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3-Nitrotoluene biomineralization by diaphorobacter species

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Three strains of *Diaphorobacter* species that could degrade 3-nitrotoluene completely, were isolated from the sludge taken from an industrial waste-water treatment plant. The complete degradation pathway was established and the first enzyme in the degradation cloned, expressed and purified from *E. coli*. The recombinant enzyme revealed a broad substrate specificity and could also degrade nitrobenzene, 2- and 3-chloronitrobenzene and 4-nitrotoluene. Several other aromatics devoid of the nitrogroup could be biotransformed into useful chiral compounds of industrial importance by the recombinant enzyme. Comparison of the gene and protein sequence with other reported dioxygenases reveals that *Diaphorobacter* is a missing link in the evolution of dioxygenases.

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