

Kinetic Dissection of the Taurine/ α -Ketoglutarate Dioxygenase Catalytic Cycle: a model α -Ketoglutarate Dioxygenase

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Taurine Dioxygenase (TauD), an Fe(II)- and α -ketoglutarate-dependent dioxygenase, liberates sulfite from organosulfonates through the hydroxylation of the carbon α to the substrate sulfonic acid. Recently we characterized a novel high-spin Fe(IV)=O²⁻ intermediate within its catalytic cycle¹ and showed that it is the hydrogen-atom-abstracting species², which was shown to have a Fe(IV)=O bond distance of 1.6 angstroms³. Using stopped-flow absorption, freeze quench Mössbauer spectroscopy and chemical-quenched-flow techniques with we have further dissected the TauD catalytic cycle⁴, defining a model system which can be used to understand other members of this important enzyme family.

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