

# *RNA Innovation Seminars*

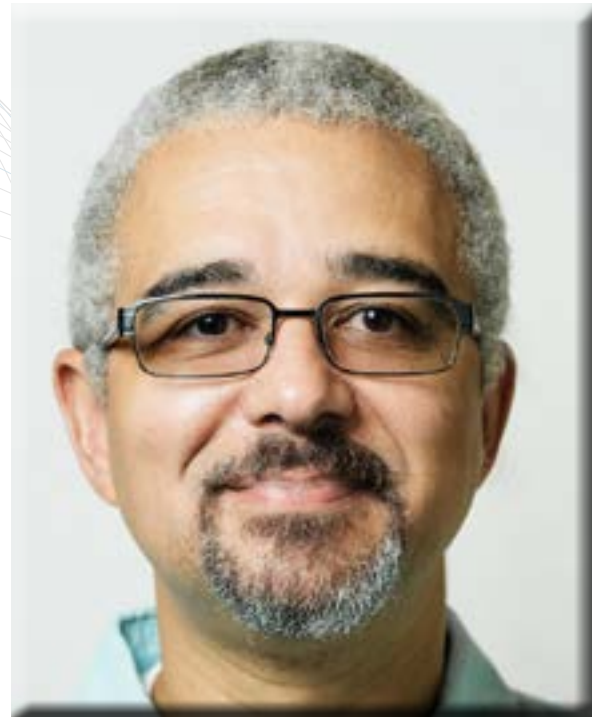


**Monday, April 18, 2022 12:00 PM EST**  
**BSRB, ABC Seminar rooms (Hybrid)**

## ***Signaling Pathway Variation and Evolutionary Hotspots in the Fungi***

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### **Abstract**

Evolutionarily conserved signal transduction pathways, such as Ras-cAMP-PKA, calcineurin, and TOR signaling, are primary regulators of stress responses and morphogenetic processes across the fungal tree of life. From an evolutionary perspective, these pathways are expected to be under relatively strong stabilizing selection, as loss-of-function mutations (LoF) in these pathways typically lead to reduced growth rates and increased sensitivity to environmental stresses. We have carried out comparative population genomic analyses of signaling pathway LoF alleles for multiple fungal species, and find that several pathways exhibit unusually high frequencies of naturally occurring putative LoF alleles. We discuss the implications of this finding for the evolutionary lability of signaling pathways in the fungi, and combine information on loss-of-function alleles with related evidence from QTL mapping and experimental evolution studies to identify pathways that may act as “evolutionary hotspots” for adaptation to novel environments.