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

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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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