SESSION LECTURE

No.23

AI and Frontier Life Science

Room: Swan Room 1

Co-Chairs:
Yi Shi

Zijie Zhang

Patricia T. Bozza

Day 3 October 21st (Monday) 09:00 – 12:30

Time	Speaker	Title
09:00-09:30	**Patricia T. Bozza** Oswaldo Cruz Institute/FIOCRUZ	Immunometabolic Reprogramming and Lipid Droplets as Targets for Intervention in Infectious Diseases
09:30-10:00	**Haiyan Liu** University of Science and Technology of China, School of Life Sciences	Designing Flexible Protein Structures and Sampling Protein Conformational Distributions with a Latent Space Diffusion Model
10:00-10:30	**Antonio Carlos Campos de Carvalho** Oswaldo Cruz Institute/FIOCRU	The advanced therapy program at Fiocruz
10:30-11:00	**Jun Wang** Institute of Microbiology, Chinese Academy of Science	Deep learning enables new discovery in microbiom
11:00-11:30	**Shuyi Zhang** School of Pharmaceutical Sciences at Tsinghua University	Predictive design of functional parts and cells
11:30-12:00	**Guoli (Scarlett) Shi** National Cancer Institute	Omicron Spike confers enhanced infectivity and interferon resistance to SARS-CoV-2 in human nasal tissue
12:00-12:30	**Zhou Tong** Institute of Microbiology, Chinese Academy of Sciences	Deciphering a Reliable Synergistic Bispecific Strategy of Rescuing Antibodies for SARS- CoV-2 Escape Variants

Patricia T. Bozza

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Dr. Patricia Bozza is a Senior Investigator and Head of Laboratory of Immunopharmacology at Oswaldo Cruz Institute/FIOCRUZ, Brazil. Patricia is an elected Member of the Brazilian Academy of Science and of The World Academy of Science (TWAS). Patricia's group long-term goal is devoted to conducting translational studies that contribute new knowledge on the interplay of metabolic and inflammatory mechanisms in the pathogenesis of emergent and/or severe infectious diseases, including dengue, Zika, COVID and sepsis.

Antonio Carlos Campos de Carvalho

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Antonio Carlos Campos de Carvalho. MD, PhD. Professor Emeritus, and renowned physiologist focusing on cardiovascular science. His research has centered on stem cells and cell therapies for cardiac diseases, combining basic and clinical research. He coordinates the Brazilian Cell Therapy Network and has led significant clinical trials on cell-based treatments for heart conditions. He currently coordinates the Advanced Therapy Medicinal Products program at Foundation Oswaldo Cruz-Fiocruz, transferring technologies for ex-vivo and in-vivo gene therapies for cancer and rare diseases to Brazil.

Zhou Tong

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Dr. Zhou Tong is currently an associate professor at the Institute of Microbiology, Chinese Academy of Sciences and the deputy secretary- general of the Chinese Society of Biotechnology.His research focuses on in vitro directed evolution and high-throughput screening system for antibodies. Under the guidance of Prof. George Fu Gao, the "Dia-19 Bispecific Antibody" successfully obtained clinical trial approval from the Center for Drug Evaluation (CDE) in February 2024, and the COVID-19 antigen detection kit obtained marketing authorization in China in December 2022.

Haiyan Liu

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PhD. Professor at the University of Science and Technology of China, School of Life Sciences. Research in his group focuses on developing and applying computational methods for biomolecular modeling and design. He is particularly interested in developing data- driven or physics-based models relating amino acid sequences to protein structures and conformational dynamics, especially models that can enable the rational design of proteins of new structures and functions, which can be tested in wet experiments.

Jun Wang

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PhD. Professor at the Institute of Microbiology, Chinese Academy of Science.Research of Wang lab focuses on the application of deep learning in exploring microbial functional peptides, including antimicrobial peptides and anticancer peptides, as well as development of bioinformatic tools for microbiome analysis, especially on utilizing the power of long reads in studying bacteriome, mycobiome and virome.

Shuyi Zhang

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Shuyi Zhang is currently an associate professor in the School of Pharmaceutical Sciences at Tsinghua University. He is interested in synthetic biology, de novo protein design, and continuous directed evolution to artificially design functional parts in a high-throughput manner by utilizing automatic platforms and artificial intelligence. His work focuses on exploring and engineering metabolism, energy, and regulatory networks in cells for biomedical applications.

Guoli (Scarlett) Shi

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PhD, Staff Scientist at the National Cancer Institute, HIV Dynamics and Replication Program, focuses on the mechanisms of cell-intrinsic immunity and how HIV and emerging viruses evade or counteract these immune barriers. Her research uncovered critical roles of Interferon-Induced Transmembrane proteins(IFITMs) in viral infection regulation, highlighted how mTOR inhibitors compromise cell-intrinsic immunity to increase viral susceptibility, and provided insights into the unique infectivity and interferon resistance of the Omicron variant in human nasal tissue.