

JOINT EVENT

# ADVANCES IN CLINICAL AND CELLULAR IMMUNOLOGY

&

# GLOBAL VIROLOGY CONGRESS

SEPTEMBER 23-24

**2024**

BARCELONA, SPAIN



**PROGRAM-AT-A-GLANCE >>**

**YOUR FIRST CHOICE  
FOR RESEARCH  
INGENUITY**

**ADV. IMMUNOLOGY 2024 & FUTURE VIROLOGY 2024**

# DAY 1

SEPTEMBER 23, 2024

# Scientific Program

07:45-08:20 Registrations

08:20-08:30 Opening Ceremony

**Moderator** Jacki Kornbluth, Saint Louis University, St. Louis VA Healthcare System, USA

**Chair** Jacques Pouyssegur, University Côte d'Azur, France; Scientific Center, Monaco

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

08:30-08:50

**Title: Prediction of the targeted immunotherapy based on the pathogenic mechanism for chronic inflammatory disease**

**Kazuyuki Yoshizaki**, *Osaka University, Japan*

08:50-09:10

**Title: Natural killer cell-derived extracellular vesicles kill treatment-resistant tumor cells**

**Jacki Kornbluth**, *Saint Louis University, St. Louis VA Healthcare System, USA*

09:10-09:30

**Title: The impact of nasal photodisinfection on SARS-CoV-2 infection**

**Richard Rusk**, *Rusk Medical Corporation, Canada*

09:30-09:50

**Title: Glycolysis controls tumor growth, bacterial, viral infections and immunity**

**Jacques Pouyssegur**, *University Côte d'Azur, France; Scientific Center, Monaco*

09:50-10:10

**Title: Global impact of Epstein-Barr virus infection in autoimmune diseases, including Immunoglobulin A nephropathy**

**Jiri Mestecky**, *University of Alabama Birmingham, USA*

10:10-10:30

**Title: Label free cell avidity detection of antibodies against immune related diseases**

**Richard B.M. Schasfoort**, *University of Twente, The Netherlands*

Group Photo 10:30-10:35

Refreshment Break 10:35-10:50

10:50-11:10	<p><b>Title: Extensive Aortic Dissection in a low risk male- A case report</b>  <b>Francis Anene</b>, <i>Darlington Memorial Hospital, United Kingdom</i></p>
11:10-11:30	<p><b>Title: Description of Sheep Pox outbreak occurred in Spain in 2022_23 and the challenges found, as well as the lesson learnt in relation with the control and eradication of the disease</b>  <b>Germán Cáceres Garrido</b>, <i>Ministry of Agriculture, Fisheries and Food (MAPA), Spain</i></p>
11:30-11:50	<p><b>Title: Tumor-derived soluble CD155 inhibits DNAM-1-mediated tumor immunity</b>  <b>Kazuko Shibuya</b>, <i>University of Tsukuba, Japan</i></p>
11:50-12:10	<p><b>Title: Decoding autoimmune control: The Intricacies of CLEC16A regulation</b>  <b>Marina Bakay</b>, <i>The Children's Hospital of Philadelphia, USA</i></p>
12:10-12:30	<p><b>Title: Sample size for estimating disease prevalence in free-ranging wildlife populations: A Bayesian modeling approach – Advances and recent developments</b>  <b>Carlos Gonzalez-Crespo</b>, <i>University of California, USA</i></p>
12:30-12:50	<p><b>Title: Emerging pharmacological strategies for treating and preventing mpox</b>  <b>Dennis E. Hruby</b>, <i>SIGA Technologies, USA</i></p>
<b>Group Photo 12:50-13:00</b>	
<b>Lunch Break 13:00-13:30</b>	
13:30-13:50	<p><b>Title: Acquired CFTR dysfunction and dense distribution of ionocytes in nasal mucosa of children with CRS</b>  <b>Yang Han</b>, <i>Capital Medical University, China</i></p>
13:50-14:10	<p><b>Title: Chronic graft-versus-host disease and refractory rhinosinusitis after allogeneic hematopoietic stem cell transplantation in children</b>  <b>Jinhao Zhao</b>, <i>Capital Medical University, China</i></p>
14:10-14:30	<p><b>Title: Vaccine hesitancy, a narrative review</b>  <b>Deona Taraj</b>, <i>University of Vlora "Ismael Qemali", Albania</i></p>
14:30-14:50	<p><b>Title: Putative roles of diabetes and obesity in severe dengue infections</b>  <b>Shamala Devi Sekaran</b>, <i>UCSI Hospital, Malaysia</i></p>
14:50-15:10	<p><b>Title: Worldwide today's challenges facing hepatitis B, risk factors, economic burden, self-management and elimination programs- A narrative review</b>  <b>Jerina Jaho</b>, <i>University of Vlora "Ismael Qemali", Albania</i></p>

15:10-15:30

**Title: Rhodococcosis mimiting tuberculosis in a patient with AIDS**  
**Gabriel Moreira Accetta**, *Universidade Estadual Paulista (UNESP), Brazil*

Refreshment Break 15:30-15:45

15:45-16:05

**Title: Integrated tools for detecting plant viruses and viroids using RNA-seq data**  
**Xiaojun Hu**, *United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Plant Germplasm Quarantine Program (PGQP), USA*

16:05-16:25

**Title: Cardio vascular complications from COVID-19, a narrative review**  
**Stiliana Brokaj**, *University of Vlore "Ismail Qemali", Albania*

16:25-16:45

**Title: Middle East respiratory syndrome corona virus spread stochastic simulations and control in camels in the United Arab Emirates**  
**Magdi Mahmoud Mohamed Ali**, *United Arab Emirates Ministry of Climate Change and Environment (MoCCA), UAE*

16:45-17:05

**Title: The impact of covid-19 on mental health and suicide: A literature review**  
**Denada Kreshpaj**, *University of Vlore "Ismail Qemali", Albania*

17:05-17:25

**Title: BRD4-PRC2 represses transcription of T-helper-2 specific negative regulators during T-cell differentiation**  
**Ka Lung Cheung**, *Icahn School of Medicine at Mount Sinai, USA*

17:25-17:45

**Title: Smad cascade: Pleiotropic cardio-metabolic consequences in primary human immune cells**  
**Kareem Awad**, *University of Turku, Finland*

17:45-18:05

**Title: Real-time detection of single bioaerosol particles via differential circular polarization scattering (CIDS)**  
**Yong-Le Pan**, *DEVCOM Army Research Laboratory, USA*

18:05-18:25

**Title: Antiviral effects of six indigenous plants on viral causative agents of Bovine Respiratory Disease Complex (BRDC)**  
**Vladimir Kurćubić**, *University of Kragujevac, Serbia*

18:25-18:45

**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*

Panel Discussion

End of Day 1



# DAY 2

SEPTEMBER 24, 2024

# Scientific Program

08:20-08:30 Introduction

Session Chair

**Michael Bukrinsky**, The George Washington University School of Medicine and Health Sciences, USA

Session Chair

**Akira Shibuya**, University of Tsukuba, Japan

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

08:30-08:50

**Title: Extracellular vesicles carrying HIV-1 Nef induce myelin impairment in the mouse brain**

**Michael Bukrinsky**, The George Washington University School of Medicine and Health Sciences, USA

08:50-09:10

**Title: Enhanced Efferocytosis Ameliorates Ischemic organ damage**

**Akira Shibuya**, University of Tsukuba, Japan

09:10-09:30

**Title: Fungal secondary metabolites as antivirals against canine coronavirus**

**Filomena Fiorito**, University of Naples Federico II, Italy

09:30-09:50

**Title: Allogeneic use of a specific mesenchymal cell line to manage complex equine wounds**

**Marcela Nilda Garcia**, Universidad Nacional de La Plata (UNLP), Argentina

09:50-10:10

**Title: RBC alloimmunization among pediatric transfusion-dependent thalassemia patients**

**Mirette Hanna**, University of Toronto, Canada


10:10-10:30

**Title: Performance evaluation of the Access HBsAg and Access HBsAg Confirmatory assays on the Dxl 9000 Access Immunoassay Analyzer**

**Vanessa Roulet**, Beckman Coulter, Immunotech, France

Group Photo 10:30-10:35

Refreshment Break 10:35-10:50

10:50-11:10	<p><b>Title: Expanding the horizon of Virus-Like Particles (VLPs) for human and animal health</b></p> <p><b>Yolandy Lemmer</b>, <i>Council for Scientific and Industrial Research (CSIR), South Africa</i></p>
11:10-11:30	<p><b>Title: Nano-immunology: Using nanomaterials to control the immune response</b></p> <p><b>Thomas J. Webster</b>, <i>School of Health Sciences and Biomedical Engineering, China</i></p>
11:30-11:50	<p><b>Title: Prevalence and antibiogram of bacteria causing urinary tract infection among patients with chronic kidney disease</b></p> <p><b>Puspa Raj Khanal</b>, <i>Sumeru Hospital Pvt Ltd., Nepal</i></p>
 Poster 11:50-12:10	<p><b>Title: Future virology: Expanding the focus of undergraduate training</b></p> <p><b>Boriana Marintcheva</b>, <i>Bridgewater State University, USA</i></p>
 Poster 12:10-12:30	<p><b>Title: Unravelling the role of nuclear INPP5K in B cells biology: Insights into B cell activation and splicing regulation</b></p> <p><b>Alice Mostafa</b>, <i>University of Liège, Belgium</i></p>
 Poster 12:30-12:50	<p><b>Title: Canine coronavirus infection is exacerbated by dioxin</b></p> <p><b>Luca Del Sorbo</b>, <i>University of Naples Federico II, Italy</i></p>
<b>Group Photo 12:50-13:00</b>	
<b>Lunch Break 13:00-13:30</b>	
13:30-13:50	<p><b>Title: Probiotics as an adjunctive intervention in systemic lupus erythematosus: A systematic review</b></p> <p><b>Arezoo Faridzadeh</b>, <i>Mashhad University of Medical Sciences, Iran</i></p>
13:50-14:10	<p><b>Title: Unveiling the lockdown effects: Exploring behavior, dietary habits and weight changes in rural Egypt during covid-19 lockdown: A cross-sectional retrospective study</b></p> <p><b>Mahmoud Reda Saleh</b>, <i>Kafrelsheikh University, Egypt</i></p>
14:10-14:30	<p><b>Title: Epigenetic regulation of SETD8 methyltransferase in TNBS-induced colitis treated with carbamylated Erythropoietin</b></p> <p><b>Priscila Rodrigues Gomes Mendes</b>, <i>H&amp;TRC - Health &amp; Technology Research Center, Polytechnic Institute of Lisbon, Portugal</i></p>
14:30-14:50	<p><b>Title: Single-cell transcriptome revealed dysregulated RNA binding protein expression patterns and functions in human ankylosing spondylitis</b></p> <p><b>Yuan Ma &amp; Zheng Ren</b>, <i>Sixth Affiliated Hospital of Xinjiang Medical University, China</i></p>

14:50-15:10

**Title: Performance evaluation of the Access anti-HBc Total assay on the Dxl 9000 Access Immunoassay Analyzer**

**Rima Bayoud**, *Beckman Coulter Immunotech in Marseille, France*

15:10-15:30

**Pre-recorded Title: Epidemiological modeling with differential equations**

**Uzoma Kenneth Egeonu**, *Southern Illinois University, USA*

15:30-15:50

**Pre-recorded Title: Comparing clinical trial drug efficacy of biologics for atopic dermatitis by patient level characteristics**

**Adel Haque**, *Pennsylvania Dermatology Partners, USA*

Panel Discussion

End of Day 2





**DISTINGUISHED SPEAKER TALKS**

**DAY 1**

*Joint Event on*

**ADVANCES IN  
CLINICAL AND  
CELLULAR  
IMMUNOLOGY  
&  
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**September 23-24, 2024  
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### Prediction of the targeted immunotherapy based on the pathogenic mechanism for chronic inflammatory disease

~Understanding the central  
immunogenesis and prediction of new  
therapy on Castleman disease (iMCD)~

**Kazuyuki Yoshizaki<sup>1</sup>, Yoshikane Kikushige<sup>2</sup>, Takuya Harada<sup>2</sup> and Shinichiro  
Tsunoda<sup>3</sup>**

<sup>1</sup>Osaka University, Japan

<sup>2</sup>Kyushu University, Japan

<sup>3</sup>Sumitomo Hospital, Japan

**Introduction:** We have still unknown the immune-pathogenic causes in some of chronic inflammatory disease. It is necessary to clear the immunological mechanism for the fundamental therapy. Idiopathic multicentric Castleman disease (iMCD) has been a one of chronic inflammatory disease with unknown etiology and IL-6 producing mechanism (Blood.1989).

**Method:** To clarify the pathogenesis of iMCD we have established an iMCD model mouse by the transplantation of the patient's lymph node cells into an immunological deficient mouse, NSG mouse, which showed iMCD like symptoms and abnormal findings.

**Result:** To know the abnormalities in iMCD model mouse, the immunological analysis had been performed. Human T and B cells were infiltrated in the spleen and liver. T cells expressed CD3<sup>+</sup>, CD4<sup>+</sup>, PD-1<sup>-</sup>, CXCR5<sup>-</sup> and CCR2<sup>+</sup> on their surface, indicating the peripheral T cells (Tph cells). B cells were activated to induce cytokines and chemokines including IL-6, and also, abundant plasma cells were infiltrated and produced human polyclonal immunoglobulins, IgG, IgA and IgE. Tph cells produced CXCL13 in its cells. These observation in iMCD model mouse has indicated the fundamental pathogenesis on the activation of Tph cells for production of CXCL13 which activated B cells via CXCR5 receptor on B cells for induction of cytokines and Igs elevation (Nature com. 2023).

**Conclusion:** iMCD may be an immunological disorder with inflammation due to the activation of Tph cells which promoted the activation of polyclonal B cells in induction of chronic inflammation and Igs induction. This analytical approach indicated the prediction for discovering the essential pathogenesis of some of chronic inflammatory disorders.

### Biography

- In 1971, Kazuyuki Yoshizaki started the research on human immunology and clinical practice on collagen disease at the Dept. of Internal Medicine, Osaka Univ. Japan.
- In 1982, he proposed the presence of T cell derived B cell Differentiation Factor (BCDF) which had later changed nomenclature to Interleukin 6 (IL-6) in 1986. (J. Immunol 1982)
- He found IL-6 functions and pathogenesis of IL-6 in inflammatory diseases, such as Castleman disease and RA. (Blood 2003, Arthritis. Rheum. 2004)
- He has treated Castleman disease, RA, JIA, Adult Still's disease with an anti-IL-6 receptor antibody (Tocilizumab) from 2005 (Blood, 2006)
- In 2023, he suggested the pathogenic mechanism of Castleman disease after establishing the model mouse. (Nature communications, 2023)
- He proposed the fundamental pathogenesis of idiopathic multicentric Castleman disease (iMCD) on Tph cell- immunological disorder with IL-6 induced chronic inflammation (Expert Review of Clinical Immunology, 2024).



## Natural killer cell-derived extracellular vesicles kill treatment-resistant tumor cells

**J. Kornbluth<sup>1,2</sup>, E. Matchett<sup>1</sup> and A. McCune<sup>1</sup>**

<sup>1</sup>Saint Louis University, St. Louis VA Healthcare System, USA

<sup>2</sup>St. Louis VA Healthcare System, USA

Cancer drugs become ineffective as tumor cells develop resistance, leading to relapse and metastasis. Drug and newer immunotherapy treatments also fail if they are unable to penetrate and reach cells deep within tumor tissue. Therefore, new therapeutic strategies are needed. We demonstrated that NK3.3EVs, extracellular vesicles (EVs) derived from the normal human natural killer (NK) cell line, NK3.3, have strong cytotoxic activity against leukemia, multiple myeloma, glioblastoma and breast cancer cells, without harming normal cells. EVs released from NK3.3 range in size from 90-200nm, contain perforin, granzymes A and B and IFN- $\gamma$ , and display multiple NK receptors and adhesion molecules on their membrane. Studies were performed to evaluate the ability of NK3.3EVs to overcome some of the obstacles to treatment efficacy, with the potential to be an option for cancer patients who fail standard therapy. We developed a 3-dimensional (3D) MCF7 breast cancer mammosphere model to test the penetrability and anti-tumor activity of NK3.3EVs in a more physiological environment. NK3.3EVs induce significant apoptosis and cell death of MCF7 cells grown in 3D. We observed internalization and penetration of fluorescent labeled NK3.3EVs into tumor spheres, resulting in sphere breakdown and tumor cell death. Another roadblock to effective cancer eradication in patients is the emergence of drug-resistant tumor cells. To investigate whether NK3.3EVs kill K562 chronic myeloid leukemia (CML) cells resistant to front-line chemotherapy, we generated an imatinib-resistant K562 cell line. NK3.3EVs kill imatinib-resistant cells as well as, or better, than the parent cells, inducing apoptosis *via* caspase-3/-7 activation. NK3.3EVs are also highly effective in killing both melphalan- and bortezomib-resistant multiple myeloma cell lines. These results provide strong evidence that NK3.3EVs may be a potential new immunotherapeutic agent, especially for difficult to treat cancers.

Joint Event

# Advances in Clinical and Cellular Immunology



## Global Virology Congress

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### Biography

Jacki Kornbluth is Professor of Pathology at Saint Louis University and Research Scientist at the St. Louis VA. She received her B.S. and Ph.D. degrees from Cornell University and postdoctoral training at the Memorial Sloan Kettering Cancer Center and the University of Pennsylvania. She held faculty appointments at the University of Pennsylvania, M.D. Anderson Cancer Center, and the University of Arkansas before joining Saint Louis University. She studied natural killer (NK)-mediated tumor killing throughout her research career. She developed the NK cell line, NK3.3, from the blood of a healthy donor; these cells are used by researchers worldwide. Her laboratory cloned and characterized a unique RBR E3 ubiquitin ligase, NKLAM, that has an important role in innate immunity. The finding that extracellular vesicles (EVs) released from NK3.3 cells have potent anti-tumor activity, with no toxic effect on healthy cells, has led to its development as a treatment for cancer patients.



## The impact of nasal photodisinfection on SARS- CoV-2 infection

**R. Rusk<sup>1</sup> and J. Hodge<sup>2</sup>**

<sup>1</sup>Rusk Medical Corporation, Canada

<sup>2</sup>Katrim Integrated Health, Canada

**Introduction:** Amidst the COVID-19 pandemic, new mutations of SARS-CoV-2 posed a challenge, necessitating broad-spectrum antiviral therapies. The nose, a primary virus colonization site, is an inception point for infection and transmission. Antimicrobial photodynamic therapy (aPDT) emerged as a promising strategy, inactivating pathogens, including viruses, by using light-activated photosensitizers.<sup>1</sup>

**In Vitro Efficacy:** In a study, PDT using methylene blue demonstrated the potential to reduce viral load, with experiments using HCoV-OC43 indicating up to 6 logs of inactivation.<sup>1</sup> RT-qPCR assessments may underestimate PDT efficacy due to RNA fragmentation during photo disinfection. Hence infectivity assays were employed for accurate effect measurement.<sup>1</sup>

**Clinical Findings:** A clinical trial observed reduced SARS-CoV-2 infectivity and decelerated the decline of SARS-CoV-2 specific immune responses.<sup>2</sup> Elsewhere, an industrial workplace initiative using PDT for nasal decolonization showed significant COVID suppression, with no serious adverse events, suggesting the method's safety and effectiveness.<sup>3</sup>

**Implementation and Safety:** aPDT's feasibility for large-scale deployment in various healthcare and community settings has been confirmed, with easy application and lack of significant adverse events in over 60,000 treatments over 9 years.<sup>1</sup> High compliance among Canadian food processing plant workers using aPDT alongside existing safety measures resulted in a lower PCR test positivity rate compared to provincial case rates.<sup>3</sup>

**Conclusion:** The collective research indicates that aPDT for nasal decolonization is an effective and safe practice that can be integrated into COVID-19 and other respiratory viral mitigation strategies, offering the potential for controlling the virus's transmission, especially in high-risk settings like food processing facilities.

1. Pires, L., et al. Translational feasibility and efficacy of nasal photodynamic disinfection of SARS-CoV-2. *Sci Rep* 12, 14438 (2022). <https://doi.org/10.1038/s41598-022-18513-0>
2. Zuaznabar, J., et al. (2023). Photodynamic nasal SARS-CoV-2 decolonization shortens infectivity and influences specific T-Cell responses. *Frontiers in Cellular and Infection Microbiology*, 13, 1110467. <https://doi.org/10.3389/fcimb.2023.1110467>
3. Rusk R, Hodge J. Impact of nasal photodisinfection on SARS-CoV-2 infection in an industrial workplace. *Public Health Pract (Oxf)*. 2023 Dec;6:100393. <http://doi:10.1016/j.puhip.2023.100393> Epub 2023 May 30. PMID: 37309366; PMCID: PMC10229198.

### Biography

Richard Rusk received his bachelor's degree in Veterinary Medicine from the University of Pretoria, South Africa, in 1992 and came to Canada to practice as a large animal veterinarian in Alberta and Manitoba. He then went on to receive his Medical Doctorate degree in 2005 from the University of Manitoba. He specialized in Public Health with an emphasis on Zoonotic diseases. He worked as a Medical Officer of Health for the Health Ministry in Manitoba, where he ran the CDC unit for many years and was cross-appointed as the Chief Occupational Medical Officer for Manitoba for 2 years. He now has a private consulting company that supports the agri-food industry and large corporations in dealing with the health and wellness of their employees, with a mantra of "One Health guidance for a healthier future world" and a focus on developing cutting-edge technology for health improvements.



## Glycolysis controls tumor growth, bacterial, viral infections and immunity

**Pouysségur J<sup>1,2</sup>, Marchiq I<sup>1</sup>, Ždravlević M<sup>1</sup> and Vucetic M<sup>2</sup>**

<sup>1</sup>University Côte d'Azur, (IRCAN), CNRS, France

<sup>2</sup>Department of Medical Biology, Centre Scientifique de Monaco (CSM), Monaco

First, we will discuss how fermentative glycolysis, a primitive hypoxic imprinted metabolic pathway present at the emergence of life is instrumental for the rapid growth of cancers, regenerating tissues, immune cells but also bacteria and viruses during infections. The 'Warburg effect', activated *via* Myc and HIF-1 respectively in response to growth factors and hypoxia, is a Master metabolic and energetic pathway which satisfies nutritional and energetic demands required for rapid genome replication.

Second, we will present the key role of lactic acid, the end-product of fermentative glycolysis able to move across cell membranes in both directions *via* monocarboxylate transporting proteins (i.e. MCT1/4) contributing to cell-pH homeostasis but also to the complex immune response *via* acidosis of the tumour microenvironment. Importantly lactate is recycled in multiple organs as a major metabolic precursor of gluconeogenesis and energy source protecting cells and animals from harsh nutritional or oxygen restrictions.

Third, we will revisit the Warburg effect *via* CRISPR-Cas9 disruption of glucose-6-phosphate isomerase (GPI-KO) or lactate dehydrogenases (LDHA/B-DKO) in two aggressive tumours (melanoma B16-F10, human Colorectal adenocarcinoma LS174T). Full suppression of lactic acid production reduces but does not suppress tumour growth due to reactivation of OXPHOS. In contrast, disruption of the lactic acid transporters MCT1/4 suppressed glycolysis, mTORC1, and tumour growth as a result of intracellular acidosis.

Finally, we will briefly discuss the current clinical developments of an MCT1 specific drug AZ3965, and the recent progress for a specific *in vivo* MCT4 inhibitor, two drugs of very high potential for future clinical applications against cancers, bacterial and viral pathogens.

### Biography

J Pouysségur graduated from an Engineering School in Biochemistry of the University of Lyon, where he obtained his PhD in 1972. He spent two years as a post-doctoral scientist at the National Cancer Institute of



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NIH (USA) and established his own research group in 1978 at the CNRS Biochemistry Centre of the University of Nice. After directing the CNRS Institute of Signalling, Developmental Biology and Cancer, affiliated to the Cancer Centre Antoine Lacassagne up to 2008, J Pouysségur, joined the Cancer & Aging (IRCAN) in Nice, and later the Biomedical Department of the Scientific Centre of Monaco (CSM).

Jacques Pouysségur has previous experience in bacterial and somatic cell genetics, metabolism, Na-H exchanger, pH regulation, MAP kinase signalling in the context of growth control in mammalian cells. In the last 25 years his group developed a strong interest in hypoxia signalling, oxygen and nutrient sensing and Bioenergetics. He is member of AACR, EACR, EMBO, the French and European Academy of Sciences the French and European Academy of Sciences.



## Global impact of Epstein-Barr virus infection in autoimmune diseases, including Immunoglobulin A nephropathy

**Jiri Mestecky<sup>1,2</sup> and Milan Raska<sup>3</sup>**

<sup>1</sup>University of Alabama Birmingham, USA

<sup>2</sup>Academy of Sciences of the Czech Republic, Czech Republic

<sup>3</sup>Faculty of Medicine and Dentistry, Palacký University Olomouc, Czech Republic

Although almost all adults are infected with EBV, there are marked differences in the acquisition of EBV infection with respect to the age, gender, ethnicity, race, and socio-economic circumstances. Thus, most African Americans, African Blacks and Australian Aborigines are infected usually without clinical symptoms very early in their lives. EBV infection has been associated with a broad spectrum of human diseases of infectious, malignant, or autoimmune nature, including IgA nephropathy. In this disease EBV-infected IgA-producing cells secrete IgA of the IgA1 isotype in its polymeric form associated the J chain, preferentially of the  $\lambda$  light chain isotype and marked deficiency of galactose residues present on the O-linked glycans in the hinge region of IgA1 (Gd-pIgA1.J. $\lambda$ ). IgA in this form serves as an autoantigen recognized by the specific antibodies, mostly of the IgG isotype, leading to the formation of nephritogenic immune complexes deposited in the glomerular mesangium with pathological consequences. Due to the physiologically delayed maturation of human IgA system, EBV preferentially infects B cells of non -IgA isotypes and the ensuing humoral and cellular responses prevent later infection of B cells which may produce Gd-pIgA1. J. $\lambda$ . Therefore, EBV infection at a very early age significantly reduces the lifetime risk of EBV infections, IgA nephropathy and some other autoimmune diseases. This finding suggests that the low incidence of IgA nephropathy in the above-described populations may be related to marked differences at the early age of EBV infection, ethnicity, race, ensuing immune responses and compromised socio-economic circumstances when compared to the high incidence of this disease in adolescents and young adults infected later in their lives with mature IgA systems and living in favorable socio-economic situations.

### Biography

Jiri Mestecky, M, PhD, is a professor of Microbiology and Medicine at the University of Alabama at Birmingham, U.S. A. He obtained his medical degree from Charles University in Prague and PhD from the Czech Academy of Sciences.

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He has worked on the induction of humoral and cellular immune responses in mucosal and systemic compartments against bacterial and viral antigens and vaccines including influenza, Epstein-Barr, human or simian immunodeficiency viruses, and streptococci using mucosal or systemic vaccine route administration and various antigen delivery systems. Furthermore, his co-workers demonstrated in humans the induction of mucosal tolerance manifested by the systemic unresponsiveness of T cells in the presence of mucosal and systemic antibody responses. The most recent studies include the role of Epstein-Barr virus infection in the development of a common human autoimmune disease – IgA nephropathy – with marked age, socio-economic and racial differences in the disease incidence.



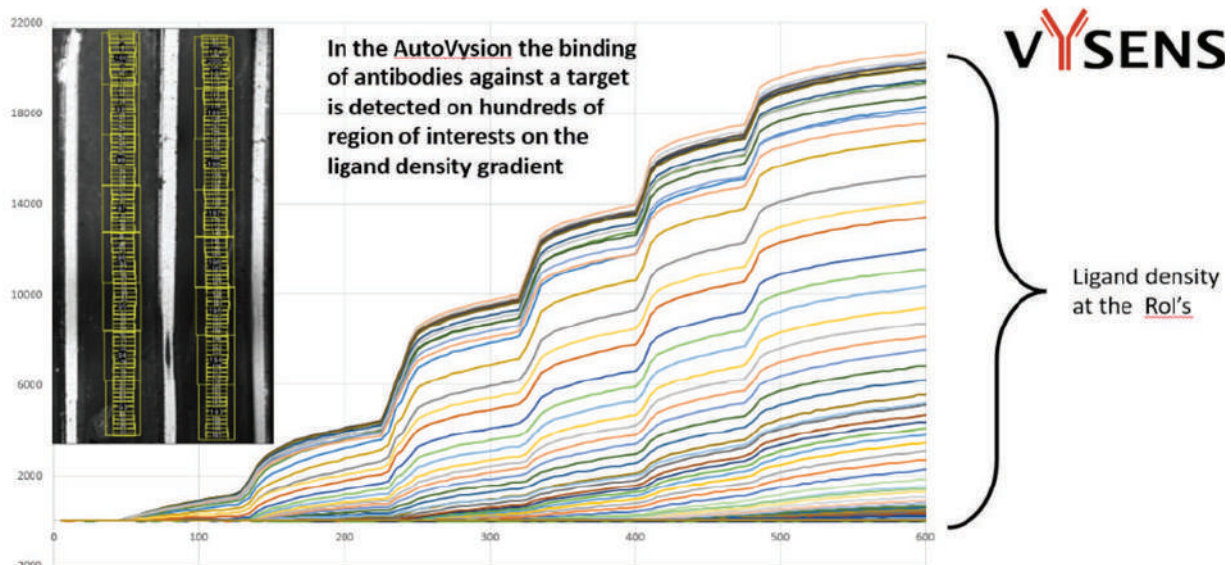
## Label free cell avidity detection of antibodies against immune related diseases

**Richard B.M. Schasfoort<sup>1</sup>** and **Jos van Weperen<sup>2</sup>**

<sup>1</sup>University of Twente, The Netherlands

<sup>2</sup>Vysens B.V., The Netherlands

In the lecture a new method will be presented for assessing concentration and affinity/avidity parameters of antibodies against immune related diseases using gradients of ligand densities detected by Surface Plasmon Resonance imaging, label free and in real-time. The quantity and quality of generated antibodies in patients to immune related diseases can be determined in a single run with the two-channel AutoVysion instrument of Vysens B.V. The instrument produces a full checkerboard of conditions using a proprietary gradient ligand chip. Special analysis software calculates from redundant imaging data the concentration and affinity parameters simultaneously and unambiguously. This unique proprietary feature of the AutoVysion enables the lab technician to get reliable and reproducible data including analysis of the results in less than 30 minutes. Previously we demonstrated in particular that high titers of low affinity antibodies in COVID-19 patients are associated with disease severity<sup>1</sup>. This was the trigger for the development of the AutoVysion instrument.



1. Hendriks, Jan, et al. "High titers of low affinity antibodies in COVID-19 patients are associated with disease severity." *Frontiers in immunology* 13 (2022): 867716.
2. Schasfoort, Richard BM, ed. *Handbook of surface plasmon resonance*. Royal Society of Chemistry, 2017.

### Biography

Richard B.M. Schasfoort (1959) graduated in 1984 as a biotechnology major from the University of Groningen. He defended his PhD thesis for a new approach to biosensor operation in 1989. He is founder of the company IBIS Technologies BV and developed the Surface Plasmon Resonance imaging (SPRi) platform since 1999. He is co-author of > 100 peer reviewed papers and editor of the two Handbooks of Surface Plasmon Resonance (2008 and 2017)<sup>2</sup>. Since the Corona outbreak in March 2020, he focused to antibody profiling using SPRi of patients with COVID19 and cooperated with the hospital Medical Spectrum Twente. The development of the so-called AutoVysion platform technology in the start-up company Vysens B.V. was first triggered by cumbersome analyzes of COVID-19 patients using high-throughput commercial instruments. We realized a prototype clinical diagnostic instrument for the measurement of the concentration and avidity of antibodies in a plug & play manner.



## Extensive Aortic Dissection in a low risk male- A case report

### Francis Anene

Darlington Memorial Hospital, United Kingdom

Aortic dissection is a major differential diagnosis in an elderly male with severe chest pain radiating to the back, with a history of hypertension, smoking, or connective tissue disorders such as Marfan and Ehlers-Danlos syndromes. Acute Aortic Dissection is a medical emergency with very high mortality rate if undetected and untreated, but unfortunately very easy to miss in the Emergency Room setting. This report describes the case of a patient presenting with extensive aortic dissection with no significant risk factors who was diagnosed following a CT angiogram of the aorta. He was subsequently managed medically before being transferred for definitive surgical management with a good outcome. It emphasizes the need to for a high index of suspicion in diagnosing aortic dissection in the absence of classical presentations.

### Biography

Francis Anene is a Specialty Doctor in Emergency Medicine and Member of the Royal college of Emergency Medicine, working towards a Fellowship of the Royal College of Emergency Medicine. He also has an interest in research, thus concurrently completing a MSc in International Public Health. He has one publication in a peer reviewed journal and another in the works. He is a peer reviewer of medical publications with two journals.



### Description of Sheep Pox outbreak occurred in Spain in 2022\_23 and the challenges found, as well as the lesson learnt in relation with the control and eradication of the disease

**Cáceres G. G<sup>1</sup>, Romero G. Luis<sup>2</sup> and Bonilla G. Sergio<sup>3</sup>**

<sup>1</sup>Head of Epidemiology Department, General Subdirectorate of Animal Health, Hygiene and Traceability, Ministry of Agriculture, Fisheries and Food (MAPA), Spain

<sup>2</sup>Deputy subdirector, General Subdirectorate of Animal Health, Hygiene and Traceability, Ministry of Agriculture, Fisheries and Food (MAPA), Spain

<sup>3</sup>Head of Service Epidemiology Department, General Subdirectorate of Animal Health, Hygiene and Traceability, Ministry of Agriculture, Fisheries and Food (MAPA), Spain

Sheep pox and goat pox are infectious viral diseases affecting ovine and caprine animals caused by two virus of the family *Poxviridae*, genus *Capripoxvirus*. Sheep pox has traditionally been endemic in Africa, the Middle East, and several Southeast Asian countries, but it is considered a transboundary disease capable of affecting previously free countries epidemically. It is a disease of compulsory immediate notification to the World Organisation for Animal Health (WOAH) and to the European Union (EU). On September 19<sup>th</sup>, 2022, the disease reemerged in Spain, free since 1968, causing a total of 30 outbreaks until May 17<sup>th</sup>, 2023, date when the last outbreak of the disease was reported. The control and eradication measures implemented were those laid down in EU legislation, based on total stamping out of positive herds, zoning and restriction of movement and strengthening of biosecurity and passive surveillance. This manuscript describes the outbreak, as well as assess the challenges and lessons learned in relation to its management, with the aim that it can help in the effective management of future outbreaks of this disease.

#### Biography

Germán Cáceres Garrido earned a Veterinary science degree at the Veterinary Medicine school of the UCM Madrid in 1999. He later pursued a Master of science (MSC) in veterinary epidemiology and public health in the Royal Veterinary College in London in 2020.

After finishing his veterinary studies, he spent three years dedicated to veterinary medicine and surgery in large and small animals in Extremadura and Madrid.

At the end of 2002 he moved to UK and was appointed as Official Veterinary Surgeon by the RVC of London and started working for UK administration on food hygiene and safety, animal welfare and notifiable disease

surveillance in slaughterhouses, cutting plants and cold stores. In 2004 he was appointed by DEFRA as a local veterinary inspector (LVI) and started carrying out export certification from UK to third countries.

At the end of 2006 he obtained a position in the National Veterinary Body and started working for MAPA (Ministry of Agriculture, Fisheries and Food) as an official veterinarian in 2008 in animal health where he has been so far. In 2020 he was upgraded to Head of the Epidemiology Department of the General Subdirectorate of Animal Health, Hygiene and Traceability.

During this many years working as an official veterinarian of MAPA he has been working in various areas related to animal health, among which he highlights the following:

- Risk assessment, management, and communication.
- Design and coordination at national level of surveillance, control, and eradication programs of animal diseases and zoonoses.
- National coordination of Contingency Planning for the control and eradication of animal epizootic diseases and zoonoses.
- Responsible at national level for biosecurity programs in swine sector and integral biosecurity in response to outbreaks of epizootic animal diseases and zoonoses.

He served as the Focal point of Spain in EuFMD (FAO) since 2015 and member of the EuFMD Technical Standards Committee (STC) since April 2019.

Currently in charge of Foot and Mouth Disease, Avian influenza, Newcastle disease, Aujeszky disease, Classical and African Swine Fever, Infectious Bovine Rhinotracheitis, Rift Valley Fever, West Nile Fever, Peste des petits ruminants, Sheep and Goat Pox and Lumpy skin disease among several others.





## Tumor-derived soluble CD155 inhibits DNAM-1-mediated tumor immunity

**Kazuko Shibuya<sup>1,2</sup> and Akira Shibuya<sup>1,2,3</sup>**

<sup>1</sup>Department of Immunology, Institute of Medicine, University of Tsukuba, Japan

<sup>2</sup>R&D Center for Innovative Drug Discovery, University of Tsukuba, Japan

<sup>3</sup>Life Science Center for Survival Dynamics, University of Tsukuba, Japan

Immune checkpoint molecules suppress the activation of immune cells and are, therefore, good candidates for molecular targets in tumor immunotherapy. CD155 is a common ligand for an activating immunoreceptor DNAM-1 and inhibitory immunoreceptors TIGIT and CD96. The expression of CD155 is significantly upregulated on tumor transformation of hematopoietic and non-hematopoietic cells. DNAM-1 binding to CD155 on tumor cells induces cytotoxicity against tumor cells by CD8<sup>+</sup> T cells and NK cells in mice. Unlike mice, however, soluble CD155 (sCD155) encoded by splicing isoforms of *CD155*, in addition to membranous CD155, is expressed in humans. To address the role of sCD155 in tumor immunity, we generated a B16/BL6 tumor transfectant stably expressing sCD155 (sCD155/BL6). After intravenous injection with sCD155-producing B16/BL6 melanoma, the numbers of tumor colonies in wild-type (WT), TIGIT knock-out (KO), or CD96 KO mice, but not DNAM-1 KO mice, were greater than after injection with parental B16/BL6 melanoma. *In vitro* assays showed that sCD155 interfered with DNAM-1-mediated cytotoxicity. In addition, DNAM-1 had greater affinity than TIGIT and CD96 for sCD155, suggesting that sCD155 bound preferentially to DNAM-1. Taken together, sCD155 inhibits DNAM-1-mediated tumor immunity and might be a target for a new cancer immunotherapy.

### Biography

Kazuko Shibuya graduated from the Medical School of the University of Tsukuba, Japan and obtained M.D. in 1987. She worked at the University Hospital of Tsukuba as a resident and then obtained a Ph.D. at the Graduate School of the University of Tsukuba in 1993. Then, she joined DNAX Research Institute in California, Palo Alto, working on helper T cell differentiation. After returning to Japan in 1996, she worked at the University of Tsukuba and the RIKEN Center for Allergy and Immunology. Her group at the university has clarified the function of the activating receptor DNAM-1 and identified its ligand CD155. Since CD155 is highly expressed in cancers, she is interested in the role of the DNAM-1-CD155 axis in tumor immunity. Recently, her group focused on the role of soluble form of CD155 in tumor immune escape and its clinical application.



## Decoding autoimmune control: The intricacies of CLEC16A regulation

**Marina Bakay<sup>1</sup>, Rahul Pandey<sup>1</sup> and Hakon Hakonarson<sup>1,2</sup>**

<sup>1</sup>The Center for Applied Genomics, The Children's Hospital of Philadelphia, USA

<sup>2</sup>Department of Pediatrics, The Perelman School of Medicine, University of Pennsylvania, USA

Genome-wide association studies (GWAS) consistently reveal an association between single nucleotide polymorphisms (SNPs) in the CLEC16A gene and various autoimmune and neurological disorders, including recent evidence implicating Parkinson's disease. To elucidate CLEC16A's role in autoimmunity, we generated mice with an inducible global knockout (KO) of *Clec16a* (*Clec16a* $\Delta$ UBC).

Global deletion of *Clec16a* in adult mice resulted in dysregulated mitophagy/autophagy, yielding a complex phenotype characterized by pronounced immune dysfunction, rapidly progressing sensory neurodegeneration, and severe lipodystrophy. Elevated endoplasmic reticulum (ER) stress and mitochondrial dysfunction led to increased oxidative stress and the production of multiple proinflammatory mediators. Dysregulated oxidative phosphorylation (OXPHOS) signaling was evident in dorsal root ganglia (DRG) and splenic lysates from *Clec16a* $\Delta$ UBC mice, accompanied by an inflammatory cytokine/chemokine profile. Knockout mice exhibited heightened antibody levels, including IgM, IgA, Ig2b, IgG3, and autoantibodies in sera.

Our findings suggest that loss-of-function variants in CLEC16A, associated with reduced CLEC16A levels, may contribute to autoimmunity by inducing elevated ER stress, resulting in dysregulated mitophagy and autophagy. These processes contribute to adipose lipolysis and the production of inflammatory mediators. Pharmacological interventions targeting ER stress, mitophagy/autophagy, or the JAK/STAT pathway partially reversed these pathological processes, suggesting potential efficacy in treating and preventing symptoms of autoimmune disorders, such as type 1 diabetes and multiple sclerosis, in individuals carrying risk associated CLEC16A variants.

### Biography

Marina Bakay is a molecular biologist by training, an expert in broad molecular and cell culture techniques with extensive experience and expertise in data analysis, project, and database managing. She works as Senior Research Scientist at the Center for Applied Genomics (CAG), at the Children's Hospital of Philadelphia

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(CHOP), USA. Dr. Bakay is currently part of translational research team at the Center for Applied Genomics and focuses on functional studies using animal models and cell-based approaches. Before Dr. Bakay has joined the CHOP she worked at the Children National Medical Center, Washington DC, when she used state-of-the-art approaches to better understand and manage human muscular dystrophies. She defended her PhD thesis at the Institute of Medicine in Saint Petersburg, Russia, about phenotype-genotype correlation in patients with cystic fibrosis.



### Sample size for estimating disease prevalence in free-ranging wildlife populations: A Bayesian modeling approach – advances and recent developments

**Carlos Gonzalez-Crespo<sup>7</sup>, James G. Booth<sup>1</sup>, Brenda J. Hanley<sup>2</sup>, Florian H. Hodel<sup>3</sup>, Christopher S. Jennelle<sup>4</sup>, Joseph Guinness<sup>1</sup>, Cara E. Them<sup>5</sup>, Corey I. Mitchell<sup>6</sup>, Md Sohel Ahmed<sup>2</sup> and Krysten L. Schuler<sup>2</sup>**

<sup>1</sup>Department of Statistics and Data Science, Cornell University, USA

<sup>2</sup>Cornell Wildlife Health Lab, Public and Ecosystems Health, Cornell University, USA

<sup>3</sup>Department of Fisheries and Wildlife, Michigan State University, USA

<sup>4</sup>Minnesota Department of Natural Resources, Nongame Wildlife Program, USA

<sup>5</sup>Cara Them Consulting, LLC, USA

<sup>6</sup>Desert Centered Ecology, LLC, USA

<sup>7</sup>Center for animal disease modeling and surveillance, University of California, USA

A two-parameter model and a Bayesian statistical framework are proposed for estimating prevalence and determining sample size requirements for detecting disease in free-ranging wildlife. Current approaches tend to rely on random (ideal) sampling conditions or on highly specialized computer simulations. The model-based approach presented here can accommodate a range of different sampling schemes and allows for complications that arise in the free-ranging wildlife setting including the natural clustering of individuals on the landscape and correlation in disease status from transmission among individuals. Correlation between individuals and the sampling scheme have important consequences for the sample size requirements. Specifically, high within cluster correlations in disease status can reduce sample size requirements by reducing the effective population size. However, disproportionate sampling of small subsets of subjects from the greater target population, combined with high correlation of disease status, tends to inflate sample size requirements, because it increases the likelihood of sampling multiple animals within the same highly correlated clusters, resulting in little additional information gleaned from those samples. Our results are consistent with those generated using both previously established approaches and extend their ability to adapt to additional biological, epidemiological, or societal sampling complications specific to wildlife health.

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### Biography

Dr. Carlos Gonzalez Crespo is a project scientist from the University of California, Davis, specializing in the epidemiology of infectious diseases. He holds a PhD and Master's degree in Biodiversity from the Autonomous University of Barcelona, where his doctoral work involved using models to assess disease management and transmission risks in urban wild boars in Barcelona. His current research focuses on the impact of infectious diseases on diverse ecosystems, with a particular emphasis on Agent-Based Models, Artificial Intelligence and Big Data to manage disease transmission at the wildlife-domestic-human interface. He is currently working on projects related to African Swine Fever (ASF) and Chronic Wasting Disease (CWD).



## Emerging pharmacological strategies for treating and preventing mpox

**Dennis E. Hruby**

SIGA Technologies, USA

Mpox has been an emerging pathogen in the African continent for some time. In 2021 the disease spread to most of the rest of the world causing thousands of infections with associated morbidity and mortality, primarily in men who have sex with men. This has focused global health efforts on providing vaccines to those most at risk, and using drugs to treat those with disease. Fortunately, the drug tecovirimat which was approved by the FDA for treatment of smallpox, also has activity against mpox. The drug has been deployed around the globe to minimize the consequences of infection and limit the spread to additional individuals. Going forward, additional countermeasures will be needed to bolster our anti-mpox capabilities. A review of drugs and therapeutics in development will be provided.

### Biography

Dennis E. Hruby, Ph.D., is a distinguished scientist with more than 30 years of experience in poxviruses, virology, and anti-infective research. Dr. Hruby currently serves as Executive Vice President and Chief Scientific Officer, having served as SIGA's Chief Scientific Officer since 2000. Dr. Hruby received his Ph.D. in Microbiology from the University of Colorado Medical Center and holds an undergraduate degree in Microbiology from Oregon State University. He conducted virology research as an NIH postdoctoral fellow at the University of Wisconsin, Madison, from 1979 through 1982, and at the State University of New York, Stony Brook, from 1977 through 1979. Dr. Hruby was a faculty member at Oregon State University for 27 years and served in a number of capacities, including Director of the Molecular and Cellular Biology Program and Chairman of the Microbiology Department. Dr. Hruby specializes in poxviruses, virology and anti-infective research.



## Acquired CFTR dysfunction and dense distribution of ionocytes in nasal mucosa of children with CRS

Yang Han<sup>1</sup>, Chao Jia<sup>2</sup>, Tieshan Wang<sup>3</sup>, Pengpeng Wang<sup>1</sup>, Wenjing Liu<sup>1</sup>, Yu Qin<sup>3</sup>, Siyu Cai<sup>4</sup>, Xiaojian Yang<sup>1</sup>, Wei Zhang<sup>1</sup>, Yuwei Liu<sup>1</sup>, Xiao Xiao<sup>1</sup>, Lejian He<sup>2</sup>,  
Wentong Ge<sup>1,5</sup> and Xin Ni<sup>1,5</sup>

<sup>1</sup>Department of Otolaryngology, Head and Neck Surgery, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, China

<sup>2</sup>Department of Pathology, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, China

<sup>3</sup>Beijing Research Institute of Chinese Medicine, Beijing University of Chinese Medicine, China

<sup>4</sup>Center for Clinical Epidemiology and Evidence-Based Medicine, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, China

<sup>5</sup>Beijing Key Laboratory for Pediatric Diseases of Otolaryngology, Head and Neck Surgery, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, China

**Background:** Ionocytes are rare cells in airway epithelium characterized by a high expression of CFTR.

**Objectives:** To investigate the morphology and distribution of ionocytes and the function of CFTR in the nasal mucosal epithelium of children.

**Methods:** The exfoliated cells of nasal mucosa from 101 children were detected using flow cytometry to analyze the number of ionocytes and CFTR and the difference of CFTR function. Nasal mucosa and polyps were collected from 10 children with CRSwNP. The RNA scope of FOXI1 and CFTR was detected in pathological paraffin sections. The expression and distribution of ionocytes and CFTR in nasal mucosa and polyp epithelium were observed.

**Results:** In CRS patients, the number of ionocytes in the nasal epithelium was lower and the number of ionocytes that did not express CFTR was higher, and the function of CFTR was also decreased. The expression of CFTR in the nasal mucosa of CRS showed the characteristics of local dense distribution and increased as the inflammation expanded. The ionocytes were "tadpole-shaped" in the epithelium and gathered in the area of high CFTR expression, the intracellular CFTR was expanded in clusters. Ionocytes that did not express CFTR was more common in the nasal polyps.

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**Conclusions:** The number of ionocytes and the function of CFTR in nasal mucosa of CRS patients decreased. With the expansion of inflammation, CFTR and ionocytes showed more obvious dense distribution. Some ionocytes lost the expression of CFTR and did not show the "tadpole" shape, which may be related to the occurrence of polyps.

### Biography

Dr. Han Yang is a clinician in the Department of Otolaryngology, Head and Neck Surgery, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, specializing in the clinical diagnosis and treatment of pediatric nasal diseases. Her main research direction is the pathogenesis of chronic sinusitis and allergic rhinitis in children and the surgical treatment of rare nasal masses in children. The research covers the genomics, transcriptomics, proteomics and single cell sequencing of chronic sinusitis and allergic rhinitis, including the relationship between chronic sinusitis and allergic diseases such as asthma, and the immune mechanism regulation and signaling pathway of allergic rhinitis. She has participated in more than 10 national and provincial projects, published several SCI articles as the first author, and applied for several patents related to sinusitis and head and neck tumors.





## Chronic graft-versus-host disease and refractory rhinosinusitis after allogeneic hematopoietic stem cell transplantation in children

**Jinhao Zhao<sup>1</sup>, Yang Han<sup>1</sup>, Pengpeng Wang<sup>1</sup> and Wentong Ge<sup>1,2</sup>**

<sup>1</sup>Department of Otolaryngology, Head and Neck Surgery, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, China

<sup>2</sup>Beijing Key Laboratory for Pediatric Diseases of Otolaryngology, Head and Neck Surgery, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University, China

A patient with chronic graft-versus-host disease (cGVHD) combined with chronic sinusitis and nasal polyps (CRSwNP) who admitted to our hospital was reviewed in this case. It's a 15-year-old male, he underwent allogeneic hematopoietic stem cell transplantation (HSCT) because of aplastic anemia. One year after the transplantation, he was diagnosed with CRSwNP, and he repudiate the history of sinusitis. He had the functional nasal endoscopic surgery (FESS) was performed 7 times during 2017 to 2023. We aim to explore the immunology causes of recurrent nasal polyps of this case.

We reached the following conclusions:

1) Metagenomic examination of patients' nasal and sinus pus indicated that *Lactobacillus rhamnosus* and *Escherichia coli* were the main local infected bacteria. Due to long-term oral immunosuppressants to maintain borderline immunity after transplantation, a large number of opportunistic pathogen infections. The postoperative pathology report showed that the eosinophilic infiltration of the nasal polyp was not obvious, the mucosa showed squamous metaplasia, the goblet cells were reduced, and the epithelial cilia were decreased. We hypothesized that the imbalance of CD4<sup>+</sup> and CD8<sup>+</sup> lymphocytes in the mucosa is an important cause of epithelial damage.

2) The genome sequencing of the nasal polyp tissue showed the genotype was 46, XX/46, XY chimerism. It is considered that the genotype is related to transplantation, but the transdifferentiation of hematopoietic stem cells into epithelial stem cells has not been reported. We compared the genome of this child with that of children with nasal polyps without a history of transplantation, and the results suggested that cell cycle-related genes were activated in this child.

3) Transcriptomic analysis of nasal polyps and nasal mucosa samples between this child and children with no history of transplantation indicated that gene pathways related to cell cycle and tumor pro-

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liferation were up-regulated, and pathways related to inflammation were also disordered to varying degrees.

### Biography

Jinhao Zhao is a master's student at Capital Medical University and works at Department of Otolaryngology, Head and Neck Surgery, National Center for Children's Health, Beijing Children's Hospital, Capital Medical University. Her major is pediatric nasal diseases, and her research direction is mainly about the pathogenesis of chronic sinusitis with nasal polyps, including the relationship between chronic sinusitis and *CFTR* gene mutation, and related studies on the chronic sinusitis and cell cycle regulation.



## Vaccine hesitancy, a narrative review

**Deona Taraj**

University of Vlore "Ismail Qemali", Albania

**Introduction:** Before vaccines invention one of the main causes of human death were the infectious diseases. Since 1400 there have been attempt to guarantee immunity against different infectious disease, but only in 1872, Louis Pasteur invented the first laboratory-based vaccine.

Vaccines are considered like the greatest invention in the medical history who have saved more human lives than any other invention and for more than a decade the biggest part of the world population have been regularly vaccinated since birth. Considering different studies and hypothesis, like MMR vaccine impact on autism or COVID-19 vaccine uncertainty, a fear and a sense of hesitation from vaccination has been developed among people.

**Objectives:** The aim of this study is to identify better the benefits and the risks of getting vaccinated and to achieve a better conclusion about weather getting vaccinated or not.

**Methodology:** A narrative review which includes different point of views from researcher all over the world, describing the importance, safety, benefits, risks and both short term and long-term side effects of vaccination.

**Results:** Vaccines plays a crucial role in immunity development and prevention of serious health risks that may occur because of infectious diseases but there is uncertainty mostly in the long-term side effects.

**Conclusions:** As long as we do not have clear evidences of the effects of the vaccines in long term, more research work need to be done, and as long as we are in risk from infectious diseases and the vaccination is the only weapon we have, we should not avoid vaccination.

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### Biography

Deona Taraj is graduated from University of Medicine Tirana, faculty of General Medicine since 2022. It is her second year working as an assistant lecturer at the University of Vlora "Ismail Qemali", faculty of Public Health, and she can say that she really enjoys working on the academic field. She sees this work as a very good opportunity to offer her contribution on the education of the new generations and also for her personal and professional growth. A PhD program is the main goal for me now and she is working for it and this year she will decide if it will be in a European university or in the Tirana University of Medicine where have studied for six years.



## Putative roles of diabetes and obesity in severe dengue infections

**Shamala Devi Sekaran<sup>1</sup>, Gehamimi Gopal<sup>2</sup>, Gayathri Thergarajan<sup>3</sup> Freddy  
Franklin<sup>2</sup> and Chandramathi Samudi Raju<sup>2</sup>**

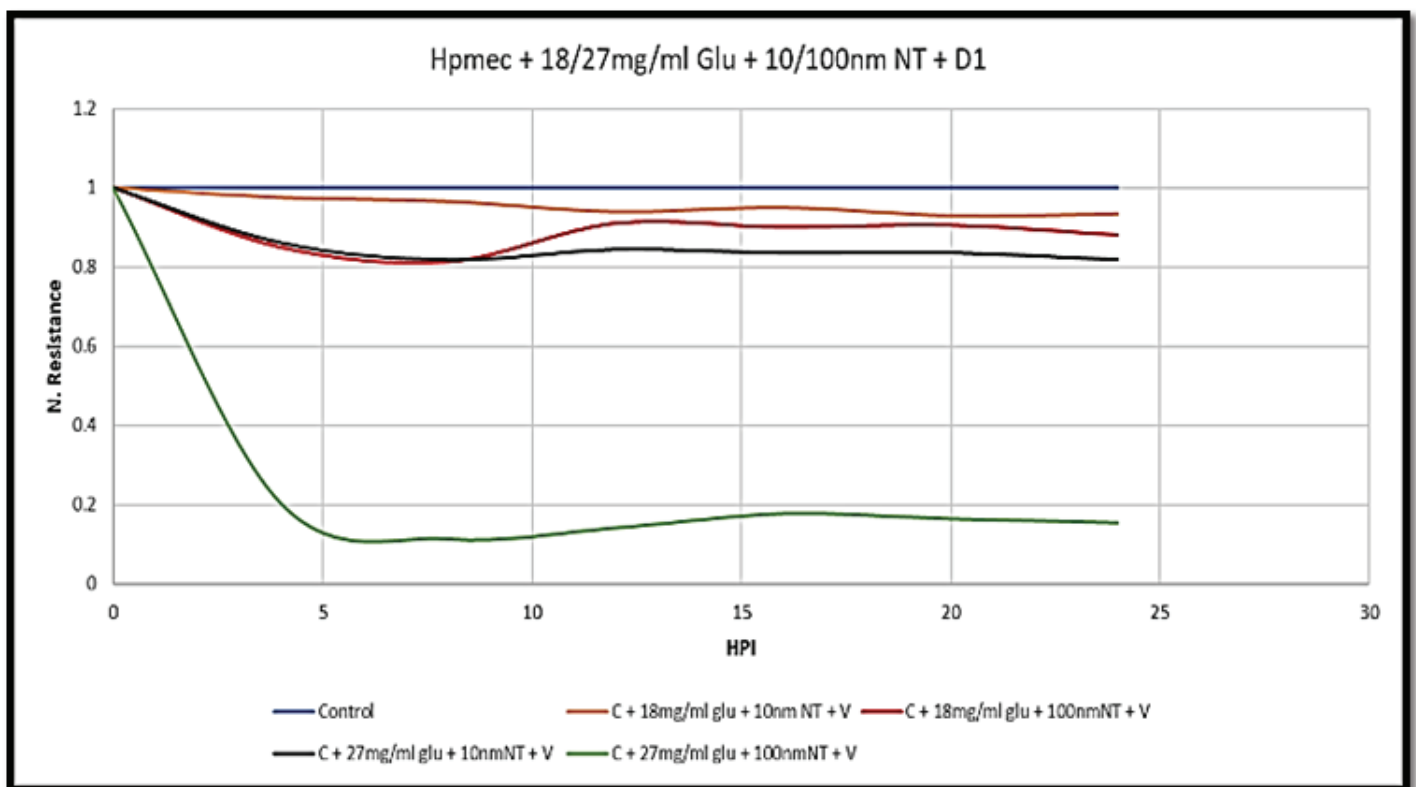
<sup>1</sup>UCSI Hospital, Malaysia

<sup>2</sup>Department of Medical Microbiology, Faculty of Medicine, University Malaya, Malaysia

<sup>3</sup>Icons International School, Malaysia

Dengue, an arboviral disease is a worldwide public health problem predicted to continue. There is an urgency to understand the mechanisms behind our immune responses both antibodies, T cells, cytokines and a host of other factors that affects this balance between protection versus pathogenesis. However, both host and viral factors are yet to be clearly characterized. The hallmark of Severe Dengue is plasma leakage which is due to several factors including presence of pro-inflammatory cytokines and dysregulation of endothelial barrier protein expression. Comorbidities such as diabetes and obesity and past clinical studies have shown to worsen the clinical manifestation of Severe Dengue with endothelial dysfunction being the common biological mechanism by which diabetes and obesity increase the risk of progression to DHF. The underlying mechanisms regarding the association between these comorbidities and dengue are still lacking. The key factors of diabetes affecting the endothelium include Th1 skewed responses and junctional-related proteins expression while obesity alters the lipid metabolism and immune response causing increased viral replication and inflammation. To understand this, we performed electro-impedance assays to determine the effect of dengue, glucose and an obesity marker on microvascular pulmonary endothelial cells. Based on ECIS measurement, the magnitude of vascular leakage observed was positively correlated with the concentration of glucose and neurotensin, whereby the loss of barrier function in HPMECs indicate that in pulmonary MECs an immediate junctional tightening followed by a sudden loss of barrier function was noted in the presence of virus and indicators of the 2 comorbidities. The prolonged junctional leakage in DENV infected pulmonary MEC with higher concentration of glucose and neurotensin may play a role in the fluid accumulation observed in the lungs, which is the most common sign of plasma leakage observed in dengue patients with comorbidities. Microarray analysis of genes expressed revealed deregulation of junctional proteins (ESAM, CX43, ZO-1 and PECAM-1) and cytokines

(IL-8, CXCL1, CXCL5, CCL2, CCL5 and CCL20) affecting the junctional proteins. Metabolomics study using QTOF-LCMS revealed that metabolites specifically regulated in dengue infections interact involve the lipid metabolism pathway.



### Biography

Shamala Devi Sekaran obtained her PhD in 1986 working on CMI responses to Dengue in mice. She is a Fellow of the Academy of Science Malaysia, Fellow of the Royal Society of Pathologists, London and in 2024 was awarded the TWAS Fellow. Currently is the Head of R & D at a private hospital, UCSI Hospital. Her main expertise is in research in infectious diseases, mainly on Dengue and other infectious organisms, has received multiple awards for kits developed, owns more than 20 patents, awarded Woman Bioinnovator in 2008 by and "Anugerah Inovasi Negara 2009 for Molecular Diagnostics of Dengue Infections. Currently investigating into the effects of being diabetic & obese on severe dengue and developing serological assays to differentiate flaviviruses. Recently ventured into field of stems cells as adjuvant treatment for various non communicable diseases Currently a member of a number of panels - Top Research Scientists, new ASM Fellows, Newton-Ungku Omar and MOSTI for vetting of research proposals submitted.



## Worldwide today's challenges facing hepatitis B, risk factors, economic burden, self- management and elimination programs- A narrative review

### Jerina Jaho

Faculty of Health, Scientific Research Center for Public Health, University of Vlore "Ismail Qemali", Albania

**Introduction:** Hepatitis B is a viral infection that affects the liver and is caused by the hepatitis B virus (HBV). It is a major global health concern, with a significant burden on public health systems worldwide. Even though the vaccine for hepatitis B is available, which is applied in several doses, and in groups at risk for infection, there is an increase in the number of cases of hepatitis B.

**Methodology:** This narrative review describes the risk factors for hepatitis B infection, economic and social-personal burden, self-care and infection control programs that positively affect the health of patients and the entire health care system.

**Results:** The economic costs of hepatitis B for healthcare systems are substantial, encompassing direct medical expenses, indirect costs related to lost productivity, and the societal burden associated with disability and premature mortality. Self-management of chronic Hepatitis B is a critical aspect of maintaining health and quality of life for individuals living with this chronic condition.

**Conclusions:** Hepatitis control programs should focus on staff training and education to provide adequate care in screening, diagnosis, treatment, dynamic follow-up or self-care promotion for patients with hepatitis B.

### Biography

Jerina Jaho completed her studies in general medicine, at the University of Medicine, Tirana, Albania, during the period 2008-2014. she has two-year experience as a doctor in family medicine in the city of Vlore and seven years as an assistant lecturer at the University of Vlore "Ismail Qemali ", Faculty of Health, Scientific Research Center for Public Health. The opportunity to be part of the academic world has brought her closer to health problems, being part of several conferences and promotional activities with a focus on preventing various diseases through the recognition of risk factors. Public health, as an important part of medicine, is a key point in research topics that will be her focus in the future. Actually, she is following her PhD studies at University "Tor Vergata", Rome, Italy.



## Rhodococcosis mimicking tuberculosis in a patient with AIDS

**Gabriel Moreira Accetta, Lenice do Rosário de Souza and Arthur Tonani  
Pereira Cançado Ribeiro**

Universidade Estadual Paulista (UNESP), Brazil

It is increasingly necessary to track, diagnose and treat HIV infection. With the advent of potent antiretroviral treatment, opportunistic infections are no longer the main cause of death in these cases. The difficulty of diagnosing an opportunistic infection that can mimic tuberculosis in a patient with AIDS was the reason for this presentation. Black woman, 39 years old, single, seamstress, from Anhembi-SP, diagnosed with HIV infection since 2002, with irregular adherence to treatment and follow-up, which began in July 2003. She returned to the outpatient clinic in December 2022, after 2 years of absence, due to cough, hemoptoic sputum, evening fever and night sweats for a month. Bacilloscopy was performed with positive results in two sputum samples and a negative rapid molecular test for tuberculosis. Basic scheme for tuberculosis treatment started on 12/08/22. In January/2023 she was hospitalized with headache, asthenia, in addition to cough and hemoptoic sputum. CT and MR imaging of the brain detected an expansive lesion in the right superior parietal lobe, the main hypothesis of which was toxoplasmosis, and specific treatment was initiated and a tuberculosis regimen was maintained. After the hospitalization period, she maintained regular outpatient follow-up, but without improvement in her condition, associated with weight loss and worsening of the severe, pulsating headache, which radiated to the cervical spine. On 05/23, she was admitted again for hospitalization with worsening in the last 2 days, now associated with drowsiness, mental confusion and reduced level of consciousness, loss of strength in the upper and lower limbs, changes in gait, dysarthria, and dyspnea. During hospitalization, trephination was performed for brain biopsy guided by navigation, when the presence of an abscess was identified and was drained. Cultures of secretion, biopsy fragments and blood, as well as histopathological examination, showed *Rhodococcus* spp. She presented with respiratory failure and septic shock, requiring mechanical ventilation, but died on 06/07/2023. Rhodococcosis is a disease related to severely immunocompromised individuals, caused by a pleomorphic, gram-positive, aerobic, partially acid-fast coccobacillus, whose main differential diagnosis is tuberculosis. The high mortality rate (55%) in AIDS patients corroborates the



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relevance of this presentation.

### Biography

- Gabriel Moreira Accetta graduated from the University of Taubaté (2016-2022), São Paulo-Brazil, currently in the second year of Medical Residency in Infectious Diseases at UNESP - FMB.
- Starting the master's degree in area of interest – Osteomyelitis.
- In 2019, he completed an exchange program in Italy in Pulmonology and Cardiac Surgery at the Univ. Siena and Milano Bicocca respectively; and in 2014 exchange through STB to Pepperdine University, California-USA.



## Integrated tools for detecting plant viruses and viroids using RNA-seq data

**Xiaojun Hu, Oscar P. Hurtado-Gonzales, Bishwo N. Adhikari, Ronald D.  
French-Monar and Joseph A. Foster**

United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), Plant Germplasm Quarantine Program (PGQP), USA

The analysis of extensive High-throughput sequencing (HTS) data poses a significant challenge in the broader adoption of HTS as a rapid diagnostics tool. Our solution, PhytoPipe (Phytosanitary Pipeline), is an open-source bioinformatics pipeline designed to offer the plant pathology diagnostician community a user-friendly tool. PhytoPipe integrates the analysis and visualization of HTS RNA-seq data, encompassing quality control, read classification, assembly-based annotation, and reference-based mapping. By consolidating results from various tools, PhytoPipe accurately detects viruses and viroids in both real and simulated RNA-seq data, notably reducing false positives. In test datasets, PhytoPipe achieves a 100% true positive rate and 0% false negative rate. Implemented in a Snakemake workflow using Python 3 and bash scripts in a Linux environment, PhytoPipe is publicly available on GitHub at <https://github.com/healthyPlant/PhytoPipe> and on Docker Hub at <https://hub.docker.com/r/healthy-plant/phytopipe>. The Docker image is compatible with Linux, Mac, and Windows systems.

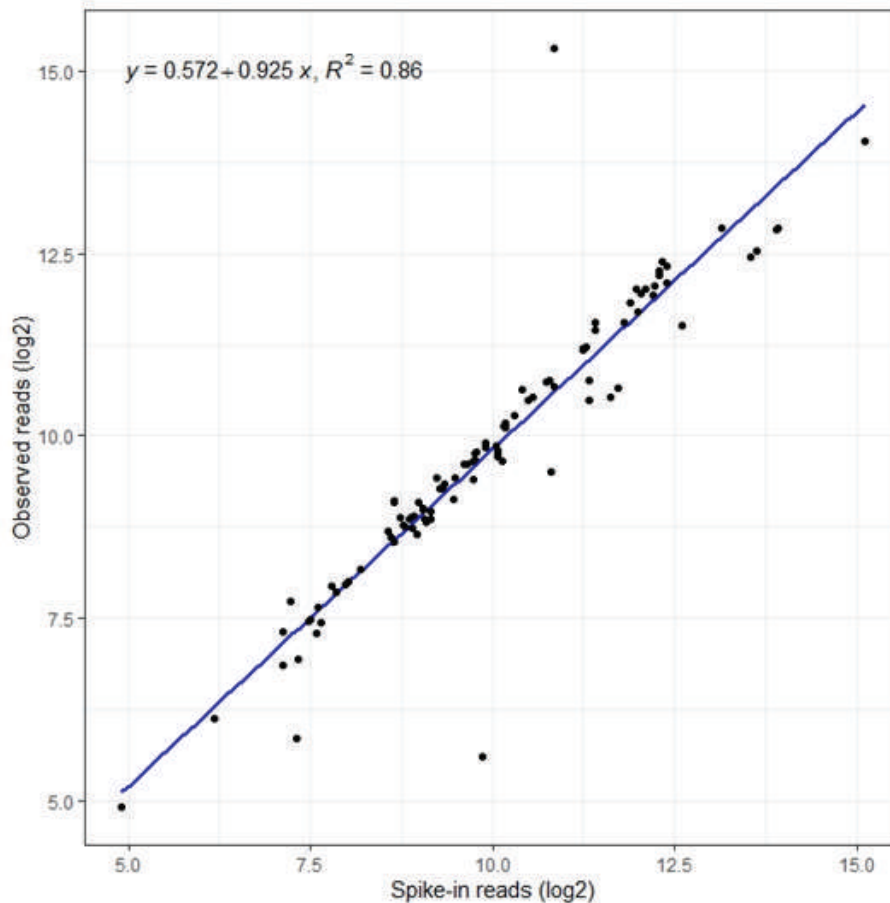


Fig 1. Comparison between spike-in and observed pathogen reads from simulated RNA-seq data. Observed 79 viruses/viroids reads from 12 crops were obtained by either mapping reads to a viral reference if viral contigs are annotated or are from Kraken2 classification. The high correlation between the spike-in and observed viral reads shows high detection ability of PhytoPipe.

### Biography

Dr. Xiaojun Hu, an accomplished bioinformatician, obtained his PhD in Bioinformatics and Computational Biology from the University of Idaho in 2009. Early in his career, he focused on researching potato virus Y recombination and mutations. Over the subsequent decade, Dr. Hu made noteworthy contributions to HIV and human genomics. Transitioning to the USDA APHIS Plant Germplasm Quarantine Program (PGQP) four years ago, he spearheaded the development of PhytoPipe, a state-of-the-art sequencing analysis pipeline. This cutting-edge tool facilitates the identification of viruses and pathogens in plant samples using RNA-seq data. Notably, the pipeline has recently been published in BMC Bioinformatics.



## Cardio vascular complications from COVID-19, a narrative review

### Stiliana Brokaj

Faculty of Health, Department of Health Care, University of Vlore "Ismail Qemali", Albania

**Introduction:** Covid-19 caused many health problems in various populations. Early diagnosing and assessing the complications made it possible to successfully manage and lower the number of cardio vascular complications.

**Methods:** This is a narrative review aiming to provide data on cardio vascular complications caused from COVID-19. The study included data from 2020-2022, in hospitalized and ambulatory patients presenting cardio vascular complications.

**Results:** Among 41 first cases with COVID-19 in Wuhan China, 15% had cardio vascular problems and hypertension, 12% manifested acute myocarditis. Among 137 infected patients, 7.3% had heart palpitations, while among as ample of 138 hospitalized patients 16.7% manifested arrhythmia, and 8.7% suffered from cardiogenic shock. Among 85 fatal cases of infected patients, 51 died from arrhythmia, and 7 died from cardiac arrest. Among 21 patients critically ill from COVID-19 infection, 7 of them had cardiomyopathy.

**Conclusions:** COVID-19 is related to high numbers of cardio vascular infections, regardless of individual characteristics of patients. Arrhythmia, cardiac arrest and cardiomyopathies are among the most frequent complications found in literature.

### Biography

MSc Stiliana Brokaj (female, 47 years old) graduated from University of Vlore in Bachelor in Nursing and Master of Scientific Nursing. Since 2017 she has been a lecturer at the University of Vlore, Faculty of Health, Department of Health Care.

During the time period of working at the university, she has tried to participate in various studies and two projects of the Faculty, Smoking in youth ages in 2020 and the efficiency and perspective of providing virtual health services after the Covid pandemic in 2021.

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The variety of study areas as co-author are focused on nursing area, violence in work areas in nursing (*ICNMHPB*), Defibrillation, Basics of supporting life, Challenges to raise the quality on health care, Ethical and professional behaviors. Theoretical and practical aspects of e-library functioning and virtual e-Hospital of Balkan Telemedicine, International Virtual e-Hospital Foundation, etc.

She is active member of the Faculty of Health, during her activities in the University have been part of the training teams in various seminars.



### Middle East respiratory syndrome corona virus spread stochastic simulations and control in camels in the United Arab Emirates

**Magdi Mohamed Ali<sup>1</sup>, Eihab M. Fathelrahman<sup>2</sup>, Adil I. El Awad<sup>2</sup>, Raeda Osman<sup>2</sup>  
and Yassir M. Eltahir<sup>3</sup>**

<sup>1</sup>United Arab Emirates Ministry of Climate Change and Environment (MoCCA), United Arab Emirates (UAE)

<sup>2</sup>Department of Integrative Agriculture, College of Agriculture and Veterinary Medicine, United Arab Emirates University (UAEU), United Arab Emirates (UAE)

<sup>3</sup>Animals Extension and Health Services Division, Abu Dhabi Agriculture and Food Safety Authority (ADAFSA), United Arab Emirates (UAE)

The Middle East Respiratory Syndrome Coronavirus (MERS-CoV) is a zoonotic infection disease in which dromedary camels played essential roles in its emergence, spread, and epidemiology. Since 2013, a total of 94 confirmed human cases and 12 deaths have been reported in the United Arab Emirates (UAE). In contrast, a high seroprevalence (97.1%) and (1.6%) molecular prevalence of MERS-CoV in camels were reported in UAE. The objective of this research is to recommend strategies to control MERS-CoV spread. Camel data were obtained from the Animal Identification and Registration System (AIRIS) - Abu Dhabi Agriculture and Food Safety Authority (ADAFSA). To choose the suitable MERS-CoV control strategy that can minimize the epidemic length and the number of affected camel farms, we employed the North American Animal Disease Spread Model (NAADSM) framework. This scientific approach allowed us to simulate a customized stochastic model for UAE to simulate MERS-CoV spread. Three different scenarios of MERS-CoV control strategies were simulated. These included implementing control strategy 1, restricted animal movement, and control strategy 2. Meanwhile, vaccination and animal movement control were considered control strategy 3. Animal movement control was the optimum strategy for controlling MERS-CoV spread. In such a scenario, the outbreak duration was reduced from 288 days in scenario 1 to only 36 in scenario 3, and the number of infected farms was also reduced from 3,141 to 6 farms. Scenario 3 was not considered an optimum scenario because, despite the high cost of vaccination, the control measure did not include a significant reduction in the number of infected animals. Implementing the optimum MERS-CoV control strategy in camels requires considering its effectiveness and cost. Animal disease spread stochastic simula-

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tions, and cost-effectiveness studies aid policymakers in formulating optimum eradication policies and increasing biosecurity.

### Biography

Magdi Ali has completed his PhD in Immunology at University of Stockholm, Sweden in almost 20 months. He got two master degrees, one in Microbiology/Molecular Genetics from Michigan State University, USA and the other in Epidemiology from University of Khartoum, Sudan. He did his postdoctoral studies at The National Institute of Health (NIH), Maryland, USA. He worked in different fields of specialties from research, teaching disease control programs to the field of Biosecurity and disaster management. He has published more than 25 articles in reputed journals and served as an editorial board member and ad hoc member to many journals e.g. Acta Tropica, International Journal of Parasitology and Sudan Journal of Dermatology and many others.



## The Impact of COVID-19 on mental health and suicide: A literature review

**Denada Krespaj**

Univeristy of Vlora "Ismail Qemali", Albania

The COVID-19 pandemic has not only posed significant threats to physical health but has also emerged as a profound catalyst for mental health crises worldwide. Mental health during the pandemic has proven to be particularly vulnerable, with a significant number of individuals tragically resorting to suicide. This phenomenon extends beyond hospital settings to include incidents occurring within homes, highlighting the pervasive nature of the crisis.

This literature review aims to comprehensively investigate the impact of COVID-19 on mental health, specifically focusing on its association with suicidal behaviors.

A systematic electronic search of current publications conducted during the pandemic period was employed, with full-text articles retrieved and analyzed.

Several studies were selected based on rigorous inclusion criteria, including relevance to the topic and robust methodology.

The reviewed studies collectively reveal the multifaceted repercussions of COVID-19 on suicidal behaviors. They highlight a complex interplay of psychosocial, economic, and healthcare-related factors contributing to increased suicide risk during the pandemic.

Factors such as social isolation, fear of infection, financial stressors, disrupted access to mental health services, and the psychological toll of illness are identified as significant contributors to heightened suicidal ideation and behaviors among affected individuals.

The synthesis of findings underscores the urgent need for targeted interventions and comprehensive mental health support strategies tailored to the unique challenges posed by COVID-19.



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### Biography

- Denada Kreshpaj, serve as a lecturer at Ismail Qemali University in Vlora.
- She holds a degree in clinical psychology, which has equipped her with a deep understanding of human behavior and mental health.
- Currently, she is immersed in the second year of doctoral studies in behavioral neuroscience at Sapienza University of Rome. Her research explores the intricate connections between brain function and behavior, aiming to uncover insights that advance our understanding of neuroscience.
- Working in academia has allowed her to combine her love for teaching with her dedication to research.
- As a young researcher, she aspires to always move forward and would be very grateful if you would consider her work.



### BRD4-PRC2 represses transcription of T-helper-2 specific negative regulators during T-cell differentiation

**Ka Lung Cheung<sup>2</sup>, Li Zhao<sup>1</sup>, Yiqi Wang<sup>1</sup>, Anbalagan Jaganathan<sup>2</sup>, Yifei Sun<sup>2</sup>,  
Ning Ma<sup>1</sup>, Ning Li<sup>3</sup>, Xinye Han<sup>1</sup>, Xueying Sun<sup>1</sup>, Huanfa Yi<sup>1</sup>, Shibo Fu<sup>1</sup>, Fangbin  
Han<sup>1</sup>, Xue Li<sup>4</sup>, Kunhong Xiao<sup>5,6,7</sup>, Martin J. Walsh<sup>2</sup>, Lei Zeng<sup>1</sup> and Ming-Ming  
Zhou<sup>2</sup>**

<sup>1</sup>Institute of Epigenetic Medicine, First Hospital of Jilin University, China

<sup>2</sup>Department of Pharmacological Sciences, Icahn School of Medicine at Mount Sinai, USA

<sup>3</sup>The Institute of Genetics and Cytology, Northeast Normal University, China

<sup>4</sup>Department of Chemistry, Michigan State University, USA

<sup>5</sup>Allegheny Health Network Cancer Institute, USA

<sup>6</sup>Department of Pharmacology & Physiology, Drexel University College of Medicine, USA

<sup>7</sup>Department of Pharmacology and Chemical Biology, School of Medicine, University of Pittsburgh, USA

BRD4 is a well-recognized gene transcriptional activator, but how it regulates gene transcriptional repression in a cell-type specific manner has remained elusive. In this study, we report that Brd4 works with Polycomb repressive complex 2 (PRC2) to repress transcriptional expression of T-helper 2 (Th2)-negative regulators *Foxp3* and E3-ubiquitin ligase *Fbxw7* during lineage-specific differentiation of Th2 cells from mouse primary naïve CD4<sup>+</sup> T cells. Brd4 through its second bromodomain (BD2) binds to lysine-acetylated-EED subunit of the PRC2 complex to facilitate histone H3 lysine 27 trimethylation (H3K27me3) at target gene loci for transcriptional repression. We found that *Foxp3* represses transcription of Th2-specific transcription factor *Gata3*, while *Fbxw7* promotes ubiquitination-directed protein degradation of *Gata3*, which in turn ensures BRD4- and *Gata3*-mediated transcriptional activation of Th2 cytokines including *Il4*, *Il5* and *Il13*. Chemical inhibition of the BRD4 BD2 induces transcriptional de-repression of *Foxp3* and *Fbxw7*, and transcriptional down-regulation of *Il4*, *Il5* and *Il13*, resulting in inhibition of Th2 cell lineage differentiation. Our study presents a previously unappreciated mechanism underlying BRD4 functions in orchestrating a Th2-specific transcriptional program that coordinates gene repression and activation and safeguards cell lineage differentiation.

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### Biography

Ka Lung Cheung runs a lab in the Department of Pharmacological Sciences at Icahn School of Medicine at Mount Sinai in New York. He received his Ph.D. degree from Rutgers, State University of New Jersey, and worked as a postdoc in Icahn School of Medicine before promotion to Assistant Professor. His research laboratory is directed at better understanding the basic cellular and molecular mechanisms of immune cell-related inflammation and tissue regeneration. They employ an interdisciplinary research approach that relies on genomic sequencing, epigenetics, chemical biology, and transgenic mouse models to understand regulation of gene transcription in chromatin at the basic molecular level. They are particularly interested in studies of discovery of novel drug targets and their functional mechanisms in T-cell regulation and pathogenicity, epigenetic regulation of the intestinal homeostasis and regeneration, and crosstalk of pathogenic cell niche between hematopoietic cells and non-hematopoietic cells in inflammatory diseases.



## Smad cascade: Pleiotropic cardio-metabolic consequences in primary human immune cells

**Kareem Awad<sup>1,2,3,4</sup>**

<sup>1</sup>Institute of Biomedicine, Faculty of Medicine, University of Turku, Finland

<sup>2</sup>InFLAMES, University of Turku, Finland

<sup>3</sup>Institute of Pharmaceutical and Drug Industries Research, National Research Centre, Egypt

<sup>4</sup>Medical Faculty, Ruprecht-Karls University of Heidelberg, Germany

Transforming growth factor beta 1 (TGF $\beta$ 1) multifaceted signalling in immune cells is complex based primarily on its specific Smad type phosphorylation (3). Epigenetic manipulation of Smad proteins relies on either pathogenic/non-pathogenic exogenous stimuli or heterogeneous link signals from the neighbouring environment (1-3). It is aimed here to study the effect of different stimuli on the Smad type phosphorylation in human monocytes derived macrophages as well as dendritic cells. Monocytes were isolated from human buffy coats according to a standard procedure and stimulated/infected with influenza viruses in different glucose concentration. Smads signalling phosphorylation was detected on both the protein and RNA level. Specific genes expression such like HAMP and PLAUR were detected. Results show how different influenza strains in normal and high glucose may modulate TGF $\beta$ 1-Smad signalling in immune cells and to what extent this affects the expressed genes. In conclusion, TGF $\beta$ 1 signalling has dual pathways in human immune cells. Interference with specific Smad proteins could have a curing role in cardio-metabolic diseases.

### Biography

Kareem Awad research concerns human immune cells responses to different pathogenic and non-pathogenic stimuli as well as the interaction of these cells with the surrounding nerves or vascular neighbouring cells. So, his previous work within years of experiences in different scientific schools in Finland, Egypt and Germany focused on the responses of these cells to pathogens such as influenza viruses' strains as well as signals from abnormal environmental contexts such like hyperglycaemia or tumour cells. In this sense, he targets diseases such as diabetes, influenza virus infection and cancers specifically the brain tumour glioblastoma. His last degree obtained from Cairo University is a PhD in Pharmaceutical Sciences "Biochemistry". More about his publications can be found on <https://orcid.org/0000-0003-1007-9632>



## Real-time detection of single bioaerosol particles via differential circular polarization scattering (CIDS)

**Yong-Le Pan and Aimable Kalume**

DEVCOM Army Research Laboratory, USA

Rapid detection and characterization of bioaerosol particles such as harmful bacteria, virus has been an important research topic for health and environment sciences. Currently real-time bioaerosol detection is mainly based on fluorescence, elastic scattering etc. optical methods, their effectiveness are often limited by the prevalence of interferents.

It was reported that DNA helical structures in biological molecules produce non-zero circular intensity differential scattering (CIDS, normalized Mueller matrix element  $-S_{14}/S_{11}$ ) compared to other particles with non-helical structures. To date CIDS measurements have only been carried out for a group of particles using a polarization modulator, lock-in amplifier, and rotating detector due to its ultra-weak signals ( $10^{-3}$ - $10^{-6}$ ). Such complex instrumentation is not suitable outside a laboratory for the usage as a biosensor.

We report an advanced method for measuring CIDS phase function from single individual flowing through particles without any moving parts or modulator. An elliptical reflector is used to project scattering light at different angles onto a 32-anode PMT for scattering phase functions illuminated by left- and right-circular polarization beam, respectively. The two beams are 80  $\mu\text{m}$  separation vertically centered at the focus of the reflector as a particle moving through them with 8 $\mu\text{s}$  time interval. This innovative setup, significantly, shortens a complete measurement from tens of minutes to 17  $\mu\text{s}$  (>50,000 particles/sec). CIDS phase functions from single particles of *B. subtilis*, *E. coli* spores, MS2 bacteriophage, *Yersinia rohdei*, DNA-tagged polystyrene (PSL) microsphere, tryptophan, PSL microsphere, atmospheric aerosol particles are carried out using this system. The results showed all bioaerosol particles have at least 3 times stronger CIDS signals than non-bioaerosol particles. This newly developed method gives promise to a real-time bioaerosol detection with low cost and reduced risk for potential interferents.

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### Biography

Dr. Yongle Pan is a world-recognized leader in the field of aerosol detection and characterization. He is a pioneer in developing real-time, *in-situ* point-detection technologies for detecting, discriminating, and identifying biological and chemical aerosol particles from complex atmosphere using laser spectroscopic methods. The technologies invented by Dr. Pan have transitioned to numerous governmental laboratories, universities, and industries all over the world. He has published more than 150 peer-reviewed journal articles and 3 book chapters, received 13 US patents, and has over 4800 citations. He was a principal investigator (PI), Co-PI, or key personnel for more than 20 scientific research projects, mentored numerous students and scientists, and collaborated with research teams throughout the world.



### Antiviral effects of six indigenous plants on viral causative agents of Bovine Respiratory Disease Complex (BRDC)

Vladimir S. Kurćubić<sup>1</sup>, Jelena M. Mašković<sup>2</sup>, Tamaš Petrović<sup>3</sup>, Gospava Lazić<sup>3</sup>, Vladimir Gajdov<sup>3</sup>, Luka V. Kurćubić<sup>4</sup> and Pavle Z. Mašković<sup>2</sup>

<sup>1</sup>Department of Food Technology, Faculty of Agronomy, University of Kragujevac, Serbia

<sup>2</sup>Department of Chemistry and Chemical Engineering, Faculty of Agronomy, University of Kragujevac, Serbia

<sup>3</sup>Department for Virology, Novi Sad Scientific Veterinary Institute, Serbia

<sup>4</sup>Department of Medical Microbiology, University Clinical Center of Serbia, Serbia

The aim of this study was researching the *in vitro* antiviral (AV) power of six plant extracts on Bovine Herpes Virus-1 (BoHV-1) subtype 1.1 and Bovine Viral Diarrhoea Virus (BVDV) genotype 1, as the cause of primary lesions on the respiratory tract of cattle. In places where lesions caused by the effects of the mentioned and some associated viruses appear, bacterial pathogens multiply intensively and rapidly, developing the BRDC (severe tissue damage, often with fatal consequences). Ethanol and aqueous plant extracts (EE and AE) of six examined plants were prepared: *Ballota nigra* (1) and *Salvia verticillata* (Lamiaceae) (5), *Onosma aucheriana* (2) and *Echium vulgare* (Boraginaceae) (3), *Erica carnea* (Ericaceae) (4), and *Hypericum perforatum* (Hypericaceae) (6). The EE and AE obtained were assayed for cell toxicity prior AV studies. Different nontoxic concentrations (<CTC<sub>50</sub>) of E were tested for AV property by cytopathic effect (CPE) inhibition assay against 100 TCID<sub>50</sub> virus concentrations of BoHV-1 and BVDV.

Table 1. Cytotoxicity and AV effects of six tested plant extracts

Sample		Virus inhibitory effect					
		Cytotoxicity CTC <sub>50</sub> (µg/mL) <sup>a</sup>	BoHV-1 (IBR/IPV) strain TN41			BVDV strain NADL	
			EC <sub>50</sub> (µg/mL) <sup>b</sup>	S <sup>c</sup>		EC <sub>50</sub> (µg/mL) <sup>b</sup>	S <sup>c</sup>
1	EE	≥ 312,5 µg/mL	> 312,5 µg/mL	< CTC	> 312,5 µg/mL	< CTC	
1a	AE	≥ 625 µg/mL	≥ 156,3 µg/mL	4	> 625 µg/mL	ND	
2	EE	≥ 312,5 µg/mL	> 312,5 µg/mL	< CTC	> 312,5 µg/mL	< CTC	

2a	AE	> 1250 µg/mL	≥ 19,53 µg/mL	≥ 64	> 1250 µg/mL	ND
3	EE	≥ 156,3 µg/mL	> 156,3 µg/mL	< CTC	> 156,3 µg/mL	< CTC
3a	AE	> 1250 µg/mL	≥ 1250 µg/mL	≥ 1	> 1250 µg/mL	ND
4	EE	≥ 312,5 µg/mL	≥ 156,3 µg/mL	2	> 312,5 µg/mL	< CTC
4a	AE	≥ 1250 µg/mL	≥ 625 µg/mL	2	≥ 625 µg/mL	2
5	EE	≥ 312,5 µg/mL	> 312,5 µg/mL	< CTC	> 312,5 µg/mL	< CTC
5a	AE	≥ 1250 µg/mL	≥ 39,06 µg/mL	32	> 1250 µg/mL	ND
6	EE	≥ 312,5 µg/mL	≥ 312,5 µg/mL	< CTC	> 312,5 µg/mL	< CTC
6a	AE	≥ 1250 µg/mL	≥ 312,5 µg/mL	4	> 1250 µg/mL	ND

<sup>a</sup> Fifty percent cytotoxic concentration - CTC<sub>50</sub>

<sup>b</sup> Fifty percent effective concentration - EC<sub>50</sub>

<sup>c</sup> Selectivity index (CTC<sub>50</sub>/EC<sub>50</sub>)

<sup>d</sup> Antiviral activity is lower than cytotoxic concentration (< CTC) or not detected (ND)

Two prepared samples of AE had antiviral effect against BHV-1 as a representative of DNA virus, but none of the samples showed an AV effect against BVDV (RNA viruses). Selectivity Index (SI = CTC<sub>50</sub>/EC<sub>50</sub>) for AE of *Onosma aucheriana* (SI = ≥64) and *Salvia verticillata* (SI = 32) indicates a significant selective inhibition of DNA virus (BoHV-1). Future research would show the active ingredients of the examined plants and mechanisms of their AV effect. This study was carried out *in vitro* but for the following investigations it is desirable to be conducted on an animal model *in vivo*.

### Biography

Vladimir S. Kurćubić is born on June 6, 1964. in Čačak, Serbia. Graduated from the Faculty of Veterinary Medicine in Belgrade, 1989. Master's thesis: "Serological testing of cattle for infection with Bovine viral diarrhea virus" 1993 - Master of Veterinary Sciences.

Ph.D. entitled "Comparative investigation of the immunogenicity of monovalent and polyvalent inactivated vaccine prepared from bovine diarrhea virus", 2004., Faculty of Veterinary Medicine in Belgrade - Doctor of Veterinary Sciences, Ph.D.

Vladimir has 218 published scientific works of various categories, of which 25 are in journals from the SCI list (WoS), visible with other results of scientific work (prominent national scientific monograph, technical solutions) on the platform established and developed by the Ministry of Science, Technological Development and Innovation, Serbia: <https://enauka.gov.rs/cris/rp/rp05508/dspaceitems.html>

Total citations: 266; a total of 25 results on Scopus; h index10.

Vicedean for Science and teaching on Faculty of Agronomy, University in Kragujevac, Serbia last 5 years.





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

Waleed S. Rasheed<sup>1</sup> and Alaa Noori Sarkees<sup>2</sup>

<sup>1</sup>Department of Public Health, College of Health and Medical Technology, Duhok Polytechnic University, Iraq

<sup>2</sup>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.

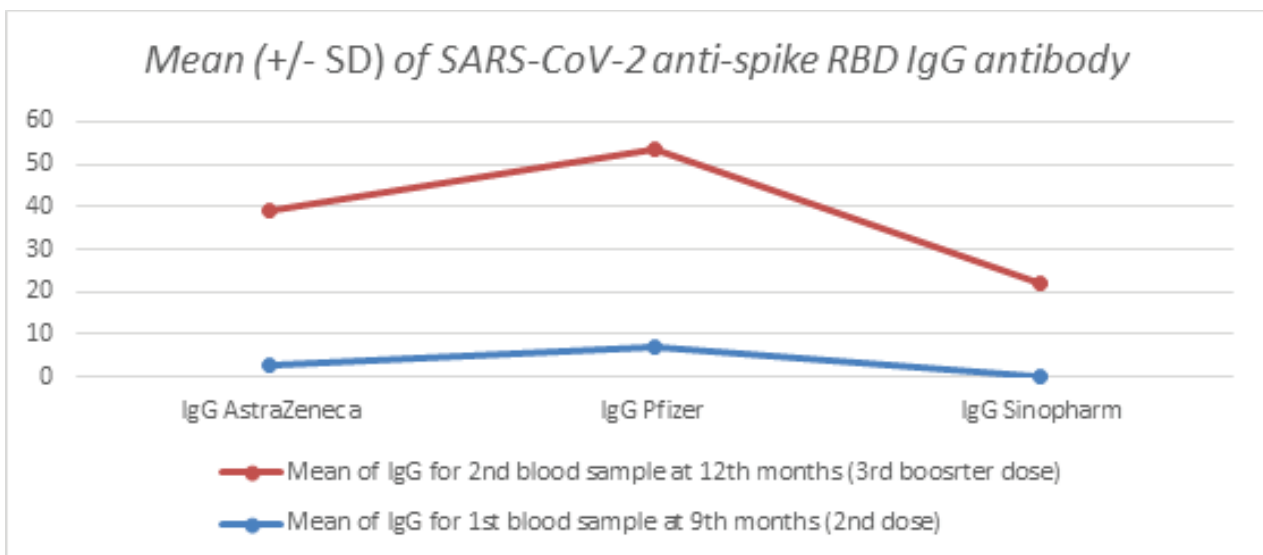
**Materials:** This longitudinal panel design was conducted with 256 healthcare workers in Duhok Province, Iraq, from June to October 2022.

**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  $\leq 0.001$ ), 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 9 <sup>th</sup> month			2nd blood sample in the 12 <sup>th</sup> 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.

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## Extracellular vesicles carrying HIV-1 Nef induce myelin impairment in the mouse brain

**M.I. Bukrinsky, J.K. Schenck, B. Brichacek and R.H. Miller**

The George Washington University School of Medicine and Health Sciences, USA

HIV associated neurocognitive disorders (HAND) are a spectrum of cognitive impairments that continue to affect approximately half of all HIV-positive individuals despite effective viral suppression *via* antiretroviral therapy (ART). White matter pathologies have persisted in the ART era, and the degree of white matter damage (i.e. myelin impairment) correlates with the degree of neurocognitive impairment in patients with HAND. The HIV protein Nef has been implicated in HAND pathogenesis, but its role in white matter damage is not well characterized. Nef is released from infected cells incorporated in extracellular vesicles (EVs), which are detected in the blood and CSF of HIV-infected patients even with undetectable HIV load. Using *in vivo*, *ex vivo*, and *in vitro* approaches, we show that Nef EVs disrupt myelin sheaths and damage glial cells in the murine central nervous system. Intracranial injection of Nef EVs reduced myelin basic protein (MBP) staining and decreased the number of CC1+ oligodendrocytes in the corpus callosum. It also induced inflammation evidenced by enrichment of microglial cells. Cerebellar slice cultures treated with Nef EVs displayed decreased MBP expression and increased unmyelinated axons. Both primary mixed brain cultures and enriched oligodendrocyte precursor cell cultures treated with Nef EVs displayed decreased number of O4+ (oligodendrocyte marker) cells, indicating oligodendrocyte damage by Nef EVs. This damage was partially blocked by AMS-55, a drug that inhibits the effect of Nef on cholesterol efflux. These results suggest that Nef EVs damage oligodendrocytes and myelin maintenance by inhibiting cholesterol efflux, providing a new therapeutic target in HAND pathogenesis.

### Biography

Dr. Bukrinsky is Professor of the Department of Microbiology, Immunology & Tropical Medicine and Professor of Biochemistry and Molecular Biology at The George Washington University School of Medicine. He is also Adjunct Professor at the Moscow State University in Moscow, Russia. He graduated from the 2nd State Medical School in Moscow, Russia, and did his PhD at the Institute of Molecular Biology in Moscow, defending his thesis in 1984. Dr. Bukrinsky is a world-recognized expert on HIV biology and pathogenesis, having published over 200 articles, including publications in Science, Nature, PLoS Biology, Cell Reports and PNAS. He is an author on 14 US patents. Dr. Bukrinsky is a fellow of the American Heart Association. He is an Editor-in-Chief of the Open AIDS Journal and a member of many Editorial Boards. Dr. Bukrinsky mentored a number of graduate and post-graduate HIV researchers from around the world.



## Enhanced Efferocytosis Ameliorates Ischemic organ damage

**Akira Shibuya<sup>1,2,3</sup> and Chigusa Nakahashi-Oda<sup>1,2</sup>**

<sup>1</sup>Department of Immunology, Institute of Medicine, University of Tsukuba, Japan

<sup>2</sup>R&D Center for Innovative Drug Discovery, University of Tsukuba, Japan

<sup>3</sup>Life Science Center for Survival Dynamics, University of Tsukuba, Japan

Immune responses contribute to tissue injury and repair in ischemic organ diseases. However, the spatiotemporal and initiating molecular events remain incompletely understood. Here, we show that mice deficient in the phosphatidylserine receptor CD300a exhibited ameliorated neurological deficits after middle cerebral artery occlusion (MCAO). CD300a inhibits the CD300b–DAP12 signaling pathway to efferocytosis. Deficiency of CD300a restored efferocytosis by circulating myeloid cells infiltrating the brain as early as 1 h after MCAO and reduced release of damage-associated molecular patterns from dead cells, resulting in milder inflammation in the penumbral region. We also show that CD300a-deficient mice exhibited ameliorated kidney and myocardial injuries after ischemia and reperfusion. Treatment with an anti-CD300a neutralizing antibody ameliorated the neurological deficit and renal and myocardial injuries after ischemia and reperfusion. These findings reveal an important role of efferocytosis in the pathology of ischemic organ diseases and identified CD300a as a target for immunotherapy.

### Biography

Akira Shibuya graduated from Hokkaido University School of Medicine, Sapporo, Japan, in 1981. After 12 years of clinical work as a hematologist, he was trained as an immunologist at DNAX Research Institute in California, where he identified an NK receptor DNAM-1 (CD226) in 1996. Shibuya's group at the University of Tsukuba focused on immunoreceptors and has clarified the molecular and functional characteristics of DNAM-1 and published more than 40 papers describing its important roles in the pathogenesis of tumors and inflammatory diseases. Shibuya's group also identified novel immunoreceptors, including the MAIR (CD300) family, the Fc ( $\alpha/\mu$ ) receptor CD351, Allergin-1, and C-type lectin receptors Clec10a (CD301) and Clec12b. To practically apply these research results to clinical, Shibuya recently founded TNAX Biopharma Corp in 2018 and established an R&D Center for Innovative Drug Discovery at the University of Tsukuba in 2019.



## Fungal secondary metabolites as antivirals against canine coronavirus

### Filomena Fiorito

Department of Veterinary Medicine and Animal Production, University of Naples Federico II,  
Italy

Canine coronavirus (CCoV), an alphacoronavirus, causes mild enteric disease in dogs. However, because of extraordinary plasticity of CoVs, mutation and/or recombination processes can occur developing new dangerous strains. Indeed, an extremely virulent CCoV strain has been detected from Italian outbreaks of fatal disease in puppies. Moreover, the recent discovery of novel canine-feline recombinant alphacoronaviruses, isolated from human patients, highlights the cross-species transmission ability of CoVs. In this scenario, to control the impact of CCoV infection, research attempts are focusing on the development of antiviral therapies involving original mechanisms of action. It has been demonstrated that the aryl hydrocarbon receptor (AHR), a ligand-activated transcription factor, modulates the host response to different human and animals CoVs. Fungal secondary metabolites (SMs) are a promising source of substances with a broad spectrum of biological activities. And, funicone-like compounds, a homogeneous group of fungal secondary metabolites (i.e., 3-O-methylfunicone, penisimplicissin and vermistatin), isolated from *Talaromyces pinophilus*, have exhibited extraordinary antiviral properties. Following infection, non-toxic concentrations of these SMs significantly increased the viability of infected cells and induced a decline in virus yield as well as in viral nuclear protein expression. In addition, we noticed a modulation of AhR, that was upregulated by CCoV, but downregulated by tested SMs. These results were accompanied by a deacidification of lysosomes. Fascinatingly, a high sequence identity of the obtained 3D structural models for the two domains (PASB and TAD) of human and canine AHRs was identified by bioinformatics analysis.

These findings represent a fundamental step for the development of innovative drugs having AHR as a potential target for therapy against CoVs.

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### Biography

Filomena Fiorito, PhD in Biology, Pathology and Environmental Hygiene in Veterinary Medicine (2005) is associate professor of Infectious Disease of Domestic Animals at the Department of Veterinary Medicine and Animal Production of University of Naples Federico II (Naples), Italy. She studies molecular processes involved in herpesviruses and coronaviruses infections, also in the presence of environmental contaminants (dioxin); surveillance of herpesviruses, coronaviruses (BCoV and SARS-CoV-2) and enteric viruses in animals; in vitro investigations about potential antiviral properties of synthetic (MG-132) and natural compounds (fungal metabolites, natural extracts containing polyphenols and flavonoids) against herpesviruses (BoHV-1) and coronaviruses (BCoV, CCoV and FCoV) infections.



## Allogeneic use of a specific mesenchymal cell line to manage complex equine wounds

**Garcia Marcela N<sup>1</sup>, Iribarne Ailen<sup>1,2</sup>, Palma M. Belen<sup>1,2</sup>, Saez<sup>1,2</sup>, Gutierrez Berta<sup>3</sup>,  
Andrini Laura<sup>1</sup>, Hernandez Hugo<sup>4</sup>, Muriel Marcos<sup>4</sup>, Lopez Ramon<sup>4</sup>, Riccillo  
Fernando<sup>1</sup>, Gatti Lucía<sup>1</sup>, Martinez Kevin<sup>1,2</sup>, Buero Guillermo<sup>5</sup>, Miriuka Santiago<sup>2</sup>  
and Carosella Edgardo<sup>6</sup>**

<sup>1</sup>Cátedra de Citología, Histología y Embriología, Facultad de Ciencias Médicas, Universidad Nacional de La Plata (UNLP), Argentina

<sup>2</sup>Instituto de Neurociencias (INEU), Fundación para la Lucha contra Enfermedades Neurológicas de la Infancia-Consejo Nacional de Investigaciones Científicas y Técnicas (FLENI-CONICET) Escobar, Argentina

<sup>3</sup>Facultad de Ciencias de la Salud, Universidad San Jorge, España

<sup>4</sup>Cátedra de Medicina Equina, Facultad de Ciencias Veterinarias, UNLP, Argentina

<sup>5</sup>Sanatorio Mater Dei, Argentina

<sup>6</sup>Commissariat a l'Energie Atomique et aux Energies Alternatives (CEA), Service de Recherche en Hemato-Immunologie (SRHI)- Université Paris Diderot, Sorbonne Paris Cite, IUH, Hopital Saint-Louis, France

Wound healing after skin injury is a complex process, particularly in equines where leg wounds are prevalent and their repair is complicated due to the anatomical characteristics. Conventional treatments are not effective enough. The umbilical cord offers an unlimited source of adult mesenchymal stem cells (ucMSCs) from Wharton's jelly tissue. The present study aims to demonstrate the safety and therapeutic potential of the allogeneic use of a specific equine mesenchymal cell line obtained from ucMSCs (named eqMC), in the healing of severe equine leg wounds. The methods employed were the isolation, culture and expansion of e-ucMSCs. Flow cytometry and a PCR assay were used for cell line characterization. This study included an immunomodulation assay, a murine pre-clinical trial and finally, an equine clinical trial. Our results showed that eqMCs express a functional HLA- G homolog (one of the most relevant immune checkpoints) the EQMHCB2. In the immunomodulation assay, the eqMCs inhibited the proliferation of activated equine peripheral blood mononuclear cells



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(e-PBMCs). In the murine pre-clinical trial, eqMCs reduced healing time by 50%. In the equine clinical trial, the injection of eqMCs into severe leg lesions improved the closure time and quality of the tissues involved, regenerating them without fibrous tissue ar formation. In conclusion, the results of this study suggest that e-ucMSCs can be used allogeneically for wound healing by creating a tolerogenic environment.

### Biography

Dr. Marcela Nilda Garcia holds a PhD in Veterinary Sciences. She is an accredited researcher at the Universidad Nacional de La Plata (UNLP). She is a Specialist in University Teaching and an Adjunct Professor of Cytology, Histology, and Embryology at the Faculty of Medical Sciences (FCM) UNLP. She has also taught numerous postgraduate training courses. She is president of the Bioethics and Research Ethics Committee (COBIMED) of the FCM, UNLP. She has presented multiple scientific presentation at national and international conferences, some of which have received awards. She has published numerous scientific papers in indexed scientific journals and has written book chapters. She is the Director of several research projects. She is the supervisor of several doctoral theses. She is co-author of a patent registered with the European Patent Office on the allogeneic use of a human mesenchymal stem cell line for dermal wound regeneration in humans.



## RBC alloimmunization among pediatric transfusion-dependent thalassemia patients

**Mirette Hanna<sup>1,2,3</sup> and Dorsa Zarabian<sup>1</sup>**

<sup>1</sup>Research Institute, The Hospital for Sick Children, Canada

<sup>2</sup>Division of Hematopathology, Department of Pediatric Laboratory Medicine, The Hospital for Sick Children, Canada

<sup>3</sup>Department of Laboratory Medicine and Pathobiology, University of Toronto, Canada

Alloimmunization is a major problem for transfusion-dependent thalassemia patients which can further complicate subsequent transfusions. Yet there is no consensus on the prophylactic antigen matching for prevention of alloimmunization or the extent of antigen matching for alloimmunized thalassemia patients.

Therefore, we conducted a retrospective study of all transfusion-dependent thalassemia patients ( $\beta$ -thalassemia, hemoglobin E/ $\beta$ -thalassemia,  $\delta\beta$ thalassemia,  $\beta$ -thalassemia with  $\alpha$ -gene deletions or  $\alpha$ -thalassemia) followed-up between July 2018 and Jun 2022 at the Hospital for Sick Children. All patients received ABO, RhD and K-matched RBC units as per our institutional protocol. In addition, alloimmunized patients received RBCs negative to the corresponding antigen. Our primary objective was to determine the frequency and specificity of alloimmunization among pediatric transfusion-dependent thalassemia patients. In addition, we studied the association between patients' characteristics and alloimmunization.

In our study, the rate of alloimmunization was estimated at 0.3%/transfusion. Eight patients (9%) had developed clinically significant alloantibodies while five patients (5%) developed warm autoantibodies. Among the former, five patients had received transfusion outside Canada and only two patients developed more than one alloantibody. Antibody against E antigen was the most commonly detected alloantibody among alloimmunized patients (75%). There was no statistically significant association between patient's sex, age, or presence of genotype variant and alloimmunization. A diagnosis of  $\beta$ -thalassemia, having developed autoantibody, and history receiving transfusion outside Canada were associated with alloimmunization.

In our study, matching RBC units for ABO, RhD and K antigens resulted in lower frequency of alloimmunization than that previously reported in pediatric thalassemia patients. Extending the matching

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to include Rh antigens could further reduce the rate of alloimmunization, though this practice might add additional challenges to inventory management.

### Biography

- Mirette Hanna, MD, PhD, FRCPC.
- Mirette Hanna, is a hematopathologist and assistant professor in the Department of Laboratory Medicine and Pathobiology, at the University of Toronto, Canada.
- Dr. Hanna completed a residency training in hematologic pathology at the University of Ottawa in Canada. In addition, she earned a PhD in experimental medicine at Universite' Laval in Quebec, Canada.



### Performance evaluation of the Access HBsAg and Access HBsAg Confirmatory assays on the Dxl 9000 Access Immunoassay Analyzer

**Vanessa Roulet<sup>10</sup>, Benoit Visseaux<sup>1</sup>, Jérémie Gautier<sup>2</sup>, Françoise Le Boulaire<sup>2</sup>,  
Catherine Coignard<sup>3</sup>, Claire Vincent<sup>4</sup>, Sandrine Gréaume<sup>5</sup>, Isabelle Voisin<sup>5</sup>,  
Veronique Lemée<sup>6</sup>, Jean-Christophe Plantier<sup>6</sup>, Yves-Edouard Herpe<sup>7</sup>, Etienne  
Brochot<sup>8</sup>, Stephanie Bord<sup>9</sup>, Marc Turini<sup>9</sup> and Juliane Hey<sup>10</sup>**

<sup>1</sup>Laboratoire Cerba, France

<sup>2</sup>Cerba Xpert, France

<sup>3</sup>Infectology, Specialized CoreLab Department, Eurofins Biomnis, France

<sup>4</sup>Biomnis Sample Library Department, Eurofins Biomnis, France

<sup>5</sup>PLER Laboratory, Etablissement Français du Sang Haute-de-France – Normandie, France

<sup>6</sup>Laboratoire de Virologie, Institut de Biologie Clinique, Hôpital C. Nicole CHU Rouen, France

<sup>7</sup>Centre de Ressources Biologiques Biobanque de Picardie, CHU Amiens Picardie, France

<sup>8</sup>Laboratoire de Virologie, Centre de Biologie Humaine, CHU Amiens Picardie, France

<sup>9</sup>R&D Department, Beckman Coulter, Immunotech, France

<sup>10</sup>Clinical Affairs Department, Beckman Coulter, Immunotech, France

**Introduction:** This study evaluated the clinical and analytical performances of the Access HBsAg and the Access HBsAg Confirmatory assays<sup>†</sup> on the Dxl 9000 Access Immunoassay Analyzer (Beckman Coulter).

**Materials and methods:** Diagnostic specificity and sensitivity of the Access HBsAg and Access HBsAg Confirmatory assays were evaluated by comparing the Access assays to the final HBsAg sample status determined using the Architect, PRISM, or Elecsys HBsAg assays, along with Architect or PRISM HBsAg Confirmatory assays. Imprecision, sensitivity on seroconversion panels, analytical sensitivity (WHO), and recognition of HBV variants were also evaluated.

**Results:** A total of 7,534 samples were included in the analysis (6,047 blood donors, 1,032 hospitalized patients, and 455 positive patients' samples). The Access HBsAg assay sensitivity and specificity were at 100.00% (99.19-100.0) and 99.92% (99.82-99.97), respectively. Access HBsAg Confirmatory assay sensitivity was 100.00% (99.21-100.0) on the 464 HBsAg positive samples. A high positive algorithm for the

Access HBsAg assay, wherein samples with S/CO  $\geq 100.00$  were considered positive without requiring repeat or confirmatory testing, was successfully evaluated with all 450 specimens with S/CO greater than 100.00 confirmed as true positive. The Access HBsAg assay demonstrated good analytical performance, equivalent recognition of seroconversion panels compared to Architect assay, and an analytical sensitivity between 0.022 and 0.025 IU/mL. All HBV genotypes, subtypes, and mutants were detected without analytical sensitivity loss.

**Conclusion:** The new Access HBsAg and Access HBsAg Confirmatory assays demonstrated robust performances. They provide low sample volume requirements and a no systematic retesting for high positive samples.

*†Access HBsAg and Access HBsAg Confirmatory assays are CE Marked and available for sale in EU. Not all products are available in all countries.*

*The Beckman Coulter marks mentioned are trademarks of Beckman Coulter, Inc. All other trademarks are the property of their respective owners. 2024-12868*

### Biography

#### Education:

Vanessa Roulet holds a PhD in Biology and Life Science from the University of Rennes (INSERM U625, France), a University Diploma in Clinical Trials' Training for Investigators from the University Paris VII and has received additional education in Biochemistry and Immunology from the University Aix Marseille II.

#### Experience:

13 years of experience in Clinical Research, 10 years in Infectious Disease.

She began her career as an R&D preclinical project manager, working on virology diagnostic test development, and later transitioning to oncology drug development. She also served as a Clinical Affairs Manager in the orthopedics, digestive, and uro-gynecologic MD fields.

Since she joined Beckman Coulter, Vanessa Roulet is in charge of several multicenter European clinical trials evaluating the clinical performances of novel Blood Virus immunoassays on the Dxl 9000 Access Immunoassay Analyzer to obtain CE-marking.

#### Publications:

Author or co-author of seven peer-reviewed scientific articles, co-inventor of two patents.



## Expanding the horizon of Virus-Like Particles (VLPs) for human and animal health

**Yolandy Lemmer, Martha O'Kennedy and Santosh Ramchuran**

Council for Scientific and Industrial Research (CSIR), South Africa

Ensuring protection against various SARS-CoV-2 variants of concern (VOC) is crucial for the development of new or improved vaccines. We developed a candidate recombinant SARS-CoV-2 virus-like particle (VLP) vaccine, displaying the S-protein of the Beta VOC, using the *Nicotiana benthamiana* plant expression platform. In previous studies, this vaccine induced high neutralizing antibody titers in New Zealand white rabbits. In this study, we assessed the efficacy of the candidate vaccine in a Golden Syrian Hamster model, using either a squalene oil-in-water emulsion adjuvant (SEPIVAC SWE, Seppic, France) or a synthetic CpG adjuvant (DCA NADA, Disease Control Africa, South Africa).

A prime-boost regimen with a 5 $\mu$ g dose of the Beta VLP vaccine elicited a robust humoral immune response. Post-boost serum neutralization against the SARS-CoV-2 Beta variant resulted in GMT 583  $\pm$ 1523 for the vaccine/SEPIVAC SWE group and GMT 1231  $\pm$ 1479 for the vaccine/DCA NADA group. Cross-neutralization on day 44 against Delta and Omicron variants showed GMT 175  $\pm$ 667 for Delta and GMT 78  $\pm$ 71 for Omicron in the vaccine/SEPIVAC SWE group, and GMT 109  $\pm$ 159 for Delta and GMT 84  $\pm$ 78 for Omicron in the vaccine/DCA NADA group.

Upon challenge with the SARS-CoV-2 Beta variant, protective efficacy was demonstrated by a reduction in viral load on day 3 post-infection. The viral load was 5.7 x 10<sup>4</sup> copies/ $\mu$ l in the vaccine/SEPIVAC SWE group versus 7.6 x 10<sup>4</sup> copies/ $\mu$ l in the control group, and 7.8 x 10<sup>4</sup> copies/ $\mu$ l in the vaccine/DCA NADA group compared to 17.3 x 10<sup>4</sup> copies/ $\mu$ l in its control group. These results highlight the potential of a plant-produced VLP-based vaccine against SARS-CoV-2 VOCs and support the development of future pan-sarbecovirus vaccines.

### Biography

A/Prof. Yolandy Lemmer's (née Benadie) currently holds a Principal Scientist position in the Biomanufacturing Technologies team at Future Production and Chemicals, CSIR, South Africa. Her current work primarily focuses on leveraging recombinant technologies for protein production, spanning vaccines, antigens, antibodies, and peptides, catering to diagnostic and vaccine needs. In addition, she actively contributes to team training in animal

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handling, models, and immunological assays. With expertise in pre-clinical animal models, she has dedicated the past four years to developing therapeutics and vaccines against SARS-CoV-2. Her research expertise is vast, covering vaccine development, nanoencapsulation for drug delivery in infectious diseases, and the application of nanotechnologies. She has worked on diseases such as Mycobacterium Tuberculosis, African Horse Sickness, Brucellosis, and COVID-19.



## Nano-immunology: Using nanomaterials to control the immune response

**Thomas J. Webster<sup>1,2,3</sup>**

<sup>1</sup>School of Health Sciences and Biomedical Engineering, China

<sup>2</sup>School of Engineering, Saveetha University, India

<sup>3</sup>Program in Materials Science, UFPI, Brazil

Nanotechnology has already revolutionized numerous industries from alternative energy to medicine. This invited talk will cover how nanoparticles can be used to either maximize or minimize immune cell functions to control inflammation. Specifically, studies will be reported in which nanotextured spinal implants inserted into humans (over 14,000 over the past 5 years) have shown no chronic inflammation and no implant rejection. Alternatively, nanoparticles will be presented in which immune cell response can be activated to kill bacteria and cancer cells. Further, implantable nanosensors will be introduced which can measure inflammation, communicate such information to a hand-held device, and then if needed, release molecules to control an immune response. The future of the merging of nanotechnology with immunology will also be presented.

### Biography

Thomas J. Webster's (H index: 123; Google Scholar) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has served as a professor at Purdue (2000-2005), Brown (2005-2012), and Northeastern (2012-2021; serving as Chemical Engineering Department Chair from 2012 - 2019) Universities and has formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 20,000 patients. His technology is also being used in commercial products to improve sustainability and renewable energy. He is currently helping those companies and serves as a professor at Brown University, Saveetha University, Vellore Institute of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society for Biomaterials and has over 1,350 publications to his credit with over 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.





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

**Puspa Raj Khanal<sup>2</sup>, Tika Bahadur Thapa<sup>1,2</sup>, Sushant Pokhrel<sup>1</sup>, Anit Lamichhane<sup>1,2</sup>, Vinay Kumar Singh<sup>2</sup>, Ojaswee Shrestha<sup>2</sup> and Manisha Sapkota<sup>1</sup>**

<sup>1</sup>Department of Laboratory Medicine, Manmohan Memorial Institute of Health Sciences, Nepal

<sup>2</sup>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 midstream 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.

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### 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 Immunopathology at the prestigious government institution, PGIMER, Chandigarh, India. Currently, he is working as a laboratory practitioner involved in teaching, learning, and research.



## Future virology: Expanding the focus of undergraduate training

### Borianna Marintcheva

Bridgewater State University, USA

Historically, knowledge about viruses, viral molecules, and viral structural elements have been a strong driver for the development of new technologies on the forefront of biomedical innovation. In contrast, Virology courses on the undergraduate level are typically focused on viruses as disease-causing agents. Usually, students come across virus-specific features as a part of the description of the viral structure and life cycles with the goal to demonstrate cause/effect relationship between the characteristics of the virus and the resulting pathology. Frequently, students walk away with the big idea that “we study viruses solely because they make us sick”, missing an opportunity to recognize virology contributions elsewhere and to form a mindset of intentionally seeking practical applications of their future discoveries. I have designed and piloted a writing-intensive elective course *Viruses and technology*, which integrates content on virus-based technologies with instruction on primary-literature analysis and scientific communication. Collaborative teams of three to five students work together to explore topics in the broad areas of Viral nanotechnology, CRISP gene editing, Virus-driven Biocontrol, Phage therapy and Phage display. Students received instruction on key concepts in virology, were guided through reading primary articles with increasing level of complexity and worked together to develop a case study focusing on a single technological development or application of their choice. Teams shared their newly accumulated knowledge with the rest of the class in a panel presentation featuring overview of the field and summaries of individual case studies. At the end of the semester students assembled a course portfolio and reflected on their experience with a focus on accomplishments and challenges. Most of the students (n=36) shared that they were proud of their work, were challenged by the level of expected details, and most frustrated with the process of integrating complex information from multiple sources.

### Biography

Borianna Marintcheva is a Professor of Biological Sciences at Bridgewater State University, Bridgewater, Massachusetts where she teaches Virology, HIV Biology, Viruses and Technology, HIV and Society among

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other courses. BY training she is a molecular virologist who has studied HSV-1 and bacteriophage T7. She is an author of *Harnessing the Power of Viruses*, Academic Press'2018 where she explores the application of scientific knowledge about viruses and their "lives" to solve practical challenges and further advance molecular sciences, medicine, and agriculture. She is passionate about science education and science promotion, and views technology in all shapes and forms as a potential driver of curiosity creativity and motivation to learn as well as powerful evidence for positive impact of science on human life.



## Unravelling the role of nuclear INPP5K in B cells biology: Insights into B cell activation and splicing regulation

**Alice Mostafa and Stephane Schurmans**

GIGA Research Centre, University of Liège, Belgium

The finely tuned regulation of B cell activation and development is largely dependent on specific molecular signalling pathways. Of these regulators, phosphoinositide 5-phosphatase INPP5K has emerged as an important player, as demonstrated by the significant changes in mouse B cell biology that result from its deletion. Notably, *Inpp5k* knockout results in almost complete absence of serum immunoglobulins and changes in B cell subpopulations. Mechanistic studies have shown that loss of *Inpp5k* increased the concentration of its substrate, PtdIns (4,5) P<sub>2</sub>, which affects IL7 receptor's dynamic structure and ensuing signalling cascades. A conserved polybasic amino acid sequence in the cytoplasmic juxtamembrane region of the IL7R $\alpha$  chain exhibits enhanced interactions with PIP<sub>2</sub> in the absence of *Inpp5k*, causing structural rigidity and defects in downstream signalling critical for B cell differentiation (Möes et al., Blood, 2023).

Our recent investigations into the nuclear expression of *Inpp5k* have unveiled intriguing insights into its role within mouse splenic follicular B cells. Notably, the absence of *Inpp5k* induces morphological alterations in the nucleus, characterized by an increased size, widened interchromatin regions, and the presence of multiple enlarged nucleoli of a compact type, suggesting stimulation of ribosomal biogenesis. RNA-seq analysis confirmed these findings, showing upregulation of ribosomal proteins expression and aberrant splicing events in genes crucial for B cell activation.

Moreover, immunocytochemistry showed a nuclear localization of *Inpp5k* within FO B cells, particularly in nuclear speckles and gems of Cajal bodies, implicating its involvement in nuclear processes. Immunoprecipitation experiments revealed an interaction between *Inpp5k* and the SMN, which is crucial for snRNP assembly and pre-mRNA splicing. Alteration in SMN expression in *Inpp5k*-deficient B cells supports the observed splicing defects.

These results shed light on the crucial role that *Inpp5k* plays in preserving the integrity and functionality of B cells and may help explain immunological diseases linked to its dysregulation.

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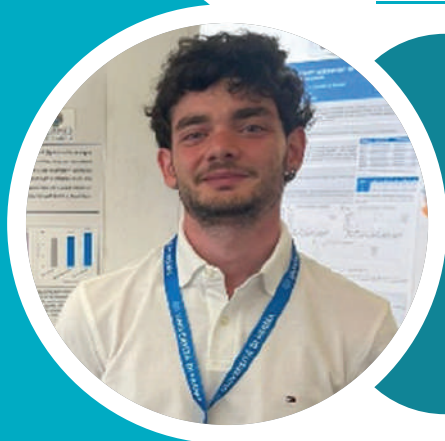


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### Biography

Alice Mostafa is a Ph.D. candidate at the University of Liege (GIGA research centre) in Belgium. Her academic journey began with a bachelor's degree in biomedical sciences (Damascus university, Syria), where she cultivated a strong knowledge in medicine and biology. This was followed by a master's degree in biology (Biomedical Technologies of Health program from Southern Federal University, Russia), which equipped her with the necessary skills for conducting cutting-edge research. Then she worked as a research associate in the laboratories of Russian Academy of Sciences in Moscow before moving to Belgium in 2022 as she obtained a doctoral grant from ULiege to work on her PhD project which aims to unravel the role of Inpp5k phosphatase in the biology of immune B cells.



## Canine coronavirus infection is exacerbated by dioxin

**Luca Del Sorbo, Rosa Giugliano and Filomena Fiorito**

Department of Veterinary Medicine and Animal Production, University of Naples Federico II, Italy

A toxic contaminant, such as 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), known as dioxin, provokes immunosuppression and increases the susceptibility to infectious diseases, both in humans and animals. Several scientific studies have highlighted the link between air pollutants and various infectious diseases, including COVID-19. However, studies on the potential influence of environmental contaminants like dioxin on coronaviruses (CoVs) are very few in the scientific literature. In this study, using a canine fibrosarcoma cell line (A72), the effects of very low concentrations of TCDD (0.01-100 pg/mL) have been evaluated following infection with canine coronavirus (CCoV-II, strain S/378), an alphacoronavirus, which is commonly responsible for enteric disease resolvable without treatment, specially in puppies. However, mutations, insertions/deletions, and recombination events can remarkably impact on the evolution of CoVs, giving rise to new threatening strains. For instance, an extremely virulent CCoV strain has been identified from Italian outbreaks of lethal infections in dogs. Furthermore, the detection of novel canine-feline recombinant alphacoronaviruses, recently isolated from humans, emphasizes the cross-species transmission ability of CoVs. Our findings showed that dioxin during infection increased cell viability, provoking a significant growth in virus yield and in the expression of viral nucleocapsid protein in infected cells. Due to cell death, alterations in the morphology of infected groups were detected, and those features were dramatically enhanced by dioxin. In addition, TCDD regulated the pathway of aryl hydrocarbon receptor (AHR), a ligand-activated transcription factor sensible to the environment and host metabolism, is also modulated by CoVs infections.

Taken together, our preliminary results demonstrated that an environmental pollutant, like dioxin, acting on AHR signaling, may exacerbate CCoV infection.

### Biography

After a Bachelor Degree in Animal Production and Technologies, Luca Del Sorbo is currently a Master student in Animal Production Sciences and Technologies at the University of Naples Federico II. He is involved in animal coronaviruses research, also in the presence of environmental contaminants (dioxin). Moreover, he is currently focusing his research efforts on the in vitro test of potential antiviral properties of synthetic (CH223191) and natural compounds (fungal secondary metabolites) against herpesviruses and coronaviruses infections.



## Probiotics as an adjunctive intervention in systemic lupus erythematosus: A systematic review

**Arezoo Faridzadeh<sup>2,3</sup>, Zahra Mirfeizi<sup>1</sup> and Mahmoud Mahmoudi<sup>2,3</sup>**

<sup>1</sup>Rheumatology Department, Rheumatic Diseases Research Center, Mashhad University of Medical Sciences, Iran

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<sup>3</sup>Department of Immunology and Allergy, School of Medicine, Mashhad University of Medical Sciences, Iran

**Introduction:** Systemic lupus erythematosus (SLE) represents a persistent autoimmune condition predominantly impacting young females. Although the exact origin of SLE remains elusive, it is thought to be instigated by diverse factors, encompassing genetic predisposition, hormonal influences, and environmental conditions. The emergence of dysbiosis in the gut microbiota has been identified as a potential mechanism linking the intestinal microbiome to the disruption of self-tolerance and the onset of chronic inflammation. This literature review endeavors to examine the impact of probiotics in regulating the gut microbiome and assess their potential therapeutic advantages in the management of SLE, contributing insights for future research initiatives and clinical applications.

**Methods:** We conducted a thorough search for papers published up to June 2023 in databases such as PubMed/MEDLINE, Web of Science, Scopus, and Cochrane Library.

**Results:** The systematic review identified 22 articles investigating the effects of probiotics on SLE. These studies, encompassing *in vivo* tests, *in vitro* research, and clinical trials, suggest that probiotics exhibit potential efficacy in mitigating inflammation and enhancing immunological responses and metabolic profiles in individuals with SLE. The majority of *in vivo* studies were appraised as having medium to high quality, with the randomized controlled trial being evaluated as of high quality.

**Conclusion:** Based on the outcomes of our systematic review, it is suggested that probiotics could be employed in combination with other treatments for the management of SLE. However, the existing data is constrained, and a more comprehensive assessment of their effectiveness would necessitate additional randomized controlled trials.



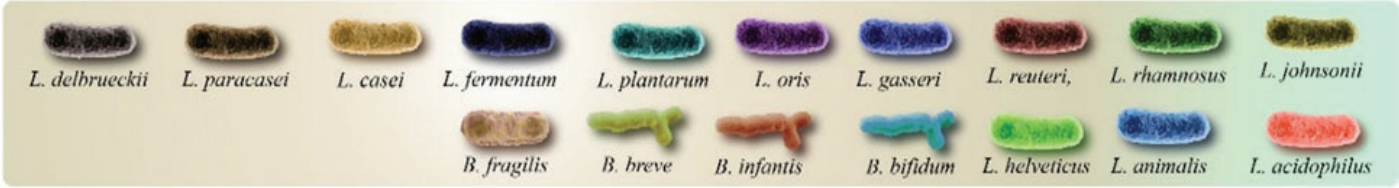
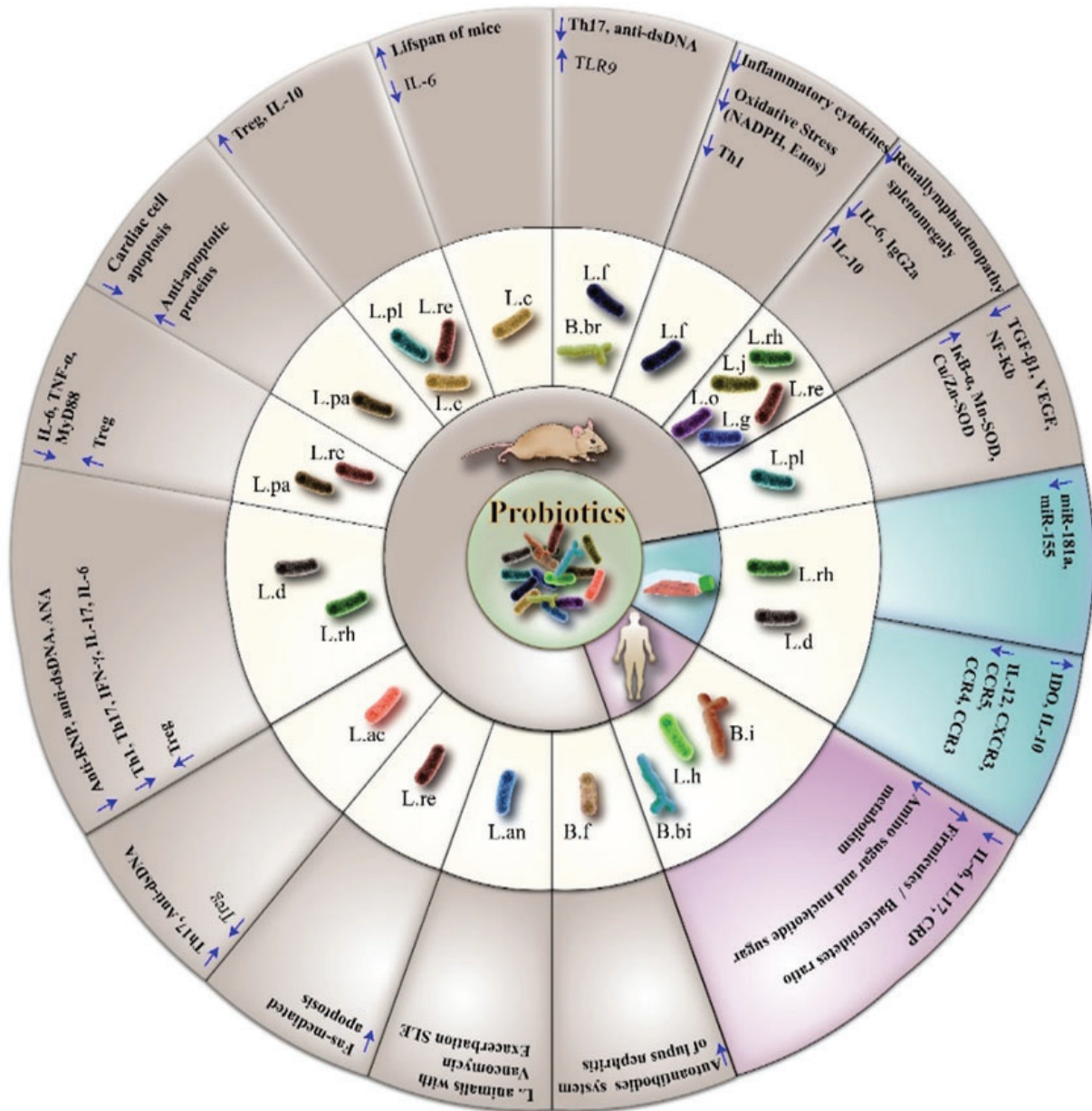


Figure 2: Overview of the Effects of Probiotics in Various Studies of SLE Disease

**Biography**

Dr. Arezoo Faridzadeh has a MD-PhD in medical immunology. She spent one year as a postdoctoral researcher in the rheumatology department and she is currently immersed in research at the Lung Department of Imam Reza Hospital in Mashhad, Iran, focusing on refractory asthma and probiotics.



### Unveiling the lockdown effects: Exploring behavior, dietary habits and weight changes in rural Egypt during COVID-19 lockdown: A cross-sectional retrospective

**Mahmoud Reda Saleh<sup>1</sup>, Mohamed Y. Abdelgaied<sup>2</sup>, Naira Galal<sup>1</sup>, Mai Tarek<sup>1</sup>, Aya Fouda<sup>1</sup> and Khaled Abdelkawy<sup>1</sup>**

<sup>1</sup>Kafrelsheikh University, Egypt

<sup>2</sup>Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, Canada

**Background:** The COVID-19 lockdown significantly impacted dietary habits and body weights globally, particularly in Egypt, where 57.03% of the population resides in rural areas, despite lack of information. The study examines the impact of COVID-19 lockdown on the weight changes of the rural Egyptian population through behavioral, physical, and dietary changes.

**Methods:** A cross-sectional online survey using Microsoft Forms was distributed in Delta regions in Egypt. The questionnaire used a modified version of the validated 14- items PREDIMED MedDiet Adherence Screener (MEDAS). The first part of the questionnaire addressed sociodemographic variables whereas the second one included questions related to dietary, behavioral and weight changes of participants. These changes were statistically tested for significance in relation to BMI, gender, home living, current job and family history of obesity.

**Results:** A total of 306 participated in the study (70% females, 13% obese, 95% living with family, 56% university students, and 36% with family history of obesity). Obese showed a significant increase in sweet intake whereas underweight and normal weight people displayed a significant decrease in eating desire. Both females and males showed significant increase in consumption of fruits and vegetables with significant decrease in soft drink. However, women showed a significant decrease in sport activity relative to men. Participants living with family showed an increase in sweet intake while those living alone explored an increase in meal frequency. Employers revealed a significant decrease in sport activities and people with family history of obesity reported more sleeping times than those without family history of obesity.

**Conclusion:** During Covid-19 quarantine, Egyptians' eating habits improved, but daily routines were disrupted. Raising awareness about obesity and providing guidance on maintaining activity, energy, and mood is crucial for future quarantine situations.

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### Biography

Mahmoud Reda Saleh is a dedicated clinical pharmacist from Kafr-Elsheikh, Egypt, with a specialized focus on Clinical Oncology Pharmacy. His professional journey has been marked by extensive practical experience and significant contributions to clinical research. In his roles at Kafr-Elsheikh Military Hospital and the KFS Oncology Center, he has expertly managed chemotherapy protocols, monitored patient outcomes, and collaborated with multidisciplinary teams.

He has led independent projects that showcase his analytical and investigative capabilities. His work includes an analysis of the behavioral impacts of COVID-19 lockdowns. He is committed to continuous professional development, having completed additional training in academic writing, digital transformation, and clinical research methodologies.

His goal is to enhance patient outcomes through personalized therapy and advanced pharmacotherapy. His career is a testament to his unwavering dedication to improving patient care and advancing the field of clinical pharmacy.



## Epigenetic regulation of SETD8 methyltransferase in TNBS-induced colitis treated with carbamylated Erythropoietin

**Priscila Mendes<sup>1</sup>, Cristiana Loução<sup>1</sup>, Diana Pedrosa<sup>2</sup>, Inês Silva<sup>1,3</sup>, Mário Gomes<sup>1,4</sup>, João Estarreja<sup>1</sup>, Mariana Delgado<sup>1</sup>, Edna Ribeiro<sup>1</sup>, Rui Pinto<sup>5</sup> and Vanessa Mateus<sup>1,3</sup>**

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<sup>2</sup>Faculty of Medicine and Biomedical Sciences, University of Algarve, Portugal

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<sup>4</sup>Centro de Química Estrutural, Institute of Molecular Sciences, Instituto Superior Técnico, Universidade de Lisboa, Portugal

<sup>5</sup>Joaquim Chaves Saúde, Laboratório de Análises Clínicas, Portugal

**Introduction:** Inflammatory bowel disease (IBD) represents a major public health burden [1]. The currently used therapy do not reverse the underlying pathogenic mechanisms. IBD patients and animal models of colitis exhibit increased p62 expression, associated with a simultaneous increase in inflammatory cytokines level. Epigenetic alterations, such as histone modification, play a key role in regulating p62 expression. SETD8, a histone H4K20 methyltransferase, regulates p62 expression limiting the inflammatory response in colitis [2]. Understanding these molecular mechanisms could contribute to new potential therapeutic targets. Carbamylated Erythropoietin (cEPO) was recently reported as a new possible pharmacological approach for IBD [3].

**Aim:** Evaluate the epigenetic regulation of SETD8 methyltransferase in TNBS (2,4,6-Trinitrobenzenesulfonic acid)-induced chronic colitis treated with cEPO.

**Methods:** Five weekly intrarectal administrations of 1% TNBS were used to induce chronic colitis on female CD-1 mice [3]. Mice were treated with cEPO (500 IU/kg/day or 1000 IU/kg/day, intraperitoneally) for four weeks. SETD8, p62, IL-6 and TNF- $\alpha$  expression was measured in the colonic tissue by RT-qPCR using specific primers.

**Results:** TNBS-induced groups showed increased expression of p62 ( $p < 0.001$ ), IL-6 and TNF- $\alpha$  ( $p < 0.05$ )

in the colonic tissues, compared to the control group. SETD8 expression was increased in TNBS-induced groups, compared to the control group ( $p < 0.001$ ) and it was decreased in cEPO1000 group, compared to the TNBS-induced group with no treatment ( $p < 0.001$ ). cEPO1000 treatment group presented a decrease in the expression of p62, IL-6, TNF- $\alpha$ , and SETD8, compared to the TNBS-induced group with no treatment. cEPO 1000 administration in healthy animals increased p62 and IL-6 expression, compared to the control group ( $p < 0.001$ ).

**Conclusions:** Expression patterns of SETD8, p62, IL-6 and TNF- $\alpha$  suffer alterations in the colonic tissue of TNBS-induced colitis. cEPO induced transcriptional effects in p62, IL-6 and TNF- $\alpha$ . Future studies will be necessary to evaluate the effect of cEPO in healthy animal models.

[1] Wang R, et al., 2019 BMJ Open 13:e065186 (2013); [2] Chen P, et al., J Gastroenterol Hepatol 36(10):2850-2863 (2021); [3] Silva I, et al., Biomedicines 11, 2497(2023).

**Acknowledgements:** This research was supported by Instituto Politécnico de Lisboa (IPL/IDI&CA2023/COLEpiGen\_ESTeSL) and Fundação para a Ciência e a Tecnologia national support (UIDB/05608/2020 and UIDP/05608/2020).

### Biography

Professor Priscila Mendes is currently integrated member of Health and Technology Research Center and Adjunct Professor at Lisbon School of Health Technology, Polytechnic Institute of Lisbon. She completed her PhD in Neurosciences from the Faculty of Medicine, University of Porto. She has authored several publications in peer-reviewed journals linked to main research interests in Pharmacology, Inflammation and Neurosciences. For the last years she has been working in animal models of Inflammatory Bowel Disease and Cerebral Ischemia to the development of new pharmacological targets. She is currently principal investigator of two ongoing funded projects and in the last decade participated in several projects. She supervised master's and undergraduate/bachelor research projects and participated in several academic juries.



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



Yuan Ma<sup>1</sup>, Zheng Ren<sup>1,2</sup> and Jing Wang<sup>1,2</sup>

<sup>1</sup>Xinjiang Institute of Spinal Surgery, Sixth Affiliated Hospital of Xinjiang Medical University, China

<sup>2</sup>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.



### Performance evaluation of the Access anti-HBc Total assay on the Dxl 9000 Access Immunoassay Analyzer

**Rima Bayoud<sup>9</sup>, Simplicie Dzamitika<sup>1</sup>, Françoise Le Boulaire<sup>1</sup>, Catherine Coignard<sup>2</sup>, Claire Vincent<sup>3</sup>, Jean- Christophe Plantier<sup>4</sup>, Véronique Lemée<sup>4</sup>, Sandrine Gréaume<sup>5</sup>, Isabelle Voisin<sup>5</sup>, Etienne Brochot<sup>6</sup>, Yves-Edouard Herpe<sup>6</sup>, Gaiane Demirdjian<sup>7</sup>, Magali Karagueuzian<sup>7</sup>, Derrick Afful<sup>8</sup> and Juliane Hey<sup>9</sup>**

<sup>1</sup>Cerba Xpert, Saint-Ouen l'Aumône, France

<sup>2</sup>Infectology, Specialized CoreLab Department, Eurofins Biomnis, France

<sup>3</sup>Biomnis Sample Library Department, Eurofins Biomnis, France

<sup>4</sup>Laboratoire de Virologie, Institut de Biologie Clinique, CHU Rouen, France

<sup>5</sup>PLER Laboratory, Etablissement Français du Sang Haute-de-France – Normandie, France

<sup>6</sup>Centre de Ressources Biologiques Biobanque de Picardie, CHU Amiens-Picardie, France

<sup>7</sup>R&D Department, Beckman Coulter, Immunotech, France

<sup>8</sup>Clinical Affairs Department, Beckman Coulter, United States

<sup>9</sup>Clinical Affairs Department, Beckman Coulter, Immunotech, France

This study evaluated the diagnostic and analytical performances of the Access anti-HBc Total assay on the Dxl 9000 Access Immunoassay System (Beckman Coulter Inc.). The multicenter study involved both prospective and retrospective sample collection from non-selected blood donors, hospitalized patients, or presumed anti-HBc Total positive individuals. Fresh/previously-frozen samples were tested with the Access and comparator assays to determine concordance; discrepant samples were tested with a second CE-marked assay. Among the 5983 non-selected fresh blood donor samples deemed anti-HBc Total negative, clinical specificity of the Access assay was 99.58% (95%CI: 99.38 – 99.72%). Clinical specificity was 99.27% (97.37 – 99.80%) among 273 anti-HBc Total negative hospitalized patient samples. Clinical sensitivity on 450 anti-HBc Total positive samples was 99.78% (98.75 – 99.96%). Evaluation in seroconversion panels revealed an average 1.4-day earlier detection versus a comparator assay. The Access assay demonstrated excellent clinical and analytical performances comparable to existing CE-marked anti-HBc Total assays.



*†Access anti-HBc Total assay is CE Marked and available for sale in EU. Not all products are available in all countries. Product availability and regulatory status depends on country registration per applicable regulations.*

*CE-IVD, CE: Products intended for in vitro diagnostic use and conforming to Vitro Diagnostic Medical Devices Regulation (EU) 2017/746 (IVDR).*

**NOTE:** *Devices may be CE marked to other directives than (98/79/EC)*

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### Biography

Education: Rima BAYOUD holds a degree in veterinary science and obtained her PhD in Virology from the University of Paris VII. She completed clinical research training at Clinact (TempoPharma).

Experience: 11 years of experience in Clinical Research and 8 years in Infectious Disease.

She began her career in clinical research as a project manager in neurology. Before joining Beckman Coulter in 2022, she worked as a hospital Clinical Research Associate in virology and then as a project manager, notably for a European Reference Network (ERN) and a Medical-University Departments (DMU) in central Paris.

Since joining Beckman Coulter, she holds the position of Clinical Scientist and is in charge of the clinical performance evaluation, in terms of diagnostic accuracy measured by specificity and sensitivity, of novel Blood Virus immunoassays for in-vitro diagnostics to obtain CE-marking.

Publications: Author or Co-author of 8 peer review scientific articles.



## Epidemiological modeling with differential equations

### Uzoma Kenneth Egeonu

Department of Mathematics, Southern Illinois University, USA

If we are interested in studying an epidemic that occurred (or is occurring) at a particular period of time (which is usually short compared to the situation where the spread is already endemic in any given population), the effect of demography (or demographic parameters) is usually not taken into consideration. However, there could be exceptions. For example, if immigration was seen to have triggered an epidemic (and there are evidences that during the epidemic, there were still cases of significant migration of infected individuals) and there were high incidences of disease-induced deaths, then the corresponding demographic parameters could be added to the mathematical model. In summary, epidemic models tries to describe the rate of rapid outbreaks that could occur in a very short time period (less than one year), while endemic models studies diseases over a longer periods of time in a population, in which there could be interruptions of susceptible individuals by births, susceptibility after a previous infection (temporary immunity) and occurrences of natural deaths and migration.

### Biography

Uzoma Kenenth Egeonu is a research associate with an understanding of the epidemiology of infectious diseases and how to optimize strategies for their control using modern methods of mathematical analysis and developing new methods as necessary.

He had his undergraduate and master's degrees at the Federal University of Technology, Owerri, Imo State, Nigeria, in industrial and applied mathematics in 2020 with a medal certificate. He is currently carrying out research at Southern Illinois University Carbondale in the United States.

In recent years, as a research associate, he has always enjoyed developing and analyzing models that help control infectious disease. His research interests include multimodality registration and its application to infectious disease growth and remodeling of biological tissue, stress defect interactions and movement in semiconductor materials, multiscale aspects of material behavior, fractional-order differential equations with some notable parameters in the fractional system, and a co-dynamic model analysis.



## Comparing clinical trial drug efficacy of biologics for atopic dermatitis by patient level characteristics

A. Haque<sup>3</sup>, S.M. Rahman<sup>1</sup> and F. Ahmed<sup>2</sup>

<sup>1</sup>University of Rochester School of Medicine & Dentistry, USA

<sup>2</sup>Perelman School of Medicine, University of Pennsylvania, USA

<sup>3</sup>Pennsylvania Dermatology Partners, USA

**Scope:** Biologic therapies such as JAK-inhibitors (Abrocitinib, Upadacitinib), IL-4 (Tralokinumab), and IL-13 (Dupilumab) antagonists have recently been approved by the FDA for moderate-to-severe atopic dermatitis (AD).

**Objective:** Given these advances and limited understanding of the comparative drug efficacy, we sought to summarize and evaluate drug efficacy, safety, and monitoring requirements by patient profile to optimize outcomes.

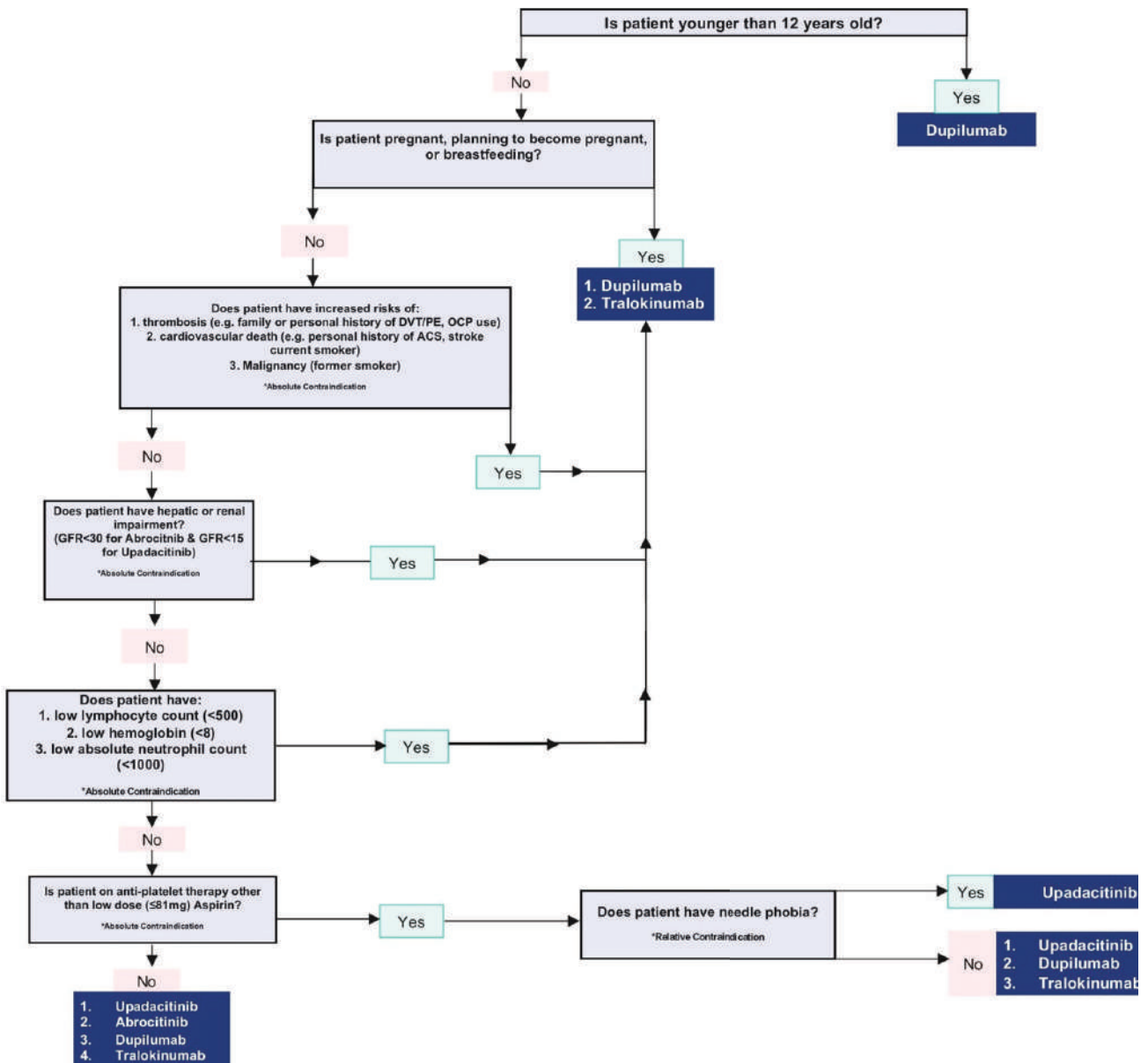
**Methods:** Published phase 3 clinical trial data for each biologic as of May 2022 was identified using ClinicalTrials.gov. Our primary endpoint scores included 16-week change from baseline of: Eczema Area and Severity Index improvement > 75% (EASI 75), SCORing atopic dermatitis (SCORAD) score, Dermatology Life Quality Index (DLQI), Pruritus Numerical Rating scale (NRS), and Investigator's Global Assessment (IGA) score.

**Results:** In terms of maximum reported EASI75 benefit, JAK-inhibitors had greater improvements compared to IL-4/IL-13 antagonists. EASI75 reported as a percent of patients with improvement varies significantly by drug: 39.7 to 76.0 (Abrocitinib), 60.1 to 73.4 (Upadacitinib), 41.5 to 68.9 (Dupilumab), 25.0 to 64.2 (Tralokinumab). These efficacy ranges depend on a patient's age, comorbidities, adjunctive treatments, dosage, and immune status among others. Therefore, we have proposed an evidence-based table (Figure 1) and algorithm (Figure 2) for screening AD patients for each approved biologic therapy based on patient profile and drug efficacy data as well as suggested drug monitoring parameters.

**Conclusions:** We acknowledge the utility of oral JAK-inhibitors for AD treatment in lieu of monoclonal antibodies but want to highlight the importance of adequately screening patients to tailor treatment regimens for optimal outcomes, particularly with rapidly changing AD treatment options.

Drug Name	Abrocitinib	Upadacitinib	Dupilumab	Tralokinumab
Drug Class	JAK inhibitor	JAK inhibitor	Monoclonal Antibody; IL-4 receptor antagonist	Monoclonal antibody; IL13 antagonist
Route of Admin	Oral	Oral	Subcutaneous	Subcutaneous
Adult Dosage	Initial Dose: 100 mg Maintenance Dose: 100 mg once daily, increase to 200 mg if no improvement after 12 weeks	Initial Dose: 15 mg Maintenance Dose: 15 mg once daily with an increase to 30mg if there is lack of adequate therapeutic response	Initial Dose: two 300mg injections Maintenance Dose: 300 mg once every other week	Initial Dose: four 150mg injections Maintenance Dose: two 150 mg once every other week
Pediatric Dosage	N/A	*For use in Children $\geq 12$ years old and weighing $\geq 40$ kg  Initial dose: 15 mg  Maintenance dose: 15 mg once daily with an increase to 30mg if there is lack of adequate therapeutic response	*pre-filled syringe can be used in ages $\geq 6$ years *pre-filled pen can be used only in ages $\geq 12$ years  <b>15 to &lt;30kg:</b> Initial dose: two 300 mg injections Maintenance dose: 300 mg injection every 4 weeks  <b>30 to &lt;60kg:</b> Initial dose: two 200mg injections Maintenance dose: 200mg injection every other week  <b><math>\geq 60</math> kg</b> Initial dose: two 300mg injection Maintenance dose: 300mg every other week	N/A
Other labeled indications		Psoriatic Arthritis Rheumatoid Arthritis Ulcerative Colitis	Moderate to severe eosinophilic asthma Chronic rhinosinusitis with nasal polyposis Eosinophilic Esophagitis	N/A
Contraindications	Current use of antiplatelet therapy except for low dose aspirin ( $\leq 81$ mg daily) during the first 3 months of treatment	absolute lymphocyte count $< 500/mm^3$ , ANC $< 1,000/mm^3$ , or Hb $< 8$ g/dL	Known hypersensitivity to Dupilumab	Known hypersensitivity to Tralokinumab
Off label uses			Bullous Pemphigoid, Allergic Contact Dermatitis, Chronic Urticaria, Prurigo Nodularis, Alopecia Areata	
Reported Relative Adverse Effects	Acne vulgaris, contact dermatitis, impetigo, nausea, abdominal pain, vomiting, infection, nasopharyngitis,	Acne vulgaris, folliculitis, upper respiratory infection, bronchitis, abdominal pain, weight gain, nausea,	Local injection site reaction, gastritis, helminth infection, arthralgia,	Local injection site reaction, upper respiratory infection, keratitis, conjunctivitis
Reported Significant Adverse Effects		Reactivation of herpes zoster and hepatitis B, tuberculosis infection, lymphoma, GI perforation, elevated liver enzymes, anaphylaxis, and angioedema	Urticaria, angioedema, psoriasis, immune thrombocytopenia, conjunctivitis	Keratocconjunctivitis and ulcerative keratitis
Black Box Label Significant Safety Risks	Increased risk of cardiovascular death, thrombosis, lymphoma, mortality (in rheumatoid arthritis patients)	Increased risk of heart attack, thrombosis, stroke, lymphoma, lung cancer, and opportunistic infections (tuberculosis, cryptococcus, pneumocystis, herpes zoster)	N/A	
Drug Interactions		Avoid combination with topical/systemic immunosuppressants		Efgartigimod Alfa (VYgart; used for Myasthenia Gravis): Reduced efficacy of Fc-binding agents
Parameters To Monitor		Avoid use with topical/systemic immunosuppressants, killed/inactivated vaccines, live vaccines		Live Vaccines: Adverse reactions and toxicities of live vaccines may be exacerbated
EAS1, 16 weeks	39.7 to 76.0	60.1 to 73.4**	41.5 to 68.9	25.0 to 64.2
SCORAD, 16 weeks	-71.7 to -27	-65.7 to -57.9**	-63.9 to -51.6	-42.7 to -25.2
DLQI, 16 weeks	-8.6 to 1.9	N/A**	-10.7 to -8.5	-11.7 to -6.1
NRS, 16 weeks	37.7 to 54.6	38.2 to 52.2**	36.6 to 58.8	20 to 45.5
IGA, 16 weeks	23.7 to 55.5	21.4 to 44.8**	24.4 to 40.2	15.8 to 40.9

**Figure 1.** Comparison of Efficacy Data between Abrocitinib, Upadacitinib, Dupilumab, Tralokinumab. Range for each primary endpoint is listed from minimum value to maximum value observed in clinical trials after pooling of Phase III studies with published results. Primary endpoints from clinical trials are as follows: EASI75, 16 weeks: percentage of Participants Achieving a 75% Reduction from Baseline in Eczema Area and Severity Index Score (EASI 75) at Week 16. SCORAD, 16 weeks: Percent Change from Baseline in SCORing Atopic Dermatitis (SCORAD) Score at Week 16. DLQI, 16 weeks Change from Baseline to Week 16 in Dermatology Life Quality Index (DLQI) Total Score. NRS, 16 weeks: Percent Change from Baseline in Worst Pruritus Numerical Rating Scale (NRS) Score at Week 16. IGA, 16 weeks: % Participants with Investigator's Global Assessment (IGA) Score of "0" or "1" and Reduction From Baseline of Greater Than or Equal to ( $\geq$ ) 2 Points at Week 16



**Figure 2.** Treatment Algorithm to assist clinicians in deciding whether to prescribe abrocitinib, upadacitinib, dupilumab, tralokinumab by first identifying age range of patients, followed by absolute contraindications, drug efficacy, and relative contraindications. If a treatment algorithm end point yields multiple drug options that can be used, recommended drug choices are listed in numerical order based on clinical trial efficacy data.

### Biography

Dr. Adel Haque is a distinguished board-certified dermatologist and Mohs surgeon based in Pennsylvania, acclaimed for his comprehensive expertise and dedication to patient care. An alumnus of Georgia Tech and the Medical College of Georgia, Dr. Haque has been recognized for his exceptional academic and clinical skills, as well as his profound commitment to community service. With a heritage rooted in India, he brings warmth and inclusivity to his practice, ensuring every patient feels like family. His proficiency extends across complex dermatological conditions and dermatological surgery. As an advocate for patient well-being, Dr. Haque's holistic approach to treatment is complemented by his role as a trusted speaker for leading pharmaceutical companies.

## About us

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