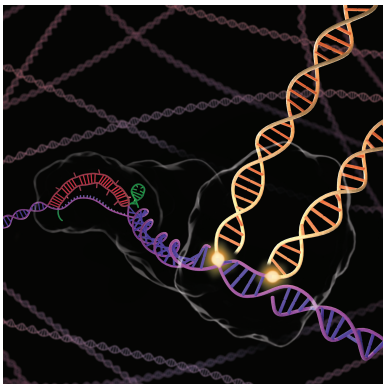
ASRC - City College of New York

Seminar in Biochemistry, Biophysics & Biodesign



SEMINAR LOCATION:
ASRC Main Auditorium
85 St. Nicholas Terrace

- *Current Cleared4 Pass or CCNY ID with gold V-22 sticker required for entrance*
- *Masks are required*
- *Maximum occupancy: 30*

THE SEMINAR WILL ALSO BE AVAILABLE ON ZOOM:

Click here for Zoom link

HOST:
Kevin Ryan
kryan@ccny.cuny.edu

FOR MORE INFORMATION, CONTACT:
Lauren Gohara
lgohara@ccny.cuny.edu
(212) 650-8803

The Biochemistry Seminar series is supported in part by The City College of New York; the CUNY Institute for Macromolecular Assemblies; and the Advanced Science Research Center at the Graduate Center of the City University of New York.

ADVANCED SCIENCE RESEARCH CENTER
THE GRADUATE CENTER
CITY UNIVERSITY OF NEW YORK

Wednesday, December 8, 2021

12:00 – 1:00 PM

CUNY Advanced Science Research Center, Main Auditorium
85 St. Nicholas Terrace, New York, NY

Samuel H. Sternberg

Assistant Professor, Dept. of Biochemistry & Molecular Biophysics
Columbia University

Evolutionary and mechanistic diversity of CRISPR RNA-guided transposases

ABSTRACT Conventional CRISPR–Cas systems maintain genomic integrity by leveraging guide RNAs for the nuclease-dependent degradation of mobile genetic elements, including plasmids and viruses. In a remarkable inversion of this paradigm, bacterial transposons have coopted nuclease-deficient CRISPR–Cas systems to catalyze RNA-guided integration of mobile genetic elements into the genome. Here we show that programmable transposition occurs at a fixed distance downstream of target DNA sequences, accommodates variable length genetic payloads, and functions robustly in diverse bacterial species. Deep sequencing experiments reveal highly specific, genome-wide DNA integration, which is enabled by the coordinated and sequential recruitment of transposase factors to target sites specified by Cascade. By exploring a large set of evolutionarily diverse CRISPR-transposon systems, we further define key sequence motifs that establish transposase-transposon specificity during DNA excision and integration. The discovery of a fully programmable, RNA-guided transposase lays the foundation for kilobase-scale genome engineering that obviates the requirements for DNA double-strand breaks and homologous recombination.