

# Debjit Ghosh, PhD

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## PROFESSIONAL SUMMARY

A passionate and motivated research professional with a demonstrated history of working in the field of Chemistry. A scientific thinker who is highly organized, analytical, detail-oriented, enjoys solving problems, and works well in teams. Author of several scientific research papers published in high-impact peer-reviewed journals.

## TECHNICAL EXPERTISE

- **Research and Development:** Herbal and nutraceutical formulation development, pre-formulation; standardization and optimization of Herbal, Ayurvedic, and Polyherbal dosage forms; phytochemical extraction, analysis, and isolation; New Product Development (NPD), organic synthesis, scale up, and technology transfer
- **Drug Delivery:** Sustained/immediate release, bioavailability enhancement (nanoparticles, microspheres); Experience with botanical extracts, oils, vitamins, minerals, antioxidants, peptides, polymers, UV filters
- **Stability Studies and Product Characterisation:** Accelerated or real-time stability, degradation studies, packaging compatibility, shelf-life prediction, particle size, moisture analysis, impurity profiling, viscosity and rheology, assay of bioactive markers, safety testing, microscopy (SEM, TEM)
- **Chromatographic and Spectroscopic Techniques:** Column Chromatography, HPLC, TLC, HPTLC, GC-MS, LC-MS, UV-Vis, AAS, MS, IR, and NMR Spectroscopy; method development and validation as per ICH guidelines
- **Pharmacological and Toxicological Investigations:** *In-vitro* bioassays using cell lines, *In-vivo* studies using animals (pre-clinical studies) following OECD guidelines, microbiological and biochemical analysis
- **Design of Experiments (DoE) and Data Analysis:** Statistical analysis using GraphPad InStat, GraphPad Prism, MATLAB, Chem Sketch, ImageJ, Origin, MS Office applications
- **Scientific Writing and Documentation:** Literature review, manuscript preparation, editorial communications, publications, medical writing, peer review, patent analysis, and technical document preparation
- **Safety standard maintenance and Regulatory knowledge:** Equipment calibration, safety compliance, regulatory guidelines (cGMP, GLP, OECD, ICH, FDA, BIS, ISO, FSSAI, and AYUSH), regulatory writing and documentation

## WORK EXPERIENCE

### Research and Innovation Manager

**Nanosafe Solutions Pvt. Ltd. | New Delhi, India | February 2025 – September 2025**

*(A material science-based technological start-up in collaboration with IIT Delhi)*

- Executed research, formulation, and process development involving polymers, active ingredients, excipients, and surfactant systems covering synthesis, characterization, optimization, and scale-up for commercialization.
- Designed and optimized formulations with a focus on functionality, stability, cost-effectiveness, and regulatory compliance. Conducted analytical characterization using advanced instrumentation and ensured robust data interpretation, documentation, and reporting.
- Conducted comprehensive literature reviews, patent landscaping, and prepared technical (TDS, MSDS) and regulatory documents. Cross-functional collaboration with other departments to ensure smooth scale-up, product quality, safety, and compliance with global standards.

### Research Scientist

**MGL Group | Rajkot, Gujarat, India | April 2022 – January 2025**

- Worked for a new R&D department in collaboration with Dr. Maulik Dhandha (Dermatologist, Pacific Skin Institute, USA) to develop a novel sunscreen formulation for long-lasting protection.
- Performed extensive literature review, patent landscape analysis, and prepared a detailed report and presentation that summarizes findings and analysis of research.
- Successfully prepared and published 2 case studies and 1 research article. Written grants by collaborating with scientific writers. Discussed research articles and also peer-reviewed preprints for Research Hub Foundation.

- Designed experiments, Prepared SOPs, and reviewed reports for the experimentation of developing delayed-release microspheres in collaboration with cross-functional teams.
- Conducted laboratory work independently at Jadavpur University, Kolkata (under the Association of Food Scientists and Technologists India [AFSTI], Calcutta Chapter) for developing herbal sunscreen formulations.
- Communicated and managed external institutions, CROs, and technology development companies to ensure smooth R&D process execution.

## EDUCATION

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### Ph.D. Chemistry (Full Time)

GITAM Institute of Science, GITAM (Deemed to be University), Visakhapatnam

**Relevant coursework:** Advanced Topics in Organic Chemistry, Separation Techniques, Presentation | **2014-2020**

### M.Sc. Pharmaceutical Chemistry

Dolphin (P.G) Institute of Biomedical and Natural Science, Dehradun (Affiliated to HNB Garhwal Central University)

**Result:** First division (81.03%) | **2011-2013**

### B.Sc. Biotechnology (with CBZ)

Dolphin (P.G) Institute of Biomedical and Natural Science, Dehradun (Affiliated to HNB Garhwal Central University)

**Result:** First division (68.04%) | **2008-2011**

## DOCTORAL RESEARCH EXPERIENCE

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### Doctoral Research Scholar (Full Time)

GITAM (Deemed to be University), Visakhapatnam, Andhra Pradesh, India | **2014-2020**

**Thesis title:** Pharmacognostical standardization, phytochemical isolation and ascertainment of pharmacological activities of a rare mangrove *Aegialitis rotundifolia* Roxb., leaves in the management of wound injuries.

- Conducted a comprehensive Pharmacognostical study using microscopy, physicochemical analysis, and toxic contaminants determination (Atomic Absorption Spectroscopy (AAS) and Microbiological Analysis).
- Successfully isolated 3 pure compounds, which were characterized using UV-Vis, MS, IR, and NMR Spectroscopy. Performed detailed analytical studies of extracts using HPTLC, HPLC, GC-MS, and LC-Q-TOF-MS.
- Formulated and developed a topical ointment containing plant extract for evaluating the *in vivo* wound healing properties. Stability studies of the ointment were conducted in accordance with the ICH guidelines.
- Conducted a comprehensive Toxicological study and *in vivo* wound healing activities on Wistar albino rats following the OECD guidelines. *In vitro* studies on cell lines (Human Dermal Fibroblast) were also performed.
- Conducted antimicrobial and antioxidant evaluations, including standard *in vitro* and *in vivo* assays, alongside biochemical analyses to support the pharmacological characterization of the plant extract.
- Prepared manuscripts and successfully published 15 scientific papers. Also assisted a few graduate students on their projects, as well as attended a few conferences.

## RESEARCH ACHIEVEMENTS

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- **Total publications:** 18 (As main author – 6 | Scopus – 10)
- **Scopus Database:** h-index – 7 | 170 Citations by 160 documents
- **Google Scholar:** Citations – 317 | h-index – 10 | i10-index – 11
- **Publication (Highest Impact Factor):** Journal of Pharmaceutical Analysis (**JCR Impact Factor – 8.9**)

## SKILLS

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- **Soft Skills:** Work collaboratively or independently, critical thinking and problem solving, planning and organizing, leadership and communication, innovation and creativity
- **Computer Skills:** Microsoft Office (MS Word, MS Excel, MS PowerPoint), Google Office Applications, Adobe Acrobat, Adobe Photoshop, Adobe Illustrator
- **Language Skills:** English (Professional), Hindi (Professional), Bengali (Native)

## CONFERENCES AND TRAINING

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### **Job Oriented Patent Analyst Training (JOPAT) (Remote)**

Indian Institute of Patent and Trademark (IIPTA), Delhi, India | **December 2024 – Present**

### **IP Awake: One-day IP awareness program for academia**

Office of Intellectual Property, Government of India, in association with GITAM (Deemed to be University) and APTDC, Confederation of Indian Industry, Hyderabad | **2018**

### **Two-day workshop on “Role of Intellectual Property Rights in Biotechnology Industries”**

Dolphin (P.G) Institute of Biomedical and Natural Science, Dehradun, in association with Indian Institute of Patent and Trademark (IIPTA), Delhi | **2013**

### **One-week Hands-On-Training on “Microbiological Techniques and Applications in Pharma Industry”**

Department of Microbiology, Dolphin (P.G) Institute of Biomedical and Natural Science, Dehradun, Uttarakhand, in collaboration with Drug Manufacturers Association of Uttarakhand | **2012**

## CERTIFICATE COURSES

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**Overview:** Total certificate courses completed: **14 (6 relevant courses highlighted below)**

### **Drug Development Product Management Specialization (Certified)**

University of California, San Diego, USA, Coursera platform | **2022**

The specialization includes 3 courses: -

- **Drug Discovery**  
Selecting a drug discovery target to filing an initial new drug application.
- **Drug Development**  
The intricacy of drug development from Phase 0 to Phase 3 clinical trials and filing a new drug application.
- **Drug Commercialization**  
Understanding of the complexities in launching new pharmaceutical products and ensuring sales success.

### **Writing in the Sciences (Certified with Honors)**

Stanford Online, Stanford University, Stanford, California, USA, Coursera platform | **2022**

- Gained knowledge about the techniques of good writing, peer review, grant writing, ethical issues in scientific publications, and writing for general audiences.

### **Thinking Critically: Interpreting Randomized Clinical Trial (Certified)**

Stanford Online, Stanford University School of Medicine, California, USA, EdX platform | **2022**

- Developed skills by learning about the concepts of randomization and blinding in reducing bias and to develop strategies to critically appraise randomized clinical trials and determine if results are valid.

### **Certificate Course in Pharmaceutical Quality Assurance (Certified)**

Ateos Foundation of Science Education and Research (AFSER), Pune, India, Udemy Inc. | **2022**

- Gained knowledge on QA Basics, Quality by Design (QbD) and TQMS, Validation, Inspection and Documentation, Quality Systems, and Role in Audits, Return and Recall of Pharmaceutical Products.

### **Basic Analytical Chemistry (Certified)**

UTokyoX, University of Tokyo, Tokyo, Japan, EdX platform | **2021**

- Acquired knowledge of basic tools of Analytical Methods, Electrochemical and Spectrochemical Analysis, Spectrophotometry, and Analytical Separations.
- Virtual hands-on experiences (Laboratory techniques): Gravimetric Analysis, SDS-PAGE.

### **Biochemistry: Biomolecules, Methods, and Mechanisms (Course Completed)**

MITx-7.05x, Massachusetts Institute of Technology (MIT), Cambridge, USA, EdX platform | **2021**

- Learned about buffers and amino acids, protein structure and purification, Enzymes, Signal Transduction, molecular modeling with PyMOL, and MATLAB.
- Virtual hands-on experiences (Laboratory techniques): SDS-PAGE, Western Blotting, X-Ray Crystallography, Protein purification using Column Chromatography, Affinity Chromatography.

## LIST OF PUBLICATIONS

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**Overview:** Total publications: **18 (12 relevant publications highlighted below)**

### Research Articles

- **Ghosh D**, Dhandha MM. Investigation of Sun Protection Factor (SPF) of Raspberry Seed Oil, Niacinamide and Zinc Oxide in combination for their possible use in a sunscreen formulation. *Skin*. 2024; 8(5): 1807-1814.
- **Ghosh D**, Mondal S, Ramakrishna K. A topical ointment formulation containing leaves extract of *Aegialitis rotundifolia* Roxb., accelerates excision, incision and burn wound healing in rats. *Wound Medicine*. 2019; 26: 100168.
- **Ghosh D**, Mondal S, Ramakrishna K. Phytochemical properties of a rare mangrove *Aegialitis rotundifolia* Roxb., leaves extract and its influence on human dermal fibroblast cell migration using wound scratch model. *National Journal of Physiology, Pharmacy and Pharmacology*. 2019; 9: 335-342.
- **Ghosh D**, Mondal S, Ramakrishna K. Pharmacobotanical, physicochemical and phytochemical characterisation of a rare salt-secreting mangrove *Aegialitis rotundifolia* Roxb., (Plumbaginaceae) leaves: A comprehensive Pharmacognostical study. *South African Journal of Botany*. 2017; 113: 212–229. **[JCR Impact Factor – 2.7]**
- Mondal S, **Ghosh D**, Ganapaty S, Chekuboyina SVG, Samal M. Hepatoprotective activity of *Macrothelypteris torresiana* (Gaudich.) aerial parts against CCl<sub>4</sub>-induced hepatotoxicity in rodents and analysis of polyphenolic compounds by HPTLC. *Journal of Pharmaceutical Analysis*. 2017; 7: 181–189. **[JCR Impact Factor – 8.9]**
- Mondal S, **Ghosh D**, Sagar N, Ganapaty S. Evaluation of Antioxidant, Toxicological and wound healing Properties of *Hibiscus rosa-sinensis* L. (Malvaceae) ethanolic leaves extract on different Experimental animal models. *Indian Journal of Pharmaceutical Education and Research*. 2016; 50(4): 620-637. **[JCR Impact Factor - 0.8]**
- Mondal S, Reddy N, **Ghosh D**, Ganapaty S. Development and validation of RP-HPLC and UV spectrophotometric methods for the quantification of Capecitabine. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2016; 8(5):279-287.
- Mondal S, **Ghosh D**, Ganapaty S, Sushrutha M. Preliminary phytochemical analysis and evaluation of hair growth stimulating potential of ethanol extract from *Eclipta alba* L. (Asteraceae) leaves in Wistar albino rats. *Asian Journal of Pharmacy and Pharmacology*. 2016; 2(5): 121-127.

### Review Article

- Mondal S, **Ghosh D**, Ramakrishna K. A complete profile on Blind-Your-Eye mangrove *Excoecaria agallocha* L. (Euphorbiaceae) – Ethno-botany, Phytochemistry and Pharmacological aspects. *Pharmacognosy reviews*. 2016; 10: 123-138.

### Book Chapter

- Biswas S, Bagchi D, **Ghosh D** (2022). The Effects of (Micro and Nano) Plastics on the Human Body: Nervous System, Respiratory System, Digestive System, Placental Barrier, Skin, and Excretory System. In Joo S.H., (Ed.). *Assessing the Effects of Emerging Plastics on the Environment and Public Health*. (pp. 148-171). Pennsylvania, USA. IGI Global Publishing.

### Case Studies

- Dhandha MM, **Ghosh D**, Dekay J. Trichodysplasia Spinulosa in a 71-Year-Old Heart Transplant Recipient. *Dermatology Practical & Conceptual* 2023;13(3): e2023166. **[JCR Impact Factor – 2.3]**
- Dhandha MM, **Ghosh D**, Tying S, Rady P. Atypical Human Papillomavirus infection with secondary Tinea in a middle-aged Caucasian male. *Skin*. 2023; 7(4): 927-931.

**Dr. Debjit Ghosh**