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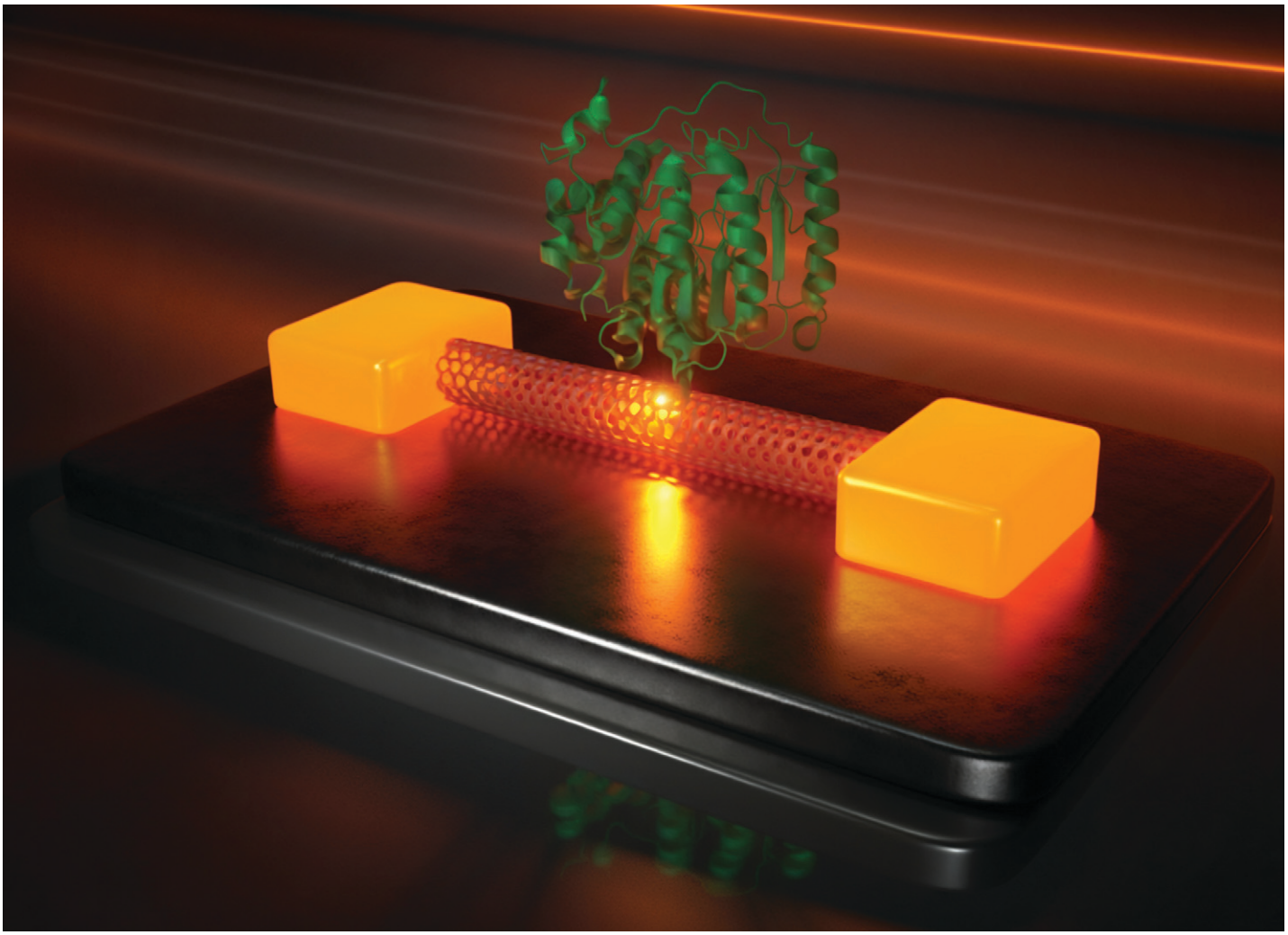

Showcasing research from Professor Yongki Choi's laboratory, Department of Physics, North Dakota State University, Fargo, North Dakota, United States of America.

Substrate structure modulates the catalytic dynamics of HDAC8 at the single-molecule level

This work explores how subtle molecular modifications can fine-tune the performance of an enzyme critical to cellular regulation. Using nanoscale electronic sensors, the catalytic motions of individual histone deacetylase 8 (HDAC8) molecules are monitored in real time. The study shows that chemical substitutions and small activating molecules can work together to stabilize efficient enzyme shapes and boost activity. These findings reveal how molecular design and dynamic motion intersect to control enzyme behavior at the single-molecule level.

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See Yongki Choi *et al.*, *Catal. Sci. Technol.*, 2025, **15**, 7324.

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