

Biography of Dr. Debabrata Das

Professor Debabrata Das is a Professor of Department of Biotechnology at Indian Institute of Technology (IIT) Kharagpur where he has been a faculty member since 1988. He received his Bachelor of Technology in Food Technology & Biochemical Engineering from Jadavpur University, Calcutta in 1977; and his Doctor of Philosophy in Biochemical Engineering from Indian Institute of Technology Delhi in 1985. Prior to joining IIT Kharagpur, he served Citurgia Biochemicals Ltd., Surat as a Biochemical Engineer.

Dr. Das has pioneered the promising research and development of biohydrogen production process by applying fermentation technology. This is a major area of green technology whereby the future world will be rewarded with the boons of a dream fuel-hydrogen! He is actively involved in the research of hydrogen biotechnology for a period of last more than ten years. His commendable contributions towards development of a commercially competitive and environmentally benign bioprocess began with the isolation and characterization of high-yielding hydrogen producing bacterial strain *Enterobacter cloacae* IIT-BT 08, which, as of today, is known to be the highest producer of hydrogen by fermentation. He has conducted basic scientific research on the standardization of physico chemical parameters in terms of maximum productivity of hydrogen by fermentation and made significant contribution towards enhancement of hydrogen yield by redirection of biochemical pathways. Dr. Das has also conducted modeling and simulation study of a continuous immobilized whole cell hydrogen production system using lignocellulosic materials as matrix. Apart from pure substrates use of several other industrial wastes such as sewage sludge, distillery effluent and cheese whey was also explored successfully by him as feed stock for hydrogen fermentation. The aim was to synchronize the bioremediation of waste water with clean energy generation.

His other major contribution in the field of biohydrogen research was the molecular characterization of Hydrogenase coded gene and the over expression of the same in a fast growing *E coli*. Currently Dr. Das is involved in the development of a novel two-stage fermentation process (dark fermentation followed by photofermentation) with a view towards amelioration of hydrogen productivity. The synergy of the process lies in the maximum

utilization of the substrate which otherwise fails to achieve complete conversion due to thermodynamic limitation. Notwithstanding a few limiting factors, two-stage fermentation process appears to have immense potentials for biohydrogen production with better energy efficiency and higher productivity. Presently, his Group is involved for doing research on carbon dioxide sequestering by using green algae.

Dr. Das has authored/coauthored a good number of publications on biohydrogen production processes in various peer-reviewed journals of national and international repute. He has also contributed several chapters in books, and presented papers and delivered several invited lectures in a number of national and international conferences on hydrogen. He has various sponsored projects on different aspects of hydrogen biotechnology under the aegis of DST (India), DBT (India), MNRE (India), DRDO (India), NSF (USA), DAAD (Germany), NTU (Denmark), Royal Norwegian Research Council (Norway). Dr. Das received IAHE Akira Matsui Award 2008 for his important contribution on hydrogen research. He is also the member of the editorial board of several journals: International Journal of Hydrogen Energy, Indian Journal of Biotechnology Biotechnology for Biofuels and International Journal of BioSciences and Technology.