UC RIVERSIDE

DEPARTMENT OF MICROBIOLOGY AND PLANT PATHOLOGY FACULTY RECRUITMENT CANDIDATE SEMINARS:

Assistant Professor in Fungal Biology

In-Person Seminar Location:
Genomics Auditorium 1102A

ZOOM Link for Seminar:
https://ucr.zoom.us/j/94909733228
Meeting ID: 949 0973 3228

Michelle Hays, Postdoctoral Scholar, Stanford University

Research Seminar:
Monday, February 26, 2024 | 1:30 p.m. – 2:30 p.m.

Seminar Title: "Host-parasite coevolution in yeast"

Abstract: Theory predicts that biotic conflict, between organisms or genetic parasites, can lead to rapid evolution and biological innovation. Conflict with genetic parasites (such as viruses or transposons) can create novelty even in essential genes and conserved processes. Determining the mechanisms that shape genomes is important for understanding evolution, phenotypic diversity and how novel biology arises. I use budding yeasts and their natural parasites to understand how genetic backgrounds and external environments shape the evolutionary paths that organisms use adapt and defend themselves. Although arguably one of the best studied model eukaryotes, yeast host-defenses are comparatively understudied. I will present three short stories that explore how host-parasite interactions are shaping yeast evolution. Some wild yeast 'fight back' against a parasitic plasmid. A variant of a host-essential gene impairs plasmid partitioning, and may share mechanisms with recently-identified viral restriction factors in primates. Exploring yeast 'immune functions' may also reveal shared biology with other species: just as yeast has been instrumental in understanding other areas, like the cell cycle. Parasites shape their host's ability to adapt to other stressors. In some environments intracellular parasites like transposons can have host-beneficial roles. Killer yeasts are infected with viruses that allow them to secrete toxins that kill competing organisms, using an intracellular antidote for their own survival. When coevolved in the lab, sensitive competitors become toxin resistant. The gene involved in toxin resistance identifies a potential drug target that could be useful in developing future therapeutics. Understanding how fungi fight and defend themselves has broad implications: for understanding and treatment of infectious diseases in many species and in cancer, where both pathogens and malignant cells adapt to biotic and abiotic pressures.

Seminar Host: Dr. Hailing Jin