

## **Dr. Rajat Ghosh** M.Pharm, Ph.D.

Assistant Professor  
Department of Pharmacy  
Tripura University (A Central University)  
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### ***Topics Taught***

- ✓ Medicinal Chemistry & Drug Designing, Pharmaceutical Chemistry, Pharmaceutical Analysis and Phytochemistry.

### ***Research Interests***

1. In Silico Approach in Drug Design and Drug Discovery.
2. Synthesis of Active Pharmaceutical Ingredients (APIs).
3. Isolation & characterization of Bioactive Molecules from Medicinal Plants.
4. Instrumental Analysis of drug molecules.
5. Quantitative & qualitative estimation of drug molecules.

### ***Professional Work Experience***

1. 12 years Post Graduate (M.Pharm) teaching & research experience in Tripura University (A Central University), Suryamaninagar, West Tripura – 799022, Tripura (2011 onwards)
2. 03 years research experience as R&D Chemist in Synthetic R&D department of R L Fine Chem., Bangalore, Karnataka (2008 to 2011).

### ***Research Laboratory Experience***

1. Various types of organic reactions including Grignard, Friedel-Crafts Acylation.
2. Handling Moisture/Air sensitive molecules and carrying out reactions in complete inert atmosphere (Under Nitrogen) & phase transfer catalysis reaction.
3. Handling of Hazardous Chemicals.
4. Process optimization and Purification of synthesized compounds by using crystallization and various chromatographic method (such as column & preparative chromatography) techniques.
5. Interpretation of Analytical Data using  $^1\text{H}$  &  $^{13}\text{C}$ -NMR, Mass spectra, FT- I.R., UV-Visible, X-ray crystallization, HPLC etc.

### ***Additional Experience***

- ✓ Experience on handling of **Drug Master Files, Impurity Profiling** during Pharmaceutical Industry tenure.
- ✓ One month Industrial Training at **Astra Zeneca India Ltd.**, Pharmaceutical company, Yelahanka, Bengaluru, Karnataka (2004-05).

## Education

| **Ph.D in Pharmacy** | Tripura University, Department of Pharmacy, Suryamaninagar, Tripura |

**Field of Research:** Synthesis and Pharmacological Evaluation of Spirooxindole Derivatives.

| **M. Pharm (Pharmaceutical Chemistry) | First Class (73.0%) | May 2006- July 2008**  
| Al-Ameen College of Pharmacy, Bangalore, Karnataka (Rajiv Gandhi University of Health Science) |

**Thesis Title:** Synthesis, Antibacterial, Analgesic & Anti-inflammatory Activities of Some Benzothiazole Derivatives.

| **B. Pharm | First Class (70.00%) | August 2001- December 2005 |**

| Regional Institute of Pharmaceutical Science and Technology (RIPSAT, Tripura University), Abhoynagar, Agartala, Tripura, India. |

### **Project work:**

Physiochemical and Biological Studies of Some New Synthesized Amino-Pyrazolo-Carboxaldehydes.

## Achievements

B. Pharm admission was taken through Tripura Joint Entrance Exam. 2001; where PCB (Physics, Chemistry and Biology) rank was 54 & PCM (Physics, Chemistry and Math) rank was 103.

## Academic Master Research Supervision

### **2014**

1. Pharmacognostic, Phytochemical & Biological investigation of *Neptunia prostrata* L.
2. Phytochemical and Biological Evaluation of *Syndrella nodiflora* Leaves.
3. Extraction and Evaluation of Antimicrobial, Antioxidative potential of *Cinnamomum tamala* Leaves.
4. Phytochemical Screening and Biological Evaluation of Antibacterial Activities of *Piper mullesua* Fruits.
5. Synthesis, Characterization, Antibacterial & Antioxidant Studies of Some Substituted  $\alpha,\beta$ - Unsaturated Ketones and Their Heterocyclic Derivatives.

### **2015**

6. Extraction and Evaluation of Antimicrobial Activities of *Solanum Violaceum* Ortega leaves.
7. Phytochemical and Biological Evaluation of *Stephania Japonica* Miers leaves.
8. Synthesis, Characterization and Biological Evaluation of Newly Synthesized Heterocyclic Compounds.

9. Assessment of Drugs Prescribed by Physicians for Hypertension, Diabetes & Peptic Ulcer in Outpatient Department of General Medicine in Tripura Medical College & Bram Teaching Hospital of Tripura.
10. Isolation & Characterization of Chemical Constituents from the roots of *Boerhavia diffusa*.

## **2016**

11. Evaluation of Antimicrobial Activities of Newly Synthesized Pyrazoline and Pyrimidine Derivatives.
12. Extraction and Phytochemical Investigations for the Evaluation of Hepatoprotective and Anti-bacterial Activity of *Neptunia prostrata* L.
13. Evaluation of Antimicrobial Activity of Newly Synthesized Thiazine Derivatives.
14. Synthesis of some Flavonoid Derivatives for Anti-Microbial Screening.

## **2017**

15. Synthesis and Characterization of some Novel Heterocyclic Compounds.

## **2018**

16. Synthesis, Characterization and Evaluation of Pharmacological activities of newly synthesized five membered heterocyclic compounds.
17. Synthesis & Characterization of Pyrimidine Based Heterocyclic Compound.
18. Synthesis Characterization and Evaluation of Pharmacological activities of Benzopyrones.

## **2019**

19. Synthesis, Characterization and Evaluation of Antimicrobial & Antioxidant Activities of some Novel Spiro Heterocyclic Compounds.
20. Synthesis, Characterization and Evaluation of Pharmacological Activities of Newly Synthesized Pyrimidine Derivatives.

## **2020**

21. Synthesis, Characterization and Antimicrobial activity evaluation of Aurone derivatives against gram negative bacteria *Pseudomonas aeruginosa*.
22. Synthesis, Characterization and Antibacterial evaluation of Spiro Heterocyclic derivatives.

## **2021**

23. Extraction, fractionation and phytochemical investigation for the evaluation of pharmacological activity of *Neptunia prostrata* L.
24. Characterization and evaluation of pharmacological activity of newly synthesized isatin based spiro compound.
25. Synthesis and antimicrobial evaluation of fatty acids and its derivatives.

## **2022**

26. Synthesis, Characterization and anti-proliferative evaluation of indole derivatives.

27. Synthesis, Characterization and anti-bacterial activity evaluation of fatty acid derivatives.
28. Extraction, Phytochemical investigation and biological evaluation of *Syndrella nodiflora*.
29. Synthesis, Characterization and biological activity evaluation of ninhydrin based Spirocyclic compounds.
30. Extraction, Phytochemical investigation and Antioxidant evaluation of *Moringa oleifera* leaves: An Asian miraculous tree.

### Research Projects

Year	Funding Agency	Title of the project	Total Grant (Rs. in Lakhs)	Tenure (In years and months)
2019	AICTE, New Delhi	Rational design and synthesis of isatin inspired spirooxindole derivatives as antineoplastic agents	15.80	04 Yrs.
2018	DBT, New Delhi	Phytochemical and pharmacological evaluations of bioactivity guided fractions of medicinal plants of Tripura	73.91	03 Yrs.
2017	DBT, New Delhi	Integrated approach to understand agarwood formation and value addition of Agarwood ( <i>Aquilaria malaccensis</i> )	17.3	03 Yrs.

### Paper Publications

1. DR Choudhury, **Rajat Ghosh**, S Debnath, S Debnath. Potential peptidyl arginine deiminase type 4 inhibitors from *Morinda citrifolia*: a structure-based drug design approach. In Silico Pharmacology. **2023**, 11:13. (Springer)
2. H Jajo, **Rajat Ghosh**. Hepatoprotective activity of the whole plant of *Neptunia prostrata* L. in carbon tetrachloride induced rats. Int J Curr Pharm Res. **2021**, 3,6, 56-59.
3. K Choudhury, B De, **Rajat Ghosh**. Review on few anti diabetic medicinal plants used by the indigenous tribal people of Tripura. Int J Multidis Edu Res. **2021**, 10, 6, 228-230. ISSN: 2277-7881. DOI: <http://ijmer.in.doi./2021/10.06.214>
4. B Debnath, P Debnath, **Rajat Ghosh**, S Debnath. In silico identification of potential inhibitors of SARS-CoV-2 papain-like protease from natural sources: A natural weapon to fight COVID-19. Coronaviruses, **2020**, 1, 1, 1-12. Bentham Science. DOI: 10.2174/2666796701999201203211330
5. **Rajat Ghosh**, JB Vitor, E Mendes, A Paulo, PC Acharya. Stereoselective Synthesis of Spirooxindole Derivatives Using One-Pot Multicomponent Cycloaddition Reaction and Evaluation of Their Antiproliferative Efficacy. ACS Omega. **2020**, 5, 42, 27332–27343. (Impact factor 2.87 in 2019)

6. **Rajat Ghosh\***, A Das, S Mallik. Inhibition of Quorum Sensing in *Pseudomonas aeruginosa*: A Review. Indian J Pharm Sci, **2019**; 81(5):797-806. (**Impact factor 0.975 in 2020**)
7. **Rajat Ghosh**, Jajo H and Acharya PC. An Overview of *Neptunia prostrata*: A Source of Herbal Medicine of Ethnopharmacological Importance. Glob J Pharmaceu Sci, **2017**, 2(1):1-3.
8. **Rajat Ghosh\***, R Nandi. Phytochemical And Biological Importance of *Boerhavia diffusa*: A Plant of Ethnopharmacological knowledge. International Journal of Pharma Sciences and Research. **2016**,7(3):134-143.
9. K. Choudhury, R. Choudhury, **Rajat Ghosh**, S. Sen, R. Chakraborty, Z.C.Momin, B.B. Goswami, B.De. Antispermogenic activity of triterpenoids isolated from *Dioscorea glabra* tuber. Der Pharma Chemica, **2016**, 8(11):76-82.
10. **Rajat Ghosh\***, K Darin, P Deb. Presence of Organic Impurities into Active Pharmaceutical Ingredients: A Review. International Journal of Pharmaceutical Sciences and Research. **2014**; 5(10):4066-4096.
11. **Rajat Ghosh\***, A Das. Synthesis and biological activities of chalcones and their heterocyclic derivatives: A Review. World Journal of Pharmacy and Pharmaceutical Sciences. **2014**.3(3):578-595.
12. **Rajat Ghosh\***, PK Deb, T Bhakta, TK Ghosh. Traditional Phyto-therapy With Herbal Compositions Used By Folk-Practitioners of Tripura (North-East) For Treatment of Various Diseases. Indo American Journal of Pharmaceutical Research. **2014**.4(02):1221-1233.
13. **Rajat Ghosh\***, P. Deb. A Study on Antioxidant Properties of Different Bioactive Compounds. Journal of Drug Delivery and Therapeutics. **2014**.4(2), 105-115. (**Impact factor: 0.402**)
14. **Rajat Ghosh\***, K Darin, P Nath, P Deb. An Overview of Various Piper Species for Their Biological Activities. International Journal of Pharma Research & Review. **2014**; 3(1):67-75.
15. **Rajat Ghosh\***, B. De. Review on: Synthesis, Chemistry and Therapeutic Approaches of Imidazole Derivatives. International Journal of Pharmaceutical Sciences Review and Research. **2013**; 23(2): 237-246.
16. **Rajat Ghosh**, B Debnath, P Deb. Pharmacognostic, phytochemical and biological studies of *Synedrella nodiflora*- a review. International Research Journal for Inventions in Pharmaceutical Sciences. **2013**; 1(3):01-04.
17. **Rajat Ghosh\***, P Nath. Phytochemical and Medicinal Properties of *Cinnamomum tamala*- a review. The Global Journal of Pharmaceutical Research. **2013**; 2(3):1786-1790.
18. P K Deb, S Das, KN Bhaumik, **Rajat Ghosh**, TK Ghosh, T Bhakta. Pharmacognostic & Preliminary Phytochemical Investigations of *Neptunia Prostrata* L. Journal of Pharmacognosy and Phytochemistry. **2013**; 2(3): 5-11.

19. B. De, M.Chakraborty, K Dutta, P. R. Bhattacharjee, S.Paul(Datta), S Sen, **Rajat Ghosh**, K. Bhattacharjee *et.al.*, In vitro study of effect of normal saline, aspirin, atenolol & doxycycline on Insulin. *J. Inst. Chemists*.**2009**; 81(5):141–149.
20. B. De, S.Sen, **Rajat Ghosh**, M.Das, M.Debnath *et.al.* Physicochemical & biological studies of some new synthesized amino-pyrazole-carboxaldehydes. *J. Inst. Chemists*.**2007**; 79(2):54-57.

### Books/ Book Chapters Published

#### **2020**

1. Book Chapter Title: Biswal S., **Rajat Ghosh**, Acharya P.C. Pharmacology of Angiotensin and Its Receptors. *Frontiers in Pharmacology of Neurotransmitters*. Springer, Singapore, **2020**. Pages 361- 380. ISBN 978-981-15-3555-0, ISBN 978-981-15-3556-7 (eBook), <https://doi.org/10.1007/978-981-15-3556-7>

#### **2019**

1. Book Chapter Title: Impact of Indian Food Dishes in Diabetes. Book Title: Diabetes Mellitus (analysis and advancement). **CBS Publishers and distributors Pvt. Ltd.** ISBN: **978-93-88108-48-5, Pages 70-124.**

#### **2018**

1. Book Chapter Title: *Role of Salt Selection in Drug Discovery and Development*. Book Title: *Advances in Pharmaceutical Product Development and Research series: Dosage form design considerations*. Volume-I. *Published in Academic Press, Elsevier*. ISBN **9780128144237**. 2018, Pages 435-472. <https://doi.org/10.1016/B978-0-12-814423-7.00013-7>

### Seminar/ Conference/ Workshop/ Refresher/ Orientations/MOOC Participated

Name of Training	Institution	Duration	Subject
NPTEL Workshop	Prof. N Suryaprakash, IISc, Bangalore	4-10 July, <b>2022</b>	High Resolution NMR Spectroscopy in Liquids and Solids: Principles and Analysis of Spectra
1 <sup>st</sup> Paramedicon: An International Conference	Institute of Medical Sciences & Banaras Hindu University	07-08 April, <b>2022</b>	Innovations in Modern/Traditional Health Sciences and Medical Technology
2 <sup>nd</sup> World Congress on	BioGenesis Health Cluster, Bengaluru,	30-31 January, <b>2022</b>	Drug Discovery, Design &

Pharmacology	India.		Development.
05-Day International Workshop	Central Library & Dept. of Library and Information Science, Tripura University	17-21 January, <b>2022</b>	Academic Writing and Publishing
International Conference	Pharma Medical Sciences Development Society, Rampur, U.P., India.	28-29 January, <b>2021</b>	Recent Trends in Pharmaceutical, Medical and Applied Sciences for Global Development (RTPMASGD-2021)
National Webinar	Ramthakur College, Agartala, Tripura	27-28, June, <b>2020</b>	Impact of COVID-19 on Indian Economy: Issues and Challenges
National Webinar	SRM University, Andhra Pradesh	29-May- <b>2020</b>	“Post COVID-19: Science and Technology”
National Webinar	Swamy Vivekanandha College of Pharmacy, Affiliated to Dr.M.G.R. University, Chennai	25-May- <b>2020</b>	“Lipid Based Nano Drug Delivery System: A Novel Targeting Approach”
National Webinar	Swamy Vivekanandha College of Pharmacy, Affiliated to Dr.M.G.R. University, Chennai	23-May- <b>2020</b>	“Molecular Docking as popular Tool in Drug Design”
National Webinar	Swamy Vivekanandha College of Pharmacy, Affiliated to Dr.M.G.R. University, Chennai	21-May- <b>2020</b>	“Role of Bioequivalence Studies in Generic Drug Product” Development
Faculty Development Program (FDP)	AICTE Training and Learning (ATAL), at Dept. of IT, Tripura University.	13-01- <b>2020</b> to 17-01- <b>2020</b>	Artificial Intelligence
QIP STC	Department of Pharmaceutical Engineering and Technology,	01 Week (03-09 October <b>2019</b> )	Emerging Computational Tools in Drug Design & Discovery



	IIT-BHU Varanasi		
NPTEL	MOOC by Prof. Harinath Chakrapani Department of Chemistry IISER Pune	12 Week (28 Jan'19 - 19 Apr'19)	Medicinal Chemistry
NPTEL	MOOC by Prof. Swagata Dasgupta Department of Chemistry IIT Kharagpur	12 Week (28 Jan'19 - 19 Apr'19)	Biochemistry
NPTEL	MOOC by Prof. Hanudatta S. Atreya NMR Research Centre IISc Bangalore	08 Week (28 Jan'19 - 22 Mar'19)	Multidimensional NMR Spectroscopy for Structural Studies of Biomolecules
Refresher Course	Tripura University, Faculty Development Centre	08 January to 28 January, <b>2019</b>	Naitalim: Gandhi's Vision of Education and Present Scenario – Advanced Teaching and Research Methods
NPTEL	MOOC by Prof. Mukesh Doble Biotechnology, IIT -Madras	08 Week (06 August to 28 September <b>2018</b> )	Computer Aided Drug Design (CADD)
Workshop	E & ICT Academy. IIT Guwahati association with Tripura University	05 days (31 <sup>ST</sup> July to 04 <sup>TH</sup> August, <b>2018</b> )	Data Analytics Using R Programming
Refresher Course	UGC-HRDC, Manipur Central University, Imphal-795003.	11 June to 2 July, <b>2015</b>	Advances in Chemistry, Biotechnology & allied disciplines
Orientation Programme	North East Hill University (NEHU), Shillong-793022, Meghalaya, India	June 23, 2014 – July 20, <b>2014</b> .	29 <sup>TH</sup> OP under UGC Academic Staff College (ASC)
Conference	Delhi.	20th-22nd December, <b>2013</b>	65th Indian Pharmaceutical Congress (IPC)



Workshop	Tezpur University Intellectual Property Right Cell in collaboration with equal opportunity cell Tripura University	21st March <b>2013</b>	Enhancing Institutional Innovation With Intellectual Property Rights
Workshop	DST, Government of India, held at Pragna Bhawan, Agartala, Tripura	October 18-19, <b>2012</b> .	Developing R&D proposals for states of North Eastern Region, INDIA
Symposium	TRIPURA UNIVERSITY & DBT, GOVT. OF INDIA.	September 28 & 29, <b>2012</b>	Integrated Approach For Teaching & Research In Life Sciences
Workshop	Microsoft & MHRD, New Delhi, Venue: Tripura University	21st November to 1st December <b>2011</b> .	NME-ICT: SAKSHAM-IT Champion Training program
Conference	BHU, Varanasi	20 <sup>th</sup> -23 <sup>rd</sup> December, <b>2007</b> .	59 <sup>th</sup> Indian Pharmaceutical Congress (IPC)

### ***Poster /Oral Presentation***

1. Poster presentation on “In silico study of phytoconstituents obtained from *Balanophora* species to evaluate anticancer potential targeting EGFR tyrosine kinase” in national conference on recent trends and innovations in pharmaceutical sciences held on 06<sup>th</sup> May, **2023** organized by Bharat Pharmaceutical Technology, Tripura.
2. Oral presentation in international conference on “Recent Trends in Pharmaceutical, Medical and Applied Sciences for Global Development (RTPMASGD-2021)” held in Pharma Medical Sciences Development Society, Rampur, U.P., India on 28-29 January, **2021**.
3. Oral presentation in national webinar on “Impact of Covid-19 on Pharmaceutical industry of India: Challenges and Prospects Ahead” held in Ramthakur College, Tripura, June 27-28, **2020**.
4. In ICUCPR-2017 (International Conference on Updates in Cancer Prevention and Research). 14-16 February, **2017**. Venue: Babasaheb Bhimrao Ambedkar University (A Central University) Vidya Vihar, Rae Bareilly Road, Lucknow-226025 (U.P.) INDIA. Presentation on: Spirocyclic Oxindole Scaffold As an Emerging Pharmacophore in the Anticancer Drug Discovery under the Theme: Therapeutics and Survivorship.
5. In One Day National Seminar On Emerging Trends in Pharmaceutical Education & Research, 07<sup>TH</sup> May **2016**, Venue: GIPS Guwahati in association with Assam Science & Technology University, Guwahati. Poster Presentation: Abstract No: ETPER-60,

Evaluation of Antimicrobial and Antioxidant Activities of Newly Synthesized Pyrazoline and Pyrimidine Derivatives.

6. In 67<sup>th</sup> Indian Pharmaceutical Congress (IPC) 2015, Mysore; poster presentation on Medicinal Chemistry & Phytochemistry. B-100:- “*In Vitro* Anthelmintic Activity of *Neptuniaprostrata* Linn. on Indian earthworm (*Pheretima posthuma*).
7. In 65<sup>th</sup> Indian Pharmaceutical Congress (IPC) 2013, Delhi; poster presentation on Medicinal Chemistry & Phytochemistry. B-3:- “Anti-proliferative & Cytotoxic activity of *Neptunia prostrata* Linn. on Human Myeloid Cell line”.
8. In 54<sup>th</sup> Annual Conference of Indian Society of Hematology & Blood Transfusion. Poster Presentation. Abstract No. 347: Apoptotic Activity of BNW-8 isolated from *Neanotis Wightiana* on Human Leukemic Cell lines. Indian J Hematol Blood Transfus (Oct-Dec 2013) 29(4):396.
9. Symposium on “Integrated Approach for teaching & research in life sciences”. September 28 & 29, 2012. Sponsored by: Tripura University & DBT, Govt. of India. Poster Presentation: “Mustard oil is best for our heart”.
10. In 59<sup>th</sup> Indian Pharmaceutical Congress, 2007, Varanasi, abstract no. B-36: synthesis & antibacterial evaluation of some benzothiazole derivatives.

### Scholarship/Award/Recognitions

1. Best poster presentation award (**Winner**) was received by M.Pharm student for “In silico study of phytoconstituents obtained from *Balanophora* species to evaluate anticancer potential targeting EGFR tyrosine kinase” in national conference on recent trends and innovations in pharmaceutical sciences held on 06<sup>th</sup> May, 2023 organized by Bharat Pharmaceutical Technology, Tripura.
2. Received award (**Third Prize**) for the Oral presentation on “Synthesis of Spirooxindole Derivatives Using a Facile One-pot Dipolar Cycloaddition Reaction and Evaluation of Their Antiproliferative Efficacy in International Conference On Recent Trends in Pharmaceutical, Medical and Applied Sciences for Global Development (RTPMASGD-2021) on 28-29 January, 2021 by Pharma Medical Sciences Development Society, Rampur, U.P., India.
3. NEC (North East Council) Scholarship obtained during M.Pharm (Post-graduation) pursuing in 2006-2008.

### Seminar/Symposium organized

#### 2020

1. “Two Day International Webinar on Drug Discovery and Drug Development” From 27<sup>th</sup>-28<sup>th</sup> August 2020.

## Talk Delivered in Seminar/Symposium/as Visiting Faculty

### 2020

1. National Level Online Webinar on 'COVID 19: Drug Discovery & Role of Modern Pharmacist' by Bharat Pharmaceutical Technology, Amtali, Agartala, Tripura on **22-24 August, 2020**.

Topic: - "COVID-19: Drug Targets & Drug Discovery"

2. National Level Online Webinar on 'National Education Policy' by Bharat Pharmaceutical Technology, Amtali, Agartala, Tripura on **18-19 September, 2020**.

Topic: - "Evolution of Education Policy"

3. Delivered a lecture on "Pharmaceutical Organic Chemistry" for 2nd year B. Pharm & D. Pharm Students of Bharat Pharmaceutical Technology, Amtali, Agartala, Tripura on **17-18 August, 2020**.

4. Delivered a lecture on "Pharmaceutical Organic Chemistry" for students 2nd year B. Pharm & D. Pharm students of Bharat Pharmaceutical Technology, Amtali, Agartala, Tripura on **26<sup>th</sup>-28<sup>th</sup> September 2020**.

### Other Information

1. Worked as departmental Head in-charge & Co-ordinator for the period **August 2015 to January 2019**.
2. Worked as **Co-ordinator of AICTE** in the Year **2015** for Department of Pharmacy, when department got AICTE affiliation for the 1<sup>st</sup> time in Tripura University.
3. Act as **member of BPGS** under Pharmacy department and **BFS** under Faculty of Science, Tripura University.
4. Act as **External Examiner** in the Pharmacy Colleges, Tripura.

### Memberships

1. Life Member of Association of Pharmaceutical Teachers of India (**APTI**), Bangalore.
2. Life Member of Indian Pharmaceutical Association (**IPA**), Mumbai.