

Characterization of methanobactin from *Methylococcus capsulatus* (Bath) and *Methylosinus trichosporium* OB3b

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Methanotrophs are gram-negative eubacteria that oxidize methane using the enzyme methane monooxygenase (MMO), which exists in both a well-studied, but rarely expressed, soluble form (sMMO), and a membrane-bound particulate form (pMMO). Copper regulates the expression of both MMOs: sMMO is expressed under copper-limited conditions and pMMO is expressed at higher copper concentrations. A small, copper-binding, siderophore-like molecule called methanobactin has been implicated in the copper sensing and/or copper uptake pathways in methanotrophs. Additionally, it has been suggested that methanobactin may be directly involved in the copper loading or activity of pMMO. We have isolated and purified methanobactin from both *Methylosinus trichosporium* OB3b and *Methylococcus capsulatus* (Bath). In contrast to data reported by other researchers, our X-ray absorption near edge data and EPR spectroscopic parameters indicate methanobactin binds copper(II). Extended X-ray absorption fine structure spectroscopic data indicate sulfur ligation, consistent with the crystal structure of *M. trichosporium* OB3b methanobactin reported by Kim et al.¹ Structural characterization of *M. capsulatus* (Bath) methanobactin is underway.

¹ Kim, H. J.; Graham, D.W.; DiSpirito, A. A.; Alterman, M. A.; Galeva, N.; Larive, C. K.; Asunskis, D.; Sherwood, P. M. A. *Science* **2004**, *305*, 1612-1615.