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## RECENT ADVANCES IN DIMETHYLFORMAMIDE (DMF) DEGRADATION BY *PARACOCCLUS* SP. STRAIN DMF

**Gurunath Ramanathan**

Indian Institute of Technology Kanpur, India

**W**e isolated and reported (J. Hazardous Materials (2009) 171, 268-272) a bacterial strain of *Paracoccus* sp. strain DMF from a domestic waste water treatment plant. This strain could completely biomineralize up to 5 g/liter of N, N-dimethylformamide (DMF). We have subsequently completed the annotation of the complete genome of this organism. We have also cloned and expressed some of the genes involved in the degradation pathway and expressed the same in *E. Coli*. The protein dimethylformidase (DMFase)- the first enzyme in the degradation of DMF, is a 201 kDa hetero tetrameric ( $\alpha\beta_2$ ) enzyme. The primary sequence of this particular amidohydrolase indicates that DMFase is a novel kind of amidase. It converts each molecule of DMF into one molecule of formate and one molecule of dimethylamine. The recombinant and native proteins were purified, crystallized and its structure solved by a combination

of cryo electron microscopy and X-ray techniques. The structure based catalytic mechanism of this amidohydrolase will be discussed.

### Biography

Gurunath Ramanathan completed his PhD in Molecular Biophysics at the Indian Institute of Science, Bangalore, India. After postdoctoral studies at MIT and the Karolinska Institute Stockholm, Sweden he worked for a brief while at Swedish University of Agricultural Sciences, Uppsala, Sweden. He joined as an assistant professor in chemistry at IIT Kanpur in 2000 where he is currently tenured as a professor of chemistry. His research interests are in the field of peptides and protein design and catalysis with a particular emphasis on use of these for environmental biochemistry. He has published more than 50 papers in reputed journals and has three patents to his credit.

gurunath@iitk.ac.in