## **First Time-Lapsed Images of Coupled-Cutting of DNA**



An illustration showing the CRISPR-Cas9 enzyme performing near-simultaneous cutting of two strands of DNA.

A. Das, J. Rai, M.O. Roth, Y. Shu, M. L. Medina, M. R. Barakat & H. Li. Coupled catalytic states and the role of metal coordination in Cas9. *Nat Catal 6*, 969–977 (2023). doi.org/10.1038/s41929-023-01031-1

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## Scientific Achievement

Scientists captured time-lapsed images of the CRISPR-Cas9 enzyme performing a near-simultaneous cutting of both strands of DNA.

## Significance and Impact

Understanding the catalytic reaction that drives CRISPR-Cas9's function could yield new tools for gene editing technologies.

## **Research Details**

- Samples were made using active AceCas9 protein from *E. coli* bacteria, RNA, and DNA.
- Cryo-EM images from LBMS and Florida State provided a 3D model of the complex, allowing researchers to observe magnesium ions guiding the CRISPR enzyme as it edits DNA.
- Researchers observed how synchronized reactions allowed for a coupled cutting of both DNA strands.



