

Special Invited Lecture
Inter-Disciplinary Explorations in Chemistry (I-DEC 2018)

Nanozymes for Cellular Redox Regulation

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Abstract:

Oxidative stress is caused by an imbalance between the production of reactive oxygen species (ROS) and the biological system's ability to detoxify these reactive intermediates. It is well known that oxidative stress is associated with diverse diseases, including cancer, renal disease, and neurodegenerative disorders such as Alzheimer's and Parkinson's disease. Antioxidant treatment has been found to be unsuccessful in many cases as they promote disease and increase mortality in humans. The reason for this unexpected behaviour is that antioxidants with strong reducing ability can act as pro-oxidants and increase the oxidative stress. Therefore, it is important to develop antioxidants without pro-oxidant activity. In this regard, our group is working on the design and synthesis of antioxidant enzyme mimetics such as small molecules and nanomaterials that can combat oxidative stress without affecting the cellular antioxidant systems. In this lecture, I will discuss our recent results on the development of nanozymes that can be used for cellular and biomedical applications.

References and Notes:

1. Ghosh, S.; Roy, P.; Karmodak, N.; Jemmis, E. D.; Mugesh, G. *Angew. Chem. Int. Ed.* **2018**, 57, 4510 – 4515.
2. Singh, N.; Geethika, M.; Eswarappa, S. M.; Mugesh, G. *Chem. Eur. J.* **2018**, 24, 8393 – 8403.
3. Singh, N.; Savanur, M. A.; Srivastava, S.; D'Silva, P.; Mugesh, G. *Angew. Chem. Int. Ed.* **2017**, 56, 14267 – 14271.
4. Vernekar, A. A.; Das, T.; Mugesh, G. *Angew. Chem. Int. Ed.* **2016**, 55, 1412 – 1416.
5. Vernekar, A. A.; Sinha, D.; Srivastava, S.; Paramasivam, P. U.; D'Silva, P.; Mugesh, G. *Nature Commun.* **2014**, 5, 5301.

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Bio-Sketch of Speaker

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Mugesh received his B.Sc. (1990) and M.Sc. (1993) degrees from the University of Madras and Bharathidasan University, respectively. He obtained his Ph.D. (1998) at the Indian Institute of Technology, Bombay. In 2000, he moved to Germany as an Alexander von Humboldt Fellow at the Technical University, Braunschweig. In 2001-2002, he worked with Prof. K. C. Nicolaou at the Scripps Research Institute, as a Skaggs postdoctoral fellow.

His research involves organic/organometallic synthesis, enzyme mimetic studies and chemical biology. He is an author of more than 130 publications in international peer reviewed journals and is a recipient of several awards/fellowships, which include: CRSI Silver Medal (2018); National Prize for Research on Interfaces of Chemistry and Biology (2017); Rajib Goyal Prize in Chemical Science by Kurukshetra University (2017); Bhagyatara Award by Panjab University (2017); JSPS Invitation Fellowship for Research in Japan (2016); ISCB Award for Excellence (2016); J. C. Bose National Fellowship, DST, Government of India (2015); Prof. S.K. Pradhan Endowment Lecture Award, ICT Mumbai (2014); Asian Rising Star Commemorative Plaque, Asian Chemical Congress (2013); Shanti Swarup Bhatnagar Prize (2012); AstraZeneca Excellence in Chemistry Award (2012); CRSI Bronze Medal (2011); CDRI Award for Excellence in Drug Research (2010); Swarnajayanti Fellowship, Government of India (2006-07); Ramanna Fellowship, DST (2006).

He is a fellow of the Royal Society of Chemistry (FRSC, 2013), The National Academy of Sciences, India (2012), Indian Academy of Sciences (2012) and Indian National Science Academy (2016). He currently serves as Vice-President and Secretary General of the Chemical Research Society of India (CRSI), President of the Asian Chemical Editorial Society (ACES) and Convener of the Kishore Vaigyanik Protsahan Yojana (KVPY), Government of India. He serves in the Editorial or Editorial Advisory Boards of *Organic and Biomolecular Chemistry* (RSC), *ACS Omega* (ACS); *Bioorganic Chemistry* (Elsevier) and *Biological Chemistry* (De Gruyter, Germany).