



Substrate specificity and spectroscopic properties 2,4-dichlorophenoxyacetic acid/alpha-ketoglutarate dioxygenase

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Summary: 2,4-Dichlorophenoxyacetic acid (2,4-D) was one of the first herbicides used which act by mimicking a plant growth hormone; it and related phenoxy herbicides are still in wide use today. It is not highly persistent in soil, due to microbial biodegradation. In the soil isolate *Ralstonia eutropha* JMP134, the first step in catabolism of 2,4-D is catalyzed by 2,4-D/(\$\alpha\$-ketoglutarate (\$\alpha\$-KG)-dioxygenase (TfdA). This O₂ and Fe(II) dependent enzyme couples the oxidative decarboxylation of \$\alpha\$-KG to the oxidation of 2,4-D producing 2,4-dichlorophenol and glyoxylate. TfdA is a useful model protein for studying \$\alpha\$-KG-dependent dioxygenases because it is readily purified and assayed

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