

2026

LONDON, UK

25
26
JUNE



4TH WORLD CONGRESS ON

**INFECTIOUS DISEASES
AND ANTIMICROBIAL
RESISTANCE**

SCIENTIFIC PROGRAM

DAY 01
THURSDAY

JUNE 25, 2026

08:00-08:30

Registrations

08:30-08:40

Inaugural Ceremony

Moderator

Carol Camp Yeakey, *The Marshall S. Snow Professor of Arts & Sciences, School of Arts & Sciences, Professor of Public Health, Bursky School of Public Health, Washington University in St. Louis, USA*

Topics: Infectious Diseases and Global Health | Infection Prevention and Control | Virology and HIV/AIDS | Immunology and Clinical Microbiology | Public Health and Epidemiology | Influenza | Zoonotic Diseases | Contagious Diseases | Next-Generation Antibiotics | Vaccines and Immunization | Ophthalmological Infectious Diseases | COVID-19 | Blood-Borne Diseases | Clinical Trials and Case Studies | Antiviral Drug Resistance

Distinguished Speaker Talks

Session Chair

Faisal M. Rahman, *Saint Xavier University, USA*

Session Chair

Florence D. Hudson, *Columbia University, USA*

08:40-09:00

Title: Compound Vulnerability: Mitigating Neighborhood Inequality, Environmental Disaster and Health Inequity among the Poor
Carol Camp Yeakey, *The Marshall S. Snow Professor of Arts & Sciences, School of Arts & Sciences, Professor of Public Health, Bursky School of Public Health, Washington University in St. Louis, USA*

09:00-09:20

Title: The COVID Information Commons - A Portal and Community for Researcher Collaboration

Florence D. Hudson, *Columbia University, USA*

09:20-09:40 Title: AI Fueled Technology & US Healthcare – Emulatable Lessons in Affordability, Accesibility & Accountability

Faisal M. Rahman, *Saint Xavier University, USA*

09:40-10:00 Title: Effects of Dietary Humic Acid Supplementation on Survival, Immune Response, and Gut Microbiota in Nile Tilapia (*Oreochromis niloticus*) Challenged with *Lactococcus garvieae*

Eden Vladimir Gaitan Morado, *Universidad Michoacana de San Nicolás de Hidalgo, México*

10:00-10:20 Title: A Unified Stochastic SIR Model with Parameter Estimation and Application to the COVID-19 Pandemic

Wei Sun, *Concordia University, Canada*

10:20-10:40 Title: Fatal Acute Miliary Tuberculosis Complicated by Obstructive Jaundice, Acute Pancreatitis, and Hemophagocytic Lymphohistiocytosis in a 57-Year-Old Immunocompetent Female: A Case Report

Akram Shammat, *Zulekha Hospital, United Arab Emirates*

GROUP PHOTO 10:40-10:50

REFRESHMENT BREAK 10:50-11:00

11:00-11:20 Title: Histoplasmosis in Oaxaca: An Emerging Systemic Mycosis Beyond Immunosuppression

Joscelin Amaranta Macías Ríos, *Instituto Mexicano del Seguro Social (IMSS) & Hospital General "Dr. Aurelio Valdivieso", México*

11:20-11:40 Title: Antibiotic and Heavy Metal Resistance Genes and Antibiotic-Resistant Bacteria (ARB) from Natural Aquatic Environments, Sewage Water Systems, and Sewage Treatment Plants (STPs) from India

Qazi Mohd Rizwanul Haq, *Jamia Millia Islamia (A Central University), India*

11:40-12:00 Title: Prevalence and Predictors of Malaria-Associated Acute Kidney Injury among Adults with Severe Falciparum Malaria in Tanzania

Priyank Chandrakant Punatar, *Muhimbili University of Health and Allied Sciences & Muhimbili National Hospital, Tanzania*

12:00-12:20 Title: Evaluation of *Sida cordifolia*-Based Hydrogel in the Management of Infection-Prone Delayed Burn Wounds

Shweta Kumar, *S. V. Polytechnic College, India*

12:20-12:40 Title: Simple Bacterial Nasopharyngitis Leading to Atypical Skull Base Osteomyelitis—A Case Report

R. Komathi S. Ramachandran, *Hospital Putrajaya, Malaysia*

GROUP PHOTO 12:40-12:50

LUNCH BREAK 12:50-13:30

Session Chair **Faisal M. Rahman**, *Saint Xavier University, USA*

Session Chair **Florence D. Hudson**, *Columbia University, USA*

13:30-13:50 Title: Effect of Network Sparsity in Classifier Performance in ASD Patients: A Multicenter Study Based on Centrality Measures of rsfMRI

Anoop Jacob Thomas, *Indian Institute of Information Technology Tiruchirappalli, India*

13:50-14:10 Title: N-Acetylcysteine to Reduce Kidney and Liver Injury Associated with Drug-Resistant Tuberculosis Treatment

Hadija Semvua, *Kilimanjaro Clinical Research Institute (KCRI)/KCMC University-Moshi, Tanzania*

14:10-14:30 Title: Intra-Oral Dirofilariasis: Case Experience from India

Rakesh Suresh, *Amrita Vishwavidyapeetham, India*

14:30-14:50 Title: From Natural Products to Smart Antimicrobial Systems: Toward Integrated and Sustainable Strategies against Antimicrobial Resistance

Soumia BELOUAGA, *University Hassan II of Casablanca, Morocco*

14:50-15:10 Title: Dental Health Concerns of Students Studying Abroad and the Prospects of Affordable Dental Care in South Asia

Umana Anjalin, *University of Liberal Arts, Bangladesh*

15:10-15:30 Title: HPV Awareness and Vaccine Knowledge Gaps among Adults in Bahrain: A Community-Based Study

Reem Al-Zahrani, *Arabian Gulf University, Kingdom of Bahrain*

15:30-15:50 Title: Biochemical and Ultrasound Predictors of ICU Admission among Hospitalized Dengue Patients in Bangladesh

Md. Tanzilur Rahman, *Chittagong Medical College, Bangladesh*

REFRESHMENT BREAK 15:50-16:00

16:00-16:20 Title: Health Benefits of Organic Food Products: Impact on Human Well-Being and Disease Prevention

Vilnara Alibekova, *Kazakh National Medical University named after S.D. Asfendiyarov, Kazakhstan*

16:20-16:40 Title: Risk Factors and Treatment of Squamous Cell Bladder Cancer

Meral KURT, *Uludag University, Türkiye*

16:40-16:50
POSTER Title: The COVID Information Commons – Machine Learning Powered Research Discovery

Florence D. Hudson, *Columbia University, USA*

16:50-17:05 Title: Emerging Perspectives on Platelet-Activating Factor in Relation to Magnesium Levels at the Cellular, Tissue and Systemic Levels in Disease States

Ezaan Khan, *Touro College of Osteopathic Medicine, USA*

17:05-17:20 Title: Resistance Patterns in Gram-Negative Bacilli Isolated in a Secondary Care Hospital: A Therapeutic Challenge in Western México

Sofía de la Paz García Alcazar, *Universidad de Guadalajara, México*

17:20-17:35	Title: Carbapenem Resistance in Klebsiella Pneumoniae: Evidence of Community Spread in Concordia (SC) - 2023/2024 Laís Destri dos Santos , <i>University of Contestado-Campus Concórdia, Brazil</i>
17:35-17:50	Title: AI Integrated Genomic Surveillance and Antimicrobial Discovery: A Mechanistic Review Güven Egemen Bilgesoy , <i>Yüksek İhtisas University, Türkiye</i>
17:50-18:05	Title: Purulent Septic Diseases of the Male Genital Organs Abilkhassenov Adil , <i>Astana Medical University, Kazakhstan</i>
18:05-18:25	Title: Diagnosis of Diabetes using Artificial Intelligence Programs Ammar Mohammed Zakariya , <i>Al-Iraqia University, Iraq</i>
18:25-18:45	Title: A Unified Real-Time Modeling Framework for Diverse Infectious Diseases and Adaptive Epidemic Response Eva K Lee , <i>The Data and Analytics Innovation Institute, USA</i>

NETWORKING

END OF DAY 1

JUNE 26, 2026

09:20-09:30

Introduction

Topics: Infectious Diseases and Global Health | Infection Prevention and Control | Virology and HIV/AIDS | Immunology and Clinical Microbiology | Public Health and Epidemiology | Influenza | Zoonotic Diseases | Contagious Diseases | Next-Generation Antibiotics | Vaccines and Immunization | Ophthalmological Infectious Diseases | COVID-19 | Blood-Borne Diseases | Clinical Trials and Case Studies | Antiviral Drug Resistance

Distinguished Speaker Talks

09:30-09:50

Title: Infectious Diseases in Italy: Guidelines for a Multidimensional Geographical Approach

Giovanni De Santis & Annamaria Bartolini, *University of Perugia, Italy*

09:50-10:10

Title: Health as a Nation Brand Value and the Importance of Information Systems in the Brand Value of Health: A Case Study of Türkiye's Health Türkiye Initiative

Hatice. Koc, *Ankara Hacı Bayram Veli University, Türkiye*

10:10-10:30

Title: Individualised Orthoplastic Management of Complex Periprosthetic Joint Infection Following Total Knee Arthroplasty

Katelynn Murray Whelan, *University Hospital Galway, Ireland*

10:50-11:10

Title: Impact of Network Sparsity on Graph Based Classification in Biological Systems: Insights from Resting State Functional Connectivity in Autism

Kiran Raj V, *Indian Institute of Information Technology Tiruchirappalli, India*

END OF DAY 2

DAY-2 VIRTUAL PRESENTATIONS

Exclusively for
Virtual Speakers

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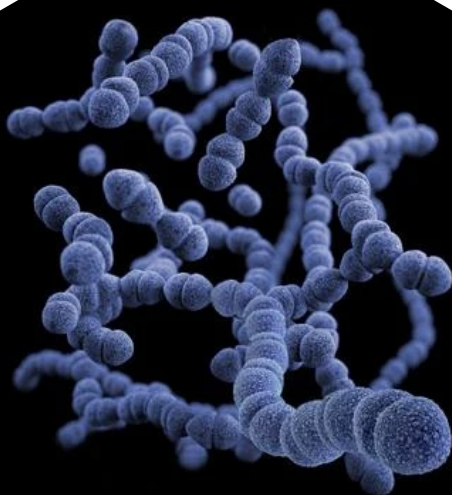
5TH WORLD CONGRESS ON

**INFECTIOUS DISEASES AND
ANTIMICROBIAL RESISTANCE**

June 2027 | Paris, France

IDAMR 2026

DAY 01



4th WORLD CONGRESS ON

INFECTIOUS DISEASES AND ANTIMICROBIAL RESISTANCE

JUNE 25-26, 2026 | LONDON, UK

SPEAKER TALKS



Compound Vulnerability: Mitigating Neighborhood Inequality, Environmental Disaster and Health Inequity among the Poor

Carol Camp Yeakey¹, Allison S. Reed² and Bronwyn Nichols-Lodato²

¹The Marshall S. Snow Professor of Arts & Sciences, School of Arts & Sciences, USA

Professor of Public Health, Bursky School of Public Health, Washington University in St. Louis, USA

²School of Arts & Sciences, Washington University in St. Louis, USA

Mitigating disasters' health consequences is critical to promoting health equity, but few studies have analyzed the short- and long-term health effects of disasters on vulnerable marginalized populations. This study attempts to fill that void by examining low income, predominantly Black residents who experienced the recent devastating tornado in St. Louis, Missouri. The study goes beyond describing the destruction of the tornado to focus upon the yet unresolved human toll and impact on the health and well-being of the vulnerable population. This research is multi-purposive. First, it provides a case study analysis of the destructive results of the May 16, 2025, tornado in the city of St. Louis, in general, and the neighborhood of north St. Louis, in particular (Carmody MacDonald 2025; Kaur & Felton 2025). Three research questions emerge. First, after the storm, what has been governments' response on federal, state and local levels to the most vulnerable citizens in St. Louis, specifically on rebuilding poor neighborhoods of color? Second, given the fact that 'housing is health,' what are the multiple dimensions of housing insecurity that are exacerbated and remain unresolved, six months after the storm? Third, what anticipatory stressors and somatic anxieties have surfaced among the affected population (Jackson and Willis 2024)? Research has shown that anticipatory stress can have profound effects on both physical and mental well-being (Raker, et.al. 2020). A preliminary study of the north St. Louis neighborhood shows a predisposition to disease as well as disease, as well as a reduced life span due to socioeconomic variables. Utilizing case study analysis, interviews, survey research, policy research analysis, and photovoice to analyze data, initial findings reveal blatant racial and class disparity in funding disaster response; marked anticipatory anxiety among residents; no therapeutic services provided residents suffering disaster relief; and governmental shift of all disaster response and financial responsibilities away from the federal government to states and locales themselves. A dis-

cussion of the foregoing, and their intended and unintended consequences, conclude this presentation, with particular emphasis on the social determinants of health and wellbeing among marginalized populations in America, given growing climate crises.

Presenter:

Carol Camp Yeakey

School of Arts & Sciences and Bursky School of Public Health, Washington University in St. Louis, USA



The COVID Information Commons - A Portal and Community for Researcher Collaboration

Florence D. Hudson and **Emily Rothenberg**

The Data Science Institute, Columbia University, USA

The COVID Information Commons (CIC) was funded by the U.S. National Science Foundation (NSF) in 2020 to develop a public access portal to facilitate the discovery of COVID-related research. The goal was to enable knowledge sharing and collaboration across NSF-funded COVID-related projects to accelerate research results and mitigate the societal effects of the COVID-19 pandemic. The success of the CIC as a portal and community, as well as the growth in COVID-19 pandemic-related research, led to the approval of a CIC-Extension (CIC-E) grant in 2021 to include COVID-related research projects funded by both the U.S. NSF and National Institutes of Health (NIH). The CIC has served as a valuable resource for thousands of researchers, students, and decision-makers in government, academia, nonprofits, and industry around the world to collaborate and accelerate the most promising COVID research. We will discuss the goal, process, and impact of the CIC as a research portal with over 14,000 NSF and NIH-funded research projects, and as a collaborative community of over 12,000 individuals, presenting it as a role model for future societal challenges that can be addressed with scientific research and researcher engagement. We will also present the broader research documented in the new book “The COVID Information Commons – Research Insights from the Coronavirus” which includes 24 chapters written by 95 CIC researchers funded by NSF and NIH who share their research results and subsequent recommendations to mitigate future pandemics across biology, public health, education, communications, human behaviour and public mobility domains. The CIC book was envisioned and developed to ensure that the coronavirus-related research done in the era of the COVID-19 pandemic would be findable, accessible, interoperable, and reusable, in line with the FAIR open data principles, to benefit science, research and humanity for years to come.

Presenter:

Florence D. Hudson

Columbia University, USA



AI Fueled Technology & US Healthcare – Emulatable Lessons in Affordability, Accessibility & Accountability

Faisal M. Rahman

The Graham School of Management, Saint Xavier University,
USA

Artificial Intelligence (AI) is creating an environment of excitement and fear in the healthcare sector. On one end, it holds out the promise of better diagnosis of a patient's illness and a more comprehensive treatment plan, it also creates the fear of loss of jobs and further decline in the element of human empathy in patient care. Author draws upon his experience of operating ambulatory surgery centers and management of physician practices in the United States to discuss potential use of proven practices to the less developed countries. AI fueled technology could be THE powerful tool to bring affordable, accessible, and accountable healthcare throughout the world.

Presenter:

Faisal M. Rahman

Saint Xavier University, USA



Effects of Dietary Humic Acid Supplementation on Survival, Immune Response, and Gut Microbiota in Nile Tilapia (*Oreochromis niloticus*) Challenged with *Lactococcus garvieae*

Edén Vladimir Gaitán-Morado¹, Ruth Escamilla-Montes², Antonio Luna-González³, Ruth Escamilla-Montes³, Genaro Diarte-Plata³ and Rodolfo Pérez-Rodríguez⁴

¹Programa Institucional de Doctorado en Ciencias Biológicas, Universidad Michoacana de San Nicolás de Hidalgo, México

²Centro de Investigaciones Biológicas del Noroeste, S.C.-Unidad Guaymas, México

³Instituto Politécnico Nacional, Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional-Unidad Sinaloa, México

⁴Laboratorio de Biología Acuática, Facultad de Biología, Universidad Michoacana de San Nicolás de Hidalgo, México

Aquaculture of Nile tilapia (*Oreochromis niloticus*) has faced challenges from pathogens such as the emerging bacterium *Lactococcus garvieae*. Humic acid (HA) was used as a prophylactic measure to evaluate its effect on the intestinal microbiota, immune system, and survival in tilapia challenged with *L. garvieae* under laboratory conditions. Four concentrations of HA were tested in feed over 83 days. The intestinal microbiota was analyzed in treatment IV (1.0 g/ kg of feed) and control through 16S rRNA gene sequencing (V3). Liver and gill tissue were collected for immune system gene expression analysis (COX-2, TGF, IL-1B, and TNF- α) through real-time qPCR methods. On day 71, the fish were inoculated by immersion with *L. garvieae* (CL₅₀ = 8.5 × 10⁵ CFU/mL). Gene expression in the liver (COX-2 and TNF α) and gills (COX-2, TGF- β , and IL-1 β) increased significantly in treatment IV. *Cetobacterium* was among the most abundant genera in the tilapia gut. *Fusobacteriota* (phylum) and the genera *Aeromonas*, *Rhodobacter*, *Gemobacter*, and *Ideonella* were enriched in HA, whereas the phylum *Patescibacteria* and genera *Pelomonas*, *Nitrobacter*, and *Clostridioides* decreased significantly. Dietary HA supplementation significantly altered gut microbiota diversity and the interaction network core. In channel catfish (*Ictalurus punctatus*), dietary HA supplementation significantly altered gut microbiota alpha diversity (Oladipupo et al. 2024). Our results in tilapia showed that, while Shannon and Simpson indices (reflecting both richness and evenness) showed no significant differences between HA and control group, the Chao1 and ACE

indices (estimating species richness) were significantly higher in HA- treated fish. Humic acid supplementation significantly improved tilapia survival against *L. garvieae* by enhancing immune gene expression and modulating gut microbiota—enriching *Fusobacteriota* and beneficial genera (*Rhodobacter*, *Ideonella*) while reducing pathogens (*Pelomonas*, *Clostridioides*). These findings support HA as a prophylactic alternative against lactococcosis in Nile tilapia (*O. niloticus*) farming.

Presenter:

Edén Vladimir Gaitán Morado

Universidad Michoacana de San Nicolás de Hidalgo, México



A Unified Stochastic SIR Model with Parameter Estimation and Application to the COVID-19 Pandemic

Wei Sun and **Terry Easlick**

Concordia University, Canada

The classical susceptible-infected-recovered (SIR) model proposed by Kermack and McKendrick in 1927 has been a focus of research for the past century, as researchers strive to understand and control infectious diseases. Mathematical analysis of the SIR model and its variants has been instrumental in informing public health policies, particularly during pandemics. Existing models typically focus on analyzing specific diseases or parameters. While these studies have been very successful in yielding new insights, these models often lack structural variability. To overcome the inherent limitations of traditional approaches, we propose a unified stochastic SIR model driven by Lévy noise. This model possesses sufficient structure to account for time dependence, nonlinearity, discontinuities, demographic factors, and environmental perturbations. We conduct a theoretical analysis of this new model, including disease extinction/persistence, parameter estimation, prediction, and numerical approximation. We apply the theoretical results to study the COVID-19 pandemic using data from New York City. This application provides parameter estimation and predictive analysis, including the unknown period of a periodic transmission function and the input/output dynamics of infection.

Presenter:

Wei Sun

Concordia University, Canada



Fatal Acute Miliary Tuberculosis Complicated by Obstructive Jaundice, Acute Pancreatitis, and Hemophagocytic Lymphohistiocytosis in a 57-Year-Old Immunocompetent Female: A Case Report

Akram Shammat¹, Ahed Assaf², Suleiman khaddour³, Saja Karaja², William Borghol², Haya Almohammad³, Mario Wassel⁴ and Kinan Alkeshk¹

¹Zulekha Hospital, Sharjah, United Arab Emirates

²Faculty of Medicine, Hama University, Syria

³Faculty of Medicine, Tishreen University, Syria

⁴Bachelor of Science, Binghamton University, USA

Miliary tuberculosis is a rare but potentially fatal form of tuberculosis caused by hematogenous dissemination of *Mycobacterium tuberculosis*. It represents approximately 2% of all tuberculosis cases.

Generally, fewer than 2 percent of cases in immune-competent adults demonstrate miliary disease and is notorious for its nonspecific clinical presentation. Diagnostic delay is common and is strongly associated with poor prognosis and high mortality.

We present a 57-year-old immunocompetent female of Pakistani origin who was admitted with vague systemic symptoms. Subsequent investigations confirmed miliary tuberculosis complicated by an exceptional constellation of severe manifestations, including obstructive jaundice, acute pancreatitis, acute respiratory distress syndrome, disseminated intravascular coagulation, liver failure, and secondary hemophagocytic lymphohistiocytosis (HLH).

Radiological imaging revealed diffuse miliary pulmonary nodules, while laboratory studies demonstrated progressive hepatic dysfunction and profound hematological abnormalities. Despite prompt multidisciplinary involvement and initiation of antituberculosis therapy, the patient's clinical condition rapidly deteriorated, resulting in multiorgan failure and death.

Conclusion: Miliary tuberculosis should be considered in patients presenting with unexplained systemic illness and multiorgan involvement, regardless of immune status. Early diagnosis relies on meticulous correlation of clinical, radiological, and laboratory findings. Prompt initiation of antituberculosis

therapy remains the cornerstone of management, including in tuberculosis-related HLH. This case highlights the critical importance of early recognition and multidisciplinary collaboration to improve patient outcomes.

Presenter:

Akram Shammat

Zulekha Hospital, United Arab Emirates



Histoplasmosis in Oaxaca: An Emerging Systemic Mycosis Beyond Immunosuppression

Joscelyn Amaranta Macías Ríos^{1,2}, Santa Diego Rendón²
and Eduardo Pérez Campos³

¹Department of Internal Medicine, Instituto Mexicano del Seguro Social (IMSS), Oaxaca, México

²Department of Internal Medicine, Hospital General “Dr. Aurelio Valdivieso”, Oaxaca, México

³Universidad Autónoma Benito Juárez de Oaxaca, México

Histoplasmosis is a systemic fungal infection caused by *Histoplasma capsulatum*, endemic in Latin America and traditionally associated with immunosuppression, particularly HIV infection. However, its clinical spectrum in endemic regions such as Oaxaca, Mexico, remains underrecognized, leading to delayed diagnosis and increased morbidity.

This study aimed to describe the epidemiological, clinical, and therapeutic characteristics of patients diagnosed with histoplasmosis in a secondary-level care hospital. A retrospective, observational case series was conducted, including patients diagnosed between January 2019 and June 2025 at the Internal Medicine Department of Hospital General “Dr. Aurelio Valdivieso”. Descriptive statistics and association analyses (Chi-square and Fisher’s exact test) were performed to evaluate relationships between risk factors and clinical presentation.

A total of 18 patients were included, with a mean age of 38.7 years; 77.8% were male. HIV infection was present in 55.6% of cases. Pulmonary involvement was the most common clinical presentation (55.6%), followed by disseminated disease (27.8%). Hemophagocytic syndrome occurred in 44.4% of patients and was strongly associated with HIV infection ($p = 0.0007$). Diagnostic confirmation was most frequently achieved through antigen detection and histopathology. Radiological findings commonly included bilateral ground-glass opacities and diffuse micronodular patterns, particularly in patients with severe immunosuppression ($CD4 < 50$ cells/ μ L).

Treatment primarily consisted of amphotericin B and itraconazole, with combination therapy used in most cases. Although overall mortality was 11.1%, significant treatment-related complications such as acute kidney injury and hypokalemia were observed.

Histoplasmosis in Oaxaca predominantly affects young adults and is strongly associated with HIV infection, although cases in non-immunocompromised individuals were also identified. Early recognition, particularly of hemophagocytic syndrome, and prompt antifungal therapy are essential to improve clinical outcomes. These findings highlight the need for increased clinical awareness and improved diagnostic access in endemic regions.

Presenter:

Joscelin Amaranta Macías Ríos

Instituto Mexicano del Seguro Social (IMSS) &
Hospital General “Dr. Aurelio Valdivieso”, Oaxaca, México



Antibiotic and Heavy Metal Resistance Genes and Antibiotic-Resistant Bacteria (ARB) from Natural Aquatic Environments, Sewage Water Systems, and Sewage Treatment Plants (STPs) from India

Qazi Mohd Rizwanul Haq

Department of Biosciences
Jamia Millia Islamia (A Central University), India

Natural aquatic environments, sewage systems, and sewage treatment plants (STPs) receiving domestic, hospital, and industrial waste harbor antibiotic resistance bacteria (ARB) carrying antibiotic resistance genes (ARGs) and heavy metal resistance genes. These are hotspots for the emergence and dissemination of resistance in bacteria. Prevalence of ARGs and ARBs was studied from different locations in India, *viz.* Delhi-NCR, Rajasthan, and the Kashmir valley. Our study demonstrated a heavy load of ARB and ARGs in natural water bodies, sewage systems, and STPs. Most of the ARB were extended-spectrum- β -lactamase (ESBL) producers with multidrug and pandrug resistance (MDR/PDR) phenotypes. Furthermore, a high percentage of ARB exhibited co-resistance to heavy metals. Molecular analysis of resistance determinants revealed the occurrence of genes conferring resistance to multiple antibiotics and heavy metals. Both pre-treatment and post-treatment water samples from STPs demonstrated high prevalence of genes conferring resistance to β -lactams (*bla*CTX-M, *bla*SHV, *bla*TEM genes), fluoroquinolones (*qnr* genes), colistin antibiotics (*mcr-1* variant), and heavy metals, *viz.*, mercury and arsenic. Remarkably, 60% of isolates from pristine lakes of the Kashmir Valley were ESBL producers, and nearly 50% of these demonstrated the MDR phenotype.

Presenter:

Qazi Mohd Rizwanul Haq

Jamia Millia Islamia (A Central University), India



Prevalence and Predictors of Malaria-Associated Acute Kidney Injury among Adults with Severe Falciparum Malaria in Tanzania

Priyank Punatar^{1,2}, Jonathan Mngumi^{1,2}, Jacqueline Shoo^{1,2}, Elizabeth Msangi^{1,2}, Upendo Nkwera¹, Gudila Valentine^{1,2}, Julieth Batanyita^{1,2}, Paschal Ruggajo^{1,3} and Daniel Msilanga^{1,2}

¹Muhimbili University of Health and Allied Sciences, Tanzania

²Muhimbili National Hospital, Tanzania

³The Aga Khan University, Tanzania

Introduction: Severe *Plasmodium falciparum* malaria remains a major public health challenge in sub-Saharan Africa, particularly in endemic regions like Tanzania. Among its complications, acute kidney injury (AKI) is one of the most severe, contributing to prolonged hospital stays, poor outcomes, and high mortality—especially where dialysis services are limited. Despite its clinical importance, malaria-associated AKI (MAKI) remains under-recognized, and data on its predictors, recovery patterns, and long-term renal outcomes are limited. This study aimed to determine the prevalence, predictors, and outcomes of AKI among patients with severe falciparum malaria admitted to Muhimbili National Hospital in Dar es Salaam, Tanzania.

Method: A hospital-based cross-sectional study was conducted in the nephrology wards of Muhimbili National Hospital, Dar es Salaam, Tanzania. Patients with severe *Plasmodium falciparum* malaria admitted between May and October 2020 were consecutively enrolled. AKI was assessed at admission, 48 hours, and day 7. Renal function was re-evaluated at three months to determine long-term renal recovery. Associated factors were analyzed using chi-squared tests followed by multivariate logistic regression, with a p-value of 0.05 considered statistically significant.

Results: A total of 318 falciparum malaria patients were recruited into our study with a mean age of 38.9 ± 17.7 years. The prevalence of AKI among malaria patients was 35.8%, 29.9%, and 15.1% at admission, 48 hours and 7 days, respectively. On multivariate logistic regression, we found that advanced age, high parasitemia count, anemia and proteinuria were significantly associated with AKI at admission. In-hospital mortality rate for patients with MAKI was 3.51%, and upon 3-monthly follow up, 6.14% of patients with MAKI persisted to Chronic Kidney Disease (CKD).

Conclusion: Advanced age, high parasitemia, anemia, and proteinuria are independent predictors of developing acute kidney injury (AKI) among patients with severe *Plasmodium falciparum* malaria. In addition, malaria-associated AKI is linked to in-hospital mortality and a risk of persistent kidney injury evolving into chronic kidney disease (CKD) at three months, underscoring the importance of early detection and intervention to improve patient outcomes.

Presenter:

Priyank Chandrakant Punatar

Muhimbili University of Health and Allied Sciences &
Muhimbili National Hospital, Tanzania



Evaluation of *Sida cordifolia*-Based Hydrogel in the Management of Infection-Prone Delayed Burn Wounds

Shweta Kumar

Department of Pharmacy, S. V. Polytechnic College, India

Burn injuries are highly susceptible to infectious complications and represent a significant global health concern, being among the most common forms of trauma. Delayed wound healing, particularly under corticosteroid influence such as dexamethasone (Decdan®), further increases the risk of infection and poses a major clinical challenge. *Sida cordifolia* (Linn.), traditionally used in wound management, offers promising therapeutic potential due to its antimicrobial and pharmacological properties. The present study aims to develop and evaluate a novel herbal hydrogel formulation containing *Sida cordifolia* extract for the treatment of delayed acid burn wounds and prevention of scarring.

The prepared hydrogel was evaluated for physicochemical characteristics including appearance, pH, and consistency, along with dermal toxicity and skin irritation. Wistar albino rats (220±20 g) were divided into seven groups (n=6) and subjected to acid burn wounds (100 mm²). Delayed wound healing was induced using intraperitoneal dexamethasone (1 mg/kg) for 10 days. After cessation of dexamethasone, treatment groups received the hydrogel until complete healing. Parameters assessed included epithelialization period, percentage wound contraction, vascular endothelial growth factor (VEGF) levels, and histopathological analysis.

The formulation exhibited satisfactory physicochemical properties and showed no dermal irritation up to 72 hours. The treated groups demonstrated faster wound contraction and reduced epithelialization period compared to control. Enhanced VEGF expression and improved histological findings confirmed accelerated tissue regeneration and reduced infection-associated complications.

In conclusion, the *Sida cordifolia*-based hydrogel is a safe, effective, and economical alternative for managing delayed burn wounds, particularly those prone to infection. Its antimicrobial benefits and wound healing properties make it a promising herbal therapeutic option.

Presenter:

Shweta Kumar

S. V. Polytechnic College, India



Simple Bacterial Nasopharyngitis Leading to Atypical Skull Base Osteomyelitis—A Case Report

R. Komathi S. Ramachandran¹, Piriya Darishini Renganathan², Azman Ali¹ and Irise Hoi Khin Chen¹

¹Department of Otorhinolaryngology-Head and Neck Surgery, Putrajaya Hospital, Malaysia

²Department of Otorhinolaryngology-Head and Neck Surgery, School of Medical Sciences, University Sains Malaysia, Malaysia

Nasopharyngitis is a common clinical scenario that may often be overlooked. However, it may lead to dire effects if action is not taken during acute setting, especially in immunocompromised patients. Skull base osteomyelitis is a rare complication of bacterial nasopharyngitis and the infection originates from the nose and paranasal sinuses. It is considered an atypical skull-base osteomyelitis as opposed to the typical otogenic causes.

We present a rare case of bacterial nasopharyngitis complicated with atypical skull base osteomyelitis in a 69-year-old woman who presented with left sided headache with no apparent nasal or ear symptoms. The serial clinical and radiological characteristics mimic those of a malignant neoplasm of the nasopharynx, posing a diagnostic dilemma and requiring a complex management approach.

Long-term antimicrobial therapy for a minimum of 6 weeks and addressing uncontrolled comorbidities remain the gold standard. Prompt diagnosis and intervention are crucial to prevent complications and disease progression. Targetted treatment in eliminating the disease progression is crucial in the outcome of the patient.

Presenter:

R. Komathi S. Ramachandran

Hospital Putrajaya, Malaysia



Effect of Network Sparsity in Classifier Performance in ASD Patients: A Multicenter Study Based on Centrality Measures of rsfMRI

Anoop Jacob Thomas and **V. Kiran Raj**

Indian Institute of Information Technology Tiruchirappalli, India

Resting state functional connectivity is one of the key factors in studying the cognitive characteristics in patients with Autism Spectrum Disorder (ASD). Graph theoretic measures involving centrality, path length and nodal/global efficiency are calculated to study these network characteristics. In this study, ABIDE open dataset is used, constituting ASD and TD participants from CMU and Caltech sites. Centrality measures involving degree centrality, betweenness centrality, clustering coefficient and eigenvector centrality are measured at different thresholds of network connectivity. Linear SVM is used to distinguish between ASD and TD using the above measures. Experimental results show that among all measures, clustering coefficient showed a higher accuracy of 79.17% with specificity and sensitivity of 75.0% and 83.3% respectively for participants from CMU site at 0.75 threshold. Although the overall classifier performance is lower in all measures across threshold levels, sensitivity with respect to clustering coefficient and eigenvector centrality has shown an increase with the increase in network sparsity. As the threshold values are increased, *i.e.*, with a sparser network representation the specificity improves in a site-specific classifier, while the same is not observed on another site probably due to inter-site variability.

Presenter:

Anoop Jacob Thomas

Indian Institute of Information Technology Tiruchirappalli, India



N-Acetylcysteine to Reduce Kidney and Liver Injury Associated with Drug-Resistant Tuberculosis Treatment

Hadija Semvua¹, Idu Meadows², Happiness Mvungi³, Kassim Salim³, Oscar Kaswaga³, Peter Mbebele³, Alphonse Liyoyo³, Athumani Ngoma³, Scott K Heysell² and Stellah G Mpagama³

¹Kilimanjaro Christian Medical University College, Tanzania

²Division of Infectious Diseases and International Health, University of Virginia, USA.

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Background: New drug classes and regimens have shortened the treatment duration for drug-resistant tuberculosis, but adverse events (AEs) and organ toxicity remain unacceptably common. N-acetylcysteine (NAC) has demonstrated potential in reducing kidney and liver toxicity in other clinical settings, but efficacy in drug-resistant tuberculosis treatment has not been rigorously evaluated.

Method: A randomized controlled trial was conducted at Kibong'oto Infectious Diseases Hospital in Tanzania to assess the efficacy of NAC in reducing AEs in patients undergoing rifampin-resistant pulmonary tuberculosis treatment. Participants received an all-oral standardized rifampin-resistant regimen alone, with NAC 900 mg daily, or NAC 900 mg twice daily for 6 months. AEs, severe AEs, and renal and liver toxicity were monitored monthly and classified according to the Risk, Injury, Failure, Loss, and End-stage kidney disease criteria and National Cancer Institute Common Terminology Criteria for Adverse Events. Incident ratios and Kaplan-Meier curves were employed to compare group event occurrences.

Results: A total of 66 patients (mean age 47 ± 12 years; 80% male) were randomized into three groups of 22. One hundred and fifty-eight AEs were recorded: 52 (33%) in the standard treatment group, 55 (35%) in the NAC 900 mg daily group, and 51 (32%) in the NAC 900 mg twice-daily group ($p > 0.99$). Severe AEs were observed in four patients in the standard group, two in the NAC 900 mg daily group, and three in the NAC 900 mg twice-daily group. Renal toxicity was more prevalent in the standard treatment group compared to those that received NAC (45% vs. 23%; $p = 0.058$), with a shorter onset of time to toxicity ($\chi^2 = 3.199$; $p = 0.074$). Liver injury events were rare across all groups.

Conclusion: Among Tanzanian adults receiving rifampin-resistant tuberculosis treatment, NAC did not significantly reduce overall AEs but demonstrated trends in reducing renal toxicity.

Presenter:

Hadija Hamisi Semvua

Kilimanjaro Clinical Research Institute (KCRI)/KCMC University-Moshi, Tanzania



Intra-Oral Dirofilariasis: Case Experience from India

Rakesh Suresh¹, Mahija Janardhanan² and Vindhya Savithri³

¹Professor & Head, Department of Oral Pathology & Microbiology, Amrita School of Dentistry, Amrita Vishwavidyapeetham, India

²Professor, Department of Oral Pathology & Microbiology, Amrita School of Dentistry, Amrita Vishwavidyapeetham, India

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Objectives & Scope: Dirofilariasis, a rare zoonotic infection endemic in the tropical and subtropical countries, is caused by a nematode of the genus *Dirofilaria*, with canines as the primary hosts. Human rarely get infected through the bite of mosquito vectors. Human manifestations are usually reported in the orbital region. Intra-oral involvement has been rarely reported.

Case study: The species responsible for human infection varies with the geographic location. The Indian sub continent being a tropical region, has prevalence of infections caused by *Dirofilariasis repens*. The human dirofilariasis cases reported in India are mostly endemic to the southern state of Kerala which points to a dense population of the potential mosquito vectors in this region. The case study presents the rare occurrence of human dirofilariasis affecting the oral cavity and the route to early diagnosis and management.

Conclusion: Intra-oral involvement in human dirofilariasis is rare, with most cases reported in the orbital/peri-orbital tissues. The final diagnosis can be confirmed only after the microscopic identification of the adult worm in the tissue sections from the affected site. This emphasizes the importance of Pathologists who need to be familiar with the morphology of the worm in tissue sections to render a timely and accurate diagnosis. Dental practitioners need to be aware of the possibility of encountering facial and intra-oral sub cutaneous nodules as a clinical manifestation of Dirofilariasis.

Presenter:

Rakesh Suresh

Amrita Vishwavidyapeetham, India



From Natural Products to Smart Antimicrobial Systems: Toward Integrated and Sustainable Strategies against Antimicrobial Resistance

Soumia BELOUFA and **Mohammed BERRADA**

Laboratory of Biology and Health, Faculty of Sciences Ben M'Sick, University Hassan II of Casablanca, Morocco

Antimicrobial resistance (AMR) represents a critical threat to global health, necessitating the development of innovative solutions capable of overcoming the limitations of conventional approaches. In this context, natural products, characterized by their rich chemical diversity and biological activities, constitute a promising foundation for the design of new antimicrobial strategies.

This work aims to propose an integrated approach that transitions from natural products to smart antimicrobial systems, based on biomaterials engineering. The methodology relies on the analysis and structuring of recent advances in the integration of natural biomolecules into functional matrices, including polymers, bioactive inorganic phases, and nanostructured architectures. Particular attention is given to hybrid systems capable of ensuring controlled release, targeted activity, and optimized interactions with biological environments.

The results highlight that these systems not only improve the efficacy of natural antimicrobial agents but also reduce the risks associated with resistance development by promoting multifactorial mechanisms of action. These approaches open new pathways for advanced applications in infection control, tissue regeneration, and targeted drug delivery.

In conclusion, the transition toward smart antimicrobial systems based on natural products represents a promising strategy to address the challenges of AMR. It provides an innovative framework combining sustainability, performance, and interdisciplinarity, positioning biomaterials as key players in next-generation therapeutic strategies.

Presenter:

Soumia BELOUFA

University Hassan II of Casablanca, Morocco



Dental Health Concerns of Students Studying Abroad and the Prospects of Affordable Dental Care in South Asia

Umana Anjalin

University of Liberal Arts, Bangladesh

Numerous studies have consistently demonstrated that the quality of healthcare in the West varies by a patient's race and ethnicity. For instance, many cultures rely on traditional oral health practices and health beliefs. Inequalities exist in oral health between people from diverse cultures. Students are no exception when it comes to the significant public health issue of oral health and hygiene. Few oral health studies are available that focus on University students and diverse cultural perspectives on oral health and hygiene. This study aims to shed light on the oral health and hygiene practices of multicultural students while they study in a host country for educational purposes, as well as their dental health concerns. In addition, the study provides valuable insights into relatively affordable dental expenses in South Asia, particularly in India and Bangladesh, highlighting the promising potential of dental tourism in these regions.

Presenter:

Umana Anjalin

University of Liberal Arts, Bangladesh



HPV Awareness and Vaccine Knowledge Gaps among Adults in Bahrain: A Community-Based Study

Reem Alzahrani¹, Maha Ali Alghamdi², Amna M. A. Mahmud¹, Faris Alsobyani¹, Sebastien Taurin¹ and Moiz Bhakait¹

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²Department of Biotechnology, College of Sciences Taif University, Saudi Arabia

Human papillomavirus is a sexually transmitted disease imposing a considerable clinical and economic burden on public health providers and has an association with cervical cancer. HPV vaccines could prevent high-grade cervical intraepithelial neoplasia and strains of HPV that cause cancer and genital warts. This study aims to assess the knowledge of HPV and HPV vaccine and the willingness for HPV vaccine among the adult population in Bahrain.

Materials and Methodology: A community-based cross-sectional study was conducted in the adult population of Bahrain aged 18-55 years. A web-based questionnaire was developed to collect data about socio-demographic characteristics, knowledge regarding HPV and HPV vaccine. It was forwarded through various social media platforms. Informed consent was acquired prior to participation in the study. The knowledge score and willingness for HPV vaccine were compared with demographics through binary logistic regression analysis. A p-value less than 0.05 was considered statistically significant.

Results: A total of 1242 participants were included, with 47.2% belonging to the age group less than 30 years and 61.1% were females. Only 40.8% were aware of HPV, 25.3% were aware of the mode of transmission of HPV, and 28.3% knew about the association of HPV with cancer. Regarding the HPV vaccine, only 23.8% were aware, with educational institutes (35.5%) and social media (29.4%) as major sources of information. Only 2.9% had received the vaccine, but 62.7% were willing to take and advise the HPV vaccine. This study highlights key factors influencing knowledge about HPV and willingness to receive the HPV vaccine among different demographic groups in Bahrain. It reveals that younger participants, particularly those under thirty, possess significantly higher levels of HPV awareness compared to older individuals. This suggests younger individuals may be more receptive to

HPV information, likely due to exposure through educational campaigns or better access to digital resources. These insights are essential for shaping public health strategies and improving HPV vaccination rates in Bahrain.

Conclusion: We concluded that the Bahraini population had an adequate level of awareness of HPV. However, knowledge regarding the HPV vaccine is lacking, despite a high level of willingness for the vaccine.

Presenter:

Reem Al-Zahrani

Arabian Gulf University, Kingdom of Bahrain



Biochemical and Ultrasound Predictors of ICU Admission Among Hospitalized Dengue Patients in Bangladesh

Md. Tanzilur Rahman¹, Nafisa Akkas¹ and Md. Maruf Ahmed Molla²

¹Chittagong Medical College, Bangladesh

²Department of Biochemistry and Molecular Biology
SUNY Upstate Medical University, USA

Background: In recent years, Bangladesh has seen a rise in dengue cases, accompanied by higher hospitalization and mortality rates. This paper deals with the laboratory and ultrasound predictors of ICU admission among hospitalized dengue patients in Dhaka North City Corporation (DNCC) Dedicated COVID-19 Hospital in 2023.

Methods: Three hundred five serological test-positive hospitalized dengue patients were enrolled in this prospective cohort study. Upon admission, each patient was tested for several laboratory markers including Hb%, hematocrit level, platelet count, and serum SGPT level. Each patient had at least one ultrasound examination by a certified radiologist on the 1st day of admission. Patients were followed until discharge from the hospital or in-hospital death.

Results and discussion: In bivariate analysis, significant association was observed between ICU admission status and platelet count [$t(226.5)=9.9, p<0.05$], hospital stay (in days) [$t(244.3)=-18.0, p<0.05$], level of SGPT [$t(203.2)=-4.3, p<0.05$], thickening of gall bladder (in mm) [$t(253.7)=-12.2, p<0.05$], pleural effusion [$\chi^2(1)=71.8, p<0.05$], ascites [$\chi^2(1)=77.5, p<0.05$], organomegaly [$\chi^2(1)=24.8, p<0.05$], hepatic echotexture status [$p<0.05$], and pancreatic abnormality [$p<0.05$]. In the multivariable model, after adjusting of variables, a significant association was observed between ICU admission status and platelet count (aOR 0.81; 95% CI 0.72–0.91; $p<0.05$), gall bladder wall thickness (aOR 1.19; 95% CI 1.06–1.34; $p<0.05$), and ascites (aOR 6.05; 95% CI 2.33–15.75; $p<0.05$).

Conclusion: In resource-limited settings like Bangladesh, triaging vulnerable patients based on laboratory and ultrasound profiles may enhance clinical management and improve patient outcomes.

Presenter:

Md. Tanzilur Rahman

Chittagong Medical College, Bangladesh



Health Benefits of Organic Food Products: Impact on Human Well-Being and Disease Prevention

V. Alibekova¹, M. Kenzhebayaeva² and L. Jakisheva²

¹Kazakh National Medical University named after S.D. Asfendiyarov, Kazakhstan

²Taraz Regional University named after M.Kh.Dulaty, Kazakhstan

Organic farming is a promising line of development for Kazakhstan, which has enormous potential to increase agricultural production in its vast cropland areas and pastures. The agricultural industry has all the necessary conditions to improve the quality of food products and preserve the environment for future generations. This line of farming began in Kazakhstan in the early 2000s and was promoted by local business owners who saw opportunities to increase product value in Kazakhstan agriculture. Later, an important part of organic farming development in Kazakhstan was taken on by international organizations and projects.

This research aims to analyze the current situation in this economic sector, including organic farming export capacity, as Kazakhstan presently has opportunities to develop agricultural production and export organic farming products.

The methods of studying this problem include statistical-economic, dialectical, and comparative methods. The authors analyzed world and European statistical data for the last five years and performed a SWOT analysis of the state of the export potential of this area of agriculture in Kazakhstan using graphs and diagrams. In this research, the authors assume that Kazakhstan has great opportunities to export organic agricultural products. The country has great potential for the creation of organic products of high quality and competitive in the world market.

Presenter:

Vilnara Alibekova

Kazakh National Medical University named after S.D. Asfendiyarov, Kazakhstan



Risk Factors and Treatment of Squamous Cell Bladder Cancer

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Bladder cancer is the most common urinary system malignancy system, and the predominant histologic type is transitional cell cancer (TCC) in Western countries. While various risk factors including cigarette smoking and various occupational exposures have been implicated in the development of bladder cancer.

Squamous cell carcinoma (Sqcc), a rare histological variant, accounts for approximately 2-5% off all bladder cancer cases. The incidence is significantly higher in developing regions such as the Middle East and Africa. This increased prevalence is strongly associated with *Schistosoma haematobium* infection. In contrast, the primary risk factors for Sqcc include recurrent urinary tract infections and long-term catheter use in the developed countries.

Sqcc develops through a process of squamous metaplasia, in which the transitional epithelium of the bladder undergoes chronic irritation, leading the replacement of urothelial cells with squamous epithelium.

Gram-negative bacteria, such as urinary *E. Coli* infection, produce nitrosamines that are highly carcinogenic., which may play a major additive and synergistic role during bladder carcinogenesis. Production of reactive oxygen species by inflammatory cells responding to infection, leading to DNA damage and activation of other carcinogens.

Sex –related disparities in survival have also been reported in Sqcc. Female patients likely exhibit worse overall survival (OS) than males.

The primary treatment for Sqcc is surgical. Clinically, Sqcc is associated with a higher rate of locoregional recurrence compared to TCC. As with TCC of the bladder, the treatment of Sqcc is needed a multidisciplinary approach,

and radiotherapy and/or chemotherapy could be administered as adjuvant therapy.

Novel therapies are urgently needed, which encompass clinicopathological and molecular characteristics of these tumors.

Our findings demonstrated similar outcomes between the Sqcc and TCC. Also, sex and metastasis at diagnosis were found to be independent predictors of OS.

Presenter:

Meral KURT

Uludag University, Türkiye



The COVID Information Commons – Machine Learning Powered Research Discovery

Florence D. Hudson and **Emily Rothenberg**

The Data Science Institute, Columbia University, USA

The COVID-19 pandemic catalysed over 14,000 U.S. National Science Foundation (NSF) and National Institutes of Health (NIH) funded research projects across many domains including virology, public health, behavioural science, education, and economic recovery. The dynamic and rapid expansion of COVID related research created challenges in discovering relevant work, avoiding duplication, and identifying collaborators. The COVID Information Commons (CIC) (NSF awards #2028999 and #2139391) addresses these challenges through machine learning-powered research organization and visualization. The CIC provides an open online portal and community to enable access to metadata related to thousands of NSF and NIH funded coronavirus research projects. The COVID Information Commons leverages Lingo4G's machine learning-powered clustering tool to organize and visualize 14,000+ NSF and NIH-funded COVID-19 research projects, enabling efficient discovery of research and researchers, enabling collaboration across research domains and individuals including researchers, students, professionals, government leaders, and citizens. Through interactive topographical maps, searchable databases, and community engagement tools, the platform connects researchers with principal investigators and facilitates evidence-based decision-making for pandemic response and recovery.

Presenter:

Florence D. Hudson

Columbia University, USA



Emerging Perspectives on Platelet-Activating Factor in Relation to Magnesium Levels at the Cellular, Tissue, and Systemic Levels in Disease States

Ezaan Khan¹, Amanda Kaine¹, Anthony Gariolo¹,
Andreas Karaolis¹, Luv Kataria¹, Dhruv Mayank Patel¹,
Sidhartha D. Ray² and Nilank Shah¹

¹Touro College of Osteopathic Medicine, USA

²Touro College of Pharmacy, Pharmaceutical and Biomedical Sciences, USA

Magnesium is an essential micronutrient that exerts fundamental roles at both the cellular and tissue levels, with broad therapeutic and preventive implications across a range of pathological conditions. Accumulating clinical and experimental evidence indicates that optimal magnesium homeostasis modulates key pathophysiological processes and serves as both a biological and prognostic marker in disorders such as stroke, myocardial infarction, type 2 diabetes mellitus, and renal failure; all of which pose risks for infectious disease. These disease states commonly originate from two major etiological determinants—hypertension and atherosclerosis—which share a unifying pro-inflammatory mediator: platelet-activating factor (PAF). PAF plays a central role in vascular inflammation by promoting platelet aggregation, macrophage infiltration, leukocyte adhesion, and vasomotor dysregulation. Importantly, magnesium demonstrates an inverse association with both platelet aggregation and PAF activity, underscoring its protective capacity in mitigating vascular inflammation and preserving endothelial function. This interplay illustrates an important consideration in the development of sepsis, septic comorbidities, and future potential supportive treatments with magnesium. In a meta-analytic literature review, we elucidate the antagonistic relationship between magnesium and PAF, with a focus on its physiological and therapeutic significance across multiple organ systems. Studies show significant mechanistic potential as supportive treatment for several conditions including sepsis along with improvement in patient outcomes in clinical trials. While emerging data support a modulatory role of magnesium in PAF-mediated inflammatory pathways, current evidence remains limited. Therefore, further mechanistic, pharmacological, and clinical investigations are warranted to clarify the multifaceted role of magnesium in attenuating PAF-driven disease processes.

Presenter:

Ezaan Khan

Touro College of Osteopathic Medicine, USA



Resistance Patterns in Gram-Negative Bacilli Isolated in a Secondary Care Hospital: A Therapeutic Challenge in Western Mexico

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²Institute of Experimental and Clinical Therapeutics, Health Science University Center, Universidad de Guadalajara, México

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Antimicrobial resistance among Gram-negative bacilli represents a major public health threat and an increasing therapeutic challenge in hospital settings. Pathogens such as *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacterales* are frequently associated with severe healthcare-associated infections and may exhibit resistance mechanisms such as extended-spectrum beta-lactamase production and carbapenem resistance. This study aimed to determine the antimicrobial susceptibility patterns of Gram-negative bacilli isolated from clinical samples in a secondary care hospital in Guadalajara, Mexico, during 2024.

A descriptive, cross-sectional, retrospective study was conducted. Gram-negative bacilli isolated from blood cultures, urine cultures, respiratory secretions, and wound exudates collected between January and December 2024 were included. A total of 743 bacterial isolates from 525 clinical records were analyzed. Species identification and antimicrobial susceptibility testing were performed using the VITEK[®] 2 automated system, and results were interpreted according to Clinical and Laboratory Standards Institute M100 criteria.

Non-fermenting Gram-negative bacilli showed high resistance to meropenem, particularly the *Acinetobacter baumannii* complex and *Pseudomonas aeruginosa*, with resistance rates of 64.3% and 41.5%, respectively. Among *Enterobacterales*, extended-spectrum beta-lactamase positivity was 59.4% in *Escherichia coli* and 45.1% in *Klebsiella pneumoniae*. Multidrug resistance predominated in *E. coli* and the *A. baumannii* complex, reaching 76.3% and 66.7%, respectively. Despite this resistance burden, *E. coli* maintained high susceptibility to meropenem and amikacin, with rates of 94.8% and 97.9%. Ceftazidime/avibact-

am and ceftolozane/tazobactam showed more than 74% susceptibility against *Pseudomonas spp.*

These findings demonstrate an alarming burden of resistance to beta-lactams and carbapenems, particularly among non-fermenting species. Strengthening local antimicrobial surveillance, optimizing empirical therapy, and reinforcing antimicrobial stewardship programs are essential to preserve effective therapeutic options.

Presenter:

Sofía de la Paz García Alcazar

Universidad de Guadalajara, México



Carbapenem Resistance in *Klebsiella Pneumoniae*: Evidence of Community Spread in Concordia (SC) - 2023/2024

Laís Destri dos Santos¹, Bruna Andressa Jung da Silva² and Bernardo Matiello Cazella³

¹Medical Student, University of Contestado-Campus Concórdia, Brazil

²Graduated in Medicine, State University of Amazonas, Brazil

³Master in Biosciences and Health, University of Contestado - Campus Concórdia, Brazil

Klebsiella pneumoniae is a Gram-negative bacterium frequently associated with severe healthcare-related infections and has become a major public health concern due to its increasing antimicrobial resistance, particularly to carbapenems. This study aimed to analyze the prevalence and carbapenem resistance profile of *K. pneumoniae* isolates identified in a clinical laboratory from Concórdia, Santa Catarina, Brazil, with special emphasis on non-hospitalized patients.

A retrospective cross-sectional analysis was conducted using 1,932 positive bacterial cultures processed between 2023 and 2024. Identification of *K. pneumoniae* was performed using standard microbiological methods. Antimicrobial susceptibility to ertapenem, meropenem, and imipenem was evaluated by disk diffusion, with minimum inhibitory concentration (MIC) confirmation for suspected resistant isolates, according to BrCAST 2023 criteria. Qualitative or quantitative cultures were used depending on sample type, and confidence intervals were calculated using Wilson's method.

Among the 1,932 positive cultures analyzed, 217 isolates (11.2%; 95% CI: 9.8–12.7%) were identified as *K. pneumoniae*, a prevalence consistent with national epidemiological estimates. Of these, 13 isolates (6.0%; 95% CI: 3.2–9.9%) demonstrated resistance to at least one carbapenem tested. Notably, all resistant isolates originated from ambulatory patients, suggesting a potential dissemination of carbapenem resistance mechanisms beyond hospital settings and into the community.

These findings highlight an emerging and concerning epidemiological scenario involving carbapenem-resistant *K. pneumoniae* in outpatient populations. The results reinforce the importance of continuous microbiological surveillance, rational antimicrobial stewardship, and integrated infection

prevention strategies to limit the spread of resistance. A multidisciplinary approach involving clinical laboratories, healthcare professionals, and public health authorities is essential to preserve therapeutic effectiveness and mitigate the impact of antimicrobial resistance on patient care and community health.

Presenter:

Laís Destri dos Santos

University of Contestado-Campus Concórdia, Brazil



AI Integrated Genomic Surveillance and Antimicrobial Discovery: A Mechanistic Review

Güven Egemen Bilgesoy and Ayşegül Akbay

Department of Medical Biochemistry, Faculty of Medicine,
Yüksek İhtisas University, Türkiye

Background: The escalating burden of antimicrobial resistance (AMR), contributing to 1.27 million annual deaths, necessitates analytical tools capable of processing high-dimensional biological data beyond human capacity. Artificial intelligence (AI) offers this capability, enabling a mechanistic shift from phenotypic observation to predictive analytics. However, the translation of computational models into clinical and public-health utility requires rigorous consideration of scalability and algorithmic interpretability.

Methods: We conducted a narrative review of high-impact literature published between 2020 and 2026, prioritizing studies integrating deep learning architectures with experimental validation. The synthesis focuses on three domains: (1) the application of Graph Neural Networks (GNNs) for de novo antimicrobial peptide design; (2) the use of Convolutional Neural Networks (CNNs) for interpreting raw MALDI-TOF mass spectra in rapid antimicrobial susceptibility testing (AST); and (3) metagenomic sequencing analytics for wastewater-based epidemiology and resistance surveillance.

Results: Generative modeling approaches, including discrete diffusion frameworks, have expanded the explorable chemical space and facilitated the identification of non-intuitive structural classes exhibiting bactericidal activity in murine models. In diagnostics, machine-learning algorithms applied to mass spectrometry data demonstrate clinically relevant discriminatory performance (AUROC >0.80) with substantially reduced turnaround times compared with conventional workflows. In environmental surveillance, predictive modeling enables spatiotemporal mapping of resistance gene dissemination; however, large-scale implementation remains constrained by the absence of standardized metadata and interoperable health information systems.

Conclusions: AI integration constitutes a significant methodological advance in AMR research, yet translation into routine practice is limited by dataset bias and the opaque (“black box”) nature of many deep learning models. AI should be regarded not as a standalone solution but as a force multiplier

whose impact on AMR mitigation is contingent upon the development of explainable artificial intelligence (XAI) and the establishment of FAIR (Findable, Accessible, Interoperable, Reusable) data infrastructures.

Presenter:

Güven Egemen Bilgesoy

Yüksek İhtisas University, Türkiye



Purulent Septic Diseases of the Male Genital Organs

Abilkhasenov Adil, Khairley Gafour and Zhanbyrbekuly Ulanbek

Department of Urology and Andrology
Astana Medical University, Kazakhstan

Objectives: To present and analyze two rare clinical cases in urological practice—Fournier’s gangrene and penile oleogranuloma—focusing on diagnostic approach, surgical management, and postoperative outcomes.

Methods: Clinical observation of two male patients treated at the Multi-disciplinary Regional Hospital No. 2 (Akmola Region) was conducted. The first case involved acute necrotizing infection of the perineum with rapid progression and systemic sepsis. The second case presented with a chronic granulomatous inflammation caused by self-injection of oily substances. Both patients underwent detailed clinical, laboratory, and imaging evaluation followed by staged surgical management and antibiotic therapy.

Results and Discussion: Early and aggressive surgical treatment combined with intensive antibiotic therapy correlated with a significant decline in inflammatory markers and improved clinical outcomes.

Table 1 summarizes the key laboratory changes before and after treatment in both patients.

Parameter	Before surgery	After treatment	Reference range	Interpretation
WBC ($\times 10^9/L$)	22.7	11.0	4–9	Leukocytosis normalized
C-reactive protein (mg/L)	260	49	< 5	Sharp decline after therapy
Procalcitonin (ng/mL)	10.68	0.30	< 0.5	Normalized after sepsis control
Glucose (mmol/L)	11.7	7.4	4.2–6.1	Improved glycaemic control

Results: In the case of Fournier's gangrene, early aggressive surgical debridement, repeated necrosectomies, and broad-spectrum antibiotics led to stabilization and full recovery after four months.

In the oleogranuloma case, radical excision of all infiltrated tissues (Sapozhkov–Reich stage 1 technique) with temporary skin reconstruction resulted in complete wound healing and preservation of erectile function.

Conclusion: Fournier's gangrene and penile oleogranuloma remain rare but severe conditions in urological surgery. Early diagnosis, radical surgical management, and multidisciplinary postoperative care are critical for reducing mortality and improving functional outcomes.

Presenter:

Abilkhassenov Adil

Astana Medical University, Kazakhstan



Diagnosis of Diabetes using Artificial Intelligence Programs

Ammar Mohammed Zakariya¹ and **Huda Abbas Kanber²**

¹Al-Iraqia University, Iraq

²University of Baghdad, Iraq

Scientific development has occupied a prominent place in the medical field, becoming an important part of diagnosing diseases and determining their levels with high accuracy, surpassing traditional methods that caused pain, contamination, and the possibility of error due to the nature of the devices used and the efficiency of the energy sources that operate them. In order to achieve high accuracy without errors, we adopted in this research a method based on an intelligent application through the use of one of the most important libraries of the Python program, which is the OpenCV library, which is based on image analysis. Here, we took two directions in this study.

The first direction is to prove that the person suffers from a disease condition, and the second is to identify the code for diabetes. Here, the study showed the validity of distinguishing between the person with diabetes, as the program identified three cases for us: the healthy ones, which represented 82% or higher, and the second for the sick, where the difference in the images showed less than the previous percentage of change, to 65%. These are the ones who suffer from diseases, and this was confirmed by the code that appeared parallel to the first test. Therefore, we were able to formulate an algorithm that would identify diabetes from the image.

Presenter:

Ammar Mohammed Zakariya

Al-Iraqia University, Iraq



A Unified Real-Time Modeling Framework for Diverse Infectious Diseases and Adaptive Epidemic Response

Eva K Lee^{1,2,3}, Yifan Liu, Mustapha Debboun⁴
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¹The Data and Analytics Innovation Institute, USA

²Georgia Institute of Technology, USA

³AccuHealth Technologies, USA

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⁷Instituto Todos pela Saúde, Brazil

Background: Epidemiological models are essential for understanding infectious disease dynamics and supporting rapid decision-making during public health emergencies. However, constructing disease-specific models from the ground up can be time-consuming and resource-intensive, introducing delays in assessing risks and selecting effective interventions. A generalized, rapidly deployable modeling system could greatly enhance outbreak preparedness and response.

Methods: We introduce a unified, general-purpose mathematical theory and modeling framework that can be quickly adapted to any contact-based or vector-borne infectious disease. The design schema classifies each disease stage or compartment along two dimensions—(a) passive or active, and (b) vulnerable, contagious, or unaffected—and defines the relationships between stages. This structured schema enables rapid assembly of disease models without the need to manually derive ordinary differential equations or explicitly track all inter-stage interactions. To demonstrate versatility and real-world performance, we applied the framework to outbreaks of Zika, Ebola, avian influenza, and SARS-CoV-2.

Results: Our results show that all major classes of compartmental epidemiology models can be systematically derived from this generalized architecture. The Zika model integrates human behavioral factors, vector control, and combined intervention strategies. The Ebola model represents pre-vaccine transmission across risk groups while assessing safe funeral practices and optimal allocation of limited hospital resources. The avian influenza model captures transmission within bird populations and spillover into humans, incorporating poultry transport and control policies. The SARS-CoV-2

model represents complex, multi-stage transmission dynamics and evaluates the effectiveness and trade-offs of pharmaceutical and non-pharmaceutical interventions across diverse risk groups. These case studies illustrate the framework's scalability, adaptability, and real-time utility.

Conclusion: This generalized modeling framework offers a flexible, elegant and rapidly deployable meta-model for infectious diseases. By accommodating multiple hosts, risk groups, and intervention processes, it enables decision-makers to build and evaluate disease models quickly, supporting timely and informed responses that can reduce both morbidity and mortality during outbreak emergencies.

Presenter:

Eva K Lee

The Data and Analytics Innovation Institute, USA

DAY 02



4th WORLD CONGRESS ON

INFECTIOUS DISEASES AND ANTIMICROBIAL RESISTANCE

JUNE 25-26, 2026 | LONDON, UK

SPEAKER TALKS



Infectious Diseases in Italy: Guidelines for a Multidimensional Geographical Approach



Giovanni De Santis and
Annamaria Bartolini

University of Perugia, Italy

Deterministic thinking has recognised the influence that the environment has on the spread of diseases (Armocida & Rigo, 2013). Today, however, global warming (Apat, 2007) and globalisation have led to other factors (genetic, pollutants, behavioural and lifestyle) altering the correct relationship between society, the environment and health, changing the approach to medicine and accessibility to related healthcare facilities. In the case of infectious diseases, the pervasiveness of viruses in different social spheres forces us to re-examine the phenomenon epistemologically. In line with the 'integrated and unifying' approach set out in the One Health Joint Plan of Action (FAO, UNEP, WHO & WOA, 2022), the scientific community is responsible for adopting a holistic approach to understanding the causes of pathological processes, and for identifying appropriate and timely mitigation and adaptation measures. From this perspective, geography's integrated and multiscale approach can be valuable (Palagiano & Pesaresi, 2011). Social, economic, environmental and biological changes are accelerating the spread of exotic animal species that become vectors of new pathogens (Bologna, 2023) for which communities are unprepared (Rossati & al., 2014). We therefore propose a multidimensional analysis that integrates clinical, spatial, socio-demographic and environmental data to investigate the spread of infectious diseases in Italy. Particular attention is paid to the effects of changing geo-environmental conditions. Clustering is paid to assess the impacts of global warming, demographic trends - including tourist flows and migration (legal and illegal) -, the inequalities induced by different lifestyles and different sanitary conditions, and gender differences, in order to present an epidemiological map that can highlight the spatial distribution of infectious outbreaks across the country. In this way, areas at risk are identified and evidence is gathered that can be used to develop policies aimed at preventing, containing and mitigating the spread of disease.

Presenter:

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Health as a Nation Brand Value and the Importance of Information Systems in the Brand Value of Health: A Case Study of Türkiye's HealthTürkiye Initiative

Hatice. Koç

Ankara Hacı Bayram Veli University, Türkiye
Presidency of the Republic of Türkiye Directorate of
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In the contemporary era, nations are engaged in the formulation of strategies to enhance their competitive standing in the global arena. One such strategy is national branding, which promotes a nation's cultural, economic and social values to shape a favourable global image. In this context, the health sector is a key driver of brand value, particularly through health tourism, which reflects medical service capacity as well as a country's quality of life and technological advancement.

Türkiye is now a global health brand, having achieved remarkable success in health tourism in recent years. Türkiye offers a wide range of quality and cost-effective health services, from aesthetic surgery, organ transplantation and in vitro fertilisation treatment to thermal tourism. It's clear that Türkiye has gained a solid position in this field. The success of its healthcare sector lies in two key factors: quality healthcare services and a strategic use of information technology. The country has effectively integrated information systems such as digitalisation, artificial intelligence and big data analyses into healthcare services, gaining a competitive advantage in the global health tourism market.

One of the most significant factors contributing to Türkiye's success in health tourism is the advancement of ICTs and the integration of sophisticated technology in healthcare services. In particular, the HealthTürkiye initiative has been designed with the specific objective of promoting this technological infrastructure and marketing. This initiative places particular emphasis on Türkiye's modern medical services, cost-effective advantages and patient satisfaction-oriented approach while reinforcing international trust in Türkiye.

This paper seeks to examine the ways in which Türkiye is enhancing its national brand value through the promotion of health tourism, with a particular emphasis on the significant role performed by information systems in

this process. Moreover, the case of the HealthTürkiye initiative will be used to illustrate how Türkiye has further reinforced its competitive edge in the fields of health tourism.

Presenter:

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Individualised Orthoplastic Management of Complex Periprosthetic Joint Infection Following Total Knee Arthroplasty

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Periprosthetic joint infection (PJI) following total knee arthroplasty represents one of the most challenging complications in modern orthopaedics, particularly when compounded by soft tissue loss and bone defects. These complex cases are associated with high failure and amputation rates, and conventional algorithm-driven strategies often prove inadequate. We present a multidisciplinary, individualised orthoplastic approach aimed at optimising infection control, soft tissue reconstruction, and functional limb salvage.

We conducted a retrospective case series of five patients with complex PJI and associated soft tissue compromise managed at a tertiary referral centre between 2023 and 2025. All cases were treated through a coordinated orthoplastic pathway integrating orthopaedic surgery, plastic and reconstructive surgery, and infectious disease expertise. Management included radical debridement, tailored antibiotic-loaded cement spacers designed according to bone loss and microbiological profile, and defect-specific soft tissue reconstruction.

Infection eradication and durable soft tissue coverage were achieved in all cases. Reconstructive strategies included primary closure (n=1), local pedicled flap (n=1), and medial gastrocnemius flap (n=2), with one case requiring a customised spacer to address significant bone loss. No patients required amputation or revision for recurrent infection. All patients regained ambulatory function, with satisfactory range of motion (mean 94°). Flap survival was 100%, and no wound breakdown occurred.

Case	Age/Sex	Soft Tissue Defect	Reconstruction	Spacer Type	Organism(s)	Outcome
1	51 M	Chronic sinus	Primary closure	Dynamic spacer	Coagulase-negative strep Staphylococcus epidermis	Infection-free ROM 0–100
2	62 M	Sinus tract	Axial bi-pedicled flap	Articulating spacer	Pseudomonas, Klebsiella, Staphylococcus epidermis	Infection-free ROM 0–95
3	65 M	Chronic wound	Medial gastrocnemius flap	1.5-stage implant	Candida albicans, coagulase-negative strep, anaerobes	Infection-free ROM 0–120
4	83 F	Wound dehiscence	Medial gastrocnemius flap	Two-stage + distal femoral replacement	Escherichia coli, proteus	Infection-free ROM 0–90
5	79 M	Bone loss	Custom spacer	Custom	Staphylococcus epidermis	Infection-free ROM 10–65

These findings demonstrate that a personalised orthoplastic strategy can achieve consistently favourable outcomes in highly complex PJI cases. Early multidisciplinary collaboration, combined with customised reconstruction and spacer design, is critical to success. This approach challenges traditional one-size-fits-all algorithms and supports a paradigm shift toward patient-specific, integrated care models for complex musculoskeletal infection.

Presenter:

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Impact of Network Sparsity on Graph Based Classification in Biological Systems: Insights from Resting State Functional Connectivity in Autism

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Biological systems are increasingly represented as complex networks to capture interactions across multiple scales. These interactions play an important role in understanding system behaviour along with analytical tasks including prediction and diagnosis. However, such data pose a significant challenge in terms of feature extraction and modeling due to higher dimensionality and noise factors. These issues in biological networks manifest into weak or spurious connections which are addressed through thresholding, resulting in network sparsity which can significantly alter the network topology. These alterations consequently affect graph-theoretic measures used in feature extraction. To examine the impact of network sparsity and predictive performance, a resting state functional connectivity was analyzed from the ABIDE dataset across a range of threshold values. Graph-theoretic measures involving centrality measures were computed across multiple threshold levels to generate network representations with varying sparsity. These measures involving degree centrality, betweenness centrality, clustering coefficient and eigenvector centrality were then used to train a linear Support Vector Machine classifier to distinguish patients with Autism Spectrum Disorder (ASD) from Typical Development (TD) participants to evaluate sparsity-dependent behaviour. Experimental results indicated strong dependence of classifier performance on network sparsity levels. Among the centrality measures, clustering coefficient achieved the highest accuracy of 79.17% with Sensitivity and Specificity of 83.3% and 75.0% respectively at a threshold of 0.75 for a site-specific dataset. Furthermore, the sensitivity and specificity varied across sparsity levels for certain graph measures revealing distinct trends across these measures, particularly improved sensitivity when the network is more sparsely distributed. This methodological approach is relevant to many conditions that affect network-level organization of the brain, including those related to Central Nervous Systems. The choice of network construction can significantly influence downstream analytical outcomes, where preprocessing choices such as thresholding can have a direct influence on feature stability and model performance.

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