Molecular Engineering & Sciences Institute

Genome Sciences UNIVERSITY OF WASHINGTON

MOLECULAR ENGINEERING SEMINAR SERIES

# Biological Design Principles: Learning by Hacking Cell Behavior

**Tuesday, May 1**
**1:00 - 2:00 p.m.**
**NanoES 181**



## Abstract

Traditionally, biology has focused on deconstructing and mapping the molecular systems that carryout complex regulatory functions. We still lack, however, a more global understanding of the design principles governing how cells solve problems and make regulatory decisions. To address this problem, we have been complementing deconstructionist approaches with synthetic approaches in which we ask how to build molecular systems that can execute particular regulatory tasks. Are there a limited number of molecular algorithms that evolution can use to solve common physiological tasks? If so, can we learn to recognize them in order to understand the function of complex cellular networks? By systematically rewiring cellular networks, we can test our understanding of cellular logic, as well as engineer cells that execute novel functions. Recent advances have demonstrated that these approaches have the potential to transform medicine by allowing us to engineer smart therapeutic immune cells that can recognize and treat cancer and other diseases with unprecedented precision.

## Presenter

### Wendell Lim, Ph.D.

**Professor and Chair, Department of Cellular & Molecular Pharmacology, UCSF**

**Investigator, Howard Hughes Medical Institute**

Wendell Lim is Professor and Chair of the Department of Cellular and Molecular Pharmacology at the University of California San Francisco and an Investigator of the Howard Hughes Medical Institute. He received his A.B. in Chemistry, summa cum laude from Harvard College, his Ph.D. in Biochemistry and Biophysics at the Massachusetts Institute of Technology, and completed his postdoctoral training at Yale University. His research focuses on the design principles of molecular circuits that govern cell decision-making and responses. His lab has made contributions in understanding the molecular machinery of cell signaling and how molecular modules have been used in evolution to build novel new behaviors. Most recently he has been a pioneer in the field of synthetic biology, exploring how these design principles can be harnessed to engineer cells with customized therapeutic response programs.