

CURRICULUM VITAE

Dr. Manas Kumar Ghosh



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Designation Assistant Professor (Stage-I), Sovarani Memorial College (University of Calcutta), India. (2023-Present)

Experience Postdoctoral Research Associate, Texas A & M University, USA. (2019-2023)
Postdoctoral Research Associate, Harvard University, USA. (2017-2019)
Postdoctoral Research Associate, The Pennsylvania State University, USA. (2014-2017)

Education

2008–2014 Ph.D. in Chemistry from The Tata Institute of Fundamental Research, Mumbai, India.
2006–2008 M.Sc. in Chemistry (Inorganic Specialization) with First class from the Indian Institute of Engineering Science and Technology, Shibpur, India.
2003–2006 B.Sc. in Chemistry (Major) with First class from The University of Calcutta, Kolkata, India.
2001–2003 Senior Secondary/XII (Science) with First division from The West Bengal Council of Higher Secondary Education, Kolkata, India.
1999–2001 Secondary/X with First division from The West Bengal Board of Secondary Education, Kolkata, India.

Research interests

Protein biochemistry, Biosynthesis, Bioinorganic chemistry, Bioorganic chemistry, Enzymology, Structure-function relationships of (metallo)enzymes, Stopped-flow kinetics, Mass spectrometry, EPR, Proton coupled electron transfer (PCET).

Technical skills

1. Spectroscopic techniques: UV-Vis absorption, Circular dichroism, Fluorescence, EPR, NMR.
2. Biophysical techniques: Stopped-flow kinetics, Rapid freeze quench, Mass spectrometry, Electrochemistry, FPLC and various chromatographic techniques.
3. Molecular Biology and Biochemistry: PCR, Mutagenesis, Cloning, Transformation, Gel electrophoresis, SDS-PAGE, Western blotting, Protein expression, Purification, Pull-down assays.
4. Peptides: Synthesis, modification, purification, and characterization of peptides.
5. Synthesis: Synthesis, purification, and characterization of inorganic complexes.
6. Programming and Scientific softwares: BASIC, Fortran 77, C programming, Origin, Global kinetics analysis (ProK, SpecFit), WinEPR & Simponia, TopSpin, EasySpin, GOLD.

Publications

1. **Manas K. Ghosh**, T. Narindoshvili, J. B. Thoden, M. E. Schumann, H. M. Holden, F. M. Raushel.
Biosynthesis of CDP-6-D-Glucitol for the Capsular Polysaccharides of *Campylobacter jejuni*.
***Biochemistry* (2024)**
2. **Manas K. Ghosh**, F. M. Raushel.
Biosynthesis of UDP- α -N-Acetyl-D-mannosaminuronic Acid and CMP- β -N-acetyl-D-neuraminic Acid for the Capsular Polysaccharides of *Campylobacter jejuni*.
***Biochemistry* (2024)**
3. D. F. Xiang, M. Xu, **Manas K. Ghosh**, F. M. Raushel.
Metabolic Pathways for the Biosynthesis of Heptoses Used in the Construction of Capsular Polysaccharides in the Human Pathogen *Campylobacter jejuni*.
***Biochemistry* (2023), 62, 3145-3158**
4. **Manas K. Ghosh**, D. F. Xiang, F. M. Raushel.
Biosynthesis of 3,6-dideoxy-heptoses for the Capsular Polysaccharides of *Campylobacter jejuni*.
***Biochemistry* (2023), 62, 1287-1297**
5. D. F. Xiang, **Manas K. Ghosh**, A. S. Riegert, J. B. Thoden, H. M. Holden, F. M. Raushel.
Bifunctional Epimerase/Reductase Enzymes Facilitate the Modulation of 6-Deoxy-Heptoses Found in the Capsular Polysaccharides of *Campylobacter jejuni*.
***Biochemistry* (2023), 62, 134-144**
6. **Manas K. Ghosh**, D. F. Xiang, and F. M. Raushel.
Product Specificity of the C4-Reductases in the Biosynthesis of GDP-6-deoxy-heptoses During Capsular Polysaccharide Formation in *Campylobacter jejuni*.
***Biochemistry* (2022), 61, 2138-2147**
7. **Manas K. Ghosh**, D. F. Xiang, J. B. Thoden, H. M. Holden, and F. M. Raushel.
C3- and C3/C5-Epimerases Required for the Biosynthesis of the Capsular Polysaccharides

- from *Campylobacter jejuni*.
Biochemistry (2022), 61, 2036-2048
8. A. Meyer, A. Kehl, C. Cui, F. Reichardt, F. Hecker, L. Funk, **Manas K. Ghosh**, K. Pan, H. Urlaub, K. Tittmann, J. Stubbe, and M. Bennati.
¹⁹F Electron-Nuclear Double Resonance Reveals Interaction between Redox-Active Tyrosines across the α/β Interface of *E. coli* Ribonucleotide Reductase.
J. Am. Chem. Soc. (2022), 144, 11270-11282
 9. D. F. Xiang, J. B. Thoden, **Manas K. Ghosh**, H. M. Holden, and F. M. Raushel.
 Reaction Mechanism and Three-Dimensional Structure of GDP-D-glycero- α -D-mannoheptose 4,6-Dehydratase from *Campylobacter jejuni*.
Biochemistry (2022), 61, 1313-1322
 10. S. Patra, C. Lin, **Manas K. Ghosh**, S. Havens, S. Cory, D. H. Russell, and D. P. Barondeau.
 Recapitulating the frataxin activation mechanism in an engineered bacterial cysteine desulfurase supports the architectural switch model.
bioRxiv, 2020
 11. H. R. Rose,* **Manas K. Ghosh**,* A. O. Maggiolo, C. J. Pollock, E. J. Blaesi, V. Hajj, Y. Wei, L. J. Rajakovich, W.c. Chang, Y. Han, M. Hajj, C. Krebs, A. Silakov, M. E. Pandelia, J. M. Bollinger, and A. K. Boal. (***Equal first authors**)
 Structural Basis for Superoxide Activation of *Flavobacterium johnsoniae* Class I Ribonucleotide Reductase and for Radical Initiation by its Dimanganese Cofactor.
Biochemistry (2018), 57, 2679-2693
 12. **Manas K. Ghosh**, P. Basak and S. Mazumdar.
 Mechanism of copper incorporation in the subunit II of cytochrome c oxidase from *Thermus thermophilus*: Identification of intermediate species.
Biochemistry (2013), 52, 4620-4635
 13. **Manas K. Ghosh**, J. Rajbongshi, D. Basumatary and S. Mazumdar.
 Role of the surface-exposed leucine 155 in the metal ion binding loop of the CuA domain of cytochrome c oxidase from *Thermus thermophilus* on the function and stability of the protein.
Biochemistry (2012), 51, 2443-2452
 14. J. Rajbongshi, **Manas K. Ghosh**, N. J. M. Sanghamitra, S. Gupta and S. Mazumdar.
 Conformational properties of the bis- μ -(thiolato) dicopper center in cytochrome c oxidase.
Indian Journal of Chemistry, (2012), 51A, 83-98

Manuscripts Under Preparation

1. **Manas K. Ghosh**, Brandon L. Greene, JoAnne Stubbe, and Daniel G. Nocera.
 Light Driven Ribonucleotide Reduction by Class Ic Ribonucleotide Reductase.
2. **Manas K. Ghosh**, Kelsey K. Sakimoto, and Daniel G. Nocera.
 Towards electrochemically driven formatotrophy: kinetic effects of formate

- disproportionation on the growth of *Cupriavidus necator*.
3. **Manas K. Ghosh** and S. Mazumdar.
Mechanistic insights of continuous movement of copper ions along the apo Cu_A matrix of ba₃ oxidases from *Thermus thermophilus*: Capture and identification of new intermediate species.
 4. **Manas K. Ghosh**, S. S. Parhad and S. Mazumdar.
Overexpression and insecticide assay of CYP6G1 in *Drosophila melanogaster* to understand the functional role of CYP6G1.

Professional Meetings

1. **M. K. Ghosh et al.**, "Radical initiation by an oxidized dimanganese cluster in a class I-d ribonucleotide reductase," Metallocofactors Gordon Research Conference, Jun 12-17, 2016, USA. **Speaker**
2. **M. K. Ghosh et al.**, "Radical initiation by an oxidized dimanganese cluster in a class I-d ribonucleotide reductase," Metals in Biology Gordon Research Conference and Seminar, Jan 24-31, 2016, USA. **Poster**
3. **M. K. Ghosh et al.**, "Role of certain surface exposed residue on the properties of the Cu_A of CcO," The 6th Asian Biological Inorganic Chemistry Conference (AsBIC6), Nov 5-8, 2012, Hong Kong, China. **Poster**
4. **M. K. Ghosh et al.**, "Mechanism of Cu_A assembly in the subunit II of cytochrome c oxidase from *T. thermophilus*: Identification of intermediate species," Protein Folding and Dynamics, Oct 15-17, 2012, India. **Poster**

Awards

1. Postdoctoral Fellowship by the Texas A&M University, USA, 2019-2023
2. Postdoctoral Fellowship by the Harvard University, USA, 2017-2019
3. Postdoctoral Fellowship by The Pennsylvania State University, USA, 2014-2017
4. Young Scientist Travel Award by AsBIC6, Hong Kong, China, 2012.
5. Full student travel grants by Department of Science and Technology, India, 2012.
6. Doctoral Fellowship by TIFR, India, 2008-2014.
7. Scholarship for Postgraduate study by IEST, India, 2006-2008.
8. Scholarship for Undergraduate study by NAC, India, 2003-2006.

Achievements

1. Selected for interview in DST INSPIRE Faculty Award, 2018.
2. Selected for Ph.D. program at the Tata Institute of Fundamental Research (TIFR), Mumbai, India, 2008.
3. Qualified Graduate Aptitude Test in Engineering examination, 2008, All India ranks 169, Score 468, Percentile 97.36.
4. Qualified National Eligibility Test (Council of Scientific & Industrial Research and University Grants Commission) examination, December-2007.
5. Selected for M.Sc. program at the Indian Institute of Engineering Science and Technology, Shibpur, India, 2006.
6. Selected for M.Sc. program at the Ramakrishna Mission Residential College Narendrapur, Kolkata, India, 2006.

Memberships

1. American Association for the Advancement of Science (2012-2014).
2. Society of Biological Inorganic Chemistry (2012-2013).
3. The Indian Science Congress Association (2012-2013).

References

1. Prof. Shyamalava Mazumdar, Department of Chemical Sciences, TIFR, Mumbai-400005, India. Email: shyamal@tifr.res.in, Cell: +91 2222782363
2. Prof. Frank Raushel, Department of Chemistry, Texas A&M University, College Station, TX-77843, USA, Email: raushel@chem.tamu.edu, Cell: +1 9795714258
3. Prof. Daniel Nocera, Department of Chemistry and Chemical Biology, Harvard University, MA-01238, USA, Email: dnocera@fas.harvard.edu, Cell: +1 6174959914
4. Prof. JoAnne Stubbe, Massachusetts Institute of Technology, Department of Chemistry, Cambridge, MA-02139, USA, Email: stubbe@mit.edu, Cell: +1 6172531814
5. Prof. Martin Bollinger, Department of Chemistry, The Pennsylvania State University, PA-16802, USA, Email: jmb21@psu.edu, Cell: +1 8148635707
6. Prof. Carsten Krebs, Department of Chemistry, The Pennsylvania State University, PA-16802, USA, Email: ckrebs@psu.edu, Cell: +1 8148656089