

Microbiology Job Talk (February 15, 2018, 10am, DV3130 – Council Chambers)

Jing Yan

Title of Talk: Building a home the *V. cholerae* way: biophysics of bacterial biofilms.

Abstract: Biofilms are surface-associated bacterial communities embedded in an extracellular matrix. Bacterial biofilms can cause chronic infections and they clog pipes and filters in industry. Investigations to date have primarily focused on the genetic and regulatory features driving biofilm formation. In this seminar, I will discuss how I have used *Vibrio cholerae* as a model biofilm former to reveal the biophysical and biomechanical principles underlying biofilm formation. I will present a new technology to image living, growing bacterial biofilms at single-cell resolution. I will use this imaging technique to investigate how cell growth, cell-cell adhesion, and cell-surface adhesion, collectively, determine the global biofilm architecture. I will show how matrix production drives biofilm expansion and excludes cheater cells. Finally, I will discuss efforts to measure the material properties of biofilms. I will show how understanding biofilms as living materials enabled the development of methods for their removal.

Biography:

Dr. Jing Yan obtained his bachelor's degree from the College of Chemistry and Molecular Engineering at Peking University. As a graduate student, he studied soft matter physics in the Department of Materials Science and Engineering at the University of Illinois, Urbana-Champaign. There, he developed non-equilibrium colloidal materials. He transitioned to biology for his postdoctoral training, working at Princeton University jointly in the Department of Molecular Biology and the Department of Mechanical and Aerospace Engineering. His focus is on bacterial biofilm formation. Dr. Yan is also a Burroughs Wellcome Fellow at the Scientific interface.