

Shreya Das

*Molecular Biology • Regenerative Medicine •
CRISPR-Based Diagnostics*

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Indian Nationality
Location: Manchester, UK

Professional Profile

Early-career molecular biologist with substantive training in tissue engineering, cellular and molecular techniques, and quantitative gene and protein expression analysis. Research experience spans liver injury, fibrosis, and cancer models, supported by proficiency in qPCR, immunohistochemistry, Western blotting, chromatin assays and critical evaluation of scientific literature. Interested in antimicrobial resistance and CRISPR-driven genetic modulation. Proficient in Python, R, PyMol, and GraphPad Prism for data analysis, protein modelling, and transcriptomics. Seeking to contribute multidisciplinary skills to innovative research in regenerative medicine, drug discovery, or cancer biology.

Education

- Sep 2023–Jul 2025 **PGCert Tissue Engineering for Regenerative Medicine**, *University of Manchester*, Manchester, UK
- Thesis: *Exploring the cellular environment during liver injury and the role of SOX9 in its repair.*
 - Relevant Modules: Foundations of Biomaterials, Tissue Repair and Regeneration, Translation of Concept to Clinic, Biostatistics, Scientific Writing.
- 2021–2023 **MSc Biological Sciences (CGPA: 7.85/10)**, *Presidency University*, Kolkata, India
- Thesis: *Structural Features of Mitochondrial Sirtuins and Modes of Inhibition by Small Molecules.*
 - Relevant Modules: Biochemistry & Biophysics, Cell Biology, Genetics & Molecular Biology, Bioinformatics.
- 2018–2021 **BSc Biological Sciences (CGPA: 8.55/10)**, *Presidency University*, Kolkata, India
- Minor in Chemistry and Physics.
 - Relevant Modules: Molecular Biology, Genetics, Recombinant DNA Technology, Biostatistics.

ACHIEVEMENTS

- Won second runner-up prize in the Poster Competition at the National Seminar on Modern Trends in Microbiology (MTIM'25), St. Xavier's College, Kolkata — among 50 participating teams.
- Secured the highest grade in a Journal Club presentation (ranked 1/30) for critical analysis of a scientific paper.
- Ranked 11 out of 1200 applicants in the Presidency University Bachelor Degree Entrance Exam (PUBDET).
- Consistently ranked among the top 10 in General Proficiency out of 600 pupils.

RESEARCH EXPERIENCE

ATGC Diagnostics

Sep 2025 – Present

Rapid CRISPR-Cas-Based Detection of Methicillin-Resistant Staphylococcus aureus (MRSA)

- Designed highly specific primers targeting the MREJ region of MRSA for CRISPR-based detection.
- Performed PCR amplification and successfully obtained cloned amplicons for assay development.
- Conducting in vitro transcription of cloned target sequences to generate RNA substrates for Cas12-mediated detection.
- Developing a one-tube CRISPR-Cas12 fluorescence assay for rapid and sensitive pathogen identification.
- Optimizing gRNA design, reaction parameters, and signal readout for low-copy pathogen detection.
- Preparing a scientific review on CRISPR-Cas-based AMR detection strategies.

University of Manchester

Feb 2025 – July 2025

Liver Fibrosis and Hepatocellular Carcinoma (HCC) Progression

- Investigated the role of SOX9 in liver repair and HCC progression using SOX9-knockout and wild-type HepG2 models.
- Performed qPCR and Western blotting to assess SOX9-dependent transcriptional and protein-level changes.
- Analyzed histopathological alterations, ferroptosis markers (SLC7A11/xCT), and HCC markers (AFP) in murine models.
- Conducted PrestoBlue cell viability assays on SOX9-KO vs wild-type cells under drug treatments.
- Evaluated the functional contribution of xCT (SLC7A11) in ferroptosis regulation and its link to HCC progression.

Presidency University

Jan 2023 – May 2023

Master's Thesis: Structural Features of Mitochondrial Sirtuins and Inhibition Modes

- Conducted structural bioinformatics analysis of SIRT3, SIRT4, and SIRT5 using BLAST, ClustalW,

and PROMALS3D.

- Modelled 3D structures and visualized catalytic domains using PyMol, UCSF Chimera, and Discovery Studio.
- Performed SAR analysis and ligand-binding profiling using LigPlot+ and PDBSum.
- Integrated computational predictions with fluorescence spectroscopy to validate inhibitory interactions.

■■■■■ ADDITIONAL PROJECTS

- Immunoperoxidase staining for HSV-1 detection in Vero cells.
- Histopathological analysis of rat liver toxicity models using H&E staining.
- Flow cytometric analysis of human peripheral blood T-cell subsets (CD4+, CD8+, T-reg).
- Conducted H&E and Trichrome staining on mammalian tissues; assessed in vitro motility of rat intestine.
- Presented poster on the Proteostasis Network and disease-related protein-folding dysregulation.
- Performed critical review of research articles on circadian myogenic differentiation and glioma stem-cell proliferation.
- Drafted a research grant proposal (INR 1.3M) on "Regulation of VLCAD Activity by SIRT5".

■■■■■ TECHNICAL SKILLS

- **Advanced Laboratory Techniques:** Cell culture (HepG2, Vero), Western blotting, qPCR/RT-PCR, immunohistochemistry, immunofluorescence, flow cytometry, ELISA, ChIP, SDS-PAGE, H&E & Trichrome staining.
- **Molecular Biology:** PCR, plasmid isolation, DNA/RNA extraction, restriction digestion, gel electrophoresis, plaque assay.
- **Microscopy & Spectroscopy:** Confocal microscopy, UV-Vis spectroscopy, light microscopy.
- **Bioinformatics & Data Analysis:** GraphPad Prism, R (DESeq2, ggplot2, Bioconductor), Python, ImageJ.
- **Structural Biology:** PyMol, Swiss-Model, Phyre2, RASMOL, Discovery Studio, LigPlot+, PDBSum.
- **Sequence Analysis:** ClustalW, MEGA.
- **Pathway & Network Analysis:** STRING, Cytoscape.

WORKSHOPS & TRAINING

- One-month International Bioinformatics Workshop: R for Genomics Data Science and ML (DecodeLife, 2025)
- International Comprehensive Bioinformatics Workshop: Transcriptomics with NGS (DecodeLife, 2025)
- Transcriptomic Data Analysis for Biomedical Research (OmicsLogic, 2025)
- CRISPR for Cancer Genomics Workshop (NSTC, 2025)
- NGS Bacterial Genomics Workshop (OmicsLogic, 2025)
- Big Data & Proteomics Program (OmicsLogic, 2025)
- Single-cell RNA-seq Analysis Workshop (OmicsLogic, 2025)
- RNA-based Therapeutics Course (IISC Bengaluru, 2025)
- Summer Research Internship in Bioinformatics & NGS (Biopractify, 2025)
- Molecular Docking & MD Simulations Internship (Biopractify, 2025)

TEACHING & TRAINING EXPERIENCE

Organized and delivered a one-week hands-on CRISPR-Cas9 workshop, training postgraduate students and researchers in gene-knockout construct design, laboratory workflows, and troubleshooting.

Further Details

Available upon request.