Dr. Jitumani Rajbongshi, MSc; Ph.D.
Assistant Professor, Department of Chemistry, Bhattadev University
Email: jitu.sangu@gmail.com
& che.jitumani@bhattadevuniversity.ac.in
Contact:9864623699, 9101435067

Professional Summary

An experienced academic and researcher with over 12 years in bioinorganic chemistry, electrochemistry, analytical chemistry, and green chemistry. Specializes in the spectroscopic and electrochemical studies of metalloproteins, focusing on electron transfer processes and sustainable practices. Research thirst aligns with Electrochemistry of inorganic complexes, addressing real-world challenges and Green Chemistry with an emphasis on waste-to-wealth practices. Experienced in undergraduate and postgraduate teaching, curriculum development, and institutional research projects.

Education

Ph.D. in Bioinorganic Chemistry (2006-2011)
Gauhati University, Assam, India

- Thesis: *Spectroscopic, Kinetic, and Electrochemical Studies of Respiratory Electron Transfer Proteins*
- Supervisors*: Prof. D.K. Das (Gauhati University), Prof. Shyamalava Mazumdar (TIFR, Mumbai)*

M.Sc. in Chemistry (2006)
Gauhati University, Assam, India

- First Class with Specialization in Inorganic Chemistry
- GATE Qualification (2006)
- Dissertation: *PVP and ZSM 5 Film modified GC Electrode and its application as Sensor*" under supervision of Prof. D.K. Das (Gauhati University. Guwahati)

B.Sc. in Chemistry (2004)
Pandu College, Gauhati University, Assam, India

- First Class
- Chemistry (Honors) with Royal combination

HS Science (2000)
Cotton College, Assam, India

- First Division

HSLC (1998)
Cotton College, Assam, India

- First Division with Star mark

Professional Experience

Assistant Professor (Stage II)
Department of Chemistry, Bhattadev University (April, 2013 – Present)

- Teach undergraduate and postgraduate courses, focusing on Inorganic Chemistry, Analytical Chemistry, Green Chemistry and Environmental Chemistry
- Coordinator of the Institutional Biotech Hub sponsored by DBT (2015-2019).
- Involved in examination duties, curriculum design, and research project supervision.

Assistant Registrar(i/c)
Office of the Registrar, Bhattadev University (December, 2019 – January, 2022**)**

- Involved in documentation process of the initial stage of Bhattadev University upgraded from erstwhile Bajali College.
- Procurement of Instruments for various departments of Bhattadev University
- Involved in whole sanitization process of the University during COVID-19 Period including preparation of sanitizers from Chemistry Lab.

Assistant Professor
Girijananda Choudhury Institute of Management and Technology, Guwahati (2011 – 2013)

- Taught undergraduate chemistry courses and contributed to institutional development.
- Involved in examination duties, curriculum design, and research project supervision.

Objective and Research Interests

- To pursue challenging, innovative research in the inter-disciplinary area of inorganic chemistry and biology through experiments and make a mark in the field of bioinorganic chemistry.
- Protein engineering and Spectro electrochemical studies of proteins exploring structure and function relationship.
- Electrochemistry of inorganic complexes, addressing real-world challenges.
- Green Chemistry with an emphasis on waste-to-wealth practices.

Selective Research Highlight

- **Site-Directed Mutation of CuA Domain**: Explored the redox behaviour and stability impact of mutations in the CuA domain and Construction of Blue copper active site in purple copper protein Scaffold by protein engineering (TIFR, Mumbai, 2009)
- **Artificial Peroxidase Study**: Study of V49D/M69A, a c552 mutant, as an artificial peroxidase (Nagoya University, Japan, 2008).
- **Direct Electrochemistry of CuA Proteins**: Characterized CuA protein from *Thermus thermophilus* on modified electrodes (TIFR, Mumbai, 2007).
- **Inorganic Synthesis:** Synthesis and characterization of iron sulfur cluster (Gauhati University, Guwahati, 2007)
- **Green Synthesis:** Synthesis and characterization of Copper and Silver Nanoparticles

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Awards and Fellowships

- Senior Research Fellowship, CSIR (2010)
- G-COE Fellowship, Nagoya University, Japan (2008)
- Junior Research Fellowship, DST-funded project (2007)
- State Merit Scholarship for matriculation (1999)

Projects Investigated

1. **Voltammetric and Spectroscopic Studies of the CuA Site from Cytochrome c Oxidase and Its Mutants**
   Funding Agency: AICTE
   File No.: 8023/RID/RPS/11/11/12
   Sanction Date: April 12, 2012
   Amount: ₹15,00,000
   Duration: April 1, 2012 – November 20, 2013

2. **Establishment of Institutional Biotech Hub (IBT Hubs) under DBT's Special Programme for North Eastern States of India**
   File No.: BT/32/NE/2012 (05)

   Funding Agency: DBT
   Sanction Date: September 19, 2013
   Amount: ₹39,50,000
   Duration: April, 2015 – November, 2019

Lab Visit

- Visited Graduate School of Science, Nagoya University, Japan to work in the Collaborative project on "Study of V49D/M69A, a c552 mutant, as an artificial peroxidase" with Professor Yoshihito Watanabe under the G- COE fellowship from May – July 2008.
- Worked in the department of Chemical sciences, Tata Institute of Fundamental Research on the structure and function relationship of CuA protein of Cytochrome ba3 from *Thermus thermophilous* under DST Project (2007-2011)
- Visited Department of Chemistry, IIT Roorkee, Uttarakhand, India (2017)

Publications

1. Rajbongshi, J., Das, D.K., Mazumdar, S., Spectroscopic and Electrochemical Studies of the pH-Induced Transition in the CuA Centre from *Thermus thermophilus*, ***Inorganica Chimica Acta***, 533, 120749 (2022).
2. Choudhury, D.K., Barman, T., Rajbongshi, J., Qualitative Phytochemical Screening and GC-MS Analysis of *Musa sapientum* Spadix, ***Journal of Pharmacognosy and Phytochemistry***, 8(1), 2456-2460 (2019).
3. Behera, R.K., Nakajima, H., Rajbongshi, J., Watanabe, Y., Mazumdar, S., Thermodynamic Effects of the Alteration of the Axial Ligand on the Unfolding of Thermostable Cytochrome c, ***Biochemistry***, 52(8), 1373-1384 (2013).
4. Ghosh, M.K., Rajbongshi, J., Basumatary, D., Mazumdar, S., 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 Function, ***Biochemistry***, 51(12), 2443-2452 (2012).
5. Rajbongshi, J., Ghosh, M.K., Sanghamitra, N.J.M., Gupta, S., Mazumdar, S., Conformational Properties of the Bis-μ-(thiolato) Dicopper Center in Cytochrome c Oxidase, ***NISCAIR-CSIR***, India (2012).
6. Rajbongshi, J., Das, D.K., Mazumdar, S., Direct Electrochemistry of Dinuclear CuA Fragment from Cytochrome c Oxidase of *Thermus thermophilus* at Surfactant Modified Glassy Carbon Electrode, ***Electrochimica Acta***, 55(13), 4174-4179 (2010).
7. Nakajima, H., Ichikawa, Y., Satake, Y., Takatani, N., Manna, S.K., Rajbongshi, J., et al., Engineering of *Thermus thermophilus* Cytochrome c552: Thermally Tolerant Artificial Peroxidase, ***ChemBioChem***, 9(18), 2954-2957 (2008).
8. Rajbongshi, J.,The Dinuclear CuA centre of Cytochrome c oxidase as a typical protein: a narrative review, *Emerging Researches in Chemical Sciences*, Pages 358-376, ISBN: 978-93-90706-89-1(2023).
9. Rajbongshi, J., Modulation in Subunit II of Cytochrome C Oxidase Through Genetic Engineering Approach, *Anandam*, Pages 1-7, ISSN 2321-8800 (2021).

10. Rajbongshi, J., Spectroscopic Kinetic and Electrochemical Studies of Respiratory Electron Transfer Proteins, *Summary of Doctoral Theses*, Vol 5 (2013), ISBN 978-81-920635-5-3.
11. Rajbongshi, J., Genetic Engineering of the Metal Ion Binding Site in the Dinuclear CuA Centre of Cytochrome c Oxidase, *Academica Bajali*, Vol 2 (2015), ISSN 234-98-374.
12. Rajbongshi, J., Effect of Site-Specific Mutation in the Loop Region of the Dinuclear CuA Centre of *Thermus thermophilus*: Studies on L155R Mutant, *Academica Bajali*, Vol 3 (2016), ISSN 234-98-374.
13. Rajbongshi, J., Venkataraman Ramakrishnan, Ekuri Pondharajan, Nobel Bota Bijoyee, ISBN 978-93-244-0671-2 (2016).
14. Rajbongshi, J., Application of Chemistry in Everyday Life, *Bigyan Saundarya*, ISBN: 978-81-933681-0-7 (2017)

Workshops/Schools and Conferences/Symposiums

- Presented a paper on National Seminar on Current Developments in Science and Technology at Bhattadev University, Pathsala (2023).
- Presented a paper on National Seminar on Recent Aspects of Chemistry Education and Research, IST, Gauhati University, Guwahati (2012)
- Participated on School on Advanced Biological Inorganic Chemistry (SaBIC 2009), TIFR, Mumbai November 2 – 4, 2009
- Presented a poster at the 13th Biennial National Symposium on Modern Trends in Inorganic Chemistry (MTIC-XIII), IISc Bangalore (2009).
- Presented a paper on School on Advanced Biological Inorganic Chemistry (SaBIC-2009), TIFR, Mumbai.
- Abstract accepted for poster in 14th International Conference on Biological Inorganic Chemistry (ICBIC-2009), Nagoya, Japan, July 25-30, 2009
- Presented a Poster in the DCS annual meeting at TIFR, Mumbai (2008)
- Presented poster at the 12th Biennial National Symposium on Modern Trends in Inorganic Chemistry (MTIC-XII), IIT Madras, Chennai, India (2007)
- Participated on DST sponsored, Winter School in Bioinorganic Chemistry during November 17-30, 2007 at IIT Bombay, Mumbai, India

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Professional Development

- FDP in Academic Research Writing (Delhi University, 2024)
- FDP on Outcome Based Education and Generative AI (Kerala State Higher Education Council, 2024)

- Participated in Online Workshop on Data Analytics & AI organized by Centre for Computer Science and Information Technology (CCSIT), Manjeri, University of Calicut, 2024)
- Refresher Course in Chemistry (Delhi University, 2023)
- Participated in workshops on chemical education, examination reforms, and curriculum development (Gauhati University, 2019)
- 113th Orientation Programme (Gauhati University, 2017)

Teaching Contributions and Experiences

- Developed and delivered courses in Inorganic Chemistry using participatory and innovative teaching methods at Bhattadev University, Pathsala (2013 onwards).
- Provided additional learning resources, including access to e-journals and reference materials at Bhattadev University, Pathsala (2013 onwards).
- Engaged in extensive mentoring and supervision of student projects at Bhattadev University, Pathsala (2013 onwards).
- Delivered an invited lecture at National Seminar on Emerging Trends in Chemistry, Department of Chemistry, Gauhati University, March 30-31, 2012
- Taught as Asstt. Professor in Chemistry at Girijananda Chowdhury Institute of Management and Technology, Azara, Ghy 17 (2011-2013)
- Delivered talk at TIFR on "Spectroscopic and electrochemical studies of CuA protein from Thermus thermophilus and its mutants" January, 24, 2011.
- Taught Analytical Chemistry in the PGDAC course, Department of Chemistry, Gauhati University (2010-11).
- Demonstrated advanced protein electrochemistry at the School on Advanced Biological Inorganic Chemistry (SaBIC-2009), TIFR, Mumbai.
- Project instructed to Mr. Pritesh Krishnakumar, Department of Chemistry, MS University Baroda at TIFR, Mumbai, India, (November-December), 2007
- Project tutored to Ms. Preshita Puja Desai, undergraduate student from D.Y Patil College, Mumbai at TIFR, Mumbai, India, (June –July), 2007
- Project tutored to Mr. Somnath Bakshi, Department of Chemistry, IIT Kanpur at TIFR, Mumbai, India (May – June), 2007
- Taught chemistry in Sambhuram Das Tribel High School, Gondhmow, Kamrup, Assam, India (May – July), 2004

Co-curricular Contributions

- Coordinator, Institutional Biotech Hub (DBT Sponsored).
- Editor, Academica Bajali, a peer reviewed journal from Bajali College (2015-2017)

- Editor, Bigyan Saundarya, a Book on popular science (2017)
- Resource person at local schools for science exhibitions and outreach programs.
- Served on institutional committees for examinations, admissions, and university governance.
- Coordinator, Youth Conclave on Skill Sponsored by Rajiv Gandhi National Institute of Youth Development Institution of National Importance by the Act of Parliament No.35/12**, Ministry of Youth Affairs and Sports, GOI**

References

1. Prof. Hiroshi Nakajima, Graduate School of Science, Department of Chemistry, Nagoya University, Japan
   Email: hnakajima@mbox.chem.nagoya-u.ac.jp
2. Prof. Shyamalava Mazumdar, Department of Chemical Sciences, TIFR, Mumbai
   Email: shyamal@tifr.res.in

"Feeding the faith and starving the fear"