

EDUCATION

Master of Science (Honours School) in Biotechnology August 2024 – May 2026
Panjab University, Chandigarh, India CGPA: 7.2/10

Bachelor of Science (Honours) in Biotechnology August 2021 – May 2024
Panjab University, Chandigarh, India CGPA: 7.0/10

SKILLS SUMMARY

- **Scripting** : Python, R, Bash
- **Operating System** : Linux (Ubuntu), Windows
- **Cloud Computing** : AWS (EC2), Google Colab
- **Version Control** : Git
- **Workflow Management** : Snakemake, Nextflow, Apptainer
- **Soft Skills** : Manuscript/scientific writing, presentation; collaboration

MASTER'S THESIS

Research: Genome-wide Identification and Characterization of Lectin Gene Families and Recombinant Expression of Selected Lectins from *Withania somnifera*

Manuscript: *Genome-wide identification and in silico characterization of lectin gene families in Withania somnifera*.

Communicated in **Functional & Integrative Genomics** (06/2026).

Keywords: genome-wide identification, recombinant protein expression, protein purification and refolding, PCR amplification and cloning

WET LAB

- **Molecular Biology:** PCR amplification; molecular cloning; recombinant protein expression in *E. coli* (pET28a, BL21(DE3))
- **Protein Isolation and Purification:** Affinity chromatography of plant lectins; Ni-NTA purification; refolding of inclusion bodies
- **Protein Characterization:** Biochemical (haemagglutination and sugar inhibition assays, SDS-PAGE, Bradford estimation), biophysical (circular dichroism spectroscopy) and biological activity (antimicrobial, antibiofilm)
- **Cell Culture:** Routine culture and maintenance of HeLa cells; MTT assay

BIOINFORMATICS WORKFLOWS & PIPELINES

- **NGS Fundamentals and Analysis:** Bulk RNA-seq analysis and de novo transcriptome assembly using short- and long-read sequencing technologies
- **Plant Genomics:** Genome Annotation (Structural, Functional, and Comparative); Genome-wide Identification and Analysis of Gene Families
- **Molecular Modeling:** Protein Structure Prediction and Visualization; Protein-Ligand Molecular Docking; Molecular Dynamics (MD) Simulations and Trajectory Analysis
- **Microbial Genomics:** Whole-genome Variant Analysis and Antimicrobial Resistance (AMR) Mutation Analysis
- **Clinical Bioinformatics:** Copy Number Variation (CNV) Analysis in cancer: Copy number alterations Inference Bulk RNA-seq Analysis

PUBLICATIONS (UNDER REVIEW)

1. **Genome-wide identification and in silico characterization of lectin gene families in *Withania somnifera*.** *Communicated to Functional & Integrative Genomics*, June 2026
2. **GWIsCan: An Automated Pipeline for Genome-Wide Identification and In Silico Characterization of Gene Families.** *Communicated to BMC Bioinformatics*, September 2026.
3. **Lectin gene families in *Medicago truncatula*: genome-wide identification, in silico characterization, and expression under rhizobial symbiosis and drought stress.** *Communicated to BMC Plant Biology*, September 2026.

CONFERENCE PRESENTATIONS

OC72: *Chimerolectins: the Emerging Important Lectins*. 32nd International Carbohydrate Symposium (ICS 2026), Bratislava, Slovakia, July 5–9, 2026. **Co-author**.

COURSES AND CERTIFICATIONS

Advances in Functional Genomics and Gene Editing Mar 2025
Global Initiative of Academic Networks (GIAN), Panjab University (India)

Next Generation Sequencing Technologies: Data Analysis and Applications Jul–Oct 2023
NPTEL Online Certification, IIT Kharagpur (India)