

## Postdoctoral Fellowship Programme in the Department of Biological Sciences

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Applications are invited from the motivated and potential candidates for postdoctoral positions available in the Department of Biological Sciences (DBS), IISER Kolkata.

The following criteria need to be fulfilled (apart from the essential criteria mentioned in the main part of the advertisement) to apply for a postdoctoral position in DBS.

1. A candidate must have secured at least 55% marks (or equivalent CGPA) in MSc (or equivalent exam) and at least one first authorship peer reviewed paper (related to her/his PhD work) published or accepted in a reputed journal.
2. Application should accompany (other than the detailed CV and copies of all certificates as mentioned in the main part of the advertisement) and fulfil other essential criteria mentioned in the main part of the advertisement.
  - i) a short research proposal (not exceeding 3 pages) on the project of interest.
  - ii) two recommendation letters (to be send by the referees directly to [dbs.pdf@iiserkol.ac.in](mailto:dbs.pdf@iiserkol.ac.in) )

\*A candidate may opt for up to three projects (details are given below) according to their preference.

Short-listed candidates will have to present her/his Ph.D. work and appear for interview

Final selection will be based on presentation (open seminar) by the short-listed candidate and performance of the candidates during the selection interview.

**How to apply:** 1. Cover letter mentioning the order of preference of the projects (up to three). 2. Detailed CV. 3. Short research proposal (one for each of preferred projects). 4. Copies of all essential documents (as mentioned in the main part of the advertisement). 5. At least two recommendation letters (to be send by the referees to [dbs.pdf@iiserkol.ac.in](mailto:dbs.pdf@iiserkol.ac.in) mentioning the name of the candidate in the subject). 6. A candidate MUST mention the code of the most preferred project in the subject of the email.

**Last date of receiving applications (via e-mail to [dbs.pdf@iiserkol.ac.in](mailto:dbs.pdf@iiserkol.ac.in) ): 01.07.2023 (January 7, 2023). Candidates MUST mention their preferred projects/mentors in the mail.**

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**Project Title:** *Computational Investigations of Interactions of Small Molecules and Nanomaterials with Proteins (Code-P1)*

**Project Mentor:** Dr. Neelanjana Sengupta

**Job responsibility:** Develop computational models of protein/small molecule/nanomaterial interactions; explore thermo-kinetic pathways targeted for disease amelioration.

**Essential/Desirable experiences and/or expertise:** PhD in chemistry/biochemistry focusing on computations of molecules/sensors/nanomaterials of biological relevance. Experience with quantum chemistry calculations and molecular modeling.

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**Title of the project:** *Studies on molecular biology, biochemistry, structural biology, computational (Code-P2) biology, antibiotic resistance and microbiological aspects of different bacteria.*

**Project Mentor:** Dr. Partha P Datta

**Qualifications:** PhD in any branch of Life Sciences with a background in molecular biology/biochemistry/structural biology/microbiology/computational biology is desirable, but experience in other research areas may be considered as well.

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**Project Title:** *Understanding urban adaptation in free-ranging dogs (Code-P3)*

**Project Mentor:** Dr. Anindita Bhadra

**Job description:** The fellow would be required to (i) carry out behavioural observations and non-invasive experiments on free-ranging dogs in various areas of India; (ii) to analyse data using R, (iii) to train students and (iv) be a teaching assistant in some courses.

**Essential/desirable experience and/or expertise:** The candidate must not be scared of dogs, and should be ready to work in the streets, at different times of the day and during all seasons. The candidate should be ready to take an anti-rabies vaccine. A strong background in statistics is desired. Experience of modeling is preferred. The candidate can be from any branch of science, but should be interested in ecology and animal behaviour. Experience of basic wet lab techniques is desirable.

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**Project title:** *Exploring the molecular mechanism of Type-VI secretion system (T6SS) in mitigating bacterial gut colonization (Code-P4)*

**Project Mentor:** Dr. Amirul Islam Mallick

**Job description:** The potential candidate needs to perform high throughput molecular techniques in microbiology, such as developing isogenic mutants, gain-of/loss-of-function mutation, Next Gene Sequencing, Real Time PCR for transcriptional analysis. etc. (Reference paper: Gupta et al., *iScience*, 2021 <https://doi.org/10.1016/j.isci.2021.103507>)

**Essential/desirable experiences and/or expertise:** Experience in handling experimental animal models (mice/rabbit/chickens) and bacterial culture is necessary. Familiarity with imaging (confocal, epifluorescence, etc.) and bioinformatics tools could be a plus point.

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**Project Name:** *Leveraging reverse genetic strategies to study structure-function interplay of virus-host attachment spike protein to design therapies for COVID-19. (Code-P5)*

**Project Mentor:** Prof. Jayasri Das Sarma

**Essential Qualification:** Ph.D. in Life science/Biology or associated field with a minimum of 55% marks in MSc or equivalent degree and at least one first-author publication in a peer-reviewed international journal.

**Desirable Qualifications:**

1. Candidates must have a thorough grasp of fundamental and practical knowledge of Cell biology, immunology, and molecular biology techniques, including cloning and expression of proteins, with independent ability to execute the research work as supported by their research publication or Ph.D. work.
2. Preferences will be given to candidates who have prior practical experiences in working with viruses or infectious pathogens at the molecular and cellular level and or are familiar with solvent-based extraction methods and handled instruments like fraction collectors and liquid chromatography. Comfortable in familiarizing oneself with new software tools.
3. Good communication skill for scientific writing and presentation is a must. Publications in reputed peer-review journals will be preferred.
4. The candidate will be expected to engage in interdisciplinary and collaborative research work. Pro-efficient in logical thinking and independent execution of the project, good writing, and oral English communication skills.

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**Project Title:** *Protein engineering to understand and improve enzymes ligand interactions and biofuel production (Code-P6)*

**Project Mentor:** Prof. Supratim Datta

**Job Description:** This project involves understanding the enzymes that catalyze the conversion of fatty acids to drop-in biofuels for combustion engines. We will mainly study how the enzymes function such that we can import them into genetically engineered microorganisms, which can then produce biofuels. The project involves combining enzyme engineering, biochemical and biophysical characterization, structural and computational biology, high-throughput screening, and genomic and proteomic discovery to identify enzyme targets. Candidates with computational, including [Type here]

bioinformatics, classical atomistic molecular dynamics (MD) simulations and free energy calculations interested in learning wet-lab experiments are also encouraged to apply.

**Essential/desirable experience and/or expertise:** A Ph.D. in protein biochemistry, bioinformatics, computational biology involving all aspects of molecular dynamics simulations of proteins and ability to work with experimentalists. Ability to develop and implement plans for complex experiments, excellent oral and written technical communication, strong problem-solving skills, and a commitment to excellence in research.