Bio-Data

Name	**Dr. Swapan Kumar Biswas**
E-mail	swapankumarbiswas@tripurauniv.ac.in , swapaniict@gmail.com
Academic Qualifications	M.Sc (Kalyani University), Ph.D (IICT-Hyderabad (Kalyani University), Post-Doctorate (MSU-MT, USA).
Present designation/position	Associate Professor
Key Expertise	Natural Product Synthesis, Asymmetric synthesis, Heterocyclic Chemistry, Methodology Development, Peptide Synthesis, Medicinal Chemistry and Solid Phase Synthesis, NMR and HPLC analysis.

Project: 54,17,233 INR ANRF Funded, on "Green Synthesis of Pyrano[2,3-c]pyrazole derivatives via multi-component reactions (MCRs) and their applications in medicinal chemistry"

Teaching & Research Experience:

Duration	Possition	Key Expertise
Dec2023-Till Date	**Associate Professor**, Department of Chemistry, Tripura University (A Central University), Agartala, Tripura, India.	Teaching PG student and Natural Product Synthesis, Asymmetric synthesis, Methodology Development, Peptide Synthesis, Medicinal Chemistry and Solid Phase Synthesis, NMR and HPLC analysis.
Apr2015-Nov2023	**Assistant Professor**, Department of Chemistry, Sree Chiatanya College, Habra, 24-Pgs(N), WB, India.	Teaching UG & PG student and Supervising PG project work, synthesis of small molecules for H_2O-spletting
Sept 2014-Mar 2015	**Project Leader, Senior Research Scientist** Jubilant Chemsys, Sector 58, Noida, India	Asymmetric synthesis, Medicinal Chemistry and Contact research.
Feb2013-Aug2014:	**Project Leader, Senior Research Scientist** TCG Lifesciences Pvt. Ltd, Kolkata, West Bengal, India.	Asymmetric synthesis, Medicinal Chemistry and Contact research, Heterocyclic Chemistry.
Jul 2010-Jul2012	**Post-Doctoral Research** with Prof. Paul A Grieco. Montana State University, Bozeman, MT, USA.	Synthesis of highly water soluble zwitterionic fluorescent dyes for application in two-dimensional difference gel electrophoresis (2D-DIGE). Synthesis of thiotripenylphosphene carboxylic acid derivative for RSNO rate determining project to bind the protein.
Aug2009-Jun 2010	**Senior Research Associate**. Escientia BioPharma Pvt. Ltd, Nacharam Industrial Area, Hyderabad.	Synthesis of Biologically active molecules, intermediates and process development for large scale reactions.
Aug 2003-Jan 2004	**Process R&D Chemist**, DABUR-Pharma, Kalyani Industrial Area, Kalyani, India.	Process R&D and production of **Irinotecan Hydrochloride as trihydrate** (IR-8), (FDA, TGA approved).

- **Feb 2006- Jul 2009:**

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Place: Indian Institute of Chemical Technology, Hyderabad, India.
Position: Senior Research Scholar under the supervision of Dr. J. S. Yadav, FNA. **Projects:**

- Studies directed towards the synthesis of 2,3-dihydroxytrinervitanes *via*-**Diels-Alder** Intramolecular cyclization, using **Julia-Kocienski** olefination and **Yadav's protocol** as the key steps.
- Gallium chloride catalyzed three component coupling of naphthol, alkyne and aldehyde: a novel synthesis of 1,3-dialkyl-3H-benzo[f]chromenes.
- Indium-mediated allylation/propargylation of α-diazoketones: a facile synthesis of 1-bromo-2-alkyl- or 2-arylpent-4-en-2-ols and *vic*-diallylation/propargylation of phenacyl bromides: a facile synthesis of 4-arylocta-1,7-dien-4-ol derivatives.

- **Feb 2004-Feb 2006**:
  Place: Indian Institute of Chemical Technology, Hyderabad, India.
  Position: Junior Research Scholar under the supervision of Dr. J. S. Yadav, FNA. **Projects:**
  - IBX mediated facile conversion of 1,3 diols to 1,2 diketones by oxidative cleavage of C-C bond.
  - Rapid and Efficient Protocol for the Synthesis of 4-chlorotetrahydropyrans using Niobium (V) chloride or Gallium halides**.**

- **Nov 2002- Jun 2003**:
  Place: University of Kalyani, India.
  Position: M.Sc. Research project under the supervision of Prof. S. P. Das.
  Projects:
  - Isolation and Transformations of Triterpenoids.

Education

Feb 2004-Jul 2009

Degree**:** Ph.D. in Organic Chemistry**.**
Institute: Degree awarded from University of Kalyani. Thesis title: **"*Studies directed towards the synthesis of 2,3-dihydroxytrinervitanes and development of new methodologies*"**

2003

Degree**: M. Sc. in Organic Chemistry.**
Institute: University of Kalyani, Kalyani, India.

2001

Degree**: B. Sc. in Chemistry** (Hons) with Physics and Mathematics as electives,
Institute: University of Kalyani, Kalyani, India.

Awards & Fellowship

- Dr. D.S Kothari Post-Doctoral Fellowship 2014-2015
- Best Scientist award from TCG Lifesciences Kolkata-Roche Collaboration year 2013-2014
- Awarded ***Senior Research Fellowship*** (**SRF**) by the Council of Scientific & Industrial Research, New Delhi, India (2006-2009).
- Awarded ***Junior Research Fellowship*** (**JRF**) by the Council of Scientific & Industrial Research, New Delhi, India (2004-2006).
- Qualified ***Graduate Aptitude Test in Engineering*** by Indian Institute of Technology (2003).

Professional Competence

- Synthesis of biologically active natural products and expertise in **multi-step synthesis**.

Bio-Data

- Development of new methodologies for **organic synthesis.**
- Profound efficiency **in handling of hygroscopic and air sensitive reactions**.
- Synthesis of peptides liquid phase as well as solid phase.
- Expertised in **HPLC (Both analytical and preparative) and GC**.
- Analysis and handling instrument of spectroscopic data viz., **NMR**, **IR**, **UV** and **Mass** spectrometer.
- Capable of performing collaborative and independent work.
- Expertised in various analytical techniques in organic synthesis like flash chromatography, LC-MS, DSC, TGA and various other chromatographic techniques.
- Expertised in the preparation of research reports and manuscripts using MS office, ChemDraw, NMR software etc.
- Familiarised with SciFinder Scholar.

Publications

T. Sahoo, P. Shrivastava, Dr. A. Chandra, **Dr. S. K. Biswas*** and Dr. B. V. Subba Reddy* (**2024**). The Biological Activity and Synthesis of Orally Active COVID-19 (SARS-CoV-2) Antiviral Drug Molnupiravir. International Academic Publishing House (IAPH), A Basic Handbook of Science, Technology and Innovation for Inclusive Development [Volume: 1], pp. 13-39. ISBN: 978-81-969828-4-3; DOI: https://doi.org/10.52756/ bhstiid.2024.e01.002

Dr. Swapan Kumar Biswas & Titas Biswas, A Book for CBCS-UG& PG, Organic Name Reaction, Rohini Nandan, ISSN/ ISBN No.978-93-91572-39-2

Swapan Kumar Biswas* Sipak Joyasawal; Conversion of α-Diazoketones into 1-Bromo-2-alkyl- or 2-arylpent-4-en-2-ols using Tin-Mediated Allylation/Propargylation. SynOpen 2023; 07(02): 161-164. DOI: 10.1055/a-2068-5625

Swapan Kumar Biswas* and Titas Biswas; Metal-free one-pot oxidative conversion: Molecular Iodine Mediated Oxidation Organic Reactions. Int. J. Exp. Res. Rev.Vol. 27: 45-52(2022). DOI: 10.52756/ijerr.2022.v27.005.

Swapan Kumar Biswas* and Titas Biswas; Utility of iodine catalyzed tandem oxidation, cross-coupling and cyclisation reactions in organic synthesis. Int. J. Exp. Res. Rev.Vol. 27: 39-44 (2022). DOI: 10.52756/ijerr.2022.v27.004.

Swapan Kumar Biswas*; Recent development of Silver-catalyzed Oxo- and Aza cyclization.Int. J. Exp. Res. Rev., Vol. 26: 90-98 (2021). DOI: 10.52756/ijerr.2021.v26.007.

Swapan Kumar Biswas* and Debasis Das*, One-pot Synthesis of Pyrano[2,3-c]pyrazole Derivatives via

Bio-Data

Multicomponent Reactions (MCRs) and their Applications in Medicinal Chemistry. Bentham Science, 552 - 568, Volume 19, Issue 5, 2022. DOI: 10.2174/1570193x19666211220141622.

Swapan Kumar Biswas* and Sushanta Saha, A report groundwater arsenic contamination assay in the delta area of West Bengal. International Academic Publishing House., Vol. 25: 84-88 (2021). https://doi.org/10.52756/ijerr.2021.v25.008.

Walid S. Maaty1, Joseph D. Steffens1, Joshua Heinemann1, Alice C. Ortmann2, Benjamin D. Reeves1, **Swapan K. Biswas1**, Edward A. Dratz1, Paul A. Grieco1, Mark J. Young3,4 and Brian Bothner1*, Global Analysis of Viral Infection in an Archaeal Model System; Frontiers in Microbiology, 2012, Volume 3, Article 411, DOI: 10.3389/fmicb.2012.00411

J. S. Yadav, **S. K. Biswas,** S. Sengupta, Progress towards the total synthesis of 2,3-dihydroxytrinervitanes. *Tetrahedron Letters,* **2010,** *51*, 4014. DOI: 10.1016/j.tetlet.2010.03.065

J. S. Yadav, B. V. S. Reddy, **S. K. Biswas**, S. Sengupta, Gallium chloride catalyzed three component coupling of naphthol, alkyne and aldehyde: a novel synthesis of 1,3-diaryl-3H-benzo[f]chromenes. *Tetrahedron Letters*, **2009,** *50*, 5798. DOI: 10.1016/j.tetlet.2009.07.134

J. S. Yadav, B. V. S. Reddy, S. Sengupta, **S. K. Biswas**, Gallium(III) chloride catalyzed hydroarylation of aryl acetylenes with naphthols and phenols: a facile synthesis of vinyl arenes. *Synthesis* **2009,** 1301. DOI: 10.1055/s-0028-1088027

J. S. Yadav, B. V. S. Reddy, **S. K. Biswas**, S. Sengupta and P. Vishnumurthy Indium-mediated *vic*-diallylation/propargylation of phenacyl bromides: a facile synthesis of 4-arylocta-1,7-dien-4-ol derivatives. *Tetrahedron Letters 49*, **2008**, 1034. DOI: 10.1016/j.tetlet.2007.12.005

J. S. Yadav, B. V. S. Reddy, P. Vishnumurthy and **S. K. Biswas**, Indium-mediated allylation/propargylation of α-diazoketones: a facile synthesis of 1-bromo-2-alkyl- or 2-arylpent-4-en-2-ols. *Tetrahedron Letters 48*, **2007**, 6641. DOI: 10.1016/j.tetlet.2007.07.136

J. S. Yadav, **S. K. Biswas.** R. Srinivas. IBX mediated facile conversion of 1,3 diols to 1,2 diketones by oxidative cleavage of C-C bond. *Synthesis,* **2006**, 4237. DOI: 10.1055/s-2006-950372

J. S. Yadav, B. V. S. Reddy, B. Eeshwaraiah, M. K. Gupta, **S. K. Biswas.** Gallium (III) halide promoted synthesis of 1,3,5-triaryl-1,5-dihalo-1,4-pentadienes *Tetrahedron Letters 46,* **2005,** 1161**.** DOI: 10.1016/j.tetlet.2004.12.080

Bio-Data

J. S. Yadav, B. V. S. Reddy, M. K. Gupta**, S. K. Biswas.** Rapid and Efficient Protocol for the Synthesis of 4-Chlorotetrahydropyrans using Niobium(V) chloride. *Synthesis,* **2004**, 2711. DOI: 10.1055/s-2004-831220.

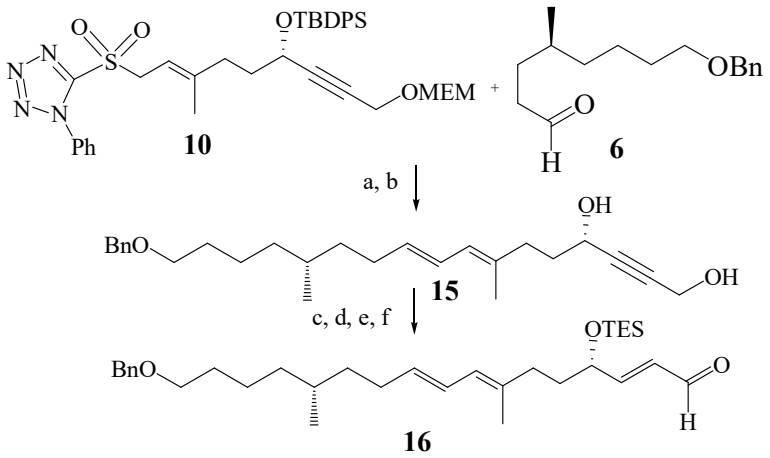
Lecture / Presentations:

- **"National Science Day" 2024 on 14th March 2024,** Lecture by Dr.Swapan Kumar Biswas, Associate Professor, Department of Chemistry,Tripura University, at Government of Tripura, Rabindranath Thakur Mahavidyalaya, Bishalgarh, Sepahijala, Tripura – 799102.
- **"Science and Technology for Environmental Sustainability and Tribal Development"** on 14th & 15th March, 2024, Organized by Government Degree College, Dharmanagar,in collaboration with Indian Science Congress Association, Dharmanagar Chapter, Venue: Government Degree College, Dharmanagar, North Tripura

Presentations at symposium

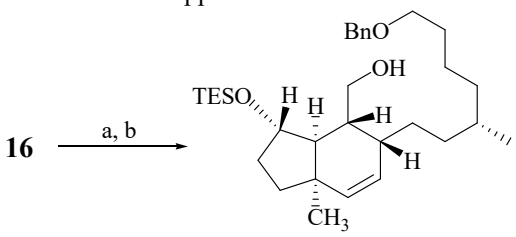
- 21st National Conference on Surfactants, Emulsions & Biocolloids (NATCOSEB XXI), November 23-25, 2023
- Poster presented on "Synthesis 1-Bromo-2-alkyl- or 2-arylpent-4-en-2-ols using Tin-Mediated Allylation/ Propargylation" One Day National Seminar on Dimensions in Chemical Sciences, held Dept. Of Chemistry And IQAC, RBC for Women, 16th May 2023.
- Poster presented on "One-pot Synthesis of Pyrano[2,3-c]pyrazole Derivatives via Multicomponent Reactions (MCRs) and their Applications in Medicinal Chemistry", Science for Society Enironment and Sustainability-2022, CSIR-North East Institute of Science and Technology, Jorhat, 24th-26th Nov 2022.
- "Production and application of Bio-Based Surfactants-A Breeff overview", Trends in surface science and related Areas, 6th Oct, 2018, Sarojini Naidu Collge for women & ISSST, Jadavpur University,
- "Synthesis of Caspases Inhibitor to……" NATCOBER-2017, 10-12 Nov, 2017, Sambalpur University
- Production and Application of Bio-Based surfactants-A Brief Overview" Trens in surface science and related areas, 20, Aug 2016; Sree Chitanya Collge & ISSST, Jadavpur University.
- Poster presented on "Studies directed towards the synthesis of 2,3-dihydroxy- trinervitanes *via* intramolecular Diels-Alder cyclization**"** in **National Symposium,** March, 2009 held at the University of Kalyani, Kalyani, West Bengal.
- Poster presented on "IBX mediated facile conversion of 1,3 diols to 1,2 diketones by oxidative cleavage of C-C bond" in **National Symposium on Current Trends In Chemistry** 30-31st January, 2007 held at the University of Kalyani, Kalyani, West Bengal.
- Poster presented on "Rapid and Efficient Protocol for the Synthesis of 4-chlorotetra-hydropyrans using Niobium (V) chloride or Gallium chloride" in **OSPC-2005** held at the Indian Institute of Chemical Technology, Hyderabad.

Coupling and IMDA: Diels- Alder precursor **16** was prepared as following, coupling of **10** and **6** using Julia-Kocienski olefination to get and followed by deprotection of TBDPS and MEM to get **15**, Red-Al reaction and protection deprotection of hydroxyl group followed by IBX oxidation to give IMDA starting material (Scheme 3).



Scheme 3: a) KHMDS, THF, –78 ºC; b) 2N HCL, MeOH; c) Red-Al, Ether; d) TES-Cl, Imd; e) TBAF, 0 ºC 2 min; f) IBX, DMSO, THF, 1eqv. $NaHCO_3$.

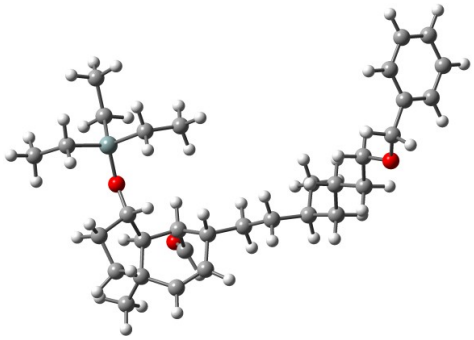
16 was heated at 160 ºC for 20 hours to provide the five- and six-member ring of trinervitanes skeletons by **intramolecular Diels-Alder,** which was converted to **3** using $NaBH_4$ (Scheme 4). The structure was confirmed by NOESY interaction, quantum mechanical calculation supported the result.



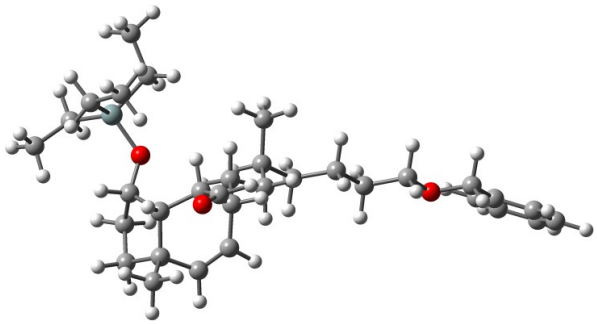
Scheme 4: a) Toluene, 0.1 eqv BHT, 160 ºC sealed tube 20h; b) $NaBH_4$, MeOH, 0 ºC.

Total energies and the relative energies (kJ/mol) at AM1, PM3, MNDO and B3LYP/6-31G (d) level of theory.

Structure	AM1	PM3	MNDO	B3LY/6-31G(d)
2a (α,α)	0.0	0.0	0.0	0.0
2b (β,β)	18.3	22.8	15.0	5.14



Pr-2(α, α) -$OSiEt_3$ down
-1765.9314611 (0.0) kJ/ mol



Pr-4 (β, β) – $OSiEt_3$ down
-1765.926501 (5.14) kJ/ mol

Yadav et al. *Tetrahedron Letters,* **2010,** *51*, 4014.

2) Gallium chloride catalyzed three component coupling of naphthol, alkyne and aldehyde: a novel synthesis of 1,3-dialkyl-3H-benzo[f]chromenes. Three-component coupling of naphthol, alkyne and aldehyde has been achieved in the presence of 10 mol% gallium(III) chloride in toluene under reflux conditions to afford the corresponding 1,3-diaryl-3H-benzo[f]chromenes in good yields. This is the first example on the preparation of chromenes from naphthol.

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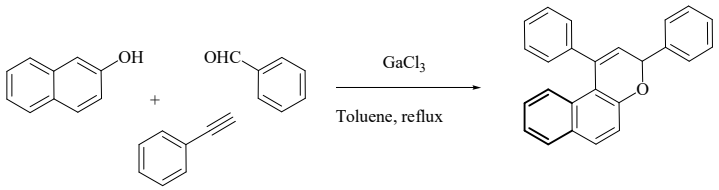
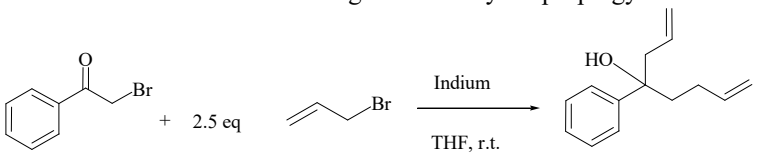


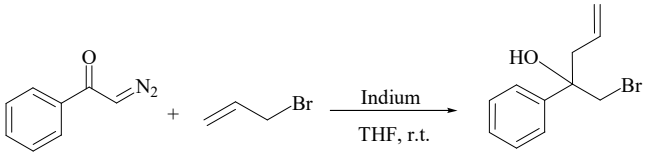
Yadav et al. *Tetrahedron Letters* **2009,** *50*, 5798.

3) Indium-mediated *vic*-diallylation/propargylation of phenacyl bromides: a facile synthesis of 4-arylocta-1,7-dien-4-ol derivatives. Phenacyl bromides undergo smooth *vic*-diallylation and dipropargylation with allyl and propargylindium reagents generated *in situ* from metallic indium and allyl or propargyl bromide to produce 4-arylocta-1,7-dien-4-ol derivatives in good yields. Phenacyl chloride and azide also participated effectively in bis-allylation. Similar results are also obtained from in situ generated allyl or propargylzinc bromide.



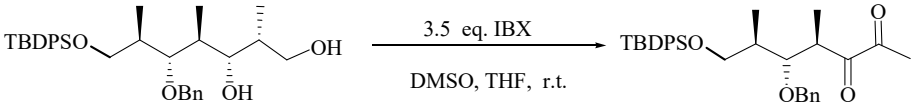
Yadav et al. *Tetrahedron Letters* **2008**, *49*, 1034.

4) Indium-mediated allylation/propargylation of α-diazoketones: a facile synthesis of 1-bromo-2-alkyl- or 2-arylpent-4-en-2-ols. α-Diazoketones undergo smooth allylation with successive bromide insertion with allylindium bromide generated in *situ* from allyl bromide and indium metal to produce 1-bromo-2-alkyl- or 2-arylpent-4-en-2-ols in high yields. Addition of propargylindium bromide produces 1-bromo-2-alkyl-or 2-arylpent-4-yn-2-ols under similar conditions.



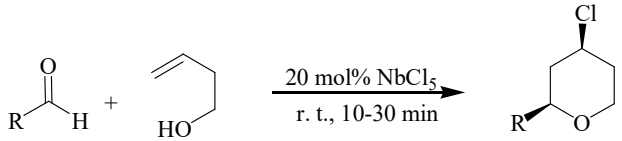
Yadav et al. *Tetrahedron Letters* **2007**, *48*, 6641

5). IBX mediated facile conversion of 1,3 diols to 1,2 diketones by oxidative cleavage of C-C bond. For the first report, the direct conversion of 1,3-diols 1 to 1,2-diketones 2 by oxidative cleavage of the C–C bond using 3.5 equivalents of 2-iodoxybenzoic acid in dimethyl sulfoxide at ambient temperature.



Yadav et al. *Synthesis* **2006**, 4237.

6). Rapid and Efficient Protocol for the Synthesis of 4-Chlorotetrahydropyrans using Niobium(V) chloride. Aldehydes undergo a rapid coupling with 3-buten-1-ol utilizing 20 mol% of niobium(V) chloride or gallium(III) halides to afford 4-chlorotetrahydropyran or 4-halo-tetrahydropyran derivatives under extremely mild conditions within short reaction times in excellent yields with high selectivity. The similar halogenated tetrahydropyrans are also obtained using.



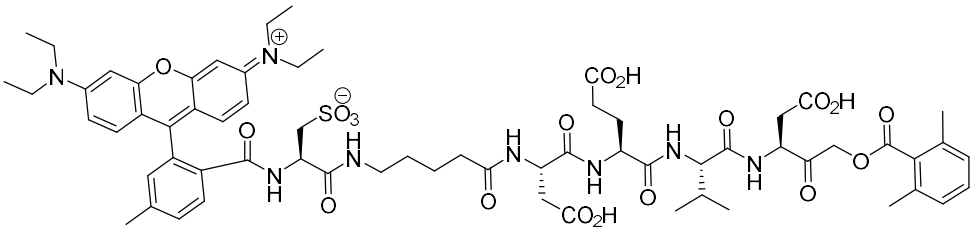
Yadav et al. *Synthesis* **2004**, 2711.

<u>Project at Montana State University</u>:

Synthesis of Caspases Inhibitor: Synthesis of highly water soluble zwitterionic fluorescent dyes (Zdye) for application in two-dimensional difference gel electrophoresis (2D-DIGE) to label the proteins from different biological treatments and thus overcome problems with excremental reproducibility of the separations of the myriad of proteins present in cells, organelles and in tissues. I have successfully completed Rhodamine Caspases inhibitor.

Preparation of Rhodamine Caspases inhibitor:

Bio-Data



Rhodamine Caspases Inhibitor

Student trained for research (*Mentoring M.Sc. Project Students)*

Tripura University

2025
Swan Das
Murchana Basumatary
Diksha Basumatary
Abhijit Debnath

(2024)
Mayukh Protim Borpatragohain
Dipraj Paul
Akash Chakraborty
Bikram Saha
Puja Sarma

Sree Chaitanya College

(2023)
Bapan Biswas
Anirudhha Das
Sourav Chakraborty
Abhishek Bose

2020
Najma Hasan
Amit Sarkar

(2022)
Sayanjit pal
Shoumik Ghosh
KOUSIKI PAL

(2018)
Baisali Indu
Animesh Mukherjee

(2021)
Jinia Nazneen
AKASH DEBNATH
Abhik Sur
Hyder Sekh

2017
Arpita Sarkar
Pranoy Sarkar
Sujoy Bhadra
Sutrishna Ghosh
Tapolabhda Talukdar

2015
Milan Kumar Sasmal
Nilkamal Basak
Manjima Chongdar
Alapan Chakarabarty
Shobhon Aich