancer. Dr. Li's research is at the forefront of multi-omics analysis within the realm of big data, where he has authored numerous influential scientific papers indexed in SCI journals. His dedication to medical science is evident through his contributions to the understanding and treatment of colorectal cancer.

IL-6 and CRP Monitoring and IgG Subclass Ratios against a domain nucleocapsid protein as markers for disease progression and its outcomes in COVID-19

Paulo Afonso Nogueira[1], Sérgio Paulo de Mello Mendes Filho[2], Raul Honorato e Melo[2], Fernanda Simão Martins[2], Paulo Jose Giroldi3, Rebeca de Souza Pinheiro[1], Yury Oliveira Chaves[1], Bárbara Batista Salgado[1], Maele Ferreira Jordão[1] and **Pritesh Lalwani[1]**

[1]Instituto Leônidas e Maria Deane, Fundação Oswaldo Cruz – Amazonas (FIOCRUZ – AMAZONAS) Manaus/AM, Brazil

[2]Serviço de Assistência Médica Domiciliar, Secretaria Estadual da Saúde de Rondônia, Brazil

[3]Laboratório Estadual de Patologia e Análises Clínicas (LEPAC), Brazil

The aim is to present two studies examined biomarkers in COVID-19.

In the first study was performed in Porto Velho, capital of Rondônia State located in Brazilian Amazon. We are present a second study about a protocol established to follow healthcare professionals who contracted COVID-19 and monitored daily with inflammatory biomarkers, including C-reactive protein (CRP), interleukin-6 (IL-6), ferritin, D-dimer, and fibrinogen. The protocol entailed nearly daily monitoring with blood sample collection and measurement of these markers. The results indicated that monitoring of IL-6/CRP ratio allowed for the establishment of therapeutic approaches that successfully prevented the worsening of the disease.

At the same time and in the other state of North of Brazil, Manaus, capital of Amazon State, we performed a comparative analysis of spike (S) and nucleocapsid (N) protein specific IgA and IgG subclass response in inpatients with severe COVID-19. The SARS-CoV-2 infection elicits a robust IgA and IgG response against the N-terminal (N1) and C-terminal (N3) region of the N protein, but a weak IgG response against the disordered linker region (N2). N and S protein specific IgG1, IgG2 and IgG3 response was significantly elevated in hospitalized patients with a severe disease compared to outpatients with non-severe disease. IgA and total IgG response between the discharged and deceased COVID-19 patients was similar, but significant differences were observed in the ratio of IgG subclass antibodies between discharged and deceased patients towards N2 protein, characterized by an imbalance of IgG3 relative to IgG2 in who succumbed to the disease.

In conclusion, these biomarkers were crucial in understanding the pathophysiology of COVID-19

which cover different contexts of the disease and in enabling clinical management aimed at achieving favorable outcomes.

Biography

Researcher at the Instituto Leônidas e Maria Deane (Fundação Oswaldo Cruz/Fiocruz Amazônia), located in Manaus, Amazonas, conducting studies on HIV and malaria.

Before the COVID-19 pandemic, he has already identified cytokine storms in patients with advanced HIV/AIDS who died. During the COVID-19 pandemic, his focuses shifted towards identifying biomarkers to comprehend the pathophysiology of COVID-19, as detailed in the aforementioned studies. Regarding HIV and COVID-19 coinfection, he found that SARS-CoV-2 infection is a risk factor for mortality in people living with HIV/AIDS, particularly those who are non-adherent in antiretroviral therapy (manuscript in preparation).

Role Of Osm-Osmr Signalling During Intestinal Epithelial Barrier Healing Using the Dss Model of Colitis

Arroyo J[1], Pohin M[1] and **Powrie F[1,2]**

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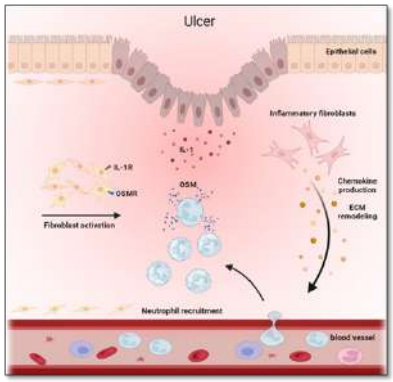
[2]*Translational Gastroenterology Unit, Experimental Medicine Division, Nuffield Department of Medicine, University of Oxford, John Radcliffe Hospital, UK*

OSM is an IL-6 family cytokine involved in homeostatic and pathological inflammatory processes through its pleiotropic effect modulating haematopoiesis, differentiation, cell proliferation and immune response. OSM is mostly produced by neutrophils and signals through the gp130-OSMR complex in mouse, expressed by intestinal nonhematopoietic stromal cells. Increased OSM and OSMR expression was associated with resistance to anti-TNF therapy in human IBD patients1 and correlated with the presence of deep ulceration of the tissue2 suggesting a role for OSM signaling in tissue healing. We will characterise the role of OSM using an intestinal wound healing mouse model induced by dextran sulphate sodium. A constitutive OSM knockout mouse strain and a conditional OSMR-flox in a tamoxifen inducible PDGFRa-CreERT2 reporter mouse strain, aimed to target fibroblasts will be used. Tissue healing will be assessed by histopathological characterisation of the inflammation landscape and re-epithelialisation of colon cross-sections slides, by flow cytometry analysis of immune and stromal populations, and by transcriptomic analysis of bulk colon tissue and sorted cell populations. In order to elucidate the potential role for OSM-OSMR signaling in the leukocyte-stromal crosstalk mechanism during the intestinal epithelial barrier repair process.



A combination of two recombinant mAbs confers efficient protection against orthopoxvirus infection

Tal Noy-Porat, Hadas Tamir, Ron Alcalay, Sharon Melamed, Nir Paran, Tomer Israely, Efi Makdasi and **Ohad Mazor**

Israel Institute for Biological Research, Israel

Members of the *Orthopoxvirus* genus can cause severe infections in humans. Global vaccination against smallpox, caused by Variola virus, resulted in the eradication of the disease in 1980. Shortly thereafter, vaccination was discontinued and consequently, immunity against smallpox and related orthopoxviruses like Monkeypox virus gradually declined, highlighting the need for efficient countermeasures not only for the prevention, but also for the treatment of already exposed individuals. To date, the only way to prevent or control an orthopoxvirus outbreak is by vaccination. However, the vaccinia-based vaccine may cause severe side-effects. Vaccinia Immune globulin (VIG), was approved by the FDA for treatment of vaccine adverse reactions and was also used occasionally for treatment of severe orthopoxvirus infections. However, this treatment carries many disadvantages and is also in short supply. Thus, a recombinant alternative is highly needed. In this study, a panel of neutralizing monoclonal antibodies, recognizing diverse proteins of vaccinia virus, the model virus of the genus, were developed from vaccinia virus-immunized non-human primates, and extensively characterized. Two mAbs, MV33 and EV42, targeting the two infectious forms of the virus, exhibited extremely high affinity and potent in vitro neutralization capabilities and were further evaluated *in vivo*. A single dose of either MV33 or EV42 administered 3 days post-infection (dpi) provided full protection against lethal ectromelia virus challenge, and a combination of both mAbs conferred full protection even when provided 5 dpi. Whole-body bioimaging and viral load analysis revealed that combination of the two mAbs allowed for faster and more efficient clearance of the virus from target organs compared to either MV33 or EV42 separately, and compared to treatment with VIG. The combined mAbs treatment further conferred post-exposure protection against the currently circulating Monkeypox virus, highlighting their therapeutic potential against other orthopoxviruses.

Biography

She is a research scientist in the Israeli Institute for Biological Research (IIBR). She received my M.Sc and PhD from Tel-Aviv university, graduated at 2009 and joined a post-doctoral position at the Weizmann Institute of Science, focusing on genetic regulation during development of the hematopoietic system. At 2012, joined IIBR Antibody Engineering group. Her research is focused on developing antibodies to infectious diseases and other disease-forming agents, as well as developing and improving antibody-discovery platforms. Her research spans the broad fields of genetics, molecular biology, microbiology, virology and synthetic biology, with over 20 publications in peer-reviewed journals.

Disease burden, health outcomes, and barriers and facilitators to health services for migrant populations in the Middle East and North African region: a suite of systematic reviews

F Seedat[1], O Bouaddi[2], E Elafef[3], T Maatoug[4], H Edries[3], A Ouahchi4, M Abdellatifi[2], S Evangelidou[5], A Requena Mendez[5] and **S Hargreaves[1]**

[1]Institute of Infection and Immunity, St George's University of London, UK
[2]School of Public Health, Mohammed VI University of Health Sciences, Morocco
[3]Blue Nile National Institute for Communicable Disease, University of Gezira, Sudan
[4]Faculty of Medicine, University of Sousse, Tunisia
[5]ISGlobal, Barcelona Institute for Global Health, Spain

Background: 46 million migrants reside in the Middle East and North Africa (MENA) region, yet little is known about policy and practice in relation to data collection and healthcare provision. We synthesised evidence on disease burden, health outcomes, and barriers and facilitators to health services for migrants in the MENA to inform the development of a new tool to strengthen data collection around key diseases.

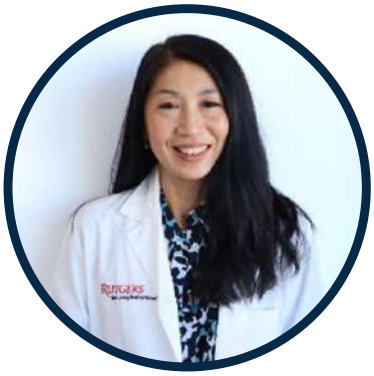
Methods: We did 7 systematic reviews to explore the disease burden, health outcomes, and barriers and facilitators to health services for the following disease areas in migrants: TB, HIV and hep B/C, malaria and neglected tropical diseases, non-communicable diseases (NCDs) mental health, maternal and neonatal health, and vaccine-preventable diseases. We searched electronic databases (PubMed/Embase) from 2000 to April 2023, with no exclusion criteria. Migrants were defined as persons who move away from their place of residence within or across a country.

Preliminary results: Most studies on migrants in the MENA are in the Middle East and focus on disease burden. In general, some migrants across some countries are at an increased risk of malaria, TB, and hepatitis B and C compared with host populations, however, this is not always consistent across the studies and depends on the countries and populations. There is a paucity of data on clinical outcomes in migrants, and on the coverage and uptake of interventions. The few available studies show that vaccine uptake in migrants is lower for migrant children compared with nationals. Testing for TB and HIV may be offered free of charge, however, some countries have deportation policies for those found positive once treatment has commenced, which can pose as a barrier.

Conclusions: This suite of systematic reviews syntheses evidence from across the MENA to address key evidence gaps. We found there is a need to strengthen data and surveillance around migrant health as an urgent next step to informing policy.

Biography

Dr Farah Seedat is a senior research fellow in global health with a career spanning 11 years and covering infectious disease epidemiology, screening, and inclusion health. She has extensive experience in conducting systematic reviews, epidemiological analyses, and in using research to develop policy. She has published over 30 peer-reviewed publications in high-, low- and middle-income countries and has developed evidence-based policy decisions and processes for the UK. Currently based in the Migrant Health Research Group at St George's University of London, Farah is leading a project developing and evaluating a data capture tool for migrant populations in the Middle East and North Africa.



Outcomes Among Patients Hospitalized for COVID-19 Treated with Remdesivir in an Urban Center Pre-COVID-19 Vaccination

Debra Chew, MD, MPH[1], Stephanie Shiau, PhD, MPH[2], Sree Sudharshan[2], Aparna Alankar[1], Malithi Desilva[1], Swetha Kodali[1], Tricia Mae Raquepo[1], Naema Meilad[1], Alexander Sudyn[1] and **Shobha Swaminathan MD[1]**

[1]Rutgers New Jersey Medical School, Division of Infectious Diseases, USA
[2]Rutgers School of Public Health, Department of Biostatistics and Epidemiology, USA

Objective: Data on treatment outcomes among minority populations treated with remdesivir are limited. We sought to evaluate outcomes among patients hospitalized with COVID-19 and treated with remdesivir among a predominantly Black and LatinX population.

Methods: This was a retrospective cohort study of adult patients hospitalized with COVID-19 and treated with remdesivir at an urban hospital in Newark, New Jersey between May 1, 2020 and April 30, 2021, prior to widespread COVID-19 vaccination uptake. We describe 28-day mortality by demographic, socio-economic and clinical factors, including clinical status by World Health Organization's (WHO) 8-point Ordinal Scale for Clinical Improvement.

Results: A total of 206 patients met study inclusion criteria (52% were male, 41% Non-Hispanic Black and 42% Hispanic). Overall mortality at 28 days was 11 percent. Eighty-one percent of patients with baseline WHO status of 4 or greater recovered by Day 14. Mortality was higher among those who were older (p=0.01), those with underlying diabetes mellitus (p=0.047), those with more severe illness on admission by WHO Ordinal Scale (WHO status >4), and those on concomitant tociluzimab or convalescent plasma use.

Conclusions: We found that remdesivir was effective in treating most COVID-19 patients in our study. Traditional risk factors, such as advanced age and underlying co-morbidities, were associated with worse clinical outcomes and deaths.

Biography

Dr. Chew, MD, MPH is an Associate Professor of Medicine at Rutgers New Jersey Medical School and an Attending Infectious Disease Physician at University Hospital in Newark NJ. She graduated from Brown University and Mount Sinai School of Medicine. She completed her Internal Medicine residency at Beth Israel Medical Center, New York, and her Infectious Diseases fellowship at Albert Einstein/Montefiore Medical Center. She was a former Epidemic Intelligence Service Officer at the Centers for Disease Control and Prevention. She also completed an MPH from Rutgers School of Public Health. Since joining Rutgers NJMS, Dr. Chew has participated in numerous NIH-sponsored trials on COVID-19, Mpox, and HIV treatment and prevention. She currently serves as the Medical Director for Infection Prevention and Control and Antimicrobial Stewardship at University Hospital in Newark. Her major clinical and research interests include antimicrobial stewardship, COVID-19, and prevention of hospital-acquired infections.

Effect of serum autoantibodies on the COVID-19 patient's prognosis

Mingzhe Ning[1], Weiming Zhang[1], Yue Tao[1], Yijia Zhu[1], Qisi Zheng[1], Fenghua Hu[1], Wenbo Zhu[1] and **Jian Wang[2]**

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[2]Department of Infectious Diseases, Nanjing Drum Tower Hospital, The Affiliated Hospital of Nanjing University Medical School, China

Objectives: Virus infection closely associated with autoimmune disease. The study aimed to explore the autoantibody profiles and the correlation of autoantibodies with the disease severity and the prognosis of the coronavirus disease 2019 (COVID-19) patients.

Methods: Three hundred thirty-seven hospitalized COVID-19 patients from 6th to 23rd January 2023 were enrolled. Logistic and Cox regression analyses were used to analyze the risk factors for the patient's disease severity and outcome. The association between Anti-extractable nuclear antigen antibody (ENA) positivity and the prognosis of COVID-19 patients was analyzed using Kaplan–Meier survival curves.

Results: 137 of COVID-19 patients were detected positive for antinuclear antibody (ANA), 61 had positive results for ENA, and 38 were positive for ANA and ENA (Table 1). ANA positivity rate was higher in non-severe illness group ($p = 0.032$). COVID-19 patients who died during hospitalization had a high rate of ENA positivity than convalescent patients ($p = 0.002$). Multivariate logistic regression showed that ANA positivity was a protective factor for the disease severity of COVID-19. Multivariate Cox regression analysis revealed that ENA positivity, white blood cells count (WBC), aspartate aminotransferase (AST), Creatinine (CREA), and CRP were independent risk factors for the outcome of COVID-19 patients, and that COVID-19 patients with ENA positivity had a lower cumulative survival rate ($p = 0.002$; Figure 1B).

Conclusion: A spectrum of autoantibodies were expressed in COVID-19 patients, among which ANA and ENA positivit was associated with the severity and prognosis of COVID-19. Therefore, autoantibodies may help to assess the disease severity and prognosis of COVID-19 patients.

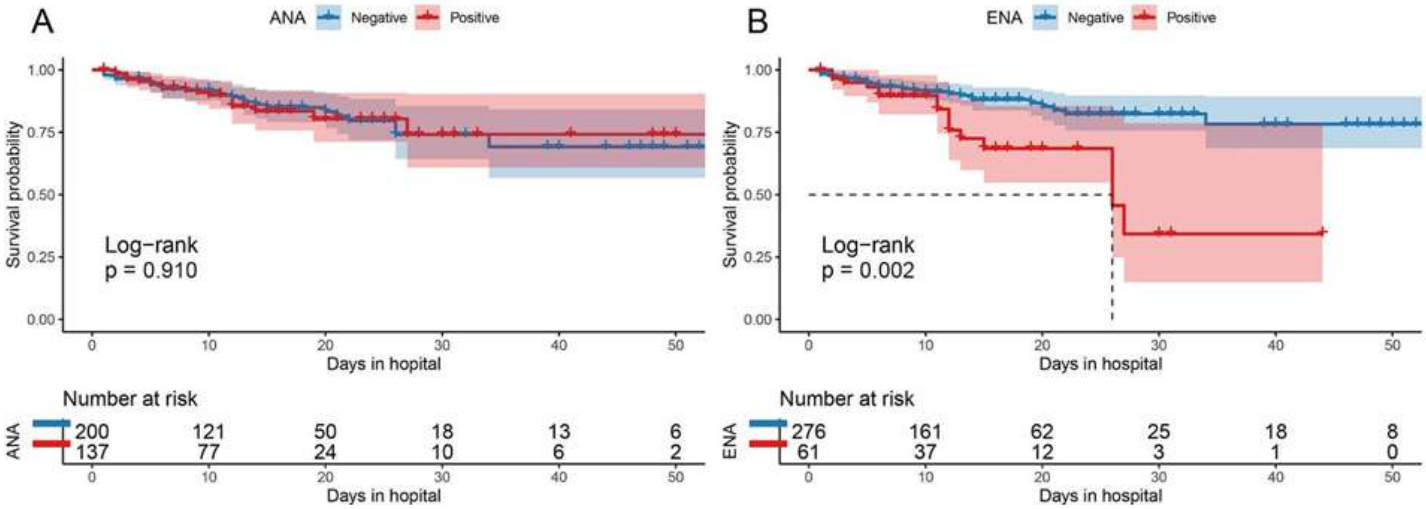

Figure 1 Comparison of the cumulative survival rate between patients with and without ANA positivity (A) and between those with and without ENA positivity (B)

Note: ANA, antinuclear antibody; ENA, anti-extractable nuclear antigen antibody.

One Health and the Opportunity for Paradigm Shifts Through a New WHO Pandemic Agreement

Nina Jamal
VIER PFOTEN International (FOUR PAWS), Austria

The COVID-19 pandemic has exposed weaknesses in healthcare systems around the world and triggered a multilateral negotiation among World Health Organisation member states on pandemic prevention, preparedness and response. With millions of lives lost and trillions of cumulative losses in financial outputs, it is undeniable, that a new way to tackle global health crises is needed. The objective of this paper was to explore whether transformational developments in defining, designing and implementing global health are underway, in the context of emerging infectious diseases and the WHO pandemic agreement.

Through direct engagement with scientists and key stakeholders in the global policy arena in the context of advocacy as well as a review of literature, I identified key developments which, if supported, can constitute a paradigm shift that can elevate health for all as an outcome.

The results showed that a paradigm shift, largely connected to operationalizing One Health, is indeed emerging. A move from a symptom-control towards a root-cause driven approach in which the drivers of zoonotic disease emergence are tackled has become a common message among experts and scientists. One Health guidance by the Quadripartite organisations meant to support governments in designing and implementing One Health strategies includes clear objectives and activities that address the risk of disease emergence. The challenge that health is viewed as an expense and economic burden rather than a desired outcome worth investing became the focus of a newly established WHO Council on the Economics of Health for All. If strategies focus on achieving equity by enabling vulnerable communities who come into daily contact with pathogens, at the human-animal-environment interface to protect themselves, governments and international institutions can effectively prevent pandemics. In this paper, I elaborate on the changes that the international community needs to make to enable those developments.

Biography

Nina Jamal is the International Head of Pandemics & Campaign Strategies at FOUR PAWS International, a global animal welfare organization for animals under direct human influence. In her current role, her focus is on the importance of pandemic prevention by tackling the root causes of disease outbreaks via a One Health approach in the Pandemic Agreement and national strategies. Before taking on that role and since 2013, Nina led the International Campaigns on Farm Animals and Nutrition at FOUR PAWS. Nina has worked on combatting climate change in campaigns and international policy within the UN Framework Convention on Climate Change negotiations as well as on environmental issues and sustainability in the private sector and in UNIDO on the implementation of international multilateral environmental agreements. Her background is in Environmental Health Sciences, Public Health and International Environmental Policy.

Physical virology: At the dawn of exascale computing

Kush Coshic[1], Christopher Maffeo[2], David Winogradoff[2] and **Aleksei Aksimentiev[2]**

[1]Max Planck Institute of Biophysics, Germany
[2]University of Illinois at Urbana Champaign, USA

Despite our understanding of the protein capsid's structure in many virus species, the three-dimensional arrangement of viral genomes has remained largely unexplored. Here, we present a multi-resolution approach to unveil the complete structure of bacteriophage HK97, encompassing its 39,732 base pair genome. Mimicking the action of a packaging motor, the genome was progressively loaded into the protein capsid. Subsequently, simulations were conducted to refine the structure of the packaged capsid at increasing resolutions, resulting in a 26 million atom model of the entire virion, inclusive of water and ions confined within the capsid. Surprisingly, we discovered DNA packaging to transpire via a loop extrusion mechanism, yielding diverse configurations of the packaged genome and imbuing each viral particle with unique attributes. Extensive all-atom simulations, spanning multiple microseconds, elucidated the impact of the packaged genome on capsid structure, internal pressure, electrostatics, and the diffusion of water, ions, and DNA. Our methodology is highly adaptable and can be readily extended to obtain structural models of other viruses, such as herpes. In light of the impending era of exascale computing, our recent discoveries promise to chart an exhilarating course for the future of physical virology.

Biography

Completed PhD (Biophysics) from the University of Illinois at Urbana Champaign, under the supervision of Prof. Aleksei Aksimentiev. Currently a postdoctoral researcher at Max Planck Institute of Biophysics, Frankfurt, under the supervision of Prof. Gerhard Hummer.

Elasticity of the HIV-1 Core Facilitates Nuclear Entry and Infection

Itay Rousso
Ben-Gurion University of the Negev, Israel

HIV-1 infection requires passage of the viral core through the nuclear pore of the cell, a process that depends on functions of the viral capsid. Recent studies have shown that HIV-1 cores enter the nucleus prior to capsid disassembly. Interactions of the viral capsid with the nuclear pore complex are necessary but not sufficient for nuclear entry, and the mechanism by which the viral core traverses the comparably sized nuclear pore is unknown. Here we show that the HIV-1 core is highly elastic and that this property is linked to nuclear entry and infectivity. Using atomic force microscopy-based approaches, we found that purified wild type cores rapidly returned to their normal conical morphology following a severe compression. Analysis of four HIV-1 capsid mutants that exhibit impaired nuclear entry revealed that the mutant viral cores are brittle. Adaptation of two of the mutant viruses in cell culture resulted in additional substitutions that restored elasticity and rescued infectivity and nuclear entry. Elasticity was also reduced by treatment of cores with the capsid-targeting compound PF74 and the antiviral drug lenacapavir. Our results indicate that elasticity is a fundamental property of the HIV-1 core that enables nuclear entry, thereby facilitating infection. These results provide new insights into the role of the capsid in HIV-1 nuclear entry and the antiviral mechanisms of HIV-1 capsid inhibitors.

A 10-year Follow-up of Bacillus Calmette-Guérin (BCG) Epiphyseal Osteomyelitis after Tokyo 172 Strain Vaccination in Infants: Epiphyseal Regeneration and Minimal Leg-Length Discrepancy

Satomi ABE

The Dept. of Orthopaedic Surg. Asahikawa Medical University, Japan

Background: Bacillus Calmette-Guérin (BCG) is a vaccine to prevent tuberculosis. Complications in infants and children include BCG osteitis and osteomyelitis of the metaphysis or epiphysis of long bones. BCG osteomyelitis is characterized by a more severe and atypical manifestation than cases caused by ordinary bacteria. However, there are limited reports on long-term follow-up in such cases. In this study, we aimed to investigate the 10-year outcomes through X-rays and physical examinations.

Case presentation: We described two individuals who developed BCG osteomyelitis after vaccination (Tokyo 172 strain) at 3 months old. Both cases underwent a biopsy of the infected epiphyseal lesion, irrigation from the metaphysis through the center of the growth plates, and received two anti-tuberculosis drugs: rifampicin and isoniazid. At the 10-year follow-up, the affected epiphysis had regenerated and both cases showed a leg-length discrepancy of less than 1 cm due to overgrowth.

Conclusions: This study reported on the long-term outcomes of two cases of BCG epiphyseal osteomyelitis in infants, revealing favorable results with regenerated epiphysis and minimal leg-length discrepancy.

Biography

Satomi ABE completed MD in 1998, and PhD in 2016 from Asahikawa Medical University, JAPAN. A lecturer in the Department of Orthopaedic Surgery at Asahikawa Medical University.

RESEARCH: Immunology of cartilage and MSC, Pathology of bone and soft tissue, 3D-motion analysis.

Targeting Mitochondrial ROS to Mitigate SARS-CoV-2 Pathology: A Novel Host-Directed Approach for Durable COVID-19 Treatment

Joseph W Guarnieri[1], Alessia Angelin[1], Jeffrey A Haltom[1], Gabrielle A Widjaja[1], Timothy Lie1, Zimu Cen[1], Sujata S Ranshing[1], Deborah G Murdock[1], Stephen B Baylin[4], Eve S Wurtele[3], Deanne Taylor[1], Christopher E Mason[2], Jonathan C Schisler[5], Robert E Schwartz[2], Afshin Beheshti6 and Douglas C Wallace[1]

[1]The Children's Hospital of Philadelphia, USA
[2]Weill Cornell Medicine, USA
[3]Iowa State University, USA
[4]University of North Carolina, USA
[5]Johns Hopkins School of Medicine, USA
[6]KBR, NASA Ames Research Center, Moffett Field, USA

Our host transcriptome and biochemical analysis of SARS-CoV-2-infected patients, cells, mice, and hamsters revealed significant inhibition of transcription for both nuclear DNA (nDNA)- and mitochondrial DNA (mtDNA)-encoded oxidative phosphorylation (OXPHOS) genes, mediated by viral proteins and virus-induced expression of miR-2393. This OXPHOS inhibition elevates mitochondrial ROS (mROS), stabilizing hypoxia-inducible factor 1 alpha (HIF-1B) and redirecting metabolism towards glycolysis, supplying substrates needed for viral biogenesis. Elevated mROS also triggers the release of mtDNA into the cytosol, contributing to the cytokine storm. OXPHOS inhibition correlates with up-regulation of mtDNA-activated genes, and SARS-CoV-2 proteins E and Orf3a expression exacerbate Ca++-influx, elevating mROS production, and triggering mtDNA release.

Since suppressing mitochondrial function and increasing mROS are essential for viral pathogenesis, interventions targeting mROS or improving OXPHOS can mitigate viral replication and COVID-19 severity. To determine whether mitochondrially targeted antioxidants could mitigate these viral effects, we challenged mice expressing human ACE2 with SARS-CoV-2 and intervened using transgenic and pharmacological mitochondrially targeted catalytic antioxidants. Transgenic expression of mitochondrially targeted catalase (mCAT) or systemic treatment with EUK8 decreased weight loss, clinical severity, and circulating levels of mtDNA, HIF-1α stabilization, viral intermediates, and inflammatory cytokines. RNA sequencing of infected lungs revealed that mCAT and EUK8 upregulated OXPHOS gene expression and downregulated HIF-1α and its target genes as well as innate immune gene expression.

Since SARS-CoV-2 continues to evolve its Spike (S) protein sequence to evade immunization constraints, a more durable intervention to combat COVID-19 is required. Our data demonstrate

that SARS-CoV-2 pathology can be mitigated by catalytically reducing mROS, potentially providing a novel host-directed pharmacological therapy for COVID-19 that is not subject to SARS-CoV-2 S gene mutational resistance.

Biography

Joseph W. Guarnieri is an expert in mitochondrial research, systems-biology, and virology, focusing on the interplay between mitochondrial function and viral subversion, particularly SARS-CoV-2. During his postdoctoral research with Dr. Douglas C. Wallace, his work revealed that SARS-CoV-2 inhibits transcription of both nuclear and mitochondrial DNA (mtDNA)-encoded OXPHOS genes, elevating mitochondrial ROS, which (1) stabilizes hypoxia-inducible-factor-1-alpha (HIF-1B), triggering a metabolic shift towards glycolysis to augment viral biogenesis, and (2) triggers the release of mtDNA, contributing to cytokine storms. He tested mitochondrial-targeted antioxidants in SARS-CoV-2-infected mice, showing reduced disease severity and inflammation, suggesting a novel therapeutic approach. In addition to his viral work, he is involved in several multi-omic analysis projects with the COVID-19 International Research Team and the NASA-Multi-Omics/Systems-Biology Analysis Working Groups, researching mitochondrial dysfunction associated with long-term space travel. In the future, he aim to further investigate mitochondrial adaptation to viral and spaceflight-induced stress and develop targeted therapeutics to counteract this mitochondrial dysfunction.

Detection of Useful or Nuisance Governmental Anti-Covid Measures

Michal Haindl, Pavel Žid and **Vojtěch Havlíček**
Institute of Information Theory and Automation, Czech Academy of Sciences, Czechia

We conducted a retrospective study to evaluate the effectiveness of Czech government measures against COVID-19 over an extensive observation period exceeding three years. For comparative analysis, we examined also the Bavarian anti-COVID measures during a two-year overlapping period with the Czech data. This study spans from the detection of the first three COVID-19 cases in the Czech Republic on March 1, 2020, through to September 2023. It traces the evolution of responses from initial vigorous efforts to combat an unknown illness to a phase of diminished nationwide measures, eventually treating COVID-19 as a routine concern from the second half of 2023. Our analysis employs an adaptive recursive Bayesian stochastic multidimensional COVID-19 model to predict several key publicly available COVID-19 data series. Results indicate that while some measures contribute to reducing transmission, their effectiveness varies significantly based on implementation timing, public compliance. This model enables us to distinguish between effective and ineffective measures, assess their timing, and predict crucial COVID-19 statistics such as infection rates, hospitalizations, mortality, and symptomatic cases. These predictions can inform daily anti-COVID strategies, necessary precautions, and recommendations for managing similar future pandemics. This study underscores the need for adaptive strategies tailored to specific contexts and evolving epidemiological data to enhance the efficacy of anti-COVID measures. Due to missing sufficient economic data we restrict our study to the COVID medical consequences only.

Biography

Michal Haindl graduated from the Czech Technical University (1979), Prague, received his Ph.D. from the Czechoslovak Academy of Sciences (1983), and subsequently earned the ScD degree (2001). He is the IAPR fellow, IEEE senior member, and Professor. Since 1983, he has worked on various image analysis and pattern recognition topics in the Institute of Information Theory and Automation (UTIA) of the Czechoslovak Academy of Sciences, Prague; University of Newcastle; Rutherford Appleton Laboratory; CWI, Amsterdam, and INRIA, Rocquencourt. In 1995 he rejoined UTIA where he was the Pattern Recognition Department head. His current research interests include random field applications in pattern recognition and image processing.

Ischemic stroke as the initial presentation in acute myeloid leukaemia vs. myelodysplastic syndrome: a case report and literature review with pathophysiological and clinical exploration

Hosna Elshony[1], Meshari Alzahrani[2], Salah Khafaji[2], Rakan Almuhanna[2], Khalid Khalil[3] and **Rabia Mudassir[2]**

Department of Internal Medicine/Haematology, Security Forces Hospital, Saudi Arabia

Background: Myelodysplastic syndromes (MDS) and acute myeloid leukaemia (AML) present intricate challenges due to their diverse clinical manifestations and thrombotic complications. Thromboembolism (TE) incidence in newly diagnosed AML patients is noteworthy, with arterial TE linked to poorer overall survival. Ischemic strokes, although relatively low in prevalence, carry significant clinical implications. Case description We report the case of an 84-year-old male with Type 2 Diabetes, Hypertension, and chronic kidney disease, presenting with seizures, focal neurological deficits, and pancytopenia. An unexpected diagnosis of AML or MDS emerged during the investigation. Despite interventions, the patient's condition deteriorated, leading to a fatal outcome weeks later.

Conclusion: This case underscores the intricate relationship between hematologic malignancies and ischemic stroke. The rarity of this complication emphasizes the importance of understanding the multifaceted mechanisms at play, including hyperleukocytosis, pro-inflammatory cytokine release, coagulation cascade activation, and direct interactions with endothelial cells. In our literature review, analysis of 15 cases, including ours, revealed a wide age range (3–87 years) and a gender bias towards females. AML diagnosis was predominant, with uniformly low platelet counts. Cortical infarctions, especially in the anterior circulation, were common. Hyperleukocytosis, disseminated intravascular coagulation (DIC), and fatal outcomes were observed in a subset of cases. Despite the grim statistics and often poor prognosis, the identification of specific risk factors, such as thrombocytopenia and cytogenetic abnormalities, offers avenues for targeted prevention and management.

Biography

Dr Khalid Khalil was graduated 2004 from medical college MUST UNIVERSITY currently is working as hematology and internal medicine consultant in security forces hospital in Makkah , with very good experience in adult hematology and internal medicine and had a good number of publications in the field of hematology nationally and internationally.

Comprehensive In-Silico Analysis of RNAi Silencing-related Genes and their Functional Regulatory Elements in mandarin Clementine (*Citrus clementina*)

Hadia Hussain[1], Maryam Noor[2] and **Noor Fatima[3]**

[1]Northeast Normal University, China
[2]Department of Biotechnology, University of Okara, Pakistan
[3]Department of Biotechnology, University of Okara, Pakistan

RNA interference (RNAi) mechanism play an important role to regulates a numerous eukaryotic gene expression, particularly in growth, response to signals of stress, as well as the conservation of genetic integrity throughout the developmental stages. It's also closely related to the process of post-transcriptional gene silencing (PTGS) and the chromatin modification levels. In RNA interference, certain gene families such as Argonaute (AGO), Dicer-Like (DCL), and RNA-dependent RNA polymerase (RDR) are responsible for RNA silencing process. As far as we know, there hasn't been study on genome-wide identification of AGO, DCL and RDR gene families in citrus clementina, despite their discovery in certain other species. Therefore, we conducted a comprehensive genome-wide in silico analysis to identify the RNA interference AGO, DCL and RDR gene families, based on various bioinformatics approaches including sequence alignment, evolutionary relationships, functional conserved domain and motif analysis, gene structure, chromosome location, sub-cellular localization, 3D- structure, protein-protein interactions (PPIs), gene ontology (GO) analysis. In this study, we have identified 12 *CcAGOs*, 5 *CcDCLs* and 1 *CcRDR* genes in citrus clementina genome corresponding to the model plant *Arabidopsis thaliana* RNAi genes. Our results of conserved domain, motif and gene structure analysis for all the identified *CcAGOs, CcDCLs* and *CcRDRs* genes showed high homogeneity within the same gene family. The Insilico sub-cellular localization analysis showed that majority of the RNAi genes were significantly located in the nucleus. The analysis of protein-protein interaction illustrated the interaction between the three identified RNAi gene families in citrus clementina. Further, gene ontology analysis showed that a total 18 identified RNAi genes were significantly involved in RNA gene silencing processes. Furthermore, it was also observed in cis-acting regulatory analysis that most of the identified RNAi genes were responsive to stress, hormone, light and other functional activities. Overall, our findings provide valuable insights for comprehensive molecular exploration of the regulatory elements of these genes for citrus clementina crop improvement against various stress factors.

Biography

Dr. Hadia Hussain was born in Pakistan. She graduated in Bioinformatics and Biotechnology at GC University Faisalabad, Pakistan. She has a master's degree in Plant Biotechnology at the Centre of Agricultural Biochemistry and Biotechnology (CABB), from the University of Agriculture Faisalabad, Pakistan. She completed her Ph.D. under Chinese government scholarship at Northeast Normal University China. Where her research is based on the functional characterization of ABA-responsive genes and transcription factors in the model plant Arabidopsis thaliana including their role in hormone signaling, plant growth and development, and plant response to environmental stresses. She has expertise on different experimental work requiring a combination of techniques in areas of molecular genetics, plant physiology, and bioinformatics.

A novel approach to identify defense-related genes against viral infection in plants using RNA sequencing approach

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Viral diseases cause significant economic losses in plants and the identification of defense-related genes is an important and necessary step to make resistance against viral infection. In this study, using the novel high-throughput RNA sequencing-based experiment (RNA-Seq), we monitored the significantly differentially expressed genes (DEGs) in the model plant Arabidopsis thaliana after the treatment to exogenous and endogenous defense peptide signals to identify the genes that have a role against viral infection. Using a novel bioinformatics analysis, we introduced a novel method to identify the genes that have a role against viral infection. We made the homozygous mutant line of the selected identified genes and have infected the plants with two important RNA plant viruses including Cucumber mosaic virus (CMV, Bromoviridae) and Zucchini yellow mosaic virus (ZYMV, Potyviridae). We found that compared to the mock-inoculated plants the homozygous mutant line of a pseudogene exhibited severe susceptibility to CMV and ZYMV viruses. Using the quantitative real-time reverse transcription PCR analysis, we evaluate the expression of the marker genes in this mutant line compared to the wild-type plants. We observed that compared to the mock-inoculated plants, as the consequence of the viral infection, the expression of the defense related genes is reduced in the mutant plants. Based on what we have found in this study, it can be concluded that pseudogenes have important role in viral infection and subsequent research is needed to identify their exact function in viral infection. Conclusively, using RNA sequencing-based method, we introduced a novel approach to identify the genes that have a role against viral infection. Our unique method can be introduced in other important crop plants to identify new defense genes against viral infection.

Comparative efficacy of *Moringa oleifera* and coconut oil-based mouthwashes versus chlorhexidine in reducing human oral microbial populations in healthy adults: a single blind clinical trial

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[2]*Health Services Academy, Pakistan*
[3]*Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Pakistan*

Introduction: Dentists have considered chlorhexidine as the gold standard antimicrobial solution against oral microbes for decades. The side effects of chlorhexidine and our historical reliance on natural remedies create the need for herbal alternative. This study evaluated the effectiveness of chlorhexidine, coconut oil, and moringa on the prevalence of human oral bacteria using a single- blind, randomised, clinical trial method.

Methods: A total of 90 oral swabs were collected from consenting human participants on day 0 of the clinical trial. The participants were given either chlorhexidine (group A), coconut oil (group B), or Moringa oleifera (group C) mouthwashes and instructed to rinse for 14 days, twice daily. The participants were sampled again on day 14. Total plate count (TPC) and differential plate count (DPC) were done on both samples of each participant collected on day 0 and day 14. Bacteria were identified by standard biochemical tests.

Results: Streptococcus mitis, Veillonella parvula, Klebsiella aerogenes, Streptococcus mutans, Bacteroides fragilis, Aggregatibacter actinomycetecomitans, Streptococcus pneumoniae, and Staphylococcus aureus were isolated from the plaque. All 3 types of mouthwash exhibited statistically significant differences in TPC and DPC of day 0 and day 14 when compared using a paired t-test (P value = 0.03, 0.01, and < 0.01 respectively). No statistically significant difference was noted in the antimicrobial activity of the three mouthwashes when compared using one way ANOVA, post- hoc Tukey's test.

Conclusion: Our results show that M. oleifera and coconut oil have a bactericidal effect on oral microbial populations associated with caries and periodontal disease, comparable to chlorhexidine

Biography

Abu Bakar Shoukat from Pakistan. He did his Master in Science (16 years Education) from Quaid-i-Azam University Islamabad, which is the top-notch university of Pakistan, and got a Gold Medal. Then he worked as Research Officer at Health care Diagnostic and Research Center Swabi for almost one and half years. After that he pursued his Master of Philosophy (M.Phil) in Microbiology from Quaid-i-Azam University Islamabad.

During my M.Phil. He worked as a Research Associate on a clinical trial titled “Assessment of the Role of Coconut oil and Moringa Leaf Extract on the prevalence of Human Oral Flora”. He carried out all the research work with some assistance of his team. After the completion of my M.Phil. He started working as a Research Officer to continue his passion for lab work.

Characterization, antibacterial, and cytotoxic activities of silver nanoparticles using the whole biofilm layer as a macromolecule in biosynthesis

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Recently, multi-drug resistant (MDR) bacteria are responsible for a large number of infectious diseases that can be life-threatening. Globally, new approaches are targeted to solve this essential issue. This study aims to discover novel antibiotic alternatives by using the whole components of the biofilm layer as a macromolecule to synthesize silver nanoparticles (AgNPs) as a promising agent against MDR. In particular, the biosynthesized biofilm-AgNPs were characterized using UV-Vis spectroscopy, electron microscopes, Energy Dispersive X-ray (EDX), zeta sizer, and potential while their effect on bacterial strains, and normal cell lines was identified. Accordingly, biofilm-AgNPs have a lavender-colored solution, spherical shape, with a size range of 20–60 nm. Notably, they have inhibitory effects when used on various bacterial strains with concentrations ranging between 12.5 and 25 µg/mL. In addition, they have an effective synergistic effect when combined with phage ZCSE9 to inhibit and kill Salmonella enterica with a concentration of 3.1 µg/mL. In conclusion, this work presents a novel biosynthesis preparation of AgNPs using biofilm for antibacterial purposes to reduce the possible toxicity by reducing the MICs using phage ZCSE9.

Novel HBZ-Fc fusion protein production in Pichia pastoris

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Introduction: Human T leukemia virus (HTLV) is a complex retrovirus with a genome that contains three common regions of all retroviridae families. HBZ is the reversed transcription protein from the 3' LTR region which is permanently expressed in Adult T cell leukemia-lymphoma or ATLL. This regulatory protein is involved in infection, cell-cell translocation, Host cell signaling interaction, apoptotic pathway interruption, and malignant transformation. In spite of TAX, simple structure, low-affinity binding to MHC molecules, and little size HBZ led to lose immunogenicity properties. Fc taq protein can improve the immune presentation by complex madding structure, increasing attachment and half-life of protein, therefore the aim of this study is to produce HBZ Fc-fusion production in the Pichia pastoris system.

Material and Methods: HBZ sequence was obtained from PDB bank standard sequence, then the gene cassette was commercially produced and transferred into Pichia Pastoris Gs 115, The transferred colonies were selected by Zeocin serial concentration and expression of Fc fusion protein were purified by Hitrap columns and the chemical and structural properties were evaluated.

Results: a purified 51 KD HBZ-Fc fusion protein was produced in the monomeric and dimeric form at 232 mg/l. Conclusion: Our results demonstrated the recombinant HBZ-Fc fusion protein production can bring a fascinating potential bio-applied tool in HTLV-I identification, pathogenesis mechanism detection, immunization, and therapeutic drug regimes.

Biography

Mohammad Mehdi Akbarin was born on March 25, 1984, in Mashhad, Iran. He is a dedicated researcher with a passion for medical Immunology, specializing in retrovirus research, particularly focusing on HTLV-1.

Dr. Akbarin holds a Ph.D. degree in Medical Immunology from Mashhad University of Medical Sciences, where he conducted groundbreaking research in the field of retrovirology. His academic journey has equipped him with a deep understanding of the immune system and its response to viral infections, particularly HTLV-1.

With over 10 years of experience in retrovirus research, Dr. Akbarin has established himself as a leading expert in the field. His research contributions have significantly advanced the understanding of HTLV-1 pathogenesis, transmission, and

potential therapeutic interventions.

Throughout his career, Dr. Akbarin has demonstrated a strong commitment to scientific excellence and innovation. His work has been published in reputable scientific journals, contributing valuable insights to the global scientific community.

Dr. Akbarin's dedication to advancing knowledge in medical Immunology and retrovirus research has earned him recognition and respect from his peers and colleagues. His expertise, combined with his unwavering passion for research, continues to drive impactful discoveries in the field of retrovirology.

In addition to his academic achievements, Dr. Akbarin is known for his collaborative spirit, mentorship of aspiring researchers, and commitment to scientific integrity. He is a valued member of the scientific community, making significant contributions to the fight against retroviral infections.

As he continues his research journey, Dr. Mohammad Mehdi Akbarin remains focused on unraveling the complexities of HTLV-1 and advancing scientific knowledge to improve the diagnosis, treatment, and prevention of retroviral diseases.

Molecular Characteristics of Community-Acquired Methicillin-Resistant Staphylococcus aureus, Hospital-Acquired MRSA Isolates, and PVL in one of the Indian hospitals

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Background- Community-acquired methicillin resistant Staphylococcus aureus (CA-MRSA) strains are increasingly replacing hospital-acquired MRSA (HA-MRSA) strains in hospitalized patients leading to poor clinical outcomes. Hence, this study aimed to characterize clinical isolates of MRSA (HA-MRSA and CA-MRSA) and to understand their clonal origin.

Methods- A total of 400 consecutive S. aureus clinical isolates were collected from the clinical bacteriology lab of a tertiary care hospital. All the isolates were screened for MRSA by cefoxitin disc diffusion test and mecA PCR, followed by SCCmec typing, antibiotic susceptibility testing, Panton Valentine Leukocidin (PVL) screening, and pulsed field gel electrophoresis (PFGE).

Results- Of the total 400 isolates, 134 categorized MRSA by cefoxitin, while 129 as mecA positive by PCR, of which 117 could be characterized into SCCmec types. SCCmecI and II were present in 1 isolate each, SCC*mec*III in 36 (31%) representing HAMRSA, While SCCmecIV in 51 (44%), and SCCmecV in 28 (24%) isolates representing CA-MRSA. Of all SCC*mec*III isolates, 70% were multidrug resistant (MDR) while 59% of SCC*mec*IV and 29% of SCC*mec*V isolates were MDR. PVL (CA-MRSA virulence factor) positivity in mecIII, IV, V isolates was 9%, 31%, 46% respectively. PFGE typing showed MRSA clones of multiple origins.

Conclusions- Study showed the evolving epidemiology of HA-MRSA and CAMRSA. CA-MRSA constituted the majority of clinical isolates amongst both community and hospital MRSA isolates. Multiple MDR clones of *mec*IV and *mec*V were circulating and replacing *mec*III in hospital settings. SCC*mec*IV isolates were predominant and evolved as MDR, however, PVL was significantly associated with CA-MRSA.

Biography

Dr. Anjana Thakur is a PhD and Postdoctoral Scientist in medical microbiology. Her work has been focused on bacterial infections. MRSA, anti-virulence therapies, and antimicrobial resistance were her main research areas. She has studied superficial and deep-seated S. aureus infections to understand underlying disease mechanisms. Lately, She has started working on ocular infections and inflammations including endophthalmitis and keratoconus.

In Silico Prediction of New Inhibitors for Kirsten Rat Sarcoma G12D Cancer Drug Target Using Machine Learning-Based Virtual Screening, Molecular Docking, and Molecular Dynamic Simulation Approaches

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[9]Peng Cheng National Laboratory, China

Single-point mutations in the Kirsten rat sarcoma (KRAS) viral proto-oncogene are the most common cause of human cancer. In humans, oncogenic KRAS mutations are responsible for about 30% of lung, pancreatic, and colon cancers. One of the predominant mutant KRAS G12D variants is responsible for pancreatic cancer and is an attractive drug target. At the time of writing, no *Food and Drug Administration* (FDA) approved drugs are available for the KRAS G12D mutant. So, there is a need to develop an effective drug for KRAS G12D. The process of finding new drugs is expensive and time-consuming. On the other hand, in silico drug designing methodologies are cost-effective and

less time-consuming. Herein, we employed machine learning algorithms such as K-nearest neighbor (KNN), support vector machine (SVM), and random forest (RF) for the identification of new inhibitors against the KRAS G12D mutant. A total of 82 hits were predicted as active against the KRAS G12D mutant. The active hits were docked into the active site of the KRAS G12D mutant. Furthermore, to evaluate the stability of the compounds with a good docking score, the top two complexes and the standard complex (MRTX-1133) were subjected to 200 ns MD simulation. The top two hits revealed high stability as compared to the standard compound. The binding energy of the top two hits was good as compared to the standard compound. Our identified hits have the potential to inhibit the KRAS G12D

mutation and can help combat cancer. To the best of our knowledge, this is the first study in which machine-learning-based virtual screening, molecular docking, and molecular dynamics

simulation were carried out for the identification of new promising inhibitors for the KRAS G12D mutant.

Biography

Chandni Hayat has her expertise in ML based virtual screening, molecular docking , Molecular dynamic simulations,in silico vaccine design, in silico peptide design, western blot analysis, DNA extraction, and polymerase chain reaction. Her expertise creates new pathways for identifying new inhibitors against different diseases. In addition to her technical skills, which include proficiency in MOE, Pymol, VMD, and Amber for molecular simulations, she has developed strong organizational and communicational abilities. These were demonstrated through her roles in coordinating student activities and seminars at Abdul Wali Khan University, and in presenting her research findings at various international conferences, such as the International Conference on Advances in Drug Discovery and Development, and International summer school on brain facts.

Temporal and geographic dynamics of bovine viral diarrhea virus in American countries

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Bovine viral diarrhea virus (BVDV) is a worldwide distributed pathogen of livestock classified into three species, BVDV-1 (Pestivirus A), BVDV-2 (Pestivirus B), and HoBi-like pestivirus (HoBiPeV; Pestivirus H). Despite being considered endemic in several regions of the Americas, the spatiotemporal distribution of BVDV is scarcely known. This study aimed to reconstruct the population dynamics of BVDV in American countries. The analyses performed with the partial 5´UTR gene showed that the oldest strains of BVDV-1a and -1b would have started their diversification in the 1770s and 1860s, being the USA the most probable ancestral location, whereas the other subtypes showed a more recent origin in the American countries around the mid-1990s, with an overlap in the 95%HPD of the tMRCAs estimated (Table 1). Both BVDV-2a and B 2b showed a similar tMRCA between the 1850s and 1880s, with the USA and BRA as the most probable ancestral location, respectively. In contrast, BVDV-2c would have arisen later in the 1970s, whereas HoBiPeV probably emerged in the 1980s in Brazil (Table 1). No evident geographic clustering was observed in the Bayesian trees, which may indicate that multiple introduction events would have occurred following the first introduction. This study provides new insights into BVDV dynamics, although further analyses including sequences from other American countries and continents will help to expand the knowledge of BVDV evolution and transmission.

Biography

She is a Senior Researcher of Assistant Researcher at Consejo Nacional de Investigaciones Cientificas y Tecnicas (CONICET-Argentina). Her research line is carried out in the Instituto Nacional de Tecnologia Agropecuaria (INTA - Argentina), a state institution dedicated to the sustainable development of the agricultural, agri-food, and agro-industrial sector through research and extension, under the motto “One Health”. Her primary research interest is to improve livestock health and welfare through the prevention and control of infectious diseases of viral origin. Particularly, our group work with the Bovine viral Diarrhea Virus (BVDV) and its effects on reproductive performance. Besides, this laboratory belongs to the Specialized Veterinary Diagnosis Service (INTA - Balcarce) with more than 50 years of experience in Argentina.

Dengue virus infection in Ethiopia: A Systematic review and Meta-analysis

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Background: Dengue is caused by a positive-stranded RNA virus called dengue virus, which is spread by Aedes mosquito species. It is a fast-growing acute febrile disease with potentially lethal consequences that is a global public health problem, mostly in tropical and subtropical countries. In Ethiopia, dengue fever is understudied, although the virus is still being transmitted and viral infection rates are rising. This systematic review and meta-analysis was aimed at estimating the pooled prevalence of DENV infection in Ethiopia.

Methods: A literature search was done on the PubMed, Hinari and Google Scholar databases to identify studies published before July, 2023. Random effects and fixed effects models were used to estimate the pooled prevalence of all three markers. The Inconsistency Index was used to assess the level of heterogeneity.

Results: A total of 11 studies conducted on suspected and acutely febrile participants were included in this review. The majority of the studies had a moderate risk of bias and no study had a high risk of bias. A meta-analysis estimated a pooled IgG prevalence of 21% (95% CI: 19-23), a pooled IgM prevalence of 9% (95%CI: 4-13) and a pooled DENV-RNA prevalence of 48% (95% CI: 33-62). There is evidence of possible publication bias in IgG but not in the rest of the markers.

Conclusion: The prevalence of dengue is become public health problem in Ethiopia. Healthcare providers, researchers and policymakers should give more attention to dengue fever.

Biography

Eshetu Nigussie is s assistant professor of Diagnostic and Public health microbiology at Madda Walabu University. He received His MSc in Diagnostic and Public Health Microbiology form Hawassa University and BSc in Medical Laboratory Technology from University of Gondar. His research interest is focused on arboviruses (especially dengue virus and Yellow fever virus), antimicrobial resistance and healthcare acquired infections. His current projects are focused on antimicrobial resistance and dengue virus.

Spatio-temporal modelling of Severity of Malnutrition and its Associated Risk Factors among Under Five Children in Nigeria Between 2003 and 2018: Bayesian Multilevel Structured Additive Regressions

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[3]Department of Statistics, Federal University of Technology, Nigeria

Malnutrition among under five children in Nigeria remains a major public health burden. It has been shown to be one of the leading causes of childhood death and has permanent consequences for cognitive development, school attendance, economic productivity in adulthood and maternal reproductive outcome. Understanding the associated risk factors of malnutrition is critical for developing appropriate interventions because its determinants interact at different degrees to affect these children. Thus, it is important, for programmatic purposes, to continue to identify the important risk factors and geographical variations especially in a country with massive variations in cultural belief and socioeconomic status of its populace. A multilevel structured additive regression, based on cumulative probit link function was adopted to explore the spatio-temporal variations on severity of three anthropometric indices among children in Nigeria using the Nigeria Demographic and Health Survey data from 2003 to 2018. Within a Bayesian context, appropriate priors were assigned on all functions and parameters. Evidently, strong and significant spatial variations was found to exist on severity of malnutrition among under five children in Nigeria showing a north-south divide. We found young age at first marriage, episodes of child illnesses, child birth weight, religion, mother's education and household wealth to be associated with undernutrition. Findings will guide in developing effective strategies to combat the devastating effect of child malnutrition in Nigeria. Consequently, there can be hope of attaining the relevant sustainable development goals.

Biography

Dr.Eunice Egonmwan Ukwajunor is a dedicated research scientist with a robust academic background and over 7 years of experience in health-related research. Armed with a PhD in Statistics from the University of Lagos, Nigeria, Dr.Ukwajunor focused on statistical and mathematical modeling of infectious diseases, exemplified by her thesis on design-weighted logistic regression and dynamic models for malaria risk. A prolific author, her publications in renowned journals explore topics like spatio-temporal modelling of malnutrition, spatial pattern and transmission dynamics of malaria. Dr. Ukwajunor has actively participated in conferences, including presenting at the 9th Annual International Workshop/Conference on Mathematical Sciences and Optimization and gave a contributed talk at the summer school Epidemiology 2023 - Models, Statistics and Genetics: Understanding Epidemics held in Kenya. Dr. Ukwajunor is also an active member of professional organizations, including the Professional Statistician Society of Nigeria (PSSN) and Mathematical Analysis and Optimization Research Group. With exceptional analytical, communication, and leadership skills, Dr.Ukwajunor continues to make impactful contributions to both academia and health-related research.

Perennial Plant Species Composition and Diversity in Relation to Socio-ecological Variables and Agroforestry Practices in Central Ethiopia

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Ethiopia has experienced a significant loss of forest that provides goods and services. Agroforestry is seen as a viable land use option to counteract the loss of biodiversity, buffer deforestation, provide ecosystem services, and sustain local livelihoods. However, it was little understood how socio-ecological factors mediated these roles, which hindered REDD+ and biodiversity conservation from being put into practice. This study aimed at investigating perennial plant species composition and diversity in relation to socio-ecological variables and agroforestry practices in the central Ethiopia. Three districts and nine kebeles (three from each district) were purposefully selected based on the existence of agroforestry and altitudinal gradients. A total of 243 sample plots were used to collect vegetation data. The results showed that across all practices, 92 plant species from 75 genera and 46 families were identified. Of these, 77% were native plant species. The study found that Margalef species richness and the Shannon diversity index were both significantly higher ($P<0.05$) in homegardens and middle elevations. Furthermore, species richness and the Shannon diversity index were found to be positively and significantly related to slopes, farm size, farm age, and wealth status. Larger farms, parklands, and lowland altitudes had the highest Simpson evenness indices, whereas wealth status and slope had no significant association with Simpson evenness. Overall, this study shows that agroforestry serves as a refuge for native species and helps to reverse the loss of species in the natural forest. However, native species are gradually being replaced with exotic species, compromising the integrity of agricultural landscapes. Our study also emphasizes the urgent need to take socio-ecological factors into account when examining biodiversity and planning agricultural landscape management policies.

Biography

Dr. Gadisa Demie Guluma holds a PhD in Agroforestry, an MSc in Biodiversity Conservation and Management, and a BSc in General Forestry. He is an accomplished researcher specializing in agroforestry, biodiversity conservation, and environmental management. His research focuses on enhancing biodiversity within agroforestry systems, developing methodologies for carbon stock estimation, and creating allometric models for biomass estimation. These contributions support sustainable land management and climate change mitigation. Dr. Guluma has authored numerous peer-reviewed publications and presented at national and international conferences. He is currently affiliated with [Current Institution/Organization], where he continues to advance the field through research and mentorship.

Endosymbionts: A Key Driver of Whitefly Biotype and Virus Transmission with special emphasize on cassava mosaic disease

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The whitefly, *Bemisia tabaci* holds significant economic importance globally as it inflicts severe economic damage through direct feeding and by transmitting several plant viruses. Among these, Begomoviruses and B. *tabaci* form crucial virus-vector complexes, posing a threat to major vegetable, field, and fibre crops. *Bemisia tabaci* encompasses multiple biotypes, each harbouring distinct bacterial endosymbiotic communities. These symbiotic bacteria play pivotal roles in various insect functions including nutrition, metabolism, reproduction, immunity, host fitness, and virus transmission abilities.

Cassava, a vital staple crop in 105 countries, faces threats from two Gemini viruses, Indian cassava mosaic virus (ICMV) and Sri Lankan cassava mosaic virus (SLCMV) transmitted by whiteflies. *Bemisia tabaci*, as a carrier of cassava mosaic disease (CMD), poses a significant threat to cassava production, with variations in its efficiency in virus transmission highlighting the importance of identifying specific B. *tabaci* biotypes. Our investigation identified the whitefly biotype associated with cassava and transmitting CMD in India particularly in Tamil Nadu as Asia II 5 through partial mitochondrial cytochrome oxidase I gene sequencing. Understanding the role of bacterial symbionts in persistent virus transmission in insects is crucial for developing effective control strategies for cassava whiteflies and CMD.

Research indicates that these bacterial endosymbionts produce a 63 kDa chaperon GroEL protein that binds to geminivirus particles, protecting them from rapid degradation in the gut and haemolymph of the insect vector. Furthermore, our research also yielded a total of 33 distinct culturable bacterial isolates belonging to Bacillota, Pseudomonadota phyla associated with adult B. *tabaci* feeding on cassava, significant secondary endosymbionts such as Rickettsia, Wolbachia, and the Enterobacteriaceae family involved in virus transmission, through metagenomics. The culturable isolates, spanning around 11 genera demonstrated varied sensitivity and resistance patterns to antibiotics, suggesting potential avenues for plant viral disease management through the exploitation and manipulation of bacterial symbionts.

Biography

Dr. S. Jeyarani is a distinguished Professor in the Department of Agricultural Entomology at Tamil Nadu Agricultural University, Coimbatore, with a profound expertise in biological control, particularly insect pathology, endosymbiont-mediated defense against parasitism, and plant virus transmission. Her pioneering research includes deciphering the intricate mechanisms of endosymbiont-mediated defense against parasitism by developing aposymbiotic populations. Additionally, she has successfully identified gut endosymbionts, specifically *Bacillus* spp., from rhinoceros beetle grubs, demonstrating significant fast composting abilities through undergraduate student projects. She had the privilege of mentoring five Ph.D. and nine M.Sc. (Ag.) students in the field of biological control, alongside three Ph.D. and one M.Sc. (Ag.) students who have specialized in endosymbiont-mediated interactions. Her leadership in research projects is evidenced by the completion of a significant project on "Biosymbiosis in insects with special reference to Wolbachia" as Co-Principal Investigator. Furthermore, she has successfully managed and collaborated on numerous high-impact projects, including a DBT project as Principal Investigator, another DBT project as Co-Principal Investigator, a Go-TN project as Co-Principal Investigator, and a NADP project as Co-Principal Investigator. She has published six research papers on endosymbiont-mediated interactions, along with 18 international and 75 national papers in reputed journals.

Search for dispersed repeats in bacterial genomes

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We have developed a de novo method for the identification of dispersed repeats based on the use of random position-weight matrices (PWMs) and an iterative procedure (IP) [1]. The created algorithm (IP method) allows detection of dispersed repeats for which the average number of substitutions between any two repeats per nucleotide (x) is less than or equal to 1.5. IP method made it possible to detect families of dispersed repeats in bacterial genomes which have not been previously reported. We applied this method to find dispersed repeats in the genomes of E. coli and 39 other bacterial phyla and could identify some repeat families comprising over 103 repeats with lengths between 400 and 600 bases. Moreover, each bacteria contains only one family of dispersed repeats. In E. coli, the identified repeat family occupy more than 50% of the genome. The number of copies is over 5x103 copies and the average repeat length is approximately 540 base pairs. Such extensive repeat family could not be detected in the E. coli genome by using the RED, RECON, or Repeat_masker programs but only by the IP method, which could find de novo repeat families with $x \leq 1.5$, whereas all other programs could do it with $x \leq 1.0$. The identified family of repeats is weakly similar and rather represents a specific motif that is superimposed on the coding sequences. Since family of dispersed repeats we found not only in the genome of E. coli but also in 39 bacteria from different phyla, it is also possible that the detected families of repeats could be involved in the creation of the liquid crystal structure within bacterial DNA through interactions between repeats within a family.

Biography

Eugene Korotkov is a Professor at the Department of Applied Mathematics in Moscow Engineering Physics Institute and Principal Investigator in Bioinformatics Department of Bioengineering Centre, Russian Academy of Sciences. He graduated from the National Nuclear Research University (MEPI), Department of Experimental and Theoretical Physics in 1974. Then, from 1980 to 1995 Korotkov EV worked at the Institute of Chemical Physics, NN Semenov and began work on the development of mathematical algorithms to study the symbolic sequences

In-silico evidence for enhancement of avian influenza virus H9N2 virulence by modulation of its hemagglutinin (HA) antigen function and stability during co-infection with infectious bronchitis virus in chickens

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Avian influenza (AI) H9N2 serotype is one of the most important low pathogenic AI serotypes. The H9N2 pathogenicity has remained as one of debated issues. There is no clear evidence about relatedness between outbreaks of the disease and virus infection. It has not been resolved if the disease induced is due to the pathogenicity of the H9N2 virus itself or due to co-infections with other pathogens. Moreover, the mechanism of induction of severe form of the disease during co-infection with other pathogens is not completely determined. Frequent incidences of H9N2 outbreaks have been reported in different countries. In Egypt, the co-infection of H9N2 with the infectious bronchitis virus (IBV) has been observed extensively during these outbreaks.

The current study reports isolation and characterization of the H9N2 virus recovered from a concurrent IBV infected broiler chicken flock in Egypt during 2011 with comparison with those of Egyptian H9N2 viruses isolated from healthy and diseased chicken flocks from 2011 to 2013.

Based on deduced amino analysis of H9N2 isolates, no particular molecular characteristic difference was noticed among all the Egyptian H9N2 isolates from apparently healthy, diseased or co-infected with IBV chicken flocks. Nevertheless, in-silico analysis, we noted modulation of stability and motifs structure of Hemagglutinin (HA) antigen among the co-infecting H9N2 AI and the IBV and isolates from the diseased flocks.

The findings suggest that the putative factor for enhancement of the H9N2 pathogenicity could be co-infection with other respiratory pathogens such as IBV that might change the HA stability and function.

Editorial: Herbal Medicines for Gastrointestinal and Hepatic Diseases - Novel Pharmacological and Toxicological approaches-Volume I

Muhammad Hasnat[1], Mirza Muhammad Faran Ashraf Baig[2], Mohammad Saleem[3], Aftab Ullah[4], Muhammad Faisal Nadeem[5], Alessandra Durazzo[6] and **Massimo Lucarini[6]**

[1]Institute of Pharmaceutical Sciences, University of Veterinary and Animal Sciences, Pakistan
[2]The University of Hong Kong, China
[3]University of the Punjab Lahore, Pakistan
[4]Jiangsu University, China
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[6]CREA-Research Centre for Food and Nutrition, Rome

After respiratory tract diseases, acute gastrointestinal infections are the second most common infections among infants and children and are responsible for morbidity and mortality. These infections are caused by a variety of microorganisms with the most common species are Helicobacter pylori, Salmonella species, Clostridium difficile, Shigella species, Giardia lamblia and Escherichia coli. Gastrointestinal system is also associated with the hepatic complications including NAFLD and gastrointestinal malignancies i.e. HCC. Worldwide, liver cancer causes second most cancer related deaths. For the management of hepatic and gastrointestinal diseases, long-term strategies are required from government and international bodies because hepatitis B virus and hepatitis C virus infected subjects are 370 million and 130 million, respectively. Traditional and complementary medicines (TCMs) are clinical practices that are used in the diagnosis, treatment and prevention of diseases. They are not completely merged into the healthcare system, however they are affordable, accessible and culturally accepted by the people. Herbal products are one of the major part of TCM. It is reported that market share of natural preparations is up to several billions of dollars in developing and developed nations, showing the trust of people on these products. Herbal medicines treat gastrointestinal diseases by affecting intestinal barrier, microbial composition and metabolites, and inflammation.

Biography

Dr. Muhammad Hasnat is currently serving as assistant professor at Institute of Pharmaceutical sciences, University of Veterinary and Animal Sciences, Lahore, Pakistan. He has completed his Ph.D. in Pharmacology from China Pharmaceutical University, Nanjing, China.

COVID-19 Surveillance Report for Sudan, 2020 to 2021

Ahmad Izzoddeen[1] and **Mustafa Magbol**[2]

[1]*FMOH, FETP, Sudan*
[2]*Faculty of medicine, Al-Zaiem Al-Azhari University, Sudan*

Background Following the World Health Organization declaration, COVID-19 was first appearance in Sudan was in March 2020. Cases were reported to the Sudan Federal Ministry of Heath through the surveillance system from different sources. This study used surveillance data from 2020 to 2021 to describe the epidemiologic patterns of COVID-19 occurrence in Sudan and provide insight for better preparedness and response. Methods Through a retrospective descriptive study, COVID19 cases records obtained from the national surveillance line-list in Surveillance and Information Directorate in Federal Ministry of Health. The analysis of data was done with SPSS version 21. Descriptive analysis done by frequencies and percentages, and further analysis through performing multivariate logistic regression. Results Out of 48,545 suspected cases tested for COVID-19 using RT-PCR, 27,453 (56.5%) tested positive with case fatality ratio of 6.5%. Higher death rate among elderly (78% > 60-year-old) and males (70.1%). From the reported cases, 53.8% showed no symptoms, while the common symptoms among symptomatic patients were; fever (26.4%), cough (19.1%), shortness of breath (16.8%) with small proportion (4.5%) reported loss of smell and taste. Specific states, Khartoum, Gezira and Red Sea showed highest prevalence. The disease peaked four times during 2020–2021, with a proposed alert threshold of 200–250 cases per week acting as an explosion point nationwide. Conclusions The high case fatality rate in the country requires further analysis, as well as the high proportion of asymptomatic infection. This will be ensured by improving the quality and completeness of surveillance data. A proposed threshold of 200–250 cases per week should be an alert to augment the measures of controlling the pandemic over the country, including providing enough supplies to decrease mortality.

Biography

Ahmad Izzoddeen

Dr. Ahmad Izzoddeen is a qualified epidemiologist completed a master degree in community medicine, and successfully passed part1 community medicine at Sudan Medical Specialization Board (SMSB). He is currently under field epidemiology training at Sudan Field Epidemiology Training Program.

Dr. Ahmad has 4 years of experience in public health field, started in 2019 in conflict affected areas in Darfur region as a health coordinator managing implementation of health services and activities to serve internally displaced persons. In addition, as a rapid response team member during COVID19 pandemic conducting cases investigation and supervising response activities.

As a field epidemiologist, undertraining at FETP, he also performed projects of surveillance evaluation during pandemics (COVID19 & Mpox). At national surveillance he lately, after the current conflict crisis, delegated to work as acting director of the national surveillance directorate based in Gezira state after HEEC office been moved from Khartoum in April 2023. With high level of responsibility, he leads the national surveillance to generate high quality, timely data to inform decision and response operations during very critical times with many challenges facing all reporting states. He is participating in different taskforces formulated by FMOH to manage the response efforts for the ongoing cholera and dengue fever outbreaks. Dr. Ahmad was also part of the team responsible for establishing and supervising implementation of electronic EWARS for the first time in Sudan.

Mustafa Altyeb Ibrahim Magbol

Dr. Mustafa Magbol had completed the bachelor of medicine and surgery at the age of 25 from Alzaiem Alazhari University, Khartoum, Sudan.

He Had 7 publications in diabetes, education and antibiotic misuse.

Explainable Artificial Intelligence for Understanding Biomarkers of Myocarditis

Rajeshwari Pasupula[1] and **Sreya Kosanam**[2]

[1]*Koneru Lakshamaiah Education Foundation, India*
[2]*Sandip University,Nashik, India*

Objective: To establish targeted mechanism for Lupeol acetate in myocarditis using AI approach.

Scope: Developing a lead molecule for myocarditis and improving the quality of life of patients at risk with targeted therapy

Methods: PRO-TOX-II https://www.ncbi.nlm.nih.gov/geo/ is a tool that predicts that toxicity of the compounds, carcinogenicity, hepatogenicity, mutagenicity and the class of toxicity of Lupeoal acetate(LA) can be deciphered by using Pro-tox II.

Swiss Targets (http://www.swisstargetprediction.ch/) data base is based on machine learning approach and is an easily accessible source for deciphering targets of small molecules. Information obtained data base can be used for pre-clinical drug development. Targets for LA will be identified from this database

STITCH data base gives interactions between LA and proteins of interest obtained from Swiss targets.This helps us to frame hypothesis about the compound protein associations and principle drug targets for LA . This data base also gives information about signaling cascade pathways and protein post translational modifications.

Identification differential expressed genes (DEG) by GEO data base (https://www.ncbi.nlm.nih.gov/geo/):Different gene sets of Myocarditis are subjected to Limma analysis with $P<0.05$ and Log Fc values (-1 and + 1).

Protein - Protein Interaction network construction (STRING: functional protein association networks (string-db.org):

Protein - Protein Interaction network of DEG will be constructed using STRING data base. This data base is used to generate insights of the pharmacological pathways involved. Prediction of possible mechanism for TM and LC will be generated using string and top ten hub genes will be visualized using cytoscape software.Signalling functions of top ten hub genes will be visualized using KEGG .Binding affinity by molecular docking using PYRX:

.Results: BAG3, IL 16,IL10 and CD4 were found to be the important hub genes and Lupeaol acetate binding affinity was found to be -11.4

Conclusion: Lupeol acetate can be developed as putative compound against Myocarditis

Biography

Dr. Rajeshwari's academic and professional background is impressive and diverse, showcasing expertise in the fields of Pharmacology, Molecular Biology, and Drug Discovery. With a doctorate from Andhra University, she has not only contributed significantly to research but also accumulated over 15 years of teaching experience. This combination of research and teaching provides a well-rounded skill set and knowledge base. Her certifications in clinical research highlight a commitment to staying current with industry practices and standards, crucial in the dynamic field of pharmaceuticals. The fact that she holds global certifications further underscores her international perspective and engagement in the field.

Dr. Rajeshwari's contributions to academia extend beyond the classroom, evident in her numerous research publications, books, and patents. These achievements demonstrate her commitment to advancing knowledge in her areas of expertise and potentially contributing to the development of new drugs or therapeutic approaches. Currently serving as an associate professor at KL College of Pharmacy, KLEF, and heading the international relations office, Dr. Rajeshwari is not only involved in educating the next generation of pharmacologists but also plays a crucial role in fostering international collaborations and relationships for the institution.

Regulation of Gluconeogenesis and Lipogenesis in Hepatocytes via targeting of PPP1R15B by miR-98-5p

Rukshar Khan[1,3], Amit Kumar Verma[3] and **Malabika Datta[1,2]**

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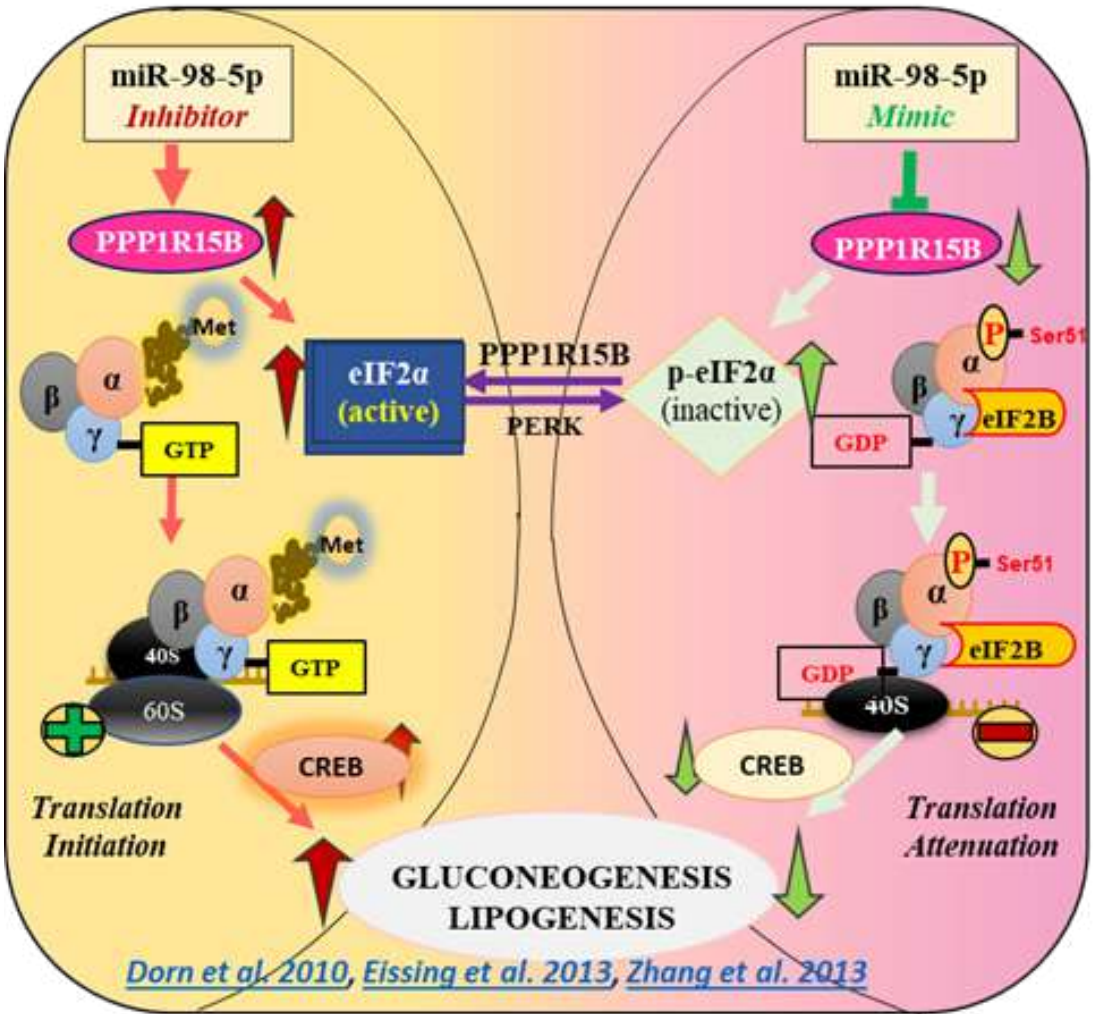
[2]Academy of Scientific and Innovative Research, CSIR-HRDC, Kamala Nehru Nagar, India
[3]Jamia Millia Islamia, India

The dysregulation of circulatory miRNAs has been linked to various diseases and utilized as diagnostic and prognostic markers. Our research illustrates that miR-98-5p, down-regulated in individuals with diabetes, plays a regulatory role in hepatic gluconeogenesis and lipogenesis by directly targeting PPP1R15B. In HepG2 cells, miR-98-5p overexpression led to a significant reduction in PPP1R15B transcript and protein levels, accompanied by increased p-eIF2B expression; these effects were reversed by a miR-98-5p inhibitor. To assess physiological relevance, we investigated two key hepatic diabetes hallmarks: hepatic lipid accumulation and glucose output. MiR-98-5p overexpression resulted in decreased transcript levels of gluconeogenic and lipogenic genes, leading to a substantial reduction in hepatic glucose production and fat accumulation in HepG2 cells. PASTAA analysis identified CREB as the most significantly enriched transcription factor. Although miR-98-5p overexpression did not impact CREB transcript levels, a notable change occurred in its protein levels. Interestingly, similar effects on gluconeogenic and lipogenic gene expression were observed with PPP1R15B siRNA, while the miR-98-5p inhibitor alone produced opposite effects. These findings collectively suggest that miR-98-5p regulates hepatic steatosis and glucose output by targeting PPP1R15B, characteristic features of hepatic dysfunction in diabetes. Targeting the miR-98-5p/PPP1R15B axis therapeutically may present a potential strategy for addressing aberrant hepatic metabolism in diabetes.



Biography

As a dedicated PhD scholar, Her research focuses on unraveling the intricate role of microRNAs in liver-related pathologies, particularly during diabetes. With a strong foundation in molecular biology techniques, She employ a multidisciplinary approach to investigate the molecular mechanisms underlying liver dysfunction and explore potential therapeutic targets. Her work has contributed to our understanding of the dysregulation of microRNAs and their impact on hepatic glucose metabolism and lipid accumulation during diabetes.

She has successfully published research articles in high-impact journals, showcasing the significance and novelty of my findings. These publications highlight my expertise in experimental design, data analysis, and interpretation, as well as my ability to communicate complex scientific concepts effectively. Additionally, her research experience has honed her skills in molecular biology techniques including cell culture, and animal models.

Driven by a passion for scientific discovery and a commitment to improving human health, She strive to make meaningful contributions to the field of diabetes research. Through Her work, she aim to advance our understanding of microRNA-mediated mechanisms and identify novel therapeutic strategies for treating liver complications in diabetes.

A comparative hierarchical data-centric approach to monitor social permeability, coping potential and social vulnerability in facing COVID-19 crisis in Africa

Saeid Rezaei and **Hamidreza Dezfoulian**
Bu Ali Sina University, Iran

The rapid spread of the COVID-19 virus and its high death rate have surprised many countries around the world. In such a situation, a lack of proper positioning against this disaster can lead to irreparable and long-term damages. Through designing a comparative interdependent platform in two phases of COVID-19's outbreak-epidemic and pandemic, this paper investigates the positioning of 8 African countries, including Egypt, South Africa, Tunisia, Morocco, Algeria, Nigeria, Cameroon, and Kenya, based on the composite indices of social permeability, coping potential and social vulnerability. Further, using the k-means approach, the under-study countries are involved in some dominant clusters by which their surrounding features compared to each other are implied. To reduce the risk arising from disasters such as COVID-19, the decision tree method is taken to extract patterns indicating the risk of vulnerability in the future. The results of the carried-out analyses prove that Algeria has the most preferable position in the social permeability index and Tunisia has the most coping potential compared to other countries. On the other hand, Cameroon and Egypt have had relatively less vulnerability in dealing with COVID-19, which can lead to valuable management perspectives. The performed clustering depicts that the dominant clusters include 0-1) Egypt, Morocco, and Tunisia, 2-4) South Africa, 1-2-4) Algeria, and 3) Nigeria, Kenya, and Cameroon. Tracing the branches of the decision tree can also facilitate achieving different vulnerability ranges and guide the adoption of appropriate policies to balance the influencing factors and reduce their adverse effects.

Biography

Saeid Rezaei was born in Iran in 1989. He is a PhD Graduate at the Department of Industrial Engineering, School of Engineering at Bu-Ali Sina University. His research interest is supply chain network management, public health, data mining, sustainability and all associated topics.

The effect of hyaluronic acid and iodine complex gel compared to Vaseline on burn wound in rat

Sara Ghorbanian Kelachayeh[1], Siamak Farokh Forghani[2], Soheila Naderi Gharahgheshlagh[2], Tooran Bagheri[2], Soodabeh Hoveidamanesh[2], Tayyeb Ghadimi[2] and **Rana Irilouzadian[2]**

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[2]Burn Research Center, Iran University of Medical Sciences, Iran

A mixture of high molecular weight HA with the iodine complex KI (Hyodine), demonstrated its ability to stimulate wound contraction and epidermal proliferation, while also maintaining wound moisture. We aimed to provide valuable insight into the potential advantages, limitations, and implications of using Hyodine in burn wound management. We recruited 25 male rats to assess the clinical outcomes and wound-healing effects of Hyodine. Each rat received a deep second-degree burn wound on their back using metal stamps. Subsequently, the rats were then randomly split into two groups. The first group was treated with a layer of H yodine gel, while the second group received Vaseline. The burn sites were photographed on days 1,7,14 and 21 using a digital camera. After excision of the burn wounds, histopathology slides were stained and evaluated in terms of the degree of epithelialization, angiogenesis, inflammatory cells infiltration, and collagen amount and arrangement. Despite a non-significant difference regarding the extent of burn wound area between intervention and control groups in the first day of experiment, the rats that were treated with Vaseline showed a significant decrease compared to those who received Hyodine in the second and third weeks (P=0.02). on the other hand, epithelialization, pathology score, and collagen synthesis were significantly different between days 7, 14, and 21 of each group. However, collagen arrangement and neovascularization were only significantly different between days 7, 14 and 21 in Hyodine group) p= 0.02 and p = 0.03, respectively). The Hyodine gel may offer beneficial outcomes in patients with a burn wound. Based on our findings, despite a non-significant difference in the extent of burn wound area, using Hyodine revealed a significant improvement in different histopathological variables including neovascularization, and collagen arrangement.

Biography

Sara Ghorbanian Kelachayeh is a graduated in molecular genetics about 4 years ago. When she was PhD student, she went to Italy (Siena) as a researcher for 6 months, duration that time, she earnt a lot new experience in her education field, got acquainted with new techniques and devices. She has been teaching to biology students in university about 3 years. This work was a part time job for her. She is currently working as a supervising production unit and R&D manager at Nikan Teb Kimia company. The experiences of teaching helped her to progress in her current job.

She has an active personality, and welcome new experiences and meeting new people.

The insidious nature of sexual control as another form of gender-based violence in patriarchal spaces

Sonene Nyawo
University of Eswatini, Eswatini

The concept of insidious sexual control on women explores the ways in which patriarchal structures systematically control and exploit women's sexual autonomy, manifesting as a pervasive form of gender-based violence (GBV). This paper delves into the intersectionality of sexuality and power, examining how societal norms, cultural practices, and institutional policies perpetuate the subjugation of women by regulating their sexual expression and identity. In patriarchal societies, women's bodies are often objectified and commodified, reinforcing gender inequalities and maintaining male dominance. The analysis focuses on various dimensions of this phenomenon, including the policing of women's sexual behavior through social stigma, the enforcement of rigid gender roles, and the manipulation of sexual norms to sustain male privilege. Additionally, the study highlights the psychological and physical consequences of such control, drawing attention to the ways in which this form of GBV is normalized within both public and private spheres. Through a critical examination of cultural narratives, media representations, and legal frameworks using feminist lenses, this research underscores the insidious nature of sexual control as a tool for oppression in a form of gender based violence. By framing women's sexuality as a site of power struggle, the paper seeks to broaden the discourse on GBV, challenging the invisibility of sexual control as a form of violence and advocating for more comprehensive approaches to gender justice. The study therefore calls for a reevaluation of societal attitudes towards women's sexuality, emphasizing the need for transformative change to dismantle the patriarchal structures that perpetuate gender-based violence in all its forms.

Biography

Sonene Nyawo (PhD) is a Senior Lecturer and Head of Department in the Department of Theology and Religious Studies, Faculty of Humanities, at University of Eswatini. She holds a Doctorate of Philosophy (Gender and Religion) from the University of KwaZulu-Natal. Her research interests include Gender and Religion, New Religious Movements in Africa, Church History, Indigenous Knowledge, Women and Peacebuilding. She has published several chapters in peer-reviewed books, as well as peer-reviewed journal articles in reputable journals, both locally and internationally. She has also co-authored Religious Education books for Eswatini Secondary and High Schools. She makes a remarkable contribution to the social welfare of the country through research undertakings, with the recent being a National Commissioned Study on Sexual and Gender-based Violence (SGBV) in Eswatini. She is an active member of the Circle of Concerned African Women Theologians.

The Combination of Cold Plasma Technique and Mesoporous Materials for Bacteria Inactivation on Vietnamese Tropical Fruits

Ha An Quoc Than, Trung Thanh Nguyen, Ngan Kim Do, Minh Anh Ngoc Tran, Duyen Ky Vo Nguyen and **Thien Huu Pham**

Institute of Applied Materials Science - Vietnam Academy of Science and Technology, Vietnam

Cold plasma treatment has gained significant attention as a rapidly emerging technology for food decontamination due to its high efficacy, environmental friendliness, and potential for large-scale food preservation. The tropical climate of Vietnam, characterized by high humidity and temperature, provides ideal conditions for microbial proliferation, leading to substantial post-harvest losses in fruits. This study explored the potential of cold plasma for inactivating predominant spoilage microorganisms isolated from tropical fruits, including durian (Durio zibethinus), longan (Dimocarpus longan), and banana (Musa sapientum). Gaseous plasma was generated using argon, air, and argon-air mixtures, and its antimicrobial efficacy was evaluated by measuring inhibition zone area. The results demonstrated that all input gases exhibited high microbial inactivation efficacy, with the level varying depending on working gas composition, and concentration. For example, Diutina catenulata, a harmful yeast on longan fruit, was completely eliminated within 180 seconds when exposed to argon-air plasma at a flow rate of 4 L/min and a 1:3 ratio. Scanning electron microscopy observations revealed significant damage to bacterial cell structure, indicating disruption of cell membrane integrity and leakage of cell cytoplasm. Moreover, preliminary findings suggest that incorporating porous inorganic materials after plasma treatment can prolong fruit shelf life and enhance quality compared to control samples. These results underscore the potential of integrating cold plasma technology with porous materials as a sustainable and efficient method for enhancing the shelf life and safety of tropical fruits susceptible to microbial contamination.

Figure. Cold plasma reactor for microbial inactivation (left) and porous material (right)

Biography

Dr. Ha An Quoc Than is the Vice Director of the Institute of Applied Materials Science, Vietnam Academy of Science and Technology. His research focuses on applying non-thermal plasma technology for high-tech agriculture. He earned his MSc from Cologne University of Applied Sciences (Germany) and Ph.D. from the Vietnam Academy of Science and Technology (VAST). Dr. Than has published extensively on plasma applications, including studies on enhancing plant growth using plasma-activated water (Plasma Chemistry and Plasma Processing, 2022), inactivating foodborne pathogens (Food and Bioprocess Technology, 2024), and controlling insect pests (Journal of Stored Products Research, 2024). His work contributes significantly to the development of sustainable and efficient agricultural practices.

Prevalence and associated factors of herbal medicine use among patients living with chronic disease in Ethiopia: A Systematic Review and Meta-Analysis

Worku Chekol Tassew[1], Getaw Wubie Assefa[2], Agerie Mengistie Zeleke[3] and **Yeshiwas Ayal Ferede[4]**

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[2]Department of CTID & HIV medicine, Teda Health Science College, Ethiopia

[3]Department of Clinical Midwifery, Teda Health Science College, Ethiopia

[4]Department of Reproductive Health, Teda Health Science College, Ethiopia

Background: Complementary use of medicinal plants with prescribed drugs is becoming more widespread concern among people with chronic disease like cancer, HIV/AIDS, diabetes and hypertension. Consequently, the purpose of this review was to determine the prevalence and associated factors of herbal medicine use among patients suffering from chronic disease.

Methods: This systematic review and meta-analysis was conducted by searching articles from Cochrane library, Google scholar, PubMed and African journal online. Data was extracted using Microsoft excel format and imported in to Stata software version 11 (Stata Corp LLC, TX, USA) for analysis. Statistical heterogeneity across the studies was investigated using Cochran's Q chi-square test at the significance level of <0.05 and the I2 index. A random-effects model was used to estimate the pooled prevalence of herbal medicine use.

Results: Our systematic search yielded a total of 17,665 records from four databases (Google scholar (12,800), PubMed (3835), Cochrane library (30) and African journal online (12)). The pooled estimate of herbal medicine use among patients with chronic disease in Ethiopia is found to be 56.94% (95% CI: 49.75, 64.12, P<0.001). Being female (POR=2.06, 95% CI=1.55, 2.75, I^2=10.0%), rural residence (POR=2.80, 95% CI=1.42, 5.52, I^2=89.1%), duration of the disease greater than 5 years(POR=6.42, 95% CI=4.188, 9.84, I^2=48.3%) and having complication (POR=4.65, 95% CI=3.75, 5.77, I^2=0.0%) were factors associated with herbal medicine use among patients living with chronic disease.

Conclusion: The study found a high prevalence of herbal medicine use among patients living with chronic disease. Being female, rural residence, duration of disease greater than 5 years and having complication were factors that are significantly associated with herbal medicine use. The prevalence of herbal medicine use among persons with chronic disease in Ethiopia presents significant implications for healthcare practice. Healthcare professionals need to adopt a patient-centered strategy that promotes open, judgment-free discussions about herbal medicine usage.

Characterization and biological activities of lipopolysaccharide of marine bacteria

Raj Kumar Sardar

Department of Biotechnology, School of Earth Biological and Environmental Sciences, Central University of South Bihar, India

Objectives: To characterize structural components of LPS from marine bacteria and investigation of biological activities.

Scope: Though marine realms are the greatest sources of bioactive molecules, non-toxic compounds that can be used as drugs and therapeutics and it is scarcely explored.

Methods used: Hot-phenol method was used to extract LPS. LAL assay was performed followed by gel clot assay using pyretoll kit. Fatty acids were estimated by FAME method and monosaccharide was identified using the phenol sulfuric acid assay with glucose as standard, Biofilms assay was carried using 0.1% crystal violet dye and the antioxidant activity by scavenging ABTS using trolox as positive control.

Results: The LPS of bacterium Idiomarina fontislapidosi was isolated, purified, characterized and analyzed their bioactivity. Fatty acids and monosaccharides composition studied by GCMS retaining the common compositional characteristic pertaining to marine LPS. Semi rough type LPS was showed non-toxic because it did not express limulus amoebocyte lysate (LAL) gelation activity. Bioactivities of the marine LPS describe that it could not exert inhibitory action on six tested bacteria, viz. Escherichia coli, Bacillus subtilis, Staphylococcus aureus and Pseudomonas aeruginosa PA01 and two clinical strains, P. aeruginosa PAL and P. aeruginosa PAH. Isolated LPS manifested a unique property by showing strong (98%) antioxidant activity by scavenging 2, 2'- azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radicals. In stress circumstances including temperature, salinity and light, the marine LPS may scavenge generated reactive oxygen species (ROS) to defend against oxidative damage.

Conclusion: This is the first report on antioxidant activity for any LPS and characterization of LPS from I. fontislapidosi so far. LPS from this bacterium possess non-toxic bioactivities and strong antioxidant properties; hence it can be a suitable candidate in drugs and therapeutics use.

Biography

Dr. Raj K. Sardar is presently working in Department of Biotechnology, Central University of South Bihar, Gaya, Bihar. He earned a Bachelor of Science in Biotechnology in 2006. He studied at Patna University, India for master degree in Applied Microbiology. He leaved the teaching job and then joined the research lab as a Junior Research Fellow at CSIR-Central Salt & Marine Chemical Research Institute, Bhavnagar, Gujarat. He has made a great contribution in scientific field particularly on lipopolysaccharides (LPS) and siderophore from marine bacteria. He has extensive research experience in basic science including Bio-films, Plastic Biodegradation, and Medical & Environmental Microbiology. He has submitted some genes to NCBI database. He has also qualified national merit base exam like NET & GATE in India. Apart from R & D work he is an excellent teacher, mentor, and motivator too. He used to write on social issues in different magazine. He enjoys playing with kids.

Clinical manifestations of pain in patients suffering from COVID-19 infected with Delta variant of SARS-Cov-2

Ali Abedi[2], Ali Mohammadian Erdi[1], Minoo Zakavi[2], Mohammad Amani[2] and **Shahnaz Fooladi[1]**

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[2]Department of Physiology, School of Medicine, Ardabil University of Medical Sciences, Iran

Background: Although respiratory presentations of COVID-19 predominate, the extra pulmonary involvement such as muscle pain, joint pain, headache, back pain, abdominal pain, and sore throat are usually included in the clinical picture of the disease and it can be considered as an early symptom in COVID-19 patients. The objective of the present study was to determine the frequency, localization, and intensity of pain in COVID-19 patients hospitalized in Imam Khomeini hospital of Ardabil, Iran.

Methods and materials: A prospective study was conducted on 388 COVID-19 patients who were admitted to Ardabil, Iran's Imam Khomeini Central Hospital between March and June 2020. Demographic characteristics of patients and general clinical manifestations of pain at the first admission to the hospital, localization, severity, and continuity of pain were evaluated by using a questionnaire and the Visual Analog Scale (VAS).

Findings: For the 388 (51.3% female, age 47.25 + 15.55 and 48.7% male, age 50.12 + 15.26 years old) Delta COVID-19 patients, the median duration from illness onset to hospitalization was 5 days. Patients' complaints included 89.7% fatigue, 85.56% cough, 67.8% fever, 64.17% loss of taste, 63.91% loss of smell, 37.9% diarrhea, and 11.85% skin lesions, respectively. Pain including muscle, joint, bone and low back pain was the chief complaint in both sexes. Pain complaints had started on average 5 days before admission. The distribution of pain was 313 (80.41%) muscle pain, 264 (70.61%) joint pain, 299 (77.1%) headache, 208 (53.6%) low back pain, 312 (80.41%) sore throat, and 157 (40.46%) abdominal pain. Out of 388 patients, 292 (75.25%) had diffuse pain.

Conclusions: Acute pain including myalgia, sore throat, arthralgia, headache, and low back pain were the most common symptoms of COVID-19 patients. Viral diseases such as COVID-19 may trigger the immune system to release cytokines that lead to muscle pain. Patients presenting to healthcare centers with complaints of pain should be evaluated for suspected COVID-19 infection.

Biography

Dr. Ali Abedi, a distinguished Ph.D. holder in Medical Physiology, serves as a dedicated professor in the Faculty of Medicine. Specializing in Pulmonary, Cardiovascular, and Renal Physiology, he imparts essential knowledge to medical students. Dr. Abedi's research delves into the intricate connections between cardiovascular health and COVID-19, contributing significantly to our understanding of these crucial areas. Driven by a passion for excellence, he fosters curiosity and critical thinking in his students, shaping the next generation of healthcare professionals. In summary, Dr. Ali Abedi's role as an educator and researcher underscores his commitment to advancing medical physiology and preparing future leaders in healthcare.

(Hypothyroidism among Type 2 Diabetic Patients Visiting Outpatient Department of Internal Medicine of a Tertiary Care Centre: A Descriptive Cross-sectional Study)

Biju Shrestha and **Chandra Kala Rai**
1Department of Physiology, Kathmandu Medical College and Teaching Hospital, Nepal

Introduction: Diabetes-thyroid relationship is said to be bidirectional. Insulin resistance and hyperinsulinemia in type 2 diabetes mellitus increase free thyroxine but decrease free tri iodothyronine and thyroid-releasing hormone synthesis. Thyroid dysfunction may in turn impose an adverse effect on glucose metabolism in type 2 diabetes mellitus. Undetected thyroid dysfunction can worsen glycemic control and predispose type 2 diabetes mellitus patients to cardiovascular and other diabetes-related complications. Recognition and timely treatment of thyroid dysfunction in type 2 diabetes mellitus patients can delay diabetic complications. The aim of this study was to find out the prevalence of hypothyroidism among type 2 diabetic patients visiting the outpatient Department of Internal Medicine of a tertiary care centre.

Methods: A descriptive cross-sectional study was conducted in a tertiary care centre, from 17 April 2021 to 5 September 2021 after obtaining ethical approval from the institutional review committee (Reference number: 130120202). A total of 384 type 2 diabetic subjects were recruited for the study. Convenience sampling method was used.

Results: Among 384 patients, the prevalence of hypothyroidism was found in 127 (33.07%) (28.36 37.78, 95% Confidence Interval). Among them, 56 (44.09%) were male and 71 (55.90%) were female. The mean age was 55.17±7.53 years.

Out of these, 54 (14.06%) had clinical hypothyroidism and 73 (19.01%) had subclinical hypothyroidism among patients with T2DM (Table 1).

Table1. Gender-wise distribution of hypothyroidism (n= 127).

Gender	Clinical hypothyroid n (%)	Subclinical hypothyroid n (%)
Male	21 (16.53)	35 (27.56)
Female	33 (25.98)	38 (29.92)

Patients with T2DM for more than 10-year duration had 65 (78.30%) prevalence of subclinical hypothyroidism (Table 3)

Table 3. Duration of diabetes (n= 127).

Duration	Clinical Hypothyroid n (%)	Subclinical Hypothyroid n (%)
<10 years	9 (7.09)	65 (51.18)
>10 years	45 (35.43)	8 (6.29)

Conclusions: The prevalence of hypothyroidism was higher than in the other studies done in similar settings.

Biography

Dr. Biju Shrestha

ACADEMIC QUALIFICATIONS:

School Leaving Certificate (S.L.C)- Adarsha Vidya Mandir High School, Manvawan,

Lalitpur, Nepal under Nepal Government.

Higher Secondary Education Board (10+2)-Galaxy Public Higher Secondary School, Gyaneswore, Kathmandu

Bachleor of Dental Surgery (B.D.S)- University of Dhaka,

Bangladesh.

Internship- People's Dental College & Hospital, Balaju

Basic Science Bridge Course- Kathmandu Medical College,

Kathmandu.

MD Physiology- Kathmandu University School of Medical Sciences(KUSMS), Chaukot,

Dhulikhel, Kathmandu University(KU).

EMPLOYMENT HISTORY:

(March, 2006 – Sept 2006) –Dental house Officer, Universal College of Medical and DentalSciences(UCMS), Bhairahawa

(Oct 2006 – Oct, 2007)- Dental house officer, IOM Teaching Hospital, Maharjgunj

(Dec. 2007 –June. 2008)- Volunteer, Bir Hospital

(July-Sept 2008)- Dental Surgeon Lions Health Club, Chahabil

(Oct 2008-June 2009)- Dental house officer, BPKIHS, Dharan

(July 2009-July 2011)- Dental house officer, KMCTH ,Sinamangal

(Nov.2016 to June 2023)- Lecturer, Kathmandu Medical College, Duwakot

(June 2023 till date)- Assistant Professor, Kathmandu Medical College, Duwakot.

Improving Gut-Brain-Skin axis based on the immunological aspects of probiotics

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[1]Medical Immunology, Aziz Sancar Institute of Experimental Medicine, Turkey
[2]Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Iran
[3]Cellular and Molecular Research Center, Research Institute for Prevention of Non-Communicable Disease, Qazvin University of Medical Sciences, Iran

The interplay between gut microbiota and human health, both mental and physical, is well documented. This connection extends to the gut-brain-skin axis, linking gut microbiota to skin health. Recent studies have underscored the potential of probiotics and prebiotics to modulate gut microbiota, supported by in vivo and clinical investigations. The comprehensive review, was explored the immunological implications of probiotics in influencing the gut-skin axis for the treatment and prevention of skin conditions, including psoriasis, acne, diabetic ulcers, atopic dermatitis, and skin cancer. Probiotics exert their effects by modulating cytokine production, whether administered orally or topically. Probiotics bolster skin defenses through the production of antimicrobial peptides and the induction of keratinocyte differentiation and regeneration. Yet, many questions surrounding probiotics remain unanswered, necessitating further exploration of their mechanisms of action in the context of skin diseases.

Biography

Lotfi H has completed her Ph.D. in Medical Biotechnology from Tabriz University of Medical Sciences, Tabriz, Iran. She is the Assistant Professor of Medical Biotechnology, at Qazvin University of Medical Sciences, Iran. Her interest issues are probiotics isolation, molecular/biochemical characterization, and investigation of their health effects. In previous publications, she has reported the anticancer, antimicrobial, and antidiabetic effects of *Lactobacillus* strains. Recently, she designed new projects on probiotics' effects on Breast cancer, Brain-gut axis, and Skin-gut-brain axis to show probiotics' positive immunomodulatory potentials. She has been serving as an editorial board member of reputed Journals (Gene Reports, Cell Biochemistry & Function, bioimpacts, Frontiers in Bioengineering and Biotechnology, Journal of Alzheimer's Disease, Journal of Inflammatory Diseases). She has worked with bioinformatic software (AutoDock, Pymol, R programs and packages for analysing GEO datasets, Cytoscape, Gephi, and Funrich). She has participated in various seminars whose latest title was Tau protein aggregation & neurodegenerative disease (held by Wiley Virtual Events).

A class of transformed joint quantile time series models with applications to health studies

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[2]*Northwestern University Feinberg School of Medicine, USA*
[3]*University of Isfahan, Iran*

Extensions of quantile regression modeling for time series analysis are widely carried on medical and health studies. This paper introduces a particular class of transformed quantile- dispersion regression models for non-stationary time series. It can flexibly incorporate the time-varying structure into the model specification and provides precise predictions for future decisions. Our proposed modeling methodology applies to dynamic processes with high variation and possible periodic, relying on a non-linear presentation. Moreover, unlike the transformed time series model, it directly interprets the regression parameters in the direction of the initial response. We present an iteratively reweighted least squares algorithm for computational purposes. Our model's performance is examined by conducting simulation experiments. To illustrate the modeling strategy, we analyze time-series measurements on influenza infection and the COVID-19 daily deaths.

Biography

Fahimeh Tourani-Farani

Professor assistance in Department of Statistics, Faculty of Mathematics and Statistics, University of Isfahan.

• PhD. In Statistics, University of Isfahan, Iran, 2014-2022

Title: An Extension of Generalized Linear Models in the Family of Transformed Distributions.

Supervisor: Dr. Iraj Kazemi

• Sabbatical leave period In Research Center for Statistics, Geneva School of Economics and Management, Switzerland, 2018-2019

Advisor: Dr. Eva Cantoni

• MSc. In Statistics, University of Isfahan, Iran, 2010-2012

Title: An introduction to Mixture Distribution with Skew-t-normal and its Applications.

Supervisor: Dr. Mohammad Bahrami

• BSc. In Statistics, University of Isfahan, Iran, 2006-2010

Title: An Investigation of the Effects of Some Factors on Manufacturing Special Good s in the Car Factory.

Supervisor: Dr. Hooshang Talebi

Analysis of the expression of exosomal miRNAs associated with response to immunotherapy in clear cell renal cell carcinoma

Dilara Asadullina, Irina Gilyazova, Elza Khusnutdinova and **Valentin Pavlov**
Bashkir State Medical University, Russian Federation

Clear cell renal cell carcinoma (ccRCC) is a malignant kidney tumor with a poor prognosis and difficult to treat. Recently, immune checkpoint inhibitor (ICI) therapy has shown high efficiency in the treatment of this disease. However, the therapy response among patients differs vastly, which is also complicated by the lack of specific tools for its prognosis. Modern studies demonstrate the high potential of exosomal miRNAs as diagnostic and prognostic markers in oncopathology.

The purpose of this study: Evaluating the expression level of exosomal miRNAs-200a, -200b, -200c, -200c, and -34a in patients with ccRCC treated with ICI.

Methods: The study included 52 patients whose venous blood samples were taken before and after therapy with ICI. Expression analysis was performed using quantitative real-time PCR.

Results: We found significantly higher levels of microRNA-34a after therapy in responders to ICI (Mean±SEM 0,08031±0,1650 vs Mean±SEM 0,4685± 0,1575, p-value= 0,0238), when compared to non-responders (Mean±SEM 0,7254± 0,4049 vs Mean±SEM 0,7280± 0,1656, p-value= 0,5714). The other miRNAs expression levels did not show statistically significant differences in patients treated with ICI.

Next, we built a Differences-in-Differences (DID) regression model to assess the differential impact of checkpoint inhibitor treatment on patients treated with ICI. The model showed the effect of exposure is statistically significant at $p<0.1$ (0.07810). Also, the effect of group is statistically significant at $p<0.05$ (0.00375), the effect of time period is statistically insignificant $p>0.1$ (0.15022). Overall the model is statistically insignificant according to F-statistic $p>0.1$ (0.1249).

Conclusion: miRNA-34a is a candidate for creating a panel of molecular markers for patient stratification and evaluating the effectiveness of ICI therapy, but additional in-depth studies are required.

Funding acknowledgements: The study was funded by the Russian Science Foundation grant No. 23-25-00392 and supported by the Bashkir State Medical University Strategic Academic Leadership Program (PRIORITY-2030).

Biography

Asadullina Dilara is a 28 years old. She graduated with honors from Bashkir State Medical University, specializing in Pharmacy. She has proved herself as a hard-working, responsible, purposeful, conscientious student. During my studies at the university she developed in many ways, successfully combining research, sports and volunteer activities. Her scientific activity began when she was studying in the second year. Now she is a postgraduate student in the specialty "Genetics" and work as a junior researcher in the laboratory of molecular genetics of the Institute of Urology and Clinical Oncology of the Bashkir State Medical University. Hee colleagues and she study exosomal microRNAs as potential molecular genetic markers of the efficacy of immune checkpoint inhibitor therapy in patients with clear cell renal cell carcinoma. She is an executor in two grants of the Russian Science Foundation.

Youth Sexual Exploitation in Nigeria: Pathway Influencers and Crossroad Solutions for An Undercarpet Menace

Akeem Opeyemi Akinbode[1], Sunday Bassey Udoh2, Patricia Eseigbe[3], Ndifreke Ubokutom[2] Udom and **Omolade Margaret Olowu[3]**

[1]Family Medicine Department, Federal Medical Centre, Nigeria
[2]University of Uyo Teaching Hospital, Nigeria
[3]Bingham University Teaching Hospital, Nigeria

Purpose of Review: This study highlights the prevalence of sexual exploitation of young people in Nigeria, as well as its contributing factors, impact, and potential solutions, based on the evidence currently available.

Recent Findings: Recent developments include the adoption of guidelines and a national action plan to combat online child sexual exploitation and violence against children, with the integration of Sexual Exploitation of Children into the National Child Act and the Nigerian Child Online Protection Policy (NCOP) of 2012.

Summary: In Nigeria, youth sexual exploitation is a great problem, that has not historically received exposure and has not been part of public discussions. There are numerous factors involved. Few policies are in existence in the country, though not still implemented due to under-reporting of cases. In order to achieve successful outcome, concerns of sexual exploitation of Nigerian youth should be resolved, utilizing evidence-based techniques and strategies.

Biography

Dr Akeem Opeyemi Akinbode studied Medicine at the University of Ilorin, Nigeria. He obtained MSc in Public Health, and Master of Business Administration degrees, both at the University of South Wales, United Kingdom. He is currently a Commonwealth scholar at the Global Health Academy, University of Edinburgh, United Kingdom studying for Master of Family Medicine. He is a Member of the West African College of Physicians (WACP), and a Family Medicine resident physician at Federal Medical Centre, Birnin-kebbi, Kebbi state, Nigeria. He is a Global Health advocate with focus on vulnerable populations, mobilizing resources at the grassroots in Nigeria. He is a volunteer with the Centre for Adolescent Health and Social Development (CAHSD), and the convener of the Women, Adolescent, and Child Health (WACH) Research Group, Nigeria. He is a member of the World Organization of Family Doctors (WONCA) Special Interest Group on Adolescent and Young Adult Health.

Determinants of viral load suppression failure among HIV adults on ARV attending health care facilities: a retrospective study in Tanga region, Tanzania

Eric Mboggo[1], Expeditho Mtisi[2], Stella E. Mushy[3], Simon Mkawe[1], Frida Ngalesoni[1], Aisa Muya[1], Edwin Kilimba[1] and **Boniface Silvan Mlay[4]**

[1]AMREF Health Africa, Tanzania
[2]Department of General Studies, Dar Es Salaam Institute of Technology, Tanzania
[3]Department of Community Health Nursing, Muhimbili University of Health Science, Tanzania
[4]National AIDS Control Program, Ministry of Health, Tanzania

Background: Availability and accessibility of Antiretroviral drugs (ARV's) improve the lives of People living with HIV (PLHIV) by improving client's immune system to overcome infections and prevent the development of AIDS and other HIV complications. Combination therapy, early initiation of ART, newer ART drugs, single dosage and drug affordability significantly contribute in the reduction of viral multiplication and suppression of HIV to undetectable plasma levels.

Methods: A retrospective longitudinal study design study was conducted from 1st October, 2018 to 30th June 2022 in all supported HIV care and treatment health facilities in Tanga region which were supported by Amref Health Africa, Tanzania. The participants were HIV adult patients aged 15 years and above on ART and attended the clinic at least once after ART initiation. Viral load suppression levels are defined with viral load <1,000 HIV RNA copies/ml (viral load suppression). Cox proportional hazard regression models were employed to identify risk factors for virological failure. P values were two-sided, and we considered a P<0.05 to be statistically significant.

Results: Fifty-nine thousand five hundred three adult clients >15 years whom were on ART were included in the analysis to determine the level of plasma Viral Load suppression after being on ART. Female 41,304 (69.4%) and male 18,199 (30.6%). Only four percent (2,290) were found to be unsuppressed i.e having plasma Viral Load >1,000cp/ml while 96% (57,213) were virally suppressed. Several factors were independently associated with virologic failure that included; age between 15 - <25 years (HR: 2.82, 95% CI 1.96 – 4.04), BMI <18.5 (HR: 1.69, 95% CI 1.23 – 2.30), advanced WHO stage IV (HR: 1.60, 95% CI 1.12 – 2.24), CD4 cell count <350 (HR: 2.61, 95% CI 2.12 – 3.23), poor adherence (HR: 1.98, 95% CI 1.80 – 2.18) and not using DTG based drug (HR: 11.8, 95% CI 9.74 – 14.3).

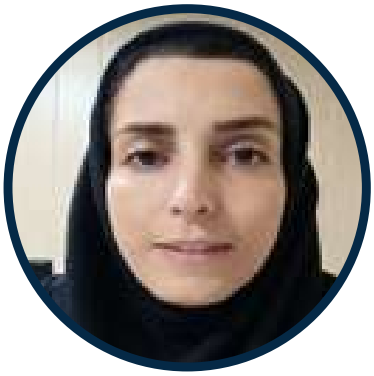
Conclusion: Virologic failure was observed in this study among clients with young age, advanced WHO stage IV, not using DTG based regimen, poor drug adherence and second line regime. To improve Viral Load Suppression among these clients; the existing HIV intervention strategies should be taken care by targeting the identified risk factors.

Biography

Eric Mboggo (MD, MPH) is a Global Health Expert with a focus on prevention and reducing the burden of infectious disease in developing countries especially Tuberculosis, Malaria, HIV/AIDS and Immunized preventable diseases. Experienced in Principles of epidemiology and biostatistics; Infectious disease epidemiology; Maternal and Child Health in global perspective; Research methods in Global Health and Research Proposal writing.

Eric has more than 12 years working experience with Project Implementation in supervisory role supporting HIV/AIDS, Family Planning, Malaria, Health System Strengthening and RMNCAH intervention activities. Involved in provision of relevant Engagement and collaboration with multilateral partners such as US Government Agencies (PEPFAR/CDC), World Vision International, Amref Health Africa and Jean Mayer USDA Human Nutrition Research Center on Aging (USA).

Highly conversant with Research proposal development skills from designing intervention, determine sample size, respond to ethical committee, moderate initial roll out phases, research publications as well as develop and win funding for several research proposals.



Does Opioid Addiction Influence Clinical and Angiographic Outcomes in STEMI Patients Undergoing Emergency PCI?

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[3]Hypertension Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Iran
[4]Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Iran

Background: Despite recognizing the traditional coronary artery disease (CAD) risk factors, some secondary factors, such as opioid substance abuse, have to be considered. We aimed to assess the relationship between opioid consumption and emergency percutaneous coronary intervention (PCI) revascularization results, according to Thrombolysis in Myocardial Infarction (TIMI) flow and in-hospital survival outcomes in ST-elevation myocardial infarction (STEMI) patients.

Materials and Methods: This case–control study was conducted on 186 patients (93 patients in each group) with acute STEMI, who were referred to Chamran Heart Center, Isfahan, Iran. Opioid addiction was diagnosed by patients' records and confirmed by conducting an interview based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria. Patients in both groups were evaluated and compared for angioplasty results based on the TIMI flow grade and in-hospital cardiovascular events and complications.

Results: Ninety-one patients (97.84%) of each group were male, and opioid-addicted patients were younger than the non-opioid users (52.95 9.91 vs. 57.90 12.17, P = 0.003). Among the CAD risk factors, prevalence of dyslipidemia was significantly higher in non-opioid users, whereas cigarette smoking was higher in opioid-addicted patients (P < 0.050). There was no significant difference between the two groups regarding pre- and post-procedural myocardial infarction complications as well as mortality rate (P > 0.050). Also, there were no significant differences between the opioid and non-opioid users regarding TIMI flow grading, and successful PCI rate based on achieving TIMI III was 60.21% versus 59.1% in opiate-dependent and non-opioid users, respectively (P = 0.621).

Conclusion: Opioid addiction has no effects on post-PCI angiographic results and in-hospital survival outcomes in STEMI patients which undergoing emergency PCI.

Biography

Fereshte sattar, MD

Cardiologist, fellowship of electrophysiology

Assistant professor at Isfahan university of medical science (nov2018-sep2023)

Assistant professor at tehran university of medical science (sep2023- now)

A Platform for The Development of Safe Subunit Vaccines

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JSC "Development of Biotechnologies", Russia

A platform based on a corpuscular adjuvant for the development of safe subunit vaccines has been developed. The platform represents virus-like particles with a diameter of 100-150 nm formed by natural bitulin and its bases. Corpuscular bitulin (trade name-"bitusphere") as an adjuvant has been used to develop several subunit vaccines. The first quadrivalent vaccine contains subunit monovalents (H1,H3,B1,B2) of influenza virus adsorbed on a corpuscular adjuvant. Preclinical and clinical studies (phase 1-2) of this vaccine have demonstrated safety and high efficacy in both animals and volunteers. The second vaccine, against COVID-19, is a recombinant antigen containing domains from the S1 and S2 regions of the virus surface antigen coupled to an Fc fragment of a human antibody adsorbed on a corpuscular adjuvant. The vaccine in preclinical and clinical studies proved to be a safe preparation capable of generating specific immunity against SARS-CoV-2 virus.

The data obtained for the two vaccines allowed the development of a third vaccine, a combination vaccine, to begin. The combined influenza virus and coronavirus vaccine contains four influenza virus antigens, which are included in the quadrivalent vaccine and recombinant virus antigenSARS-CoV-2 . Each of the antigens is sorbed on an adjuvant and then formulated into a single balk. In animal models, it has been shown that the antigens included in the combined vaccine induce the synthesis of specific antibodies of a magnitude not inferior to the antigenic response when animals are immunized with the monovalent vaccine.

Biography

Krasilnikov Igor, PhD (biotechnology), Doctor of Biological Sciences, Professor. The USSR Cabinet Council Awarded, 1984 (Tick-borne encephalitis vaccine).

Head of Science, JSC " Biotechnology Developments" , Moscow, Russia.

Vice-President of Russian Biotechnology Society named after Ovchinnikov.

Member of Working expert groups on Influenza vaccines of WHO 2007-2019.

Clear cell morphology could be the most sensitive for immunotherapy in ovarian cancer

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Clinic for gynecology and obstetrics of the University Clinical Center, Serbia

Introduction: Programmed death-ligand 1 (PD-L1) was expressed in various gynecology tumors. High-grade ovarian cancers could be a potential target for immune anti-PD-L1 modulate therapy. Antibodies targeting PD-L1 molecules are emerging cancer therapeutics. This study was designed to evaluate the expression of PD-L1 marker in the high-grade ovarian cancer types and evaluate its prognostic potential.

Methods: The study included 18 patients with ovarian high-grade serous cancer (HGSC) and 11 patients with clear cell cancer (CCC) histology type, both in the International Federation of Gynecology and Obstetrics (FIGO) stage I. The expression of the PD-L1 marker was measured by tissue microarray-based immunohistochemistry. Expression levels of PD-L1 were correlated with the presence of tumor-infiltrating lymphocyte (TIL) and other histopathology parameters.

Results: HGSC ovarian cancers predominantly had low PD-L1 expression, while CCC ovarian cancers had high PD-L1 expression ($p<0.001$). PD-L1 expression did not show significant differences considering analyzed parameters other than histology type (localization, size, FIGO stage, lymphovascular invasion, tumor necrosis, and presence of TIL) among all ovarian cancers. There was no statistically significant difference in any of the tumor characteristics within histological types of ovarian cancers.

Conclusion: PD-L1 expression was significantly higher in clear cell histology type than in high-grade serous ovarian cancers in FIGO I stage.

Biography

Dr. Ljubisa Jovanovic is a research assistant and pathologist at the Clinic for gynecology and obstetrics of the University Clinical Center of Serbia in Belgrade. He graduated from the Faculty of Medicine in Belgrade with an average score of 9.73. He completed his specialization in pathology with an excellent grade, postgraduate studies in the field of "Human reproduction", and subspecialization in the field of Medical Cytology with the highest scores. Ph.D. studies were finished at Medical Faculty in Belgrade with the theme "Expression of immunosuppression markers in ovarian epithelial tumors and their association with autophagy markers". Dr. Jovanovic is involved in several research studies. He is author of significant research papers which mostly described ovarian cancer, new prognostic parameters and therapy possibilities.

Platelet-rich plasma in Management of Anosmia (Single versus Twice Injections)

Mahmoud Ahmed Shawky
Lecturer of Otorhinolaryngology Al-Azhar University-Egypt

Background: Anosmia is a common symptome that may affect the quality of life and increasing mortality. People with anosmia may lose interest in eating and may not be able to fully taste foods. This can lead to malnutrition and weight loss. Anosmia can also lead to depression because it may impair one's ability to smell or taste pleasurable foods. Platelet rich plasma (PRP) is an anti inflammatory product with autologous biologic and neuroprotective effects. This prospective study evaluated the role of PRP on olfactory neuroregeneration in patients with anosmia and compare the results of single and twice injections.

Methods: 54 patients who had olfactory loss greater than 6 months in duration, no evidence of sinonasal inflammatory disease, and no improvement with olfactory training and topical steroids. 27 patients received a single intranasal injection of PRP into the mucosa of the olfactory cleft and 27 patients received a twice injection with 3 weaks interval between them. The Q-Sticks Test was administered at the beginning of the study and at 1 and 3 months.

Results: All patients reported a subjective improvement of their smell shortly after injection but then stabilized. At 3-month post-treatment, 16 patients improved significantly after single injection and 19 patients improved significantly after twice injection. There were no adverse outcomes from intranasal PRP injections.

Conclusion: PRP appears safe for use in the treatment of olfactory loss, and preliminary data suggest possible efficacy, especially for those with persistent loss. Further studies will help determine optimal frequency and duration of use.

MicroRNAs, long non-coding RNAs, and circular RNAs and gynecological cancers: focus on metastasis

M.Derakhshan[1,2]

[1]*Assistant professor, Isfahan University of medical sciences, Iran*
[2]*clinical embryologist, shahid beheshti IVF center, Iran*

This discussions highlights the important role of non-coding RNAs, including microRNAs, long non-coding RNAs, and circular RNAs, in the metastasis of gynecological cancers. ncRNAs have been demonstrated to contribute to all stages of metastasis in most types of cancers, controlling proliferation, migration, invasion,

EMT, and metastasis. These molecules regulate various aspects of the metastatic process, including cellular transformation, tumor growth, invasion, migration, and angiogenesis. Additionally, they can act as prognostic markers and potential therapeutic targets for gynecological cancers. There are complex interactions between ncRNAs and proteins, DNA, and complementary RNA molecules to affect metastasis, as might be expected given the complexity of the metastatic process. To further understand the role of ncRNAs and the affected signaling networks in metastasis, powerful gene function-based methods are required. Rapid sequencing of the human genome (including ncRNAs) is now possible through the latest advancements in genome editing techniques like CRISPR/Cas9 technology. Combining functional genetic screening with appropriate animal models and single-cell-based assays is now within reach, which will enable us to better understand the molecular processes controlling the function of ncRNAs in metastasis. Moving forward, there are several avenues for future investigation. First, further studies are needed to elucidate the molecular mechanisms by which non-coding RNAs contribute to the metastatic process. This will provide a better understanding of how these molecules can be targeted for therapeutic purposes. Second, the development of non-invasive diagnostic methods for gynecological cancers based on non-coding RNAs is an important area for future research. Third, the identification of novel noncoding RNAs that play a role in gynecological cancer metastasis will provide new targets for therapeutic intervention. Fourth, the use of non-coding RNAs as therapeutic agents in the treatment of gynecological cancers is an exciting prospect that warrants further investigation. Moreover, the roles of ncRNAs in gynecologic cancer progression will require further validation by analyzing sufficient numbers of clinical samples.

The role of SARS-CoV-2 accessory proteins in immune evasion

Milad Zandi
Department of Virology, School of Medicine, Lorestan University of Medical Sciences

Many questions on the SARS-CoV-2 pathogenesis remain to answer. The SARS-CoV-2 genome encodes some accessory proteins that are essential for infection. Notably, accessory proteins of SARS-CoV-2 play significant roles in affecting immune escape and viral pathogenesis. Therefore SARS-CoV-2 accessory proteins could be considered putative drug targets. IFN-I and IFN-III responses are the primary mechanisms of innate antiviral immunity in infection clearance. Previous research has shown that SARS-CoV-2 suppresses IFN-B by infecting host cells via ORF3a, ORF3b, ORF6, ORF7a, ORF7b, ORF8, and ORF9b. Furthermore, ORF3a, ORF7a, and ORF7b have a role in blocking IFNB signaling, and ORF8 represses IFNB signaling. The ORF3a, ORF7a, and ORF7b disrupt the STAT1/2 phosphorylation. ORF3a, ORF6, ORF7a, and ORF7b could prevent the ISRE promoter activity. The main SARS-CoV-2 accessory proteins involved in immune evasion are discussed here for comprehensive learning on viral entry, replication, and transmission in vaccines and antiviral development.

Biography

As an accomplished professional in the field of virology, he currently serves as an Assistant Professor at Lorestan University of Medical Science since October 2023. Prior to this, from December 2022 to October 2023, he held the position of Senior Researcher at Tehran University of Medical Sciences. Renowned for his contributions to the scientific community, he has been recognized with several prestigious awards, including the Outstanding Scientist Award at the International Conference for Award Winners on Engineering, Science, and Medicine in July 2023, and the Researcher Award at the International Research Awards on New Science Inventions in September 2022. He actively contributes to various international journals and conferences, holding editorial roles in esteemed publications such as Reviews in Medical Virology journal and serving on scientific committees for scientific organizations.

Asthma and COPD overlap syndromes (ACOS): Risk factors and Contributing factors

Mohammad Amin Gholami[1], Hossein Esmaeilzadeh[1,2], Hesamedin Nabvizadeh[1,2], Mohammad Reza Yousefi[1], Negar Mortazavi[3] and **Mohebat Vali[4]**

[1]Allergy Research Center, Shiraz University of Medical Sciences, Iran
[2]Department of Allergy and Clinical Immunology, Namazi Hospital, Shiraz University of Medical Sciences, Iran
[3]Department of Clinical Pharmacy, School of Pharmacy, Shiraz University of Medical Sciences, Iran
[4]Student Research Committee, Shiraz University of Medical Sciences, Iran

Background: The exact description of asthma and chronic obstructive pulmonary disease overlap syndrome (ACOS) is uncertain. This study aims to determine the frequency and symptoms of ACOS and to verify certain risk factors associated with ACOS.

Methods: Severe asthmatic patients with and without ACOS above 40 years old participated in this cross-sectional study. The receiver operating curve analysis (ROC) was used to assess the best cutoff values of age, body mass index (BMI), and spirometric data to distinguish asthma patients with overlap syndrome from asthma patients without overlap syndrome. Univariable and multivariable binary logistic regression was used to determine demographic and clinical factors that were associated with ACOS and asthma.

Results: Of the 88 patients, 46 (52.2%) had ACOS and 42 (47.7%) had just severe asthma. The mean age of ACOS patients (Sd) was 54.91(12.57) years and in asthma-only patients was 48.69 (13.51). The ROC analysis for age and BMI showed that age B 49 years and BMI B 27 kg/m2 were the best predictors of ACOS. Spirometry data showed that the forced vital capacity (FVC) (lit) > 2.16, forced expiratory volume in the first second (FEV1) > 69, FEV1 / FVC > 96.5, and FVC (%) > 63 cut points could be used to determine the diagnostic criteria between ACOS and asthma only, respectively. Multivariate modelling showed that among the demographic and clinical variables, age over 49 years (odds ratio [OR], 3.53 [95% CI, 1.07-11.63] p = 0.025) and living in a big city (OR, 7.42 [95% CI, 1.75-31.49] p = 0.007) were significant.

Conclusion: Age over 49 and BMI above 27 have a significant association with ACOS. Also, living in a big city is considered to be another risk factor for ACOS compared with asthma. Spirometry can help distinguish ACOS from severe asthma in this study.

Biography

Mohammad Amin Gholami a junior researcher and graduated Medical Doctor from Shiraz university of Medical Sciences. He has a background of research in immunology and allergy and I have a translated book from English to Persian about the drug allergy and management. He eager to work with the immunologist around the world and eager to share my thoughts and research in this area.

Level of knowledge about neonatal danger signs and associated factors among postpartum mothers in public hospitals, north eastern Ethiopia

Molla Kassa, Muluken Amare Wudu and **Dagne Belete Gebrye**
Wollo University, Ethiopia

Background: Knowing and seeking medical attention for a neonatal danger sign has many benefits for reducing neonatal morbidity and death. Despite numerous interventions that have been made to raise mothers' awareness about neonatal danger signs, the desired level of knowledge has not yet been reached in Ethiopia. Objective: To assess the level of knowledge of neonatal danger signs and associated factors among postpartum mothers in public hospitals in the Eastern Amhara region, north eastern Ethiopia.

Methods: A hospital-based cross-sectional study was conducted in four government hospitals between January 10, 2023, and February 10, 2023.421 participants in the study were selected using a systematic random sampling technique. Face-to-face interviews, observation, and chart reviews were used to collect the data. The association was discovered through multivariate logistic regression analysis.

Result: Only 36.6% (154) of mothers were knowledgeable about new born danger signs in this study. Mothers who had higher institution status [(adjusted odds ratio) AOR = 3.355, 95% CI (1.751, 6.428)]; who were civil servants or a private employer [AOR = 2.986, 95% CI (1.822, 4.892)] and [AOR = 2.544, 95% CI (1.269, 5.138)]; and who had counselling about breastfeeding [AOR = 2.614, 95% CI (1.695, 4.029)] were positive predictors of awareness of neonatal danger signs.

Conclusion: In this study, the level of mothers' awareness of new born danger signs was low and required more effort. Moreover, mothers who were educated, worked as civil servants or private employers, had a family size of 4–6, and received breastfeeding counselling were linked to mothers' good awareness of new born danger signs. As a result, intensive community and facility-based health promotion activities on new born danger signs should be strengthened, with special emphasis on uneducated and housewife mothers and breastfeeding counselling sessions.

Biography

Molla Kassa affiliated institution is Wollo University. He has BSc degree in Nurse and Masters in pediatrics and child health nurse. He is a senior health researcher with best experience in analytical background in the domain of maternal and child health and public health, communicable and none-communicable diseases. He has work experiences in data analysis for different individual and organizations with excellence over 8 years in the field of research, project evaluations and data automations. In addition, he has research experience on various diseases after getting my MSc study with obtained excellent (First Class with great distinction) award in MSc completion from Mekelle University from 2017 up to now. He has published 4 researches and he performed study design, statistical modelling and data analysis for these researches. From four researches, three studies were medium researches grants and he was principal investigator.

Inhibition of mir-21 in T lymphocytes and evaluate its effect on the expression of c-myc protein and its role of T cells apoptosis in MS disease

Mostafa Manian[1,2]

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[2]*Department of Immunology, Faculty of Medicine, Iran University of Medical Sciences, Iran*

Background: MicroRNAs (miRNAs) are normally short non-coding RNAs, 18-22 nucleotides in length, known as post-transcriptional regulators of gene expression by binding to the 3'UTR of the target mRNAs, causing translational repression or degradation. According to apoptosis has a fundamental role in the pathogenesis of MS and the role of miR-21 in apoptosis and also the increase of miR-21 in the lymphocytes of MS patients, it is possible to demonstrate the immunopathogenesis of the disease and define a therapeutic method in the future In this study, inhibitions of miR-21 with locked nucleic acid technology (LNA) and evaluation of its inhibitory effects on prevention of proliferation of cells and induction of apoptosis and necrosis, expression level of protein PDCD4, C-myc, were conducted.

Method: T cells of MS patients was transfected with LNA-anti-miR-21,Mimic LNA and scrambled LNA for 48h. Quantitative real-time reverse transcriptase-PCR (qRT-PCR) was performed to assess miR-21 and C-myc mRNA expression by LNA-anti-miR-21 compared with scrambled LNA-transfected cells and untreated cells. The viability of the cells was evaluated by MTT (3-[4, 5-dimethylthiazol-2-yl]-2, 5-diphenyl tetrazolium bromide) assay and Annexin V/propidium iodide staining assay was used to detect apoptosis. The protein expression level of PDCD4 and C-myc was determined in four groups of cells (transfected by LNA-anti-miR,Mimic LNA transfected by scrambled LNA and untreated cells) by using western blot analysis.

Results: The expression level of miR-21 in T cells of MS patients was measured and completely inhibited in LNA-anti-miR group, compared with untreated cells (Control) and scrambled LNA-transfected cells , at 48 h after transfection. After inhibition of miR-21, MTT1 assay indicated that in cells transfected with LNA-anti-miR-21, the cell viability significantly 1 (3-[4, 5-dimethylthiazol-2-yl]-2, 5-diphenyl tetrazolium bromide) decreased compared with the control and scrambled LNA,Mimic LNA groups. In the study of apoptosis and necrosis (Propidium iodide /AnnexinV), we observed a significant increase in the apoptotic cells after transfection with LNA-anti-miR-21, compared with other groups. In examining the Western blot,it shown the increased level of the protein PDCD4 in cells transfected with LNA-anti-miR-21 and increased level of the protein C-myc in cells transfected with Mimic LNA ,compared with the control and scrambled

LNA groups.

Conclusion: This study has shown that inhibition of miR-21 in T cells of MS patients can act as an inhibitory effect on T cell proliferation and T cell hyperactivity and increases apoptosis. According to the present study, miR-21 has a negative regulatory effect on PDCD4 protein and anti-apoptotic effects and induce T cell hyperactivity. Consistent with other studies, miR-21 as a c-myc activator and cell growth was also confirmed in our studies. The results of this study may be used as one of the treatment approach for autoimmune diseases in the future, especially MS, and a method based on inhibition of autoreactive lymphocyte cells using inhibition of miRNAs can be designed.

Biography

Mostafa Manian is an Assistant professor, Head of Department of Medical Laboratory Science, Faculty of Medicine, Islamic Azad University of Kermanshah, Kermanshah , Iran.

During his master and PhD, he has acquired considerable skills from Multiple Sclerosis (MS) to Cancers, which allowed me to identify how manipulating the regulatory mechanisms impacts the disease output.

Tolerance & Autoimmunity

Muhammad Akram[2], Marium Ahsan[1], Momina Iftikhar[2], Tansif Ur Rehman[3], Francisco Garcia-Sierra[4], Riadh S Al-Malki[5], Fethi Ahmet Ozdemir[6], Gaweł Sołowski[6], Najmiatul Fitria[7], Marcos Altable[8] and **Adonis Sfera[9]**

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Fundamental ideas in immunology, tolerance and autoimmunity define the delicate balance between immune recognition and self-tolerance. To prevent negative reactions against self-antigens, tolerance mechanisms ensure that the immune system detects and reacts to foreign antigens. Autoimmune diseases are caused by a failure in tolerance mechanisms, in which the immune system involuntarily attacks its own tissues. This review examines the mechanisms of immunological tolerance, including peripheral and central tolerance processes. Discusses how antigen-presenting cells, cytokines, and regulatory T cells contribute to maintaining self-tolerance and avoiding autoimmunity. Additionally, it analyzes elements including genetic predisposition, environmental triggers, and molecular mimicry that lead to the breakdown of tolerance. Understanding these mechanisms is essential for creating personalized treatments for autoimmune disorders and using tolerance induction for medicinal purposes.

Introduction:

The fundamental ideas in immunology, tolerance and autoimmunity mean a delicate balance in the immune system's reaction to self and non-self.(del Guercio P et al.,1993). While establishing strong defenses against foreign invaders, tolerance mechanisms ensure that the immune system detects and tolerates the body's own antigens or autoantigens. (Thatte AM et al.,2024).Preventing autoimmune diseases, which occur when the immune system unintentionally attacks healthy tissues, requires maintaining this delicate balance.(Rose NR et al.,1981). It is essential to understand the mechanisms of immunological tolerance, which

involve both peripheral and central processes regulated by cytokines, antigen-presenting cells, and regulatory T cells.(Groux H et al.,2001). It is equally crucial to examine the elements that lead to the breakdown of tolerance, such as inherited susceptibility, external stimuli, and molecular mimicry. To clarify the role of these ideas in health, disease, and possible treatments for autoimmune diseases, this review takes a closer look at these ideas. Important ideas in immunology include tolerance and autoimmunity, which represent the many ways the immune system discriminates between self and non-self. Preserving immune tolerance ensures that the primary goal of the immune system is to protect the body against infection rather than damaging its own tissues. Processes such as central tolerance, which teaches maturing immune cells in the thymus and bone marrow to identify and eradicate self-reactive clones, are essential for this regulation.(Sharma SK et al.,2013). Furthermore, autoreactive lymphocytes that evade central deletion are suppressed or eliminated in peripheral tissues through the action of peripheral tolerance mechanisms. (Zehn D et al.,2006)Regulatory T cells (Tregs) are important components of peripheral tolerance because they weaken the immune system to preserve tolerance and prevent autoimmune diseases. Furthermore, cytokines and antigen-presenting cells (APCs) are essential for immune control and antigen presentation. (Mittal SK et al.,2015)

Tolerance

The concept of tolerance in immunology describes the ability of the immune system to identify and accept the body's own antigens, or "autoantigens", as "self" and to refrain from mounting an immunological defense against them. By ensuring that the immune system recognizes the difference between self and foreign antigens, it helps avoid autoimmune reactions.(Žižek S et al.,2008)

Autoimmunity

Autoimmunity is the result of the immune system misinterpreting autoantigens as foreign substances and launching an attack against them. This produces tissue and organ damage, as well as inflammation, which are characteristics of autoimmune disorders. (Rodríguez-Pinto D.B et al.,2005)

Immune tolerance mechanisms

the immune system remains immune to self-antigens through these mechanisms. They include peripheral tolerance (maintained in peripheral tissues through processes such as regulatory T cells and anergy) and central tolerance (occurring during the maturation of T and B cells in the thymus and bone marrow, respectively). (Goverman JM et al.,2011)

Regulating T cells (Tregs)

Tregs, or regulatory T cells, are a subset of T cells that are essential for preserving immune tolerance because they inhibit the activation and activity of other immune cells. By inhibiting autoreactive T cells, they help in the prevention of autoimmune reactions. (Kondelková K et al.,2010)

Central tolerance

The tolerance mechanisms that occur during the formation of T cells (in the thymus) and B cells (in the bone marrow) are called central tolerance. To stop autoimmunity, cells that have a strong affinity for self-antigens are eliminated or made inactive. (Gallegos AM et al.,2006)

Peripheral tolerance

Mechanisms of peripheral tolerance include anergy (the functional inactivation of autoreactive lymphocytes), Treg suppression, and elimination of autoreactive cells. These mechanisms operate outside of the primary lymphoid organs, such as the thymus and bone marrow. (Arnold B et al.,1993)

Antigen-presenting cells (APCs)

are specialized immune cells that deliver antigens to T cells to trigger an immune response. Examples of APCs include dendritic cells, macrophages, and B cells. By presenting autoantigens without costimulatory signals, they also contribute to the maintenance of tolerance by inducing T cell deletion or anergy. (Rodríguez-Pinto D et al.,2005)

Cytokines

Immune cells release cytokines, which are signaling chemicals that control immune responses. Through their effects on immune cell activation, differentiation, and function, they play important roles in mediating immune tolerance, inflammation, and autoimmune processes. (Dinarello CA et al.,2000)

Autoimmune

diseases are disorders in which the body's immune system involuntarily attacks and attacks healthy tissues or organs. Lupus, multiple sclerosis, type 1 diabetes, and rheumatoid arthritis are some examples. (Cooper GS et al.,2003)

Genetic predisposition

Susceptibility to autoimmune diseases is influenced by genetic factors. Due to their effects on immune modulation, antigen presentation, or cytokine generation, certain genetic variants may predispose people to developing autoimmune diseases. (De la et al.,2004)

Environmental triggers

In people genetically predisposed to autoimmune diseases, environmental variables such as infections, pollutants, nutrition, and stress can cause or worsen autoimmune diseases. These stimuli have the power to enhance the immune response or induce a decrease in tolerance to autoantigens. (Ho SM et al.,2019)

Molecular mimicry

When environmental antigens or infectious agents mimic self-antigens, this phenomenon is known as molecular mimicry. The pathophysiology of autoimmune diseases may be promoted by cross-reactive immune responses, in which the immune system targets both the foreign antigen and the self-antigen. (Cusick MF et al.,2012)

Conclusion

In summary, tolerance mechanisms are essential to keep the body's own tissues safe from attacks by the immune system. Autoimmune disorders can arise due to dysfunctions in these pathways. Understanding the functions of antigen-presenting cells, regulatory T cells, and environmental triggers is essential to creating therapies that effectively balance the immune system and alleviate autoimmune diseases. Prospective research could potentially advance targeted treatments and improve outcomes for those affected by these complex diseases.

Enhancing treatment strategies for small bowel cancer: a clinical review of targeted therapy and immunotherapy approaches

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Small bowel cancer (SBC) is a rare and aggressive disease with a poor prognosis, necessitating the exploration of novel treatment approaches. This narrative review examines the current evidence on targeted therapy and immunotherapy for SBC, focusing on the two most common subtypes: adenocarcinoma and neuroendocrine tumor. A comprehensive search of PubMed, Scopus, and Google Scholar databases was conducted to identify relevant clinical trials and case reports published in English up to September 2023. The review includes 17 clinical trials and 10 case reports, indicating that targeted therapy and immunotherapy can have the potential to improve survival rates in patients with SBC. Notably, promising targeted medicines include bevacizumab, cetuximab, and trastuzumab, while pembrolizumab and nivolumab show potential as immunotherapies. However, it should be noted that the magnitude of the increase in survival rates with these interventions was small. Further research is needed to determine the optimal combination of targeted therapy and immunotherapy for individual patients with SBC.

The role of nutrition on the treatment of Covid 19

Samer Younes
Department of Pharmacy, Tartous University, Syria

Background: The rapid and extensive transmission of the SARS-CoV-2 virus has led to a worldwide COVID-19 pandemic. Initially thought to be an acute illness, many patients have reported persistent and recurring symptoms even after the infectious period. This has given rise to a new epidemic known as "long-COVID" or post-acute sequelae of coronavirus disease, which has significantly impacted the lives of millions of individuals globally. The symptoms of both COVID-19 vary from person to person, but they share similarities with other respiratory viruses, such as chest pain, shortness of breath, and fatigue, as well as adverse effects on metabolic and pulmonary health. Nutrition plays a crucial role in immune function and metabolic health, and therefore, it is believed to have an impact on reducing the risk or severity of symptoms for both COVID-19. However, despite the importance of nutrition in these physiological functions related to COVID-19, the exact role of nutrition in the onset or severity of COVID-19 infection is still not fully understood. This review aims to explore established and emerging nutrition approaches that may have a role in COVID-19, while emphasizing the significance of established nutrition and clinical practice guidelines as the primary resources for patients and healthcare practitioners.

Biography

Samer Younes is a dedicated professional with 2 years of experience in pharmaceutical services and a strong background in clinical pharmacology. Excellent track record of delivering community health education programs and strong clinical and technical knowledge. Finished bachelor's degree in Pharmacy at 31.01.2024 from faculty of pharmacy, Tartous university, Syria and looking forward to applying for full funded scholarships to continue his master degree studies in Italy.

The effect of Persian medicine herbal formulation in respiratory symptoms, pulmonary function and intestinal permeability of asthma's patients: A Triple-Blind Randomized Controlled Trial

Sh Saeidinejat and **Derakhshan**

Faculty of Traditional Persian Medicine, School of Persian and Complementary Medicine, Mashhad university of medical sciences, Iran

Background: Herbal medicines are widely used by asthma patients to control symptoms. This study investigated the efficacy and safety of Glasthma (a Persian medicine herbal formulation contained Cydonia Oblonga, Ziziphus Jujuba, Glycyrrhiza glabra, Echium amoenum and hazelnut) on asthma symptoms and intestinal permeability.

Material and Methods: In this placebo-controlled triple-blind randomized clinical trial, 40 asthma patients were categorized randomly to Glasthma group (n=20) and control group (n=20). The Glasthma group received 15 cc of Glasthma syrup twice daily for 4 weeks. The same dosage of placebo syrup was administered to the control group. Respiratory symptoms, pulmonary function tests and 5-hour urine Lactulose to Mannitol ratio were assessed before and 4 weeks after starting treatment.

Results: Clinical symptom scores by asthma control test ($P < 0.001$), asthma control questionnaire 7 ($P < 0.007$), FEV1 ($P < 0.001$) and MMEF25-75 ($P<0.002$) were significantly improved in Glasthma group compared to placebo group. Both Lactulose and Mannitol levels were significantly reduced in Glasthma group ($P<0.028$, $P<0.0000$), however, the changes in the ratio were not significant. No serious adverse effects were observed in both groups.

Conclusion: These findings suggest that Glasthma formulation may be effective in improving asthma symptoms and regulating the gut-lung axis.

Biography

Shahin Saeidinejat is a medical doctor that hold a PhD in Complementary Medicine from Mashhad University of Medical Sciences (MUMS), Iran. Her doctoral research focused on studying the efficacy of herbal drugs in allergic syndromes such as Urticaria and Asthma. Throughout my PhD studies, she engaged in several projects investigating the utilization of herbal formulations and their impact on patient outcomes. One significant study was aimed at evaluating the effectiveness and safety of a standardized herbal formulation, called Glasthma, in asthma patients, focusing on the gut-lung axis. This research, conducted over three years, demonstrated improved asthma symptoms, pulmonary function tests, and intestinal permeability. She believes this study contributes valuable insights to the field, as it is the first to simultaneously evaluate respiratory and digestive functions in asthmatic patients.

Additionally, she conducted research on the efficacy of Barley Extract in Chronic Spontaneous Urticaria, a randomized, double-blind, placebo-controlled clinical study. This research evaluated the impact of Barley Extract, a formulation based on Hordeum vulgare seeds with known anti-inflammatory properties, on the symptoms and quality of life of patients with chronic urticaria. The study demonstrated positive effects on symptom severity, pruritus, swelling, daily activities, sleep problems, and overall well-being.

She also completed a Master's in Public Health (MPH) with a specialization in health services management. Her MPH coursework encompassed a wide range of research areas, including basic sciences, education, epidemiology, field research, and complementary medicine.

Throughout her academic and professional journey spanning over 17 years, she has contributed to numerous research projects, resulting in the publication of 21 articles, academic reports, and conference presentations.

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