

# Shivansh Singh

Mail to:- shivansh.singh@students.iiserpune.ac.in

## EDUCATION

### IISER PUNE

INTEGRATED MSc-PHD IN BIOLOGY  
2023-2029(Expected)| Pune,India

### UNIVERSITY OF DELHI

#### SRI VENKATESWARA COLLEGE

BS in Biochemistry

CGPA: 8.5/10

June 2023| New Delhi,India

### DR. VIRENDRA SWARUP EDUCATION CENTRE

Senior secondary school:95.2%/100

High school: 89%/100

Grad. May 2020| Kanpur, Uttar Pradesh, India

## COURSE WORK

### UNDERGRADUATE

#### THEORY + PRACTICUM

•Cell Biology| •Proteins| •Hormone biochemistry and functions| •Metabolism of lipids and carbs| •Atomic Structure, Bonding, General Organic Chemistry Aliphatic Hydrocarbons| •Basics of Statistical Inference| Practicum  
•Biochemical Techniques •Chemical Energetics| •Human Physiology| •Gene organization, replication and Repair| •Metabolism of amino acids and nucleotides| •Bioinformatics| •Concepts in Genetics| •Gene expression and regulation| •Nutritional Biochemistry| •Advanced Cell Biology •Genetic Engineering and Biotechnology| •Molecular Basis of Infectious Disease

### ONLINE COURSES

•Quantitative methods for biology(edx)  
•Principles of Synthetic biology(edx)  
•Medical Biomaterials(NPTEL)  
•Data Analysis for Biologists(NPTEL)

## RESEARCH INTERESTS

•Membrane Physiology and Biochemistry  
•Biofabrication, Tissue constructs  
•Biomedical sciences and Proteomics

## SKILL SETS

### PROCESSING AND CHARACTERIZATION TOOLS

#### GENERAL BIOCHEMISTRY LAB

•Fluorescence Inverted Microscopy  
•Benchtop Centrifuge Machine // Model No: 5804 R , Eppendorf  
•UV VIS Spectrophotometer // Model No: DU 730 , Beckmann Coulter  
•Magnus Inclined Binocular Microscope // Model No: MLX-B Plus  
•Gel electrophoresis(SDS, Agarose, NATIVE)  
•Hematology(CBC, SGPT, Lipid profiles, PCV, Hb estimation, Blood Glucose estimation)  
•Chromatographic technique(Gel Filtration, TLC, Ion Exchange, Affinity)  
•Co-Immunoprecipitation and CHIP assays  
•Western Blotting  
•Rotary Microtome profiling

#### GENETICS LAB

•*Drosophila melanogaster* fly genetic cross+culture+maintenance  
•Population genetics+ Karyotyping+ Pedigree

#### IMMUNOLOGY LAB

•Immunofluorescence staining + visualization  
•Basic Immunology techniques(*Ouchterlony* DID, *Mancini* SRID)  
•Enzyme linked immunosorbent assay (ELISA) + DOT ELISA

#### GENETIC ENGINEERING LAB

•DNA amplification(PCR)// Model No: Bio-Rad T100  
•Plasmid Isolation + Restriction digestion  
•DNA Transformation + Blue and White selection technique

## VISUALIZATION SOFTWARES

#### STRUCTURAL VISUALIZATION

•PyMOL •Jmol •RASMOL •Blender 3d •Maya

#### BIOINFORMATICS TOOLS

•ABCPred and Ellipred // Epitope prediction  
•Patchdock and AutoDock Vina // Molecular docking  
•SWISS MODEL // Homology Modelling  
•EMBOSS and CLUSTALW // Sequence Alignment

### 3D MODELLING

4+ years experience

•Blender 3d(Hard Surface and Organic modelling)| •Texturing, rendering and presentation skills

### PROGRAMMING

•Java(Over 5000 lines) •Python| •MATLAB| •R| •Latex|

### WEB DEVELOPMENT

•HTML5 •Tailwind CSS •JavaScript •Bootstrap

## RESEARCH EXPERIENCE

### **SRI VENKATESWARA COLLEGE** | RESEARCH INTERN

Jul 2021 - Nov 2021 | New Delhi, India

- **Topic:** Computational characterization of food allergens prevalent in India
- Built a database of plausible food allergy data, including their PDB structures, amino acid sequences, distinct immune responses generated, and their linear and conformational epitope binding sites
- Open source softwares used:- PyMOL, AlphaFold, ABCPred, Phyre, SWISS-MODEL

### **SRI VENKATESWARA COLLEGE + AIIMS DELHI** | RESEARCH INTERN

Jun 2022-November 2022 | New Delhi, India

- **Topic:** Immunohistochemical detection of anti-apoptotic marker and differential mRNA network analysis of Rhabdomyosarcoma (Rare skin cancer disease)
- Conducted bioinformatics study which ruled out potential miRNAs that potentially upregulate tumor suppressive gene targets (PTEN, p53 gene)
- Wet lab studies included observing immunostaining fluorescence of XIAP (anti-apoptotic) marker in Rhabdomyosarcoma samples (Age:14, Male) against positive control of desmin staining through Immunohistochemistry techniques
- Open source softwares used:- miRNET, GEO2r, KEGG, MATLAB

### **INDIAN INSTITUTE OF SCIENCE, EDUCATION, AND RESEARCH, PUNE.** | PHD ROTATION PROJECT

Aug 2023-November 2023 | Pune, India

Guide:- Dr. Thomas Pucadyil [Membrane Biochemistry]

- **Topic:** Studying role of acyl chain unsaturation on Dynamin related protein-1(Drp1) activity
- Studying changes in Dynamin related protein 1(Drp-1) function in presence of varying cardiolipin acyl chain saturation levels present in mitochondrial membrane.
- Drp1 has been reported as a fission protein that aids in mitochondrial division. Study was conducted using active fission-based assay called Supported Membrane Templates (SmRT).

### **INDIAN INSTITUTE OF SCIENCE, EDUCATION, AND RESEARCH, PUNE.** | PHD ROTATION PROJECT

Jan 2024- April 2024 | Pune, India

Guide:- Dr. Gayatri Pananghat [Structural Biology]

- **Topic:** Studying role of acyl chain unsaturation on Dynamin related protein-1(Drp1) activity
- Working under Dr Gayatri Pananghat on the structural dynamics of FtsA protein (in *Spiroplasma melliferum*), a crucial bacterial cell division complex.
- We looked at ATP binding motifs and polymerization interfaces, upon the aspects of inducing mutations in the sequences to facilitate such activities in vitro.

### **INDIAN INSTITUTE OF SCIENCE, EDUCATION, AND RESEARCH, PUNE.** | PHD ROTATION PROJECT

May 2024- July 2024 | Pune, India

Guide:- Dr. Mayurika Lahiri [Cancer Biology]

- **Topic:** Studying role of acyl chain unsaturation on Dynamin related protein-1(Drp1) activity
- Studying the role of Api5 (Apoptosis-Inhibitor 5) protein in controlling cancer. Our project is concerned with figuring out how UV-C radiation can cause DNA damage in Api5 Overexpressed and deregulated cells over 9-hour time points.

## ACHIEVEMENTS AND HONORS

- Qualified **Graduate Aptitude Test in Engineering(2023) Biotechnology(BT)** | Score:429 | National Rank:1139
- Qualified **Graduate Aptitude Test in Engineering(2023) Life Sciences(XL)** | Score:503 | National Rank:1313
- Qualified **Joint Admission Test for Masters(2023) Biotech** | Score:53/100 | National Rank:134
- Active life-Member of **Society for Biomaterials and Artificial Organs(India)(2022)**
- Active Life-Member of **Society for Tissue Engineering and Regenerative Medicine(2022)**
- Ranked **6th in school** in first level **19th SOF National Science Olympiad**(Year:2016)
- Certificate of **Social Service** by HelpAge India(Year:2015)
- Ranked **4th in school** in first level **18th SOF National Science Olympiad**(Year:2015)

## INTERNATIONAL CONFERENCES AND POSTER PRESENTATIONS

- Biomaterials Online Conclave 2022, National Centre for Nanoscience and Nanotechnology, University of Madras, SBAOI  
| **MARCH 7-15, 2022**
- International Symposium on Emerging Materials for Biomedical Engineering, IIITDM Jabalpur, SBAOI  
| **JANUARY 30-31, 2022**
- International Hands-on Training Workshop Using Bioinformatics Tools for Understanding Protein Biology, Biochemistry department, Shivaji College  
| **OCTOBER 11-12, 2021**
- Selected as Presenter at International Conference on Biomedical Research, ACBR, Delhi University  
| **NOVEMBER 2 -4, 2022(POSTER PRESENTATION)**
- Selected as Chief Author and Presenter at 15th Biennial South Asian Academy of Ophthalmology International Conference  
| **NOVEMBER 11-13, 2022(POSTER PRESENTATION)**

## DECLARATION

All this information mentioned in the resume is correct to the best of my knowledge.

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