Biochemistry of Methanogenesis: Mechanism of Methyl-Coenzyme M Reductase

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Seminar Series

Presented by…

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Abstract

Methanogenesis is responsible for the production of about 1 billion tons of methane per year and accounts for nearly all of the methane found on earth. Methyl Coenzyme M Reductase (MCR), the key enzymatic catalyst in the anaerobic synthesis of methane, also catalyzes the reverse reaction—the oxidation of methane (AOM). This protein is unique to methanogens and anaerobic methane oxidizers. MCR is one of the eight known Ni enzymes that catalyze the utilization and/or production of gases that play important roles in the global biological carbon, nitrogen, and oxygen cycles.

MCR is an unusual enzyme in that it is the only known enzyme that contains a nickel tetrapyrrole (F430). It contains novel post-translational modifications in amino acid residues located at the surface of a 50-Å-long channel that accommodates the two substrates or the products. The active state of the F430 catalyst is a low-valent Ni(I) state and the metal ion appears to traverse three oxidation states (1+, 2+ and 3+) during catalysis. Professor Ragsdale's lecture will focus on recent studies aimed at deciphering the catalytic mechanism of MCR.

More info?

http://www.biochem.med.umich.edu/?q=ragsdale

Date: Wednesday, May 28, 2014

Location: EMSL Auditorium

Time: 10:00 a.m.