

# Engineering Cytochrome P450s for Enantioselective Cyclopropenation of Internal Alkynes

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## Scientific Achievement

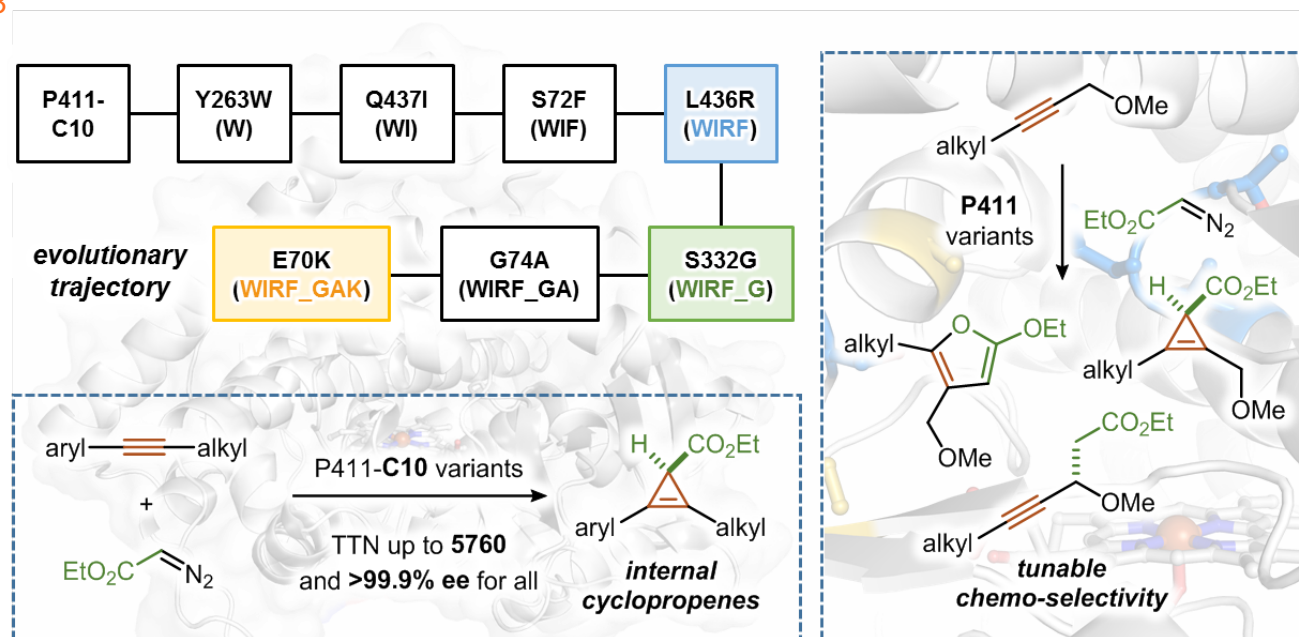
- We evolved cytochrome P450 enzymes to carry out efficient cyclopropene synthesis via carbene transfer to internal alkynes.

## Significance and Impact

- The engineered P450 enzymes, as genetically encoded biocatalysts, accommodated diverse internal alkynes for cyclopropenation with unprecedented efficiencies and selectivities.

## Technical Details

- Directed evolution of cytochrome P450 enzymes.
- Highly enantioselective synthesis of internal cyclopropenes (as pure enantiomers).



Directed evolution of a P450 variant, P411-C10, led to a lineage of engineered P450 enzymes, capable of catalyzing highly efficient and selective synthesis of synthetically useful, highly strained cyclopropenes from internal alkynes.