

Soumen Barik

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Indian Institute of Science
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Education

Indian Institute of Science

*Integrated Ph.D. in Chemical Sciences;
Course Work CGPA: 8.7 out of 10*

Bangalore, India

Aug 2018 – Present

Midnapore College (Autonomous)

B.Sc., Chemistry (Honours), Physics, Mathematics; First Class.

Midnapore, India

Aug 2015 – June 2018

Nachipur Adibasi High School

*Higher Secondary education, Chemistry, Physics, Mathematics;
First Class.*

West Bengal, India

Aug 2013 – June 2015

Research Experience

Indian Institute of Science

Ph.D. in Organic Chemistry

Supervisor: **Prof. Akkattu T. Biju**

Bangalore, India

Aug 2020 – Present

Thesis: *Harnessing the Potential of N-Heterocyclic Carbene Organocatalyst for Atroposelective Synthesis of C–N Axially Chiral Molecules and Control Over S(VI) Stereocenters.*

Indian Institute of Science

MS Research Project

Supervisor: **Prof. Akkattu T. Biju**

Bangalore, India

Aug 2019 – April 2020

Thesis: *N-Heterocyclic Carbene-Catalyzed (3 + 3) Annulation of Thioamides and Bromoenals for the Enantioselective Synthesis of Thiazinones.*

Awards and Honours

The Prime Minister's Research Fellows (PMRF)

Awarded the Prime Minister's Research Fellowship by the Government of India (*received "recommended with commendation grade" for outstanding performance in annual reviews*).

Aug 2021 – Present

CSIR-Junior Research Fellowship (JRF)

Awarded the CSIR-JRF by Joint Council of Scientific and Industrial Research, India.
(**All India Rank 46**).

June 2019

CSIR-Junior Research Fellowship (JRF)

Awarded the CSIR-JRF by Joint Council of Scientific and Industrial Research, India.
(**All India Rank 90**).

Dec 2018

Joint Admission Test for M.Sc.(JAM)

Conducted by the Indian Institute of Technology, Bombay (**All India Rank 178**).

Feb 2018

DST INSPIRE Scholarship

Scholarship awarded by the Department of Science and Technology for being the top 1% in the state in Higher Secondary Examination.

Aug 2015 – July 2018

Merit-Cum-Means scholarship

Scholarship awarded by the Government of West Bengal.

July 2015 – June 2018

Conferences

Pfizer Symposium 2025

Presented a talk on "Control Over S(VI)-Stereogenic Centres: NHC-Catalyzed Enantioselective Synthesis of N-Acyl Cyclic Sulfonimidamides." during the Pfizer Symposium 2025 held at IISc, Bangalore, India.

Feb 2025

Conference for Young Researchers National Organic Symposium Trust (J-NOST 2024) Oct 2024
Presented a talk on “N-Heterocyclic Carbene (NHC)-Catalyzed Atroposelective Synthesis of C–N Axially Chiral Molecules” during the XIX J-NOST 2024 held at IIT Gandhinagar, Gujrat, India.

30th International Conference on Organometallic Chemistry (ICOMC 2024) July 2024
Presented a poster on “N-Heterocyclic Carbene (NHC)-Catalyzed Atroposelective Synthesis of C–N Axially Chiral Molecules” during the ICOMC-2024 held at Agra, India.

Indo-French Seminar on Catalysis for Sustainability (IFSCS 2023) Dec 2023
Presented a poster entitled “N-Heterocyclic Carbene (NHC)-Catalyzed Atroposelective Synthesis of C–N Axially Chiral Molecules” during the IFSCS 2023 held at IISER Trivandrum, India.

International Conference on Organometallics and Catalysis (ICOC 2023) Nov 2023
Presented a talk on “N-Heterocyclic Carbene (NHC)-Catalyzed Atroposelective Synthesis of C–N Axially Chiral Molecules” during the ICOC-2023 held at Goa, India.

Thieme-IISc Organic Chemistry Symposium Oct 2023
Presented a poster entitled “N-Heterocyclic Carbene (NHC)-Catalyzed Atroposelective Synthesis of C–N Axially Chiral Molecules” during the Thieme-IISc Organic Chemistry Symposium held at IISc, Bangalore, India.

Publications

Publications from Ph.D. Thesis

4. Control Over S(VI)-Stereogenic Centres: NHC-Catalyzed Enantioselective Synthesis of *N*-Acyl Cyclic Sulfonimidamides.
Barik, S.; Paravakkal, F. D.; Gupta, P.; Roy, P.; Biju, A. T. *Manuscript under preparation*
3. N-Heterocyclic Carbene-Catalyzed Atroposelective Synthesis of *N*-Aryl Phthalimides and Maleimides via Activation of Carboxylic Acids.
Barik, S.; Ranganathappa, S. S.; Biju, A. T. *Nat. Commun.* **2024**, *15*, 5755.
2. Kinetic Resolution Approach to the Synthesis of C–N Axially Chiral *N*-Aryl Aminomaleimides via NHC-Catalyzed [3+3] Annulation.
Barik, S.; Das, R. C.; Balanna, K.; Biju, A. T. *Org. Lett.* **2022**, *24*, 5456.
1. NHC-Catalyzed Desymmetrization of *N*-Aryl Maleimides Leading to the Atroposelective Synthesis of *N*-Aryl Succinimides.
Barik, S.; Shee, S.; Das, S.; Gonnade, R. G.; Jindal, G.; Mukherjee, S.; Biju, A. T. *Angew. Chem. Int. Ed.* **2021**, *60*, 12264.
This article appears in ‘HOT Topic’: Organocatalysis. Highlighted in Synfacts 2021, 17, 691.

Co-author Publications

9. N-Heterocyclic Carbene (NHC) Organocatalysis: from Fundamentals to Frontiers.
Chakraborty, S.; **Barik, S.**; Biju, A. T. *Chem. Soc. Rev.* **2025**, *54*, 1102.
8. Access to β -Keto Amino Acid Derivatives via Interrupted Polonovski Strategy Involving NHC-Catalyzed Aza Benzoin Reaction.
Dehury, B. S.; **Barik, S.**; Sankar, G.; Biju, A. T. *Org. Lett.* **2024**, *26*, 10690. *Highlighted in Synfacts 2025, 21, 318.*
7. N-Heterocyclic Carbene-Catalyzed Imine Umpolung/Semipinacol Rearrangement Cascade for the Synthesis of Indoxyls.
Das, R. C.; **Barik, S.**; Kunhiraman, A. A.; Goswami, A.; Mondal, A.; De, M.; Biju, A. T. *ACS Catal.* **2024**, *15*, 4202.
6. Nucleophilic Acylation-Annulation Cascade of 2-Chlorobenzonitriles using Aldehydes Triggered by N-Heterocyclic Carbenes.
Gadhave, M. S.; **Barik, S.**; Wessels, F.; Biju, A. T. *Org. Lett.* **2023**, *25*, 8314.
5. N-Heterocyclic Carbene-Catalyzed Atroposelective Synthesis of N–N Axially Chiral 3-Amino Quinazolin-ones.
Balanna, K.; **Barik, S.**; Barik, S.; Shee, S.; Manoj, N.; Gonnade, R. G.; Biju, A. T. *ACS Catal.* **2023**, *13*, 8752.

4. Dynamic Kinetic Resolution of γ,γ -Disubstituted Indole 2-Carboxaldehydes via NHC-Lewis Acid Cooperative Catalysis for the Synthesis of Tetracyclic ϵ -Lactones.
Balanna, K.; **Barik, S.**; Shee, S.; Gonnade, R. G.; Biju, A. T. *Chem. Sci.* **2022**, *13*, 11513.
Among the 2022 Chem.Sci. Pick of the Week Collection. This article appears in 2022 Chem. Sci. 'HOT Article Collection.'
3. Synthesis of Functionalized Dihydrocoumarins by NHC-Catalyzed [3+3] Annulation of Enals with 2-Substituted Naphthoquinones.
Shee, S.; **Barik, S.**; Ghosh, A.; Biju, A. T. *Org. Lett.* **2021**, *23*, 8039.
2. Oxidative N-Heterocyclic Carbene (NHC) Catalysis for the Rapid Access to Functionalized Pyrrolo-oxazinones.
Ghosh, A.; Barik, S.; **Barik, S.**; Shee, S.; Biju, A. T. *Tetrahedron* **2021**, *94*, 132330.
Invited to the Special Issue on System-Oriented Development of Organocatalysis.
1. NHC-Catalyzed (3+3) Annulation of Thioamides and Modified Enals for the Enantioselective Synthesis of Functionalized Thiazinones.
Ghosh, A.; **Barik, S.**; Biju, A. T. *Org. Lett.* **2019**, *21*, 8598.

Teaching Experience

Teaching Assistant

Aug 2021 – Dec 2021

UG Organic Chemistry course : **UC-206T: Basic Organic Chemistry Part-1**

Instructors: **Prof. A. T. Biju & Prof. D. P. Hari**

Class Strength: 120 students

Responsibilities involved designing pedagogical & instructional materials; setting up and correcting assignments, quizzes, and exams; routinely giving feedback to students for improving performance in the course; and assisting in course grading.

PMRF Teaching Assistant

Aug 2021 – Dec 2023

Second year undergraduates at Maharani Lakshmi Ammanni College for Women

Class Strength: 70 students

Served as an instructor for a course on “stereochemistry & asymmetric synthesis” for second-year undergraduate students as a part of the mandatory teaching requirement for PMRF awardees.

PMRF Teaching Assistant

Jan 2024 – Dec 2024

Second year postgraduates at Maharani Lakshmi Ammanni College for Women

Class Strength: 15 students

Served as an instructor for a tutorial course on “preparation of CSIR-NET & GATE examinations” for second-year post graduate students as a part of the mandatory teaching requirement for PMRF awardees.

Mentorship

Mentored 9 students(3 women, 6 men)

Mentees – Mr. Rohan Chandra Das (Ph.D. student), Ms. Sowmya Shree R. (Ph.D. student), Mr. Deeptanu Sarkar (Integrated Ph.D. student), Mr. Mahesh S. Gadhave (Ph. D. student), Mr. Gautham Kumar Singh (MSc. student), Mr. Felix Wessels (Research intern from Germany), Ms. Fathima Dinsha Paravakkal (Project assistant), Ms. Hemlata Chauhan (Summer intern), Mr. Palash Roy (Ph.D. student)

References

Prof. Akkattu T. Biju

Professor

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Prof. Durga Prasad Hari

Assistant Professor

Dept of Organic Chemistry,

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