

Biomedical Sciences speaker series presents:

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"Unveiling the Blueprint: Design Principles of Pathogenesis in Health and Disease"

BMSC 252 SEMINAR SERIES

LAB RESEARCH SUMMARY

MONDAY, SEPTEMBER 29, 2025

4PM-5PM

SCHOOL OF MEDICINE
EDUCATION BUILDING II
ROOM 205

The Chaturvedi Lab at UC Riverside investigates how complex biological systems make decisions, and how those decisions can be modeled, engineered, and ultimately directed toward better clinical outcomes. We take a systems and synthetic biology approach to questions at the interface of development, oncogenesis, and host-disease interactions, asking how cellular and molecular circuits are wired, how they adapt, and how they can be reprogrammed.

Our group develops both experimental and computational platforms to make these questions tractable. We build synthetic circuits to probe network logic, engineer single-cell technologies that capture decision-making in real time, and create predictive frameworks that integrate machine learning with emerging tools in quantum computing. These methods allow us to study biology as a dynamic, information-rich system and to uncover rules that generalize across contexts.

The translational potential of our research is equally central. We are applying these principles with our clinical partners to design therapies with stronger barriers to resistance, to develop strategies that make transplantation safer, and to improve clinical outcomes in populations living with chronic infection. In all cases, our aim is to treat biology not as a collection of pathways, but as a system of principles that can be revealed, modeled, and engineered to create new possibilities for medicine.