Department of Biomedical Engineering
The Chinese University of Hong Kong

Molecular tools for probing bacteriophage-host interactions in clinical pathogens



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Venue : Room 1122, William M W Mong Engineering Building, CUHK

Abstract

Recent years have seen the emergence of an entirely new field in microbiology, the comprehensive characterization of the immune systems of bacteria and their relations to the viruses of bacteria, bacteriophages. As with other areas of microbiology, these studies have overwhelmingly focused on a limited number of model organisms for which the proper culturing techniques and genetic tools have been developed. However, by studying only a small number of species, our knowledge regarding these systems suffers a great limitation. Furthermore, often what is true for these species may not be the case for other clinically, or environmentally important bacteria. In this regard, a great deal of knowledge is lost regarding the identification and functional characterization of unknown systems. We focus on mapping the phage-sensitivity properties of a large collection of clinical isolates of the emerging pathogen *Acinetobacter baumannii* against a diverse panel of Acinetobacter bacteriophages we have isolated. Utilizing genomic sequencing, a variety of bioinformatic tools, and genetic manipulation methodologies we have specifically optimized for Acinetobacter strains, we aim to identify and characterize anti-phage defense mechanisms in their original backgrounds. We hypothesize that studying these systems within their native contexts will greatly expand our knowledge and lead to discoveries not possible in heterologous settings.

Biography

Dr. Bálint Csörgő completed his Ph.D. under the supervision of Dr. György Pósfai at the Biological Research Centre in Szeged, Hungary, focusing on bacterial strain engineering for synthetic biology purposes. He next joined the group of Dr. Csaba Pál at the same institute and continued working on the development of high-throughput genome engineering methodologies in a variety of bacteria. With the support of a Marie-Skłodowska Curie Global Fellowship, he subsequently worked in the group of Dr. Joe Bondy-Denomy at the University of California, San Francisco and the group of Dr. Lars Steinmetz at the European Molecular Biology Laboratory in Heidelberg, Germany working on the development of CRISPR-Cas-based gene-editing technologies. In 2023, he returned to his native Hungary and established the Gene Technology Research Group at the HUN-REN Biological Research Centre, focusing on the study of the co-evolutionary relationship between pathogenic bacteria and bacteriophages.

***** ALL ARE WELCOME *****

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