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13 AUGUST

Dr. Elizabeth Kellogg

Associate Member
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Elizabeth Kellogg did her undergraduate studies at UC Berkeley and received a PhD from the University of Washington, working on computational biology in the group of David Baker. She then became a postdoctoral fellow in the lab of Eva Nogales at UC Berkeley using cryo-electron microscopy. Her scientific background results in a scientific approach that seeks to understand biology with a quantitative perspective, relying on biological structure determination and design. Since starting her own group at Cornell University in 2019, Dr. Kellogg has sought to understand how transposons reshape genomes and how they can be repurposed as genome-editing tools. In particular, her group has investigated the behavior and molecular mechanisms of programmable, CRISPR-associated transposons (CASTs), to determine how DNA integration is regulated spatially and temporally in a genomic context, using a combination of biochemical, structural, single-molecule and genetic approaches. Among other honors, Dr. Kellogg was selected as Pew Biomedical Scholar in 2021 and received the 2023 Margaret Oakley Dayhoff Award from the Biophysical Society. She joined St. Jude as an Associate Member in 2023.

Mechanistic insights into RNA-guided DNA integration using transposons

CRISPR-associated transposition systems allow guide RNA-directed integration of a single DNA insertion in one orientation at a fixed distance from a programmable target sequence. These transposition systems are highly complex, with multiple components interacting to carry out a highly coordinated sequence of events to select target-sites and subsequently integrate cargo DNA. The Kellogg lab seeks to understand the underlying mechanisms of programmable DNA-insertion by using high-resolution single-particle Cryo-EM to characterize the structure of these and related transposition systems.