

JEFFREY I. ZINK INORGANIC CHEMISTRY SEMINAR SERIES



Dr. Nicholas Truex

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“Protein Technologies for Unlocking Immunity and Expanding the Folding Code”

Abstract: My research group develops nature-inspired protein technologies to address real-world challenges and advance human health. Our interdisciplinary program focuses on two areas: fold-switching proteins and artificial transcription factors (ATFs). (1) Fold-switching proteins interconvert between distinct conformations to control cellular processes in response to subtle cues or mutations. Little is known about this class of proteins because preparing key mutants is challenging and competing structures are nearly isoenergetic. To better characterize and understand these proteins, we are developing protein synthesis methods to evaluate the structures within the narrow energy range of fold switching. Our studies focus on homologs of Streptococcus protein G as model systems to develop integrated chemical and biophysical approaches that will, in turn, uncover new molecular principles of fold-switching proteins relevant to human health. (2) Artificial transcription factors (ATFs) provide an alternative platform for immune activation by turning on endogenous genes inside cells. Most immune-activation strategies target extracellular receptors, but their effectiveness can be limited by reduced receptor expression, disrupted signaling, or off-target toxicity. To bypass these limitations, we develop zinc finger ATFs that regulate immune function by controlling gene expression. We identify ATFs that activate immune genes and characterize their biophysical and biological properties. We also develop protein delivery strategies for efficient cellular transport and therapeutic applications. Together, these protein technologies integrate tools from chemistry, biology, and engineering and are enabling new ways to study metamorphic proteins and to precisely control immune function.

Meet the Speaker
TBD | YH 3096

Tuesday, November 3rd, 2026
4:00 p.m. | YH4222 - Collaboratory
Dongwon Yoo Seminar & Conference Hall

UCLA College | Physical Sciences
Chemistry & Biochemistry

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