

## Doctor of Philosophy Programme (DBS)

### Ph.D. advertisement for the Spring 2025 semester

Applications are invited from eligible candidates for admission to the Ph.D. program of the Department of Biological Sciences, IISER Kolkata. The details of the admission process are given below. Applicants are advised to go through the research areas available at the following link on the Institute website (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs>) as well as the department page ([http://bio.iiserkol.ac.in/?page\\_id=5624](http://bio.iiserkol.ac.in/?page_id=5624)).

The fields of research open to application in this round of Ph.D. selections are given below, along with names of faculty members working in the respective fields:

**Inter-disciplinary Biology:** For students interested in working in the areas of One Health, Microplastic in food and environment, extremophiles, microbial engineering, applied microbiology, and antimicrobial resistance with Sunil Kumar Khare ([https://bio.iiserkol.ac.in/?page\\_id=1949](https://bio.iiserkol.ac.in/?page_id=1949)) in **collaboration** with

- Amirul Islam Mallick (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/amallick/>)
- Supratim Datta (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/supratim/>)
- Punyasloke Bhadury (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/pbhadury/>)

**Biophysics, Biochemistry, and Structural Biology:** For students interested in Cellular Biophysics, Structural Biology, cryo-EM, Molecular Biophysics, Molecular Biology, Biochemistry/Chemical Biology, Structural Proteomics, Cell Signaling, Structure based Drug Designing, Drug Development, Drug Delivery, Molecular Medicine, Cancer Nanomedicine and Regenerative Nanomedicine

- Amit Kumar Mandal (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/amitkm/>)
- Babu Sudhamalla (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/s-babu/>)
- Partha Pratim Datta ([https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha\\_datta/](https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha_datta/))
- Rahul Das (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rahul-das/>)
- Rituparna Sinha Roy (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rituparna/>)
- Supratim Datta (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/supratim/>)

**Cell Biology and Protein Biochemistry:** For students interested in Actin Binding protein in cell migration and diseases.

- Sankar Maiti (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/spm/>)

**Developmental and Stem Cell Biology:** For students interested in Mesenchymal Stem cell biology and Metazoan Morphogenesis.

- Malancha Ta (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/malancha-ta/>)
- Mohit Prasad (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/mohitprasad/>)
- Sreeramaiah N. Gangappa (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/ngsreeram/>)

**Disease Biology:** For students interested in Virology, Immunology, Epigenetics and Chromatin Biology, Gene Regulation, Neural Cell Biology, Neuroscience, Lysosome Biology and related Diseases, Natural Killer cells, Immunotherapy, Cancer, Infectious Diseases, Peptide based therapeutics against Cancer, Ischemic Disease, Bleeding Disorder, Antimicrobial Resistance (AMR), Molecular Basis of Stress Response, Drug Development, Drug Delivery, Molecular Medicine, Cancer Nanomedicine and Regenerative Nanomedicine

- Amit Kumar Mandal (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/amitkm/>)
- Arnab Gupta (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/arnab-gupta/>)
- Babu Sudhamalla (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/s-babu/>)
- Jayasri Das Sarma (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/dassarmaj/>)
- Partha Pratim Datta ([https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha\\_datta/](https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha_datta/))
- Rahul Das (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rahul-das/>)
- Rituparna Sinha Roy (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rituparna/>)
- Rupak Datta (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rupakdatta/>)
- Sumit Sen Santara (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/sumit-santara/#gsc.tab=>)

**Neurovirology, Neuroimmunology and Neurobiology of the Diseases and Cancer Biology:** Nexus between Virus-induced neuroinflammation and gap junction intercellular communication to understand the mechanism of virus-induced Neurodegeneration and finding parallels between the human neurological disease multiple sclerosis and SARS-COV2 mediated neuropathogenesis, Therapeutic approaches to combating glioblastoma and cervical and ovarian cancers.

- Jayasri Das Sarma (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/dassarmaj/>)

**Microbiology and Marine Biology:** For students interested in Marine Microbiology, Climate Change and Ocean Acidification, Microbial Ecology, Community and Ecosystem Ecology, Restoration Ecology, Biodiversity Conservation, Wildlife Habitat Management, and Bioremediation.

- Partha Pratim Datta ([https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha\\_datta/](https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha_datta/))
- Punyasloke Bhadury (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/pbhadury/>)
- Robert John Chandran (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/robert-john/>)

**Synthetic Biology and Biotherapeutics:** For students interested in synthetic biology, Biotherapeutics, enzyme and protein engineering, Biochemical Engineering and Bioenergy, Bioinorganic chemistry

- Supratim Datta (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/supratim/>)
- Rituparna Sinha Roy (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rituparna/>)

**Theoretical and Computational Biology:** For students interested in any branch of Theoretical Biology, including Theoretical and Computational Biophysics, Multiscale Molecular Simulations, Bioinformatics, and Computational Cell Biology and cryo-EM Image Processing

- Dipjyoti Das (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/dipjyoti-das/>)
- Partha Pratim Datta ([https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha\\_datta/](https://www.iiserkol.ac.in/web/en/people/faculty/dbs/partha_datta/))

**Behavior, Ecology, and Evolution:** For students interested in Animal Behaviour, Community Ecology, Biodiversity and Conservation, Marine Microbiology, Microbial Ecology, Chemical Ecology, and Plant- insect Interactions.

- Annagiri Sumana (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/sumana/>)
- Anindita Bhadra (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/abhadra/>)
- Anuradha Bhat (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/anuradhabhat/>)
- Punyasloke Bhadury (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/pbhadury/>)
- Radhika Venkatesan (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/rv/>)
- Robert John Chandran (<https://www.iiserkol.ac.in/web/en/people/faculty/dbs/robert-john/>)

**Note: Only those faculty members whose names are given above will accept students through this round of Ph.D. admissions. Therefore, before applying, students should check this list carefully to ensure that labs of their interest are available for admission in this round.**

### **Minimum Eligibility Criteria**

**A1.** Masters' (or B.E., B.Tech., M.Tech., MBBS) degree holders or equivalent (with **minimum 55 % marks**) in any branch of science, including Physics, Chemistry, Mathematics, Biological Sciences, Agricultural Sciences, Ecology and Environmental Sciences, Pharmaceutical Sciences, Chemical Engineering or equivalent

**OR**

**A2.** Students with 4 Years bachelor's degree (minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed) in any branch of science , including Physics, Chemistry, Mathematics, Biological Sciences, Agricultural Sciences, Ecology and Environmental Sciences, Pharmaceutical Sciences, Chemical Engineering or equivalent.

A relaxation of 5% marks or its equivalent grade may be allowed for applicants from SC, ST, or PwD category: Students whose final results in Master's/ 4 year Bachelors or equivalent are yet to be declared can also apply. However, if selected, the offer for these students will be provisional, subject to fulfilling the above criteria **at the time of admission.**

**AND**

**Applicants must have any one of the following qualifications.**

- Qualified a National Level Eligibility Examination that provides a 5-year PhD fellowship such as CSIR–JRF / UGC–JRF / DBT–JRF–A / ICMR–JRF / DBT–BINC–JRF / Rajiv Gandhi National Fellowship/ National Fellowship for Scheduled Caste Students by CSIR-UGC / National Fellowship for Higher Education of ST Students / National Fellowship for OBC Candidates / National Fellowship for persons with disabilities (NFPWD).
- **The aforementioned fellowships must be valid on December 31, 2024.**
- INSPIRE-PhD fellowship (**Should be in possession of provisional selection letter at the time of Interview**).

### **Institute-funded Ph.D. positions:**

**In the laboratory of Sumit Sen Santara:** An Institute-funded Ph.D. position is available in the laboratory of Dr. Sumit Sen Santara. The project involves the genetic modification of Natural killer cells to enhance its activity against cancer cells. The project uses CRISPR techniques for gene knockout, immunological and cellular assay, RNAseq data analysis. Collaboration with computational groups is routinely undertaken. Candidates are encouraged to be familiar with lab publications and contact the PI for any queries.

**Essential qualifications:** Master's degree or equivalent (with minimum 60 % marks) in relevant branches of biology/Bioinformatics or other relevant fields. The candidate should have qualified for one of the National eligibility exams like GATE/NET-LS/ IIT-JAM, etc.

**Desirable skills:** Candidates who can apply for Inspire fellowship will be preferred. The ability to develop complex experiments, strong problem-solving skills, and a commitment to research will be preferred. Experience in bioinformatics techniques, public database analysis, computer coding (python, R) molecular biology, and mammalian cell culture would be an advantage.

**In the laboratory of Robert John Chandran:** One IISER Kolkata funded PhD position is available for research in the field of **terrestrial ecology**. The potential projects are:

1. Ecophysiology of drought stress and thermal tolerance and adaptive capacity for climatic changes in tropical dry forest tree species populations in central India, and
2. Decadal scale vegetation and land cover changes in the Terai-Duar Savanna and Grasslands Ecoregion and its influence on plant diversity and carbon cycling.

The prospective candidate may indicate interest in one or more of the above projects. I am particularly keen on recruiting students with skills and interests in GIS/RS based landscape ecological analyses and modeling. I envisage the projects to involve significant field work, landscape ecological analyses, and statistical modeling. The projects are already supported by funding from MoE STARS and ANRF (formerly SERB), with significant background research already carried out by the lab.

**Essential Qualifications:** Master's Degree in any Basic Science, including Physical Sciences, but

preferably in Ecology/Botany/Forestry/ Geography/Environmental Sciences/ Life Sciences with a strong knowledge and orientation towards ecology. Candidates should have a strong academic background and should have at least qualified a National Exam such as CSIR/UGC NET-LS, GATE, JGEEBILS, or equivalents.

**Desirable Qualifications:** Theoretical/experimental knowledge in ecophysiology, ecology, landscape ecology, statistical modeling, GIS/RS methods.

### **Ph.D. Position in Cell Migration Research at Sankar Maiti's Laboratory**

Sankar Maiti's laboratory is offering a fully funded Ph.D. position, supported by the institute, to investigate the regulation of actin-binding proteins in cell migration. The research will involve tasks such as recombinant protein expression and purification, biochemical characterization of actin-binding proteins, and the use of imaging techniques. The project also includes overexpression studies and Crispr-Cas9-mediated knockdown to explore the role of these proteins in cell migration mechanisms. Candidates with an interest in actin cytoskeletal rearrangement in pathogenesis and developmental biology are encouraged to apply.

#### **Essential Qualifications:**

- A Master's degree or equivalent with at least 60% marks in relevant fields, including Chemistry, Biology, Engineering, Biochemistry, Biotechnology, Biophysics, Molecular Biology, Life Sciences, or related disciplines.
- Qualification in a national eligibility exam such as GATE, NET-LS, IIT-JAM, etc.

#### **Desirable Skills:**

- Ability to design and conduct complex experiments
  - Strong problem-solving skills and dedication to research
  - Experience in molecular biology, cell biology, and protein biochemistry is highly preferred
- Interested candidates are encouraged to contact the Principal Investigator for more details.

**In the Laboratory of Radhika Venkatesan:** An institute-funded position is available at the laboratory of Dr. Radhika Venkatesan. The project will involve understanding chemical interactions between plants and insects using various study systems. The project work will involve usage of instruments like HPLC, GCMS and basic chemical characterization. Interested candidates are encouraged to get familiar with ongoing lab projects and contact the PI for any queries.

**Essential qualifications** include M.Sc/MS/MTech degree or equivalent Master's degree with good scores in subjects like chemistry, biochemistry, ecology and statistics is desirable. The candidate should be open to studying new research topics and learn new analytical techniques. Experience in analytical techniques would be desirable.

**In the laboratory of Rituparna Sinha Roy:** An Institute-funded Ph.D. position is available in the laboratory of Dr. Rituparna Sinha Roy. The projects are related to developing the peptide based regenerative medicine and peptide based cancer therapeutics . Candidates are encouraged to be familiar with lab publications and contact Dr. Rituparna Sinha Roy (e-mail: rituparna@iiserkol.ac.in) for details.

**Essential qualifications:** Master's degree or equivalent (with minimum 60 % marks) in, Zoology/ Human Physiology/Physiology/Biochemistry/Microbiology/Biotechnology/Bioinformatics/ Computational Biology/Interdisciplinary Biology/Integrated Biology. Candidates having MSc degree

in Physical Chemistry, BSc in Chemistry Hons and having exposure in computational work can also apply. Candidates from Biology background need to have BSc Hons in Zoology/Human Physiology/Physiology/Biochemistry/Microbiology/Biotechnology or other relevant fields. Candidates from a Biology background need to have Chemistry as one of the pass subjects in BSc. The candidate should have qualified for one of the National eligibility exams like GATE/NET-LS/DBT-JRF category B etc or an equivalent exam.

**Desirable skills:** Candidates who can apply for Inspire fellowship will be preferred. The candidates need to have idea about solid phase peptide synthesis, cell based assays, in vivo experiment, molecular biology related works, protein engineering, histopathology and computational biology (MD simulations, related works. Computational work will involve MD simulations with CHARMM36 all atom force-fields using GROMACS, post MD simulation trajectory analysis and force-field development of unnatural amino acids. Candidates need to have good knowledge in chemistry and chemical biology of peptides.

**In the laboratory of Sreeramaiah N Gangappa:** An institute-funded PhD position is available in my lab. The project will involve understanding the genetic and epigenetic basis of light and temperature-mediated regulation of plant growth and disease resistance using Arabidopsis and Rice as model systems. The project involved cutting-edge tools such as genetics, genomics, biochemical and biotechnological tools to understand the molecular mechanisms that control growth and reproduction, as well as disease resistance in response to varying climatic conditions. Our larger goal is to develop climate-resilient crop varieties for better yield and quality traits. Interested candidates are encouraged to familiarize themselves with ongoing lab projects and may contact the PI with any queries.

**Essential qualifications** include an M.Sc/M.Sc(Agri.)/MS/MTech degree with a specialization in Genetic and Plant Breeding/Botany/Plant Pathology/Plant Physiology/Agriculture Biotechnology, etc., or an equivalent Master's degree with good scores in subjects like Botany, Agriculture, Biotechnology, and statistics desirable. The candidate should be open to studying new research topics and learning new analytical techniques. Experience in genetic and molecular biology techniques would be desirable.

### **Shortlisting and Interview Process**

Please note that fulfilling the minimum essential criteria does not ensure shortlisting for interviews. The PIs in DBS may set additional shortlisting criteria based on the candidates' academic records, experience, and research experience.

Only those candidates who have been shortlisted for the interview stages will be informed of further details. Therefore, all candidates are requested to check this page (<https://apply.iiserkol.ac.in/phd/>) regularly for updates.

### **DBS Spring 2025 Ph.D. Timeline:**

- PhD application portal opens: 03.10.2024
- Application portal closes: 20.10.2024
- Publication of shortlist for the Interview: 30.10.2024

- Selection Interview window: November 11 – 18, 2024
- **Tentative in-person PhD interview dates: Nov 11 (Monday), Nov 12 (Tuesday)**
- Departments send the tentative list of selected candidates to the Academic Office by 25.11.2024
- Publication of PhD interview results by: 9.12.2024
- Pre-registration portal opens: 10.12.2024
- Pre-registration deadline: 24.12.2024