

AI Designs Enzymes That Outperform Nature

New breakthrough in artificial metalloenzymes for sustainable catalysis

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highly enantioselective photocatalysts

Catalytic Precision

The study demonstrates the first de novo design of artificial metalloenzymes capable of achieving high enantioselectivity in photocatalytic reactions.

This marks a paradigm shift in synthetic chemistry, where AI-designed protein scaffolds now enable precise stereocontrol in light-driven reactions—previously only possible with natural enzymes or complex synthetic systems. The breakthrough allows for the use of commercially available racemic metal complexes, reducing reliance on rare or expensive chiral catalysts.

01

AI Redefines Catalyst Design

This approach decouples catalytic function from natural biological constraints, allowing AI to explore vast, non-biological protein architectures that outperform evolution in targeted chemical tasks.

02

Energy Efficiency Through Molecular Orchestration

In energy systems, such molecular-level control could translate to lower power demands in industrial catalysis, reducing carbon intensity in chemical manufacturing—especially for pharmaceuticals and high-value materials.

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