Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Internal Seminar

Models of molybdenum cofactor with pterin-based dithiolene ligands and investigations through the exchange of molybdenum by rhenium

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Molybdenum cofactor (Moco)-dependent oxidoreductases are physiologically essential enzymes, which are present in nearly every known organism (from microorganisms to humans) and play a central role in the sulfur, nitrogen and carbon metabolism.[1, 2] Moco is a highly oxygen-sensitive compound and it's isolation is almost impossible. Hence, the development of a synthetic cofactor proposes a reasonable approach for a comprehensive understanding of cofactor's features and activity.

The aim of this project is to investigate the role of the pterin unit in the natural cofactor. Furthermore, this project focus on the influence of the molybdenum center on the cofactor's stability and catalytic activity. Therefore, this project targets on the development of pterin-based dithiolene complexes of molybdenum but also of rhenium, that can mimic the catalytic activity of the natural cofactor. In the search for a structural and functional moco-model, with optimum balance between stability and catalytic activity, the physical and chemical properties of the synthesized complexes are studied with particular focus on the influence of the pterin moiety and on the analogy and differences of molybdenum and rhenium.

References:

1. R. Hille, Chemical Reviews, 1996, 96, 2757-2816.
2. R. R. Mendel, Journal of Biological Chemistry, 2013, 288, 13165-13172.

Wednesday, Feb 5th 2020

2:30 PM (Tea/Coffee at 2:00 PM)

Seminar Hall, TIFR-H