Positively charged amino acids are essential for electron transfer and protein-protein interactions in the soluble methane monooxygenase complex from methylococcus capsulatus (Bath)

BALENDRA, S., LESIEUR, C., SMITH, T. J. and DALTON, H.

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Table 1. Effect of cross-linking and covalent modification reagents on activity of the hydroxylase.

Reagent	Assay	Specific activity (nmol min^{-1} [mg of hydroxylase]$^{-1}$)
None	Whole complex	220 ± 8
	Peroxide shunt	98 ± 2
BS^3 (cross-linker)	Whole complex	0
	Peroxide shunt	97 ± 4
Sulfo-NHS-acetate (primary amine neutralizer)	Whole complex	0
	Peroxide shunt	93 ± 5
p-hydroyphenylglyoxal (arginine modifier)	Whole-complex	0
	Peroxide shunt	97 ± 4

Table 2. Effect of covalent modification of the hydroxylase on NADH oxidation activity.

Assay components	Rate of NADH oxidation (nmol min^{-1} [mg of hydroxylase]$^{-1}$).
Hydroxylase	0
Reductase	1.93
Hydroxylase + reductase	24.1
Hydroxylase + reductase + protein B	20.3
Hydroxylase +reductase + protein B + propene	29.4
Primary amine-blocked hydroxylase + reductase	1.44
Primary amine-blocked hydroxylase + reductase + protein B	2.41
Primary amine-blocked hydroxylase + reductase + protein B + propene	1.76
Arginine-blocked hydroxylase + reductase + protein B	6.59

Table 3. Effect of covalent modification of the hydroxylase on inhibition of the peroxide shunt reaction by protein B. Specific activity was measured at 1 $mg.mL^{-1}$ of hydroxylase and expressed in nmol of epoxypropane formed min^{-1}.(mg of hydroxylase)$^{-1}$.

Protein B[a]	Specific activity via the peroxide shunt (nmol min^{-1} [mg of hydroxylase]$^{-1}$)		
	Native hydroxylase	Primary-amine neutralised hydroxylase	Arginine modified hydroxylase
0	98 ± 2	93 ± 5	97 ± 4
5	30 ± 3	91 ± 7	93 ± 4

[a] Concentration of protein B expressed as moles per mole of hydroxylase αβγ monomer

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