GBSBC

Genetics, Bioinformatics, & Systems Biology Colloquium

presents

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UC San Diego

THURSDAY
OCT 12TH

12PM

LEICHTAG
AUDITORIUM

ZOOM
JOIN

ENGINEERING LONGEVITY – COMPUTATIONALLY-GUIDED REPROGRAMMING OF CELL AGING

In this talk, I will present our recent work that combined high-throughput dynamic measurement technologies with math-based theoretical frameworks to interrogate how intracellular molecular networks govern aging processes. Specifically, we investigated single-cell aging dynamics throughout the replicative lifespans of S. cerevisiae, and found that isogenic cells diverge towards two aging paths, with distinct phenotypic changes and death forms (Jin et al., 2019; Li et al., 2020). We developed a nonlinear dynamic model of the underlying molecular network of aging, which quantitatively simulated divergent aging trajectories and guided the engineering of a synthetic gene oscillator to substantially extend the lifespan (Zhou et al., 2023). Our results establish a causal connection between gene network architecture and cellular longevity and set the stage for the rational design of synthetic gene networks that can effectively slow aging in more complex organisms.

PRESENTED BY:

IGM Institute for Genomic Medicine
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