DEPARTMENT OF CHEMISTRY, MISSOURI UNIVERSITY OF SCIENCE & TECHNOLOGY

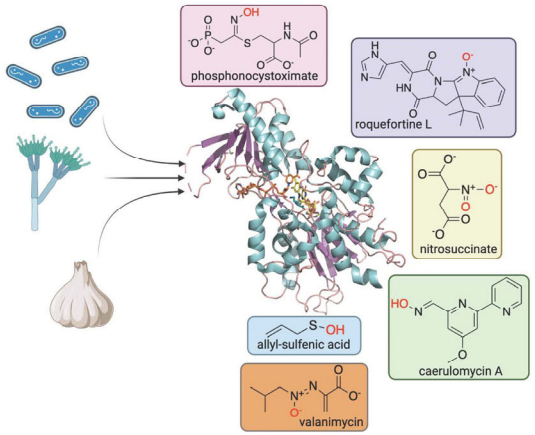
Enzyme Research and Drug Discovery

Research Topics

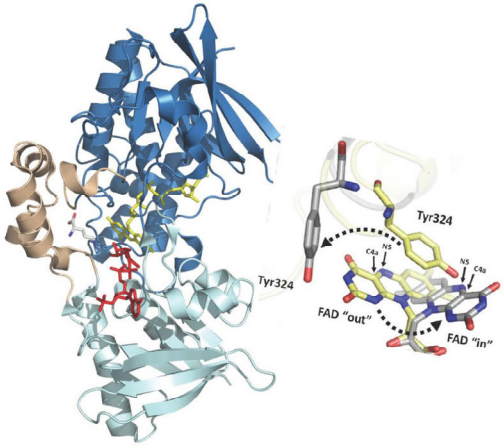
- Natural Product Biosynthesis
  - Antibiotic biosynthesis: Nitrogen oxidizing enzymes
  - Inhibition of siderophore biosynthesis
- Plant Metabolism and Defense
  - Plant growth hormone biosynthesis
  - Plant sulfoxide and aldoxime containing compounds
- Xenobiotic resistance
  - Characterization antibiotic degrading enzymes
  - Characterization of insecticide inactivating enzymes

Facilities

- Rapid-reaction kinetics, high-throughput screening, protein expression and purification, biophysical techniques.
- Center for Biomedical Research



Compounds with antibiotic activity studied in the laboratory



Structure of a siderophore biosynthetic enzyme and conformational changes that occur in the active site

PoC

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Funding

- NSF, NIH, USDA, and NIFA

Keywords

- Antibiotic discovery, plant metabolism, enzyme mechanisms, flavin-dependent monooxygenases

Recognitions/Significant achievements

- Elucidation of the mechanism of multiple oxidation reactions. Highlighted in ASMBM Today.
- Determination of a novel mechanism of action for reduced flavin in dehalogenation reactions.
- Determination of the mechanism of rifampicin inactivation by flavin-dependent monooxygenases.
- Elucidation of allicin biosynthesis in garlic. Highlighted in C&E News.

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