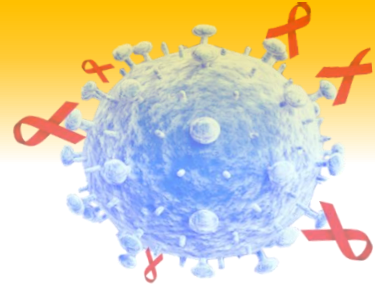


# AIDS Institute

## Department of Microbiology

### Seminar



## Engineering Next-Generation of Viral Vectors for Gene Therapy

11:00am, Friday, March 15, 2024

Room 36, 5/F, Laboratory Block, Faculty of Medicine Building, 21 Sassoon Road



**Speaker: Bonnie Danqing ZHU,**

**Assistant Professor**

**Department of Chemical and Biological Engineering, The Hong Kong  
University of Science and Technology**

Bonnie Zhu joins the Department of Chemical and Biological Engineering (CBE) as an Assistant Professor in Spring 2023. Bonnie completed her Ph.D. at Stanford University in Bioengineering, supervised by Prof. Fan Yang and Prof. Sarah Heilshorn. Her research employs materials chemistry, protein engineering, and stem cell approaches to develop models of tissue development that capture the dynamic complexity of cell-ECM interactions. She then continued her training as CIRM Postdoctoral Fellow and Siebel Scholar at UC Berkeley and UCSF. Her work focuses on using protein engineering and computational approaches to engineer safe and targeted therapeutic gene delivery vectors for treatment of neurological diseases.

**Abstract:** Gene therapy, the delivery of genetic material to the cells of a patient for therapeutic benefit, has been increasingly successful over the past decade. The most successful gene delivery vectors are based on adeno-associated viruses (AAV). Although these natural viruses are safe and non-pathogenic, they present several barriers that limit their efficacy in delivery as they were not evolved by nature for human therapeutic applications. Directed evolution, a strategy involves the iterative genetic diversification of a molecule to create a gene pool and functional selection to isolate variants with optimal properties, has thereby emerged as a powerful approach for re-evolving AAVs of novel and improved functions. In parallel, recent advances in deep sequencing technologies allow millions of sequences to be assayed and used for training machine learning (ML) models for prediction of protein properties. Using the combination of directed evolution and ML-guided design, we have engineered ‘designer’ viral variants with greatly improved packaging, diversity, and primary human brain infection capabilities. The

**ALL ARE WELCOME | FREE ADMISSION**

#### Enquiries

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