

## BCH 252 Seminar Series



**Dr. Kenji Murakami, Assistant Professor,  
Department of Biochemistry and  
Biophysics, Perelman School of Medicine at  
the University of Pennsylvania**

**Seminar Title: "Structural basis of a  
transcription pre-initiation complex on a  
divergent promoter"**

**Abstract:** Most eukaryotic promoter regions are divergently transcribed. As the RNA polymerase II pre-initiation complex (PIC) is intrinsically asymmetric and responsible for transcription in a single direction, it is unknown how divergent transcription arises. Here, the *Saccharomyces cerevisiae* Mediator complexed with a PIC (Med-PIC) was assembled on a divergent promoter and analyzed by cryoelectron microscopy. The structure reveals two distinct Med-PICs forming a dimer through the Mediator tail module, induced by a homodimeric activator protein localized near the dimerization interface. The tail dimer is associated with ~80-bp upstream DNA, such that two flanking core promoter regions are positioned and oriented in a suitable form for PIC assembly in opposite directions. Also, cryoelectron tomography visualized the progress of the PIC assembly on the two core promoter regions, providing direct evidence for the role of the Med-PIC dimer in divergent transcription.

**Biography:** I obtained my PhD in Japan, the University of Tokyo, and did a postdoc study at Stanford University. Since 2015, the Murakami laboratory at UPenn has been working for research focused on transcription and DNA repair in eukaryotes using cryo-electron microscopy, cross-linking mass spectrometry, biochemical and computational techniques.

**ZOOM Link:** <https://ucr.zoom.us/j/92569273073>

**Meeting ID:** 925 6927 3073

**Passcode:** 689525

**Tuesday, May 16, 2023**

**12:00 p.m. - 12:50 p.m. PST**

**Host: Dr. Sean O'Leary & Dr. Maria Ninova**