# Dr. Biswarup Jash

Assistant Professor, Indian Institute of Technology Kharagpur


## Contact Details


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## Professional Experiences

| | |
|---|---|
| Mar 2022 - Present | Assistant Professor; *Indian Institute of Technology Kharagpur* |
| Feb 2021 - Mar 2022 | Postdoctoral Researcher; *Stanford University,* USA<br>Supervisor: Dr. Eric T Kool. |
| Aug 2018 - Sept 2020 | Postdoctoral Researcher; *University of Stuttgart,* Germany<br>Supervisor: Dr. Dr. Clemens Richert. |
| Feb 2018 - June 2018 | Postdoctoral Researcher; *University of Münster*, Germany.<br>Supervisor: Dr. Jens Müller. |

## Education

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|---|---|
| 2007 | Secondary; *Ramakrishna Mission Vidyapith*; Purulia, West Bengal. |
| 2009 | Higher Secondary; *Ramakrishna Mission Vidyapith*; Purulia, West Bengal. |
| 2009 - 2012 | B.Sc. in Chemistry; *Ramakrishna Mission Residential College (Autonomous)*; Narendrapur, Kolkata. |
| 2012-2014 | M.Sc. in Chemistry; *Indian Institute of Technology* Kanpur.<br>M.Sc. thesis title: *"DNA and Protein binding studies of a luminescent Tb(III) complex of Anthracene semicarbazone".*<br>Supervisor: Dr. Asish K. Patra. |
| Oct 2014-Feb 2018 | Ph.D. Student; *University of Münster / WWU Münster*, Germany.<br>Ph.D. thesis title: *"1H-Imidazo[4,5-f][1,10]phenanthroline as a ligand in metal-modified nucleic acids".*<br>Supervisor: Dr. Jens Müller. |

## Publications

### Selected publication:

1. B. Jash, P. Tremmel, D. Jovanovic, C. Richert*; *"Single Nucleotide Translation without Ribosomes"*
   *Nature Chemistry* **2021**, *13*, 751-757.
   DOI: 10.1038/s41557-021-00749-4
   'Behind the Paper' at Nature Portfolio: "*The Molecules that were Able to Start Translation*"
   Highlights in News & Views: "*The origin of translation*" by Ying Zheng & Jia Sheng
   DOI: 10.1038/s41557-021-00760-9

2. B. Jash, J. Müller*; *"Stable Copper(I)-mediated base pair in DNA"*
   *Angewandte Chemie International Edition* **2018**, *57*, 9524-9527.
   DOI: 10.1002/anie.201802201
   Highlighted in annual overview of Inorganic chemistry 2018 in *Nachrichten aus der Chemie.*

3. B. Jash, P. Scharf, N. Sandmann, C. Fonseca Guerra, D. A. Megger, J. Müller*; "*A metal-mediated base pair that discriminates between the canonical pyrimidine nucleobases*"
   *Chemical Science* **2017**, *8*, 1337-1343.
   DOI: 10.1039/C6SC03482A

4. B. Jash, C. Richert*; *"Templates direct the sequence-specific anchoring of the C-terminus of peptido RNAs"*
   *Chemical Science* **2020***, 11,* 3487-3494.
   DOI: 10.1039/C9SC05958J

5. B. Jash, E. T. Kool, *"Conjugation of RNA via 2'-OH acylation: Mechanisms determining nucleotide reactivity"*
   *Chemical Communication* **2022**, *58*, 3693-3696.
   DOI: 10.1039/D2CC00660J

### Additional publication:

6. H. S. Park, B. Jash, L. Xiao, Y. W. Jun, E. T. Kool*; *"Control of RNA with quinone methide reversible acylating reagents"*
   *Organic & Biomolecular Chemistry* **2021**, *19*, 8367-8376.
   DOI: 10.1039/D1OB01713F

7. B. Jash, J. Müller*; *"Stable Hg(II)-mediated base pairs with a phenanthroline-derived nucleobase surrogate in antiparallel-stranded DNA"*
   *Journal of Biological Inorganic Chemistry* **2020**, *25*, 647-654.
   DOI: 10.1007/s00775-020-01788-x

8. B. Jash, J. Müller*; *"A stable Zinc(II)-mediated base pair in parallel-stranded DNA duplex"* *Journal of Inorganic Biochemistry* **2018**, *186,* 301-306. DOI: 10.1016/j.jinorgbio.2018.07.002

9. B. Jash, J. Müller*;*"Concomitant site-specific incorporation of Silver(I) and Mercury(II) ions into a DNA duplex"* *Chemistry – A European Journal* **2018**, *24,* 10636-10640. DOI: 10.1002/chem.201802470

10. B. Jash, J. Müller*; *"Metal-mediated base pairs: from characterization to application"* (Minireview) *Chemistry – A European Journal* **2017**, *23,* 17166-17178. DOI: 10.1002/chem.201703518

11. B. Jash, J. Müller*; *"Application of a metal-mediated base pair to the detection of medicinally relevant single nucleotide polymorphisms"* *European Journal of Inorganic Chemistry* **2017**, 3857-3861. DOI: 10.1002/ejic.201700665 Selected as *very important paper, Cover picture* and *Cover profile*. Highlighted in *ChemistryViews,* Highlighted in *EurJIC's Dutch-German* virtual issue.

12. B. Jash, J. Neugebauer, J. Müller*; "*Enantiospecific formation of metal-mediated base pair inside a DNA duplex*" *Inorganica Chimica Acta* **2016**, *452*, 181-187. DOI: 10.1016/j.ica.2016.02.012. Invited contribution to a special issue on *"Metal-Nucleic Acid Interactions"*

13. P. Scharf,[§] B. Jash,[§] J. A. Kuriappan, M. P. Waller, J. Müller*; "*Sequence-dependent duplex stabilization upon formation of a metal-mediated base pair*" ([§]equal first author contribution) *Chemistry – A European Journal* **2016**, *22*, 295-301. DOI: 10.1002/chem.201503405

## Teaching and Advising Experiences

**At IIT Kharagpur**

**Teaching experience:** (Average Teaching Feedback Score (4.37/5.0)

- Molecular Structure and Bonding (Autumn, 2022-2023 & 2023-2024)
- Chemistry of 3d-elements (Spring 2022-2023)
- Bioinorganic Chemistry (Spring 2023-2024)
- Chemistry Laboratory (Autumn, 2022-2023 & Spring 2022-2023)

- Advanced Inorganic Laboratory (Autumn 2023-2024)

**Advising experience:**

***Ph.D. Scholar***

1) Nirmal Pal (From Aug 2022)
2) Debarati Bhattacharya (From Aug 2023)
3) Manick Mistri (From Aug 2023)

***Current M.Sc. Scholar***

1) Sanshay Sen
2) Indrajit Bhowmik
3) Shankha Subhra Mandal

***Former M.Sc. Scholar***

Thulunga Basumatary (M.Sc. scholar, 2022-23)

***Before joining IIT Kharagpur***

**Teaching assistant:**

1. Teaching Assistant in the advanced practical course of *"Organische Synthese für Fortgeschrittene OC-3"* at Institut für Organische Chemie, Universität Stuttgart, Germany (2020).
2. Teaching Assistant in the advanced practical course of *"Moderne Synthesechemie - Anorganische Chemie 2"* at Institut für Anorganische und Analytische Chemie, WWU Münster, Germany (2016).

**Advising experience:**

Supervised eight Master students during master's training course.
Supervised two Bachelor students during their bachelor's thesis.

## Research Interest as Principal Investigator

As chemists, we are intensely interested in the field of nucleic acid, and value in-depth investigation of the subject and its challenges.

We primarily focus on two topics.

1) G-quadruplex nucleic acid
2) Prebiotic chemistry

## Project/Funding as Principal Investigator

| Sl. No. | Title | Amount (Lakh) | Duration | Sponsoring Agency | Status |
|---|---|---|---|---|---|
| 1 | Role of metal ions in the synthesis of the early form of biomolecules | 25 | 3 yrs | ISIRD, SRIC, IIT Kharagpur | Ongoing |
| 2 | Route to find out the primitive form of enzymes and their functions in the early biochemical reactions | 33 | 2 yrs | SRG from SERB, India | Ongoing |

## Other Activities

- Co-PI - Circular Dichroism Spectropolarimetry, CRF – IIT Kharagpur (Aug 2023 – Present).
- Instrument in-charge CHN-analyser, Chemistry department (Aug 2023 – Present).
- Member, Course Structure Committee for Newly Introduced B.Sc. B.Ed. (ITEP).
- Member, Departmental PG Committee, Chemistry (Aug 2023 – Present).
- Member, Departmental Laboratory Safety & Hazards Committee (Aug 2023 – Present)
- Department Website Co-Administrator (Aug 2023 – Present)

## Awards and Honors

- INSPIRE Faculty Award from the Department of Science & Technology (India). (2019)
- Magna-cum-Laude award in Ph.D., University of Münster / WWU Münster. (2018)
- International Graduate School of Chemistry Fellowship; Münster, Germany. (2014)
- SBIC Grant Winner for participation in EUROBIC'13. (2016)
- INSPIRE Fellowship from 2009-2014.
- “Indian Academy of Science” fellowship for summer research internship. (2013)
- AIR 29 in CSIR-NET Exam for JRF (2013), AIR 5 in JAM Exam (2012), AIR 229 in GATE Exam (2014)
- “National Merit Scholarship” from West Bengal State Government from 2009-2012.
- Outstanding all-round performance award in Chemistry Honors in college. (2012)
- Secured 1st position in Chemistry Honors at B.Sc. level. (2013)

## Presentation

1. Invited Oral Presentation at GCRC-2023 at GITAM University, Vishakpatnam (07.12.2023)
2. Department of Chemistry, IIT Kharagpur, India (2021).
3. DST Inspire Faculty Fellowship Presentation (2019).
4. Poster talk at Saarbrücken, University of Saarlandes, Germany (19.09.2019-20.09.2019)

5. Invited oral presentation at Ramakrishna Mission Vidyamandira (Residential Autonomous College), Belur, West-Bengal; India. (20.07.2018)
6. Poster presentation at SFB 858, 9th Münster Symposium on Cooperative Effects in Chemistry, Germany. (16.03.2018)
7. Poster presentation at SFB 858, 8th Münster Symposium on Cooperative Effects in Chemistry, Germany. (12.05.2017)
8. Flash presentation at FoChIn 2017, Münster, Germany. (04.05.2017)
9. Poster presentation at 13th European Biological Inorganic Chemistry (EUROBIC); Budapest, Hungary. (28.08.2016 - 01.09.2016)
10. Oral presentation at Koordinationschemietreffen; Kiel, Germany. (29.02.2016)
11. Invited oral presentation at COST CM 1105 WG-2 Meeting; Lisbon, Portugal. (05.10.2015)