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## Time-Resolved Crystallography Captures Light-Driven DNA Repair

Tuesday 27 August 2024 17:30 (15 minutes)

Photolyase is an enzyme that uses light to catalyze DNA repair. To capture the reaction intermediates involved in the enzyme's catalytic cycle, we conducted a time-resolved crystallography experiment. We found that photolyase traps the excited state of the active cofactor, flavin adenine dinucleotide (FAD), in a highly bent geometry. This excited state performs electron transfer to damaged DNA, inducing repair. We show that the repair reaction, which involves the lysis of two covalent bonds, occurs through a single-bond intermediate. The transformation of the substrate into product crowds the active site and disrupts hydrogen bonds with the enzyme, resulting in stepwise product release, with the 3' thymine ejected first, followed by the 5' base.

## I plan to submit also conference proceedings

No

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