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Research Interests

Evolution of Methylotrophy.

Education

- **Harvard University** — Cambridge, MA
  PhD Program, Organismic and Evolutionary Biology — *Sep. 2009 -*
  - Recipient of the Organismic and Evolutionary Biology Department Fellowship in 2009
  - Recipient of the Graduate School of Arts and Sciences (GSAS) Fellowship in 2009
- **Stanford University** — Stanford, CA
  M.S., Environmental Engineering and Science — *Sep. 2007 - June 2009*
  - Recipient of the John F.P. Braitz Fellowship in 2007
  - Recipient of the Civil and Environmental Engineering Department Fellowship in 2007
- **Delhi College of Engineering, Delhi University** — New Delhi, India
  B.E., Environmental Engineering — *Aug. 2003 - May 2007*
  - Recipient of the Delhi College of Engineering Alumni Association Award as the top ranked student in the Environmental Engineering Major in 2007[1]

Research Experience

- **Evolution of Single Carbon Compound Metabolism in Microbes** — Harvard University
  Research Project guide: Prof. Christopher Marx — *2009-*
  - Studying the evolution of metabolic modules in methylotrophs.
  - Studying the genetic mechanisms underlying adaptation to grow on the toxic single carbon compound - formaldehyde
  - Using adaptive tools to uncover putative gene functions.
  - Conducting Taxonomy and Systematics of Methlyobacterium strains
- **Uranium bioreduction at the Oak Ridge Field Site, TN** — Stanford University
  Research Project guide: Prof. Craig Criddle — *2007-08*
  - Investigated the capacity of two electron acceptors (O_2 and NO_3) to reoxidize microbially reduced Uranium in sediment and water samples from the Oak Ridge Field site.
  - Research published in the Journal of Water Research.
- **Bioremediation of Petroleum-based Hydrocarbons** — Delhi College of Engineering
  Senior Thesis Guide: Prof. S.K. Singh — *2007*
  - Enriched and isolated microbes that could degrade specific compounds found in petroleum waste.
  - Studied the effect of environmental parameters on growth rate of aforementioned microbes.
  - Research conducted in conjugation with Indian Oil Corporation Limited, India.
- **Decentralized Waste Water Treatment Plants for Small Communities** — JNU, India
  Research Project Guide: Prof. A.L. Ramanathan — *2006*
  - Helped conduct pilot plant studies of a waste water recycling unit.
  - Research conducted in conjugation with an NGO:Vigyan Vijay Foundation, New Delhi, India.
  - Research presented at the Youth Conference on Water Management, Delhi Sustainable Development Summit 2007.
- **Phytoremediation in the Yamuna Biodiversity Park** — Delhi University
  Research Project Guide: Faiyyaz Khudsar — *2005-06*
  - Helped conduct research on the ability of different tropical grasses to reduce alkalinity in soils.

Publications

- Boonchayaanant B., **Nayak D.**, Xin D., Criddle C.S. 2009. *Uranium Reduction and Resistance to Re-oxidation under Iron-reducing and Sulfate-reducing conditions.* Water Research. Volume 43, Issue 18, pp 4652-4664.

[1] http://www.dcealumni.org/award2007.asp

Teaching Experience

- Currently serving as a Teaching Fellow for an Undergraduate laboratory based-research course called Evolution in Action at Harvard University (OEB 100). Spring 2011
- Served as a Teaching Fellow for a Undergraduate/Graduate Advanced Aquatic Chemistry Lab Course at Stanford (CEE 273A). Winter 2008.
- Served as a Teaching Fellow for a Graduate level Aquatic Chemistry class at Stanford (CEE 273). Fall 2007.

Awards and Grants

- Awarded the MSI (Microbial Sciences Initiative) Travel Grant in 2010

Posters and Talks

- Presented a Poster at the International Society of Microbial Ecology Meeting in Seattle, WA (Aug 2010)
- Presented a Poster at the Gordon Research Conference on Molecular Basis of Microbial One-Carbon Metabolism in Lewiston, ME (Aug 2010)

Summer Courses

- Hopkins Microbiology Course, Hopkins Marine Station, Stanford University 2007

Relevant Courses

- Environmental Microbiology, Environmental Biotechnology, Environmental Microbial Genomics
- Microbial Physiology, Microbial Evolution, Metabolic Biochemistry of Microorganisms
- Advanced Genetics, Microbial Genetics and Evolution
- Biostatistics, Statistics for Biology
- Pathogens and Disinfection, Public Health Microbiology, Climate Change in the 21st Century
- Soil Chemistry, Aquatic Chemistry, Hydrology

Society Membership

- Student Member of International Society of Microbial Ecology 2010