

BCH 252 Seminar Series



**Dr. Stephen Floor, Associate Professor,
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Seminar Title: "RNA molecular recording"

Abstract: RNA deaminases are powerful tools for base editing and as RNA molecular recorders. However, the enzymes used in currently available RNA molecular recorders such as TRIBE or DART/STAMP have limitations due to RNA structure and sequence dependence. We designed a platform for directed evolution of RNA molecular recorders. We engineered an RNA A-to-I deaminase (rABE) that has high activity, low bias, and low background. Using rABE, we present REMORA (RNA Encoded Molecular Recording in Adenosines), wherein deamination by rABE writes a molecular record of RNA-protein interactions. By combining rABE with the C-to-U deaminase APOBEC1 and long-read RNA sequencing, we measured binding by two RNA binding proteins on single mRNAs. Orthogonal RNA molecular recording of PUM1 and PUM2 reveals that PUM1 competes with PUM2 for a subset of sites in cells. We further identify transcript-isoform specific RNA-protein interactions driven by isoform changes distal to the binding site. The genetically encodable RNA deaminase rABE enables single-molecule identification of RNA-protein interactions with cell type specificity. I will discuss our findings using RNA molecular recorders to understand RNA biology, and how the RNA chaperone DDX3 regulates gene expression.

Tuesday, October 17th, 2023 | 12:00 p.m. - 12:50 p.m. PST

In-Person: Genomics Auditorium 1102A

Host: Dr. Sean O'Leary