Ramandeep Kaur

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PUTATIVE PUBLICATIONS

1. **Gene Regulatory Networks associated with high- and low-capacity nitrogen-fixing rhizobia.** (Correspondence: Dr Senthil Subramanian (senthil.subramanian@sdstate.edu), Professor, South Dakota State University)

2. ***Vitis riparia* chromosomal genome assembly and transcriptomic validation. (**Correspondence: Dr Anne Fennell (Anne.Fennell@sdstate.edu), Distinguished Professor, South Dakota State University)

3. **miRNA regulatory elements of grapevines for dormancy induction. (**Correspondence: Dr Anne Fennell (Anne.Fennell@sdstate.edu), Distinguished Professor, South Dakota State University)

4. **Guava Genome Database (GuavaINGDB): A comprehensive Genome Database for *Psidium Sp.*** (Correspondence: Dr Amandeep Mittal (amandeep.mittal@pau.edu), Assistant Professor, Punjab Agricultural University, India)

REFRENCES

1. **Dr Senthil Subramanian** (senthil.subramanian@sdstate.edu), Professor; Associate Dean for Research, College of Natural Sciences, South Dakota State University

2. **Dr Anne Fennell** (Anne.Fennell@sdstate.edu), Distinguished Professor, Department of Agronomy, Horticulture and Plant Science, South Dakota State University

3. **Dr Amandeep Mittal** (amandeep.mittal@pau.edu), Assistant Professor, Punjab Agricultural University, India

EDUCATION

M.S., Plant Science, South Dakota State University (SDSU), Brookings, SD, USA **2021- Present**

Thesis Projects:

- *Gene Regulatory Networks associated with high- and low-capacity nitrogen-fixing rhizobia.*
- *miRNA analysis for dormancy induction in Vitis riparia grapevines.*

Advisors:

- Dr Senthil Subramanian (Senthil.Subramanian@sdstate.edu)
- Dr Anne Fennell (Anne.Fennell@sdstate.edu)

GPA: 4.0/4.0

Certificate Graduate in Data Science, South Dakota State University, Brookings, SD, USA **2021- 2023**

Advisors:

- Dr Senthil Subramanian (Senthil.Subramanian@sdstate.edu)
- Dr Anne Fennell (Anne.Fennell@sdstate.edu)

GPA: 3.250/4.0

Overall GPA: 3.591/4.0

B.tech., Biotechnology, Punjab Agricultural University (PAU), Ludhiana, Punjab, India **2017-2021**

Major: Bioinformatics and Molecular Biology

Advisor: Dr Amandeep Mittal

CGPA: 7.81/10

WORK EXPERIENCE

Graduate Research Assistant, SDSU, USA

2021- Present

Projects worked on:

- *Gene Regulatory Networks associated with high- and low-capacity nitrogen-fixing rhizobia. (Thesis Project)*
- *miRNA analysis for dormancy induction in Vitis riparia grapevines. (Thesis Project)*
- *Promoter Analysis of differentially expressed genes between Vector control and STTM160 (miRNA 160 silenced) soybean roots.*
- *RNAseq analysis of shoot tip during photoperiod induced growth cessation in V. riparia grapevines.*

Undergraduate Internship Trainee, PAU, India

2020-2021

Project:

- *Development of GuavaINGDB: Guava Genome Database*

TEACHING EXPERIENCE

1. **Teaching Assistant, SDSU** Fall 2022-2023
   PS 763: Crop Physiology – Graduate Course

2. **Teaching Assistant**, **SDSU** Spring 2022-2023
   STAT 435/535: Applied Bioinformatics – Graduate level Course

MENTORING

Mentored a **REU student (summer intern) 2022** to conduct bioinformatics' analysis for her **REU research project – "Central and peripheral zone-specific transcriptomes during soybean nodule initiation".**

DRY LAB SKILLS

Commandline tools and softwares:

- Gene regulatory network prediction using Qubic2, Inferelator and Lemon-Tree algorithm.
- Motif enrichment: Finding AuxRE motif (TGTCNN) in promoter using perl script.
- Variant Calling using Samtools
- Quality Assessment and Trimming- Trimmomatic, FastQC, Seqtk
- Mapping- Hisat2, TopHat, Bwotie, BWA, STAR
- HTSeq counts and FeatureCounts

Web-based softwares:

- Enrichment Analysis- GSEA and GAGE
- Gene Mapping and generating a Linkage Map using MapMaker 3.0, Map Disto.
- Diversity Analysis of Germplasm: PHYLIP, DARwin 5, Mega.

Data analysis and Statistical tests (in R):

- Differential Gene Expression analysis: DESeq2
- Pathway analysis
- PCA biclustering
- Fischers' exact test on differentially expressed data using metaRE package (in R)
- Various Regression Models – simple linear, multiple linear and logistic regression
- GAM model analysis
- Recursive Partitioning

Programming Skills:

- R Language & Bioconductor Packages
- Python
- Perl Language
- Bio-python
- C- language

Data Visualization Skills:

- Ggplot2 – all kinds of plots
- PCA
- Heatmap
- R
- MS-Excel

WET LAB SKILLS

- RNA-Extraction
- cDNA synthesis
- Quantification with qPCR
- Phenotyping of Psidium guajava
- Measurement of plant parameters and Cross Pollination of Avena sativa germplasm (Dr Rahul Kapoor)
- Hands on of microplate reader (script and Kluster caller)

TALKS AND PRESENTATIONS

- Poster presentation at **Research Day, SDSU** Dec 6, 2022
- Small oral talk at **Research Day, SDSU** April 28, 2023

CERTIFICATIONS

1. South Dakota State University certificate in Data Science.
2. Machine Learning with Python, Capacity Building and Research Entrepreneurship Centre in Artificial Intelligence, Big Data and IoT at Panjab University, Chandigarh.
3. Big Data Analytics, Ministry of Electronics & Information Technology at Panjab University, Chandigarh.
4. Computer Aided Drug Design and Protein Analysis, IIT BHU Varanasi.