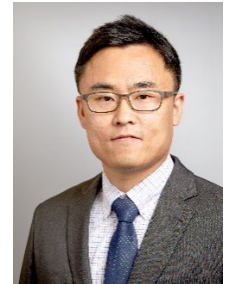


Speaker Profile`s

Speaker (1) Dr. Jinki Yeom
Designation Assistant Professor, Programme in Emerging Infectious Diseases, Duke-NUS Medical School.



Title “Protein longevity as a wake-up call for dormant cells”

Abstract All living organisms require nutrients to grow and reproduce. When nutrient quantity or quality is low, organisms reduce their growth rate and enter a dormant state characterized by arrested physiological activity and critical for cell survival. We now report that preserving proteins during dormancy speeds the return to a growth state. We establish that the bacterium *Salmonella enterica* reduces proteolysis by adenosine triphosphate (ATP)-dependent proteases by decreasing ATP amounts when starved for magnesium, carbon or nitrogen. The yeast *Saccharomyces cerevisiae* also reduces ATP amounts and ATP-dependent proteolysis when starved for nutrients. Drugs that increase ATP amounts delay entry into the growth state by promoting ATP-dependent proteolysis. Thus, the better the ability to preserve proteins during dormancy, the faster prokaryotes and eukaryotes exit the dormant state as soon as nutrients become available. Starvation-promoted protein longevity likely also plays a role in the germination of bacterial spores and in antibiotic persistence.

Biography Jinki Yeom is an Assistant Professor at the Duke-NUS Medical School. He received his Ph.D. in Microbiology and B.Sc. in Life Sciences and Biotechnology from Korea University in South Korea. During Ph.D., his research interest was centered on antibiotic resistance mechanism in *Pseudomonas aeruginosa*. Later he studied about metabolomics of antibiotic resistant bacteria for his Post-doctoral fellowship in Korea Basic Science Institute. After completing his Post-doctoral studies, he moved to USA and worked in the Department of Microbial Pathogenesis at the Yale School of Medicine. As a postdoctoral researcher, his work focused on mechanism of bacterial proteolysis and antibiotic tolerance in *Salmonella Typhimurium*. He has authored 23 research papers focusing on antibiotic resistance, bacterial oxidative stress response and bacterial proteolysis.

Research interests Bacterial oxidative stress response and bacterial proteolysis that regulates antibiotic resistance.

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Speaker (2) Dr. Yonggui Gao
Designation Associate Professor, School of Biological Sciences and Institute of Structural Biology, Nanyang Technological University.
Title “Ribosome protection: an emerging antimicrobial resistance mechanism”

The ribosome, a protein synthesizing machine, is one of the richest targets for over half of clinically used antibiotics. We have determined several structures of ribosome complexes that offers insight into action mechanism of antibiotics as well as rationalizes mutations resulting in resistance. On the other hand, antibiotics could help us trap ribosome in certain state so that the structure can be reconstructed and visualized.

Abstract

Current antibiotic resistance crisis urgently requires a better understanding of drug resistance mechanisms and an effectively targeted drug discovery. A wide range of mechanisms could mediate antibiotic resistance, which is currently one of the biggest threats to global health and food security. Recently, we identified a few ATP-binding cassette family proteins that can confer resistance across species to various antibiotic classes through unknown mechanisms. Elucidating these mechanisms will enable us to rational design improved antimicrobial agents that overcome multidrug-resistant bacteria. Here I will be presenting our recent progress towards a better understanding of action mechanisms of antibiotic and drug resistance involving ribosome protection.

Biography

Dr. Yonggui Gao attained his PhD from Zhejiang University, China, and has his scientific training from Hokkaido University (Japan) and Medical Research Council Laboratory of Molecular Biology (Cambridge, UK), supported by COE Fellowship and Career Development Fellowship, respectively. In 2010, Dr. Gao was awarded Singapore NRF Fellowship, since then he moved to NTU. Dr. Gao is an expert in structural biology and protein chemistry. Currently, his group is interested in studying: structure and function of ribosome, molecular mechanism of antibiotic targeting ribosome and antimicrobial compound development; chemical modification on DNA/RNA leading to gene regulation correlated with human disease (like obesity) and the inhibitor design; as well as exopolysaccharide biosynthesis, regulation and its potential application development. He also serves as an Editorial Board Member for several journals (including Nature Publishing Group).

Research interests

- Structure and function of ribosome, molecular mechanism of antibiotic targeting ribosome and antibacterial compound development;
- Chemical modification on DNA/RNA leading to gene regulation correlated with human disease/disorder (like obesity, cancer/tumor progression) and the inhibitor design;
- Stress response, biofilm formation and regulation (involving c-di-GMP signaling and gene expression regulation);
- Pathogen-host interaction relevant to drug resistance.

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