

ADITI DAS

POST-DOCTORAL RESEARCH FELLOW
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EDUCATION

PRINCETON UNIVERSITY 2001-2005, Advisor: Prof. Michael H. Hecht
Ph.D. (Chemistry) – 2005; M.A. (Chemistry) - 2003

I. I.T. (INDIAN INSTITUTE OF TECHNOLOGY), KANPUR 1996-1998, Advisor: Prof. Sabyasachi Sarkar
M.Sc. (Chemistry)

ST. STEPHEN'S COLLEGE, DELHI UNIVERSITY, INDIA, 1993-1996
B.Sc. (Honors) (Chemistry)

RESEARCH EXPERIENCE

UNIVERSITY OF ILLINOIS-URBANA CHAMPAIGN

Post Doctoral Research Fellow, 2006-Present, Advisor: Prof. Stephen G. Sligar

- Development of ultrasensitive detection methodology for membrane proteins using Nanodiscs and Localized Surface Plasmon Resonance (LSPR). (*Collaborators: Prof. Richard Van Duyne, Prof. George Schatz*)
- Understanding the mechanism of redox potential regulation in membrane bound cytochrome P450s and nitric oxide synthase. (*Collaborator: Prof. Thomas Poulos*)
- Isolation of A β oligomers (involved in Alzheimer disease) binding receptors from synaptosomes into Nanodiscs (*Collaborator: Prof. William Klein*)
- Development of label free assay for cholera toxin binding to receptors in Nanodisc using nanomechanical detection methodology. (*Collaborator: Prof. Vinayak David*)
- Nanodisc-based delivery of siRNA to silence genes involved in defense against HIV infection (*Collaborator: Prof. Steve Wolinsky*)

PRINCETON UNIVERSITY

Research Associate, Chemistry, 2001 – 2005, Advisor: Prof. Michael H. Hecht

- Electrochemical studies of *de novo* designed alpha helical heme proteins.
- Nanografting *de novo* proteins onto gold surface (*Collaborator: Prof. Giacinto Scoles*)
- Peroxidase activity of *de novo* designed heme proteins on gold surface
- Evaluation of small molecule binding to designed proteins using solution-state NMR

NAVAL RESEARCH LABORATORY

Summer Intern, 2002, 2004, Supervisor: Dr. Scott. A. Trammell

- Design of TNT biosensors using *de novo* designed proteins as scaffolds.

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I. I. T. (DELHI)

Research Fellow, Center for Biomedical Engineering, 1998-2001 Advisor: *Prof.* Alok. R. Ray

- Synthesis of copolymers of poly (propylene fumarate) and poly (propylene glycol) for use in bone tissue engineering.

I. I. T. (KANPUR)

Research Scholar, Chemistry Department, 1996-1998, Advisor: Dr. Sabyasachi. Sarkar

Synthesis of molybdenum based functional mimics of aerobic acetylene hydratase enzymes.

AWARDS AND HONORS

- **2007.** Outstanding Researcher Award, NSF-Nanoscale Science and Engineering Center (Awarded annually to the top researcher among post doctoral associates and graduate students in the NSF-NSEC center).
- **2006-11.** NSF-Nanoscale Science and Eng. Center (NSEC) Postdoctoral Fellowship.
- **2005.** FMC Corporation Graduate Fellowship in Chemistry, Princeton. (Awarded annually to the top graduate student in Biochemistry and Organic Chemistry.)
- **2004.** Dean's List Finalist for Honorific Fellowship, Princeton.
- **2004.** Honorific Fellowship Nomination, Princeton. (Top three in the Department of Chemistry.)
- **1998.** CSIR-JRF Fellowship, India. Awarded annually to the 12 students in chemistry country-wide.
- **1998.** Graduate Aptitude Test in Engineering (Score 98.5 percentile), India
- **1993-96.** Merit List Scholarship, Delhi University, India. (Top 10 of 900 undergraduates in chemistry.)
- **1992.** Certificate of Merit at Indian National Mathematics Olympiad (INMO).
- **1990, 92.** National Scholarship from Govt. of India. (Top 0.1% in national board examinations.)

EXPERIENCE IN TEACHING, GRANT WRITING AND LAB MANAGEMENT

- Teaching Assistant in General Chemistry Labs (CHM 201) in fall 2002, '03 and '04. Obtained average evaluation of "Excellent" (4.5/5).
- Active management and mentorship of graduate and undergraduate students, and summer high-school interns during graduate school and post-doctoral research.
- Writing and editing of grant subsections and management of strategy meetings with collaborators for grant applications. Contributed to successful research grants (NSF-Nanoscale Science and Engineering Center at Northwestern university, NIH-NIGMS Grants GM31756 and GM 33775)

PATENTS

- Van Duyne, R., Zhao, J., **Das, A.**, Zhang, X., Schatz, G. and Sligar, S. (2006) "Resonance Surface Plasmon Spectroscopy: Low Molecular Weight Substrate Binding to Cytochrome P450" Patent Applied For
- Klein, W., Sligar, S. G., Velasco P. and **Das, A.** (2009) "An isolated set of central nervous system proteins that bind oligomers of amyloid beta (also known as ADDLs)" Invention Disclosure

PUBLICATIONS

1. **Das, A.** and Sligar, S.G. "Modulation of Redox Potential of Cytochrome P450 Reductase by the Phospholipid Bilayer" *Biochemistry*, **2009**, Submitted.
2. Turk, S., **Das, A.**, Sligar, S. G. and Dravid, V. "Nanomechanical Detection of Cholera Toxin Using Microcantilevers Functionalized with Ganglioside-Nanodiscs" *ACS Nano*, **2009** Submitted.
3. **Das, A.**, Zhao, J. Van Duyne, R. and Sligar, S.G. "Screening of Type I and II Drug Binding to Human Cytochrome P450-3A4 in Nanodiscs by Localized Surface Plasmon Resonance Spectroscopy.", *Anal. Chem.*, **2009**, *81* (10), 3754–3759.
4. Li, H., **Das, A.**, Sibhatu, H., Jamal, J., Sligar, S. and Poulos, T.L. "Exploring the Electron Transfer Properties of Neuronal Nitric Oxide Synthase by Reversal of the FMN Redox Potential" *J. Biol. Chem.* **2008**, *283*(50), 34762-34772.
5. Zhao, J., **Das, A.** Sligar, S.G. and Van Duyne, R. "Resonance Localized Surface Plasmon Spectroscopy: Sensing Substrate & Inhibitor Binding to Cytochrome P450" *J. Phys. Chem. C* **2008** *112* (34), 13084-13088.
6. Gruia, F., Ionascu, D., Kubo, M. Ye, X., Dawson, J., Osborne, R.L., Sligar, S. G., Denisov, I., **Das, A.** Poulos, T. L., Terner, J. and Champion, P.M. "Low Frequency Dynamics of *Caldariomyces fumago* Chloroperoxidase Probed by Femtosecond Coherence Spectroscopy" *Biochemistry* **2008**, *47*(18), 5156-5167.
7. **Das, A.**, Grinkova, Y. and Sligar, S.G. "Redox Potential Control by Drug Binding to Cytochrome P450 3A4." *J. Am. Chem. Soc.* **2007** *129* (45), 13778-13779
8. **Das, A.** and Hecht, M. H. "Peroxidase Activity of *De Novo* Heme Proteins Immobilized on Electrodes." *J. Inorg. Biochem.* **2007**, *101* (11-12) 1820-1826
9. Kimmich, N., **Das, A.** Sevrioukova, I, Meharena, Y., Sligar, S.G. and Poulos, T. L. "Electron Transfer between P450cin and its FMN-Containing Redox Partner" *J. Biol. Chem.*, **2007**, *282* (37), 27006-27011
10. Zhao*, J., **Das, A.***, Zhang, X, Schatz, G., Sligar, S., Van Duyne, R. "Resonance Surface Plasmon Spectroscopy: Low Molecular Weight Substrate Binding to Cytochrome P450" *J. Am. Chem. Soc.* **2006**, *128* (34), 11004-11005. (* Co-first authors)
(In News): (1) Enhanced LSPR detects binding of small molecules. *Analytical Chemistry*, **2006**, *78*(21), 7356.
(2) Kirrill's Café paper of the month. August 2006 http://www.icgeb.org/~p450srv/cafe_archive_2006.html
11. **Das, A.**, Trammell, S. A. and Hecht, M. H. "Electrochemical and Binding Studies of an immobilized *De Novo* Heme Protein" *Biophys. Chem.* **2006**, *123* (2-3), 102-112.
12. Hu, Y., **Das, A.**, Hecht, M. H. and Scoles, G. "Nanografting *De Novo* Proteins onto gold surface" *Langmuir* **2005**, *21*(20), 9103-09.
13. Hecht, M.H., **Das, A.**, Go, A., Bradley, L. and Wei, Y. (2004) "De Novo Proteins from Designed Combinatorial Libraries." *Protein Science* **2004**, *13*(7): 1711–1723.
14. **Das, A.** (2005) "Electrochemical and Functional Studies of *De Novo* Alpha Helical Protein from a Designed Combinatorial Library." Ph.D Thesis Princeton University **November 2005**
15. **Das, A.** Model Chemistry of Aerobic Acetylene Hydratase Enzymes. M.Sc. Thesis: I.I.T (Kanpur) 1998

PRESENTATIONS, POSTERS AND INVITED TALKS

- 2009 ACS National Meeting, Aug 11-16, Chemical Toxicology Division, Washington, DC, **Talk**.
- 2009 ACS National Meeting, Aug 11-16, Colloids Division, Washington, DC, Poster.
- 2008 Turkey Run Analytical Conference, Indianapolis, IN, Poster.
- 2006-09 Annual Meetings at the NSF Nanoscale Science & Engineering Center (NSEC) for Signal Transduction and Receptor Design SRG, Chicago, IL, Posters and **Talks**.
- 2004 Abstracts of Papers, 228th ACS National Meeting, August 22-26, Inorganic Division Philadelphia, PA, **Talk**
- 2004 Abstracts of Papers, 228th ACS National Meeting, August 22-26, Biological Chemistry Division, Philadelphia, PA, Poster
- 2003 17th Symposium of the Protein Society, July 26-30, Programs and Abstracts. Protein Science Vol 12,2, Supplement 2, Boston, MA Poster
- 2003 **Invited talk**. Chemical and Biological Engineering. Rensselaer Polytechnic Institute (RPI), Troy, NY

ASSOCIATIONS AND SERVICES

- **2008-09**, Board of Postdoctoral Associates and Graduate Students. NSF-Nanoscale Science and Eng. Center (NSEC) at Northwestern University
- **2003- Present**, American Chemical Society
- **2002- 2004**, Protein Society
- **2005-Present**, Biophysical Society
- **2009-Present**, American Society for Biochemistry and Molecular Biology

REFERENCES

Postdoctoral advisor:

Prof. Stephen G. Sligar
Department of Biochemistry
University of Illinois – Urbana Champaign
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Graduate advisor:

Prof. Michael Hecht
Department of Chemistry
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Princeton, NJ 08544
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Collaborator

Prof. Richard Van Duyne
Department of Chemistry
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