Curriculum Vitae — *Sk. Sheriff Shah*

Dr. Sk. Sheriff Shah
Department of Chemistry
Indian Institute of Technology Kharagpur
Kharagpur, West Bengal, INDIA-721 302
Email: bubulshah@gmail.com
Ph: +91-9002496896

EDUCATION

- **Ph.D.** in Chemistry (Organic Photocatalysis) **January 2013 - July 2019**
  Indian Institute of Technology Kharagpur, West Bengal, India.
  Thesis Title: "Application of Visible Light Organic Photoredox Catalysts in C–H Functionalizations and Oxidation of Alcohols"
  Supervisor: Professor Dr. N. D. Pradeep Singh, Department of Chemistry, Indian Institute of Technology Kharagpur
- **M. Sc.** in Chemistry **July 2008 - September 2010**
  Gauhati University, Guwahati, Assam, India.
- **B. Sc.** in Chemistry (Major) **July 2005 - June 2008**
  Bholanath College under Gauhati University, Guwahati, Assam, India.

PROFESSIONAL EXPERIENCES

- **Research Associate** in Chemistry **July 2019 - To date**
  Indian Institute of Technology Kharagpur, West Bengal, India.
  Supervisor: Professor Dr. N. D. Pradeep Singh
  Topic: NIR photocatalysis for cancer treatments
- **Project student** in Chemistry **Aug 2012 - Dec 2012**
  Indian Institute of Technology Guwahati, Assam, India.
  Supervisor: Professor Dr. Anil Kumar Saikia
- **Teacher** at Annesha Shiksha Niketan, Assam, India **Dec 2010 - Apr 2012**

RESEARCH INTERESTS

- **Photocatalysis**- to explore photocatalysis for organic transformations (reduction of CO_2 and aryl halides).
- **Catalysts**- to design new NIR-based photocatalysts for cancer treatments.
- **C-H activations**- to develop new metallaphotoredox methods for C-H activations.
- **Organic Synthesis**- to study clean and green methods for organic syntheses.
- **Intermediates**- to investigate photochemistry of reactive intermediates.
- **Drug delivery systems**- to study novel NIR(near-infrared)-based drug delivery systems.
- **Fluorophores**- to develop new ESIPT-based fluorophores for biological and material applications.

RESEARCH EXPERIENCES

- **Photocatalysis**- successfully developed visible light induced photocatalysis for organic syntheses.
- **Metallaphotoredox catalysis**- the merging of organic photocatalysts (e.g. 4CzIPN) and metal catalyst $Pd(OAc)_2$ for C−H functionalizations [$C(sp^2)$−H and $C(sp^3)$−H)] was developed.
- **Oxidation**- achieved visible light induced selective oxidation of alcohols via polarity induced hydrogen atom transfer.
- **Organophotocatalysis**- explored organophotoredox mediated amides synthesis by direct coupling of alcohols and amines.
- **Fluorophores**- designed ESIPT-based fluorophores (emission color ranging from blue to red) and used them as photoremovable protecting groups as well as drug delivery systems.
- **NIR photocatalysts-** developed NIR-based photocatalysts for cancer treatments.
- **Drug delivery systems**- studied photoinduced drug delivery systems for cancer treatments.
- **Photophysical study**- investigated photophysical properties using steady state UV/Vis absorption and emission spectroscopy.

PUBLICATIONS

1. **Sk. Sheriff Shah**, Amrita Paul, Manoranjan Bera, Yarra Venkatesh, and N. D. Pradeep Singh. Metallaphotoredox-Mediated Csp^2-H Hydroxylation of Arenes under Aerobic Conditions. *Org. Lett.* **2018**, *20*, 5533−5536.

2. **Sk. Sheriff Shah**, Maniklal Shee, Amit Kumar Singh, Amrita Paul, and N. D. Pradeep Singh. Direct Oxygenation of C-H Bonds through Photoredox and Palladium Catalysis. *J. Org. Chem.* **2020**, *85*, 3426−3439.

3. **Sk. Sheriff Shah**, Maniklal Shee, Yarra Venkatesh, Amit Kumar Singh, Samya Samanta, and N. D. Pradeep Singh. Organophotoredox Mediated Amide Synthesis by Coupling Alcohol and Amine through Aerobic Oxidation of Alcohol. *Chem. Eur. J.* **2020**, *26*, 3703 – 3708.

4. **Sk. Sheriff Shah** and N. D. Pradeep Singh. Pseudohalide Assisted Aerobic Oxidation of Alcohols in the Presence of Visible Light. *Tet. Lett.* **2018**, *59*, 247–251.

5. **Sk. Sheriff Shah**, S. Karthik, and N. D. Pradeep Singh. Vis/NIR Light Driven Mild and Clean Synthesis of Disulfides in the Presence of $Cu_2(OH)PO_4$ under Aerobic Conditions. *RSC Adv*. **2015**, *5*, 45416–45419.

6. Maniklal Shee, **Sk. Sheriff Shah**, and N. D. Pradeep Singh. Organophotoredox Assisted Cyanation of Bromoarenes via Silyl-Radical-Mediated Bromine Abstraction. *Chem. Commun.* **2020**, *56*, 4240−4243.

7. Maniklal Shee, **Sk. Sheriff Shah**, and N. D. Pradeep Singh. Photocatalytic Conversion of Benzyl Alcohols/Methyl Arenes to Aryl Nitriles via H-Abstraction by Azide Radical. *Chem. Eur. J.* 10.1002/chem.202001332.

8. Amit Kumar Singh, Moumita Kundu, Samrat Roy, Biswajit Roy, **Sk. Sheriff Shah**, Asha V Nair, Bipul Pal, Mahitosh Mondal, and N. D. Pradeep Singh. Two-photon responsive Napthyl tagged p-hydroxyphenacyl based drug delivery system: uncaging of anti-cancer drug in the phototherapeutic window with real-time monitoring. *Chem. Commun.*, **2020**, DOI: 10.1039/D0CC01903H.

9. Yarra Venkatesh, Amrita Chaudhuri, Saugat Mondal, **Sk. Sheriff Shah**, and N. D. Pradeep Singh. Wavelength-Orthogonal Photocleavable Monochromophoric Linker for Sequential Release of Two Different Substrates. *Org. Lett*. **2020**, *22*, 295−299.

10. Amrita Paul, Angana Biswas, Sreyashi Sinha, **Sk. Sheriff Shah**, Manoranjan Bera, Mahitosh Mandal, and N. D. Pradeep Singh. Push-Pull Stilbene: Visible Light Activated Photoremovable Protecting Group for Alcohols and Carboxylic Acids with Fluorescence Reporting Employed for Drug Delivery. *Org. Lett*. **2019**, *21*, 2968−2972.

11. S. Karthik, Avijit Jana, M. Selvakumar, Yarra Venkatesh, Amrita Paul, **Sk. Sheriff Shah**, and N. D. Pradeep Singh. Coumarin Polycaprolactone Polymeric Nanoparticles: Light and Tumor Microenvironment Activated Cocktail Drug Delivery. *J. Mater. Chem. B* **2017**, *5*, 1734-1741.

12. Sandipan Biswas, Joyjyoti Das, Shrabani Barman, **Sk. Sheriff Shah**, Moumita Gangopadhyay, Tapas K. Maity, and N. D. Pradeep Singh. Single Component Image Guided 'On-demand' Drug Delivery System for Early Stage Prostate Cancer. *Sensors and Actuators B* **2017**, *244*, 327–333.

13. Yarra Venkatesh, Kumari Shanti Kiran, **Sk. Sheriff Shah**, Amrita Chaudhuri, Satyahari Dey, and N. D. Pradeep Singh. One- and Two-Photon responsive Sulfur Dioxide (SO_2) Donors: A Combinatorial Drug Delivery for Improved Antibiotic Therapy. *Org. Biomol. Chem*. **2019**, *17*, 2640–2645.

14. Melvin S. Samuel, **Sk. Sheriff Shah**, Vasudevan Subramaniyan, Tanvir Qureshi, Jayanta Bhattacharya, and N.D. Pradeep Singh. Preparation of Graphene Oxide/Chitosan/Ferrite Nanocomposite for Chromium(VI) Removal from Aqueous Solution. *International Journal of Biological Macromolecules* **2018**, *119*, 540–547.

15. Melvin S. Samuel, **Sk. Sheriff Shah**, Jayanta Bhattacharya, Kalidass Subramaniam, and N.D. Pradeep Singh. Adsorption of Pb(II) From Aqueous Solution Using a Magnetic

Chitosan/Graphene Oxide Composite and Its Toxicity Studies. *International Journal of Biological Macromolecules* **2018**, *115*, 1142–1150.

PRESENTATIONS

- Oral Presentation in **254th ACS National Meeting and Exposition, (2017)** Washington D.C., USA.
- Poster Presentation at **LCMB** (**2014**), Indian Institute of Technology Kharagpur, West Bengal, India.

SCIENTIFIC AND TECHNICAL SKILLS

- **Syntheses:** Proficient in the synthesis of sensitive organic molecules in inert condition, metal-complexes, light sensitive molecules, recrystallization and purification of synthesized compounds, reagent purification and distillation of solvents.
- **Instruments:** Characterization of organic molecules by NMR, UV/Vis, IR, MALDI-TOF, GC-MS, and HRMS. Study radicals by EPR. Morphology study of nanoparticles by using FESEM, EDX, TEM, HRTEM, and AFM. Analytical experiences on UV-Visible spectroscopy, fluorescence, and HPLC.

ACHIEVEMENTS AND AWARDS

- CSIR-UGC National Eligibility Test (NET) (December, 2011): Qualified, **JRF**
- Graduate Aptitude Test in Engineering (GATE, 2010, 2011, 2012): Qualified

TEACHING EXPERIENCES

- Guided 3 graduates and 3 undergraduate students for research projects
- Undergraduate Organic Chemistry practical course, 2 terms in the year 2014–2016 at IIT Kharagpur
- Postgraduate Organic Chemistry practical course, 1 term in the year 2015–2016 at IIT Kharagpur
- Undergraduate Organic Chemistry theoretical classes (tutorial), 4 terms within the years 2014–2017 at IIT Kharagpur

LEADERSHIP SKILL AND VOLUNTEER WORK

- Research mentor for undergraduate and graduate students for the accomplishment of their research projects
- Group organizer and Instrumental in charge of Dr. N. D. Pradeep's lab.

REFERENCES

Dr. N. D. Pradeep Singh
Professor
Department of Chemistry
Indian Institute of Technology
Kharagpur-721302, India
E-mail: ndpradeep@chem.iitkgp.ac.in
Phone: +91-3222-82324

Dr. Rajarshi Samanta
Associate Professor
Department of Chemistry
Indian Institute of Technology
Kharagpur-721302, India
Email:rsamanta@chem.iitkgp.ac.in
Phone: +91-3222-283310

Dr. Anoop Ayyappan
Associate Professor
Department of Chemistry
Indian Institute of Technology
Kharagpur-721302, India
E-mail: anoop@chem.iitkgp.ac.in
Phone: +91-3222-283316