

## CURRICULUM VITAE

**SUSHMITA SENI**

**M.Sc. Biotechnology**

Wheat Molecular Biology Lab, School of Agricultural Biotechnology,  
Punjab Agricultural University, Ludhiana, Punjab- 141004, India.

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**Ph:** +91-8360133702

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### PROFESSIONAL OBJECTIVE:

To build a long-term profession as a teacher that will offer endless opportunities for career growth and to keep up with cutting-edge educational technologies

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### ACADEMIC PROFILE:

**M.Sc. Biotechnology- Punjab Agricultural University, India** (August 2018 –March 2021)

**Major: Biotechnology; Minor: Plant Breeding and Genetics; Supporting: Statistics**

*Thesis title:* “Whole transcriptome assembly and annotation of wild wheat *Aegilops speltoides* for identification of novel heat stress tolerance genes”

- Supervisor: Dr Satinder Kaur, Molecular Geneticist, Punjab Agricultural University, India
- OCPA : 8.24/10

**B.Sc. Biotechnology (Hons.) - Punjab Agricultural University, India** (August 2014 – June 2018)

- Subjects: Agricultural biotechnology, Cytogenetics, Biochemistry, Plant breeding and genetics, Nanobiotechnology, Microbiology, Crop physiology, Molecular biology, Statistics etc.
- In-house training project entitled, “Aspects of genomics in commercially important tomato varieties in context to their shelf life”
- **Supervisor:** Dr Prashant Mohanpuria, Assistant Professor (Biotechnology), Punjab Agricultural University, India
- OCPA : 8.05/10

**Higher secondary school education- U.S.P.C Jain Public School, Punjab, India** (March 2014)

- Subjects: Physics, Chemistry, Biology, English, Physical Education
  - Percentage obtained : 91%
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### AREAS OF INTEREST:

**Biotechnology, Molecular Biology, Genetics, Plant physiology, Genomics and Transcriptomics, Bioinformatics, Cytogenetics, Biochemistry, Nanobiotechnology, Microbiology**

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## RESEARCH EXPERIENCE:

### M.Sc. Biotechnology- Punjab Agricultural University, India

(April 2019 –March 2021)

Wheat Molecular Biology Lab, School of Agricultural Biotechnology, Punjab Agricultural University, India

#### Key Responsibilities

- Knowledge of linux commands
- Quality assessment of raw transcriptomic data using FastQC
- Trimming of adapter sequences and poor quality sequences using Trimmomatic 0.38
- *Denovo* assembly of transcriptome data using Trinity
- Quality assessment of assembled transcriptome using Busco and generation of plots using R package
- Diamond BLAST of assembled transcripts with non-redundant database
- Identification of longest ORFs using Transdecoder
- Identification of conserved protein domains and motifs using Pfamscan
- Annotation of assembled transcripts using BLAST2GO and Mapman and Wego analysis
- Transcript abundance estimation using RSEM
- Identification of orthologous genes using OrthoMCL
- Blast2sequence analysis and Multiple sequence alignment (Clustalx) of the orthologous transcripts
- Designing real-time PCR primers using Perl primer to check genome specific expression of selected heat stress related genes
- RNA extraction and real time expression studies of selected genes using qRT-PCR.

### B.Sc. Biotechnology

(January 2018 - June 2018)

Fruit Molecular Biology Lab, School of Agricultural Biotechnology, Punjab Agricultural University, India

#### Key Responsibilities

- BLAST analysis for *Pectate lyase* gene sequence available from plants
  - Seed sterilization and germination of tomato seeds on MS media
  - Genomic DNA isolation and quantification of DNA through agarose gel electrophoresis
  - PCR amplification of region of *PL* gene from tomato varieties and its purification
  - Sequence analysis of the PCR product
  - Tissue culture and regeneration of tomato using leaf disc method
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## WORK EXPERIENCE

(March 2021- December 2021)

- Worked as a Bioinformatics Analyst at NGB Diagnostics Pvt. Ltd., Noida, India

### Key Responsibilities

- Transcriptomic data analysis (*de novo* and reference based),
- Whole genome sequencing analysis
- Circular RNA and Long non-coding RNA analysis
- Metagenomics analysis
- Gene prediction
- Small RNA data analysis
- Genome annotation
- Knowledge of Linux, Perl and R

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## PUBLICATION:

Seni, S., Kaur, S., Malik, P. *et al.* Transcriptome based identification and validation of heat stress transcription factors in wheat progenitor species *Aegilops speltoides*. *Scientific Reports* **11**, 22049 (2021). <https://doi.org/10.1038/s41598-021-01596-6>

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## SKILLS AND EXPERIENCE:

- **Molecular Biology techniques**
  - Good hand at DNA, RNA isolation, Plasmid DNA isolation and quantification
  - Working experience with PCR, Real time PCR. Agarose Gel electrophoresis, SDS PAGE, Gel documentation and nanodrop
  - **Tissue culture:** Hands-on experience in preparation of media and stock solutions, micropropagation and plant regeneration and green house work
  - **Instruments handled:** Roche LightCycler96, Gel documentation system, Thermocycler, Autoclave, Tissue lyser
- **Cytogenetic techniques:** Preparation of mitotic and meiotic slides, pollen fertility tests, in-situ hybridization and karyotyping
- **Bioinformatics**
  - Primer designing, NGS data analysis, phylogenetic analysis, whole genome sequencing analysis, transcriptomic data analysis, metagenomics analysis, circular RNA and long non-coding RNA analysis, gene prediction, genome annotation
  - Softwares, databases and tools handled: NCBI, UniProtKB, BLAST, Ensembl, PDB, RasMol, Chimera, Clustal W, Clustal X, Pfam, PfamScan, FGENSESH, PHYLIP, Sequin, Uniprot, MEGA, PerlPrimer, Primer3, MISA, MapMaker, Rstudio, FastQC, Trinity, Trimmomatic, Trim galore, MapMan, Blast2GO, DeSeq, EdgeR, OrthoMCL, Tophat, Cufflink, Cuffdiff, Augustus, GATK, BWA, STAR, HISAT, Picard, Calypso, R
- **Biochemistry:** Practical experience in different biochemical analysis of different Biomolecules, preparation of standard solutions, chromatography and spectrophotometry techniques
- **Nanobiotechnology:** Sound knowledge of working of SEM, TEM, AFM, Fluorescence microscopy, Confocal microscopy, X-ray crystallography, specimen preparation
- **Microbiology and pathology:** Examination of different types of bacteria and fungi and pathogens, bacterial staining, preparation of different types of media, isolation, cultivation and

purification of microorganisms. Plating streaking and culturing of different bacterial and fungal strains

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#### WORKSHOPS AND TRAININGS:

- Participated in Live Webinar series on “**Genome Editing and Marker-Assisted Selection for Precision Plant Breeding**” organized by Chandra Shekhar Azad University of Agriculture & Technology, Kanpur on May 30, 2020
  - Participated in Live Webinar series on “**Applications of small RNA sequencing- Insights into a researcher’s perspective**” organized by Bionivid Technology Pvt. Ltd on May 16, 2020
  - Participated in Live Webinar series on “**Applications of Omics in Climate Smart Agriculture**” organised by Centre for Advanced Agricultural Science and Technology for Climate Smart Agriculture and Water Management, Mahatma Phule Krishi Vidyapeeth, Rahuri held from April 30-May 02, 2020
  - Attended NAHEP sponsored short training for 12 days on “**Plant Genetic Resources Management and Utilization**” at ICAR – NBPGR, New Delhi, India held from Sept 30-Oct 11, 2019
  - Attended 5 days “**workshop on R**” organised by South Dakota State University from Sept 13- 17 Sept 2019
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#### AWARDS AND FELLOWSHIPS:

- Qualified **JNU-CEEB** conducted by Jawaharlal Nehru University, New Delhi, India-2018
  - Awarded **University Merit Certificate** for outstanding academic progress and average grade point higher than 80% throughout the undergraduate program
  - Awarded **University Merit Scholarship and Certificate** for outstanding academic progress and average grade point higher than 80% in every semester of the postgraduate program
  - Awarded **gold medal** for securing **highest OCPA** in M.Sc. Biotechnology (batch 2018-2021)
  - Qualified **ICAR-SRF** 2020 examination
  - Secured 94.8 percentile in **CSIR-NET Life Sciences** (2020)
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#### VOLUNTEER EXPERIENCE:

- Member at **IWGSC** (International Wheat Genome Sequencing Consortium)
  - An active member of National Service Scheme (NSS) and participated in various events like tree plantations, cleanliness drives, blood donation camps and social awareness campaigns
  - **Active member of PAU Science Club**
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### ADDITIONAL SKILLS:

- Computer Literacy: Microsoft Office, MS Excel, R software for statistical analysis.
  - Good documentation and presentation skills.
  - Ability to work independently as well as in team.
  - Good organization skills and habit of working in planned manner to achieve the defined targets.
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### REFERENCES:

- Dr. (Mrs.) Parveen Chhuneja  
Director/HOD, School of Agricultural Biotechnology  
Punjab Agricultural University, Ludhiana, Punjab, India  
Email: [dirsoab@pau.edu](mailto:dirsoab@pau.edu), [pchhuneja@pau.edu](mailto:pchhuneja@pau.edu)  
Contact No.: +919888885557  
*Relationship to the applicant: M.Sc. Advisory Committee Member (Punjab Agricultural University, Ludhiana): 2018-2021*
  - Dr. (Mrs.) Satinder Kaur  
Molecular Geneticist, School of Agricultural Biotechnology  
Punjab Agricultural University, Ludhiana, India  
Email: [satinder.biotech@pau.edu](mailto:satinder.biotech@pau.edu)  
Contact No.: +91 9872625702  
*Relationship to the applicant: M.Sc. supervisor (Punjab Agricultural University, Ludhiana): 2018 – 2021*
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### DECLARATION

- I Sushmita Seni, hereby declare that all above given information are correct and accurate to best of my knowledge.

*Place: Ludhiana*

*Date: 6 May, 2022*

*Sushmita Seni*