

P021 Initial characterisation of the novel cytochrome P450 XplA
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Royal Demolition Explosive (RDX) is a widely manufactured high explosive and is a recognised environmental hazard owing to its toxicity and recalcitrance to biodegradation. As a result of the continued manufacture, use and disposal of this compound large areas of land and ground water are polluted worldwide. This work investigates a gene, *xplA*, identified in a strain of the bacterium *Rhodococcus rhodochrous* (11Y) whose product can utilize RDX as a nitrogen source. XplA is a predicted novel fused cytochrome P450 consisting of an N-terminal flavodoxin domain giving XplA two out of three of the required components for a complete P450 redox system. We have heterologously expressed XplA in *E. coli* conferring on the recombinant bacteria the ability to degrade RDX. Furthermore, His-tagged XplA was purified allowing MS/MS to confirm that XplA does indeed have the unique flavodoxin-P450 arrangement. Carbon monoxide binding gives the characteristic absorption maximum at 450nm expected of a P450 and a non covalently bound flavin group has been detected within the protein. Using ferredoxin reductase to substitute for the first redox step, the purified enzyme has been shown to have activity towards RDX. The way is now open for further characterisation and optimisation of this environmentally useful enzyme.