

Surjeet Kumar Arya, Ph.D.

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Education

- **Ph.D. (2019)**, Plant Molecular Biology (Computational Biology), CSIR-NBRI, India.
Thesis: Transcriptome-based screening of RNAi targets in *Phenacoccus solenopsis*.
- **M.Sc. (2012)**, Biotechnology, University of Hyderabad, India.
- **B.Sc. (Hons) (2010)**, Biomedical Sciences, Delhi University, India.

Research / Work Experience

Research Associate / Computational Biologist — University of Kentucky, Lexington, KY, USA | Mar 2025 – Present

- **Project:** Epigenetic regulation of hormonal signaling in insects.
- ATAC-seq and RNA-seq analyses on TcA cells under NAA40 knockdown and 20E treatment.
- Identified EcRE motif enrichment and chromatin accessibility near 20E-responsive promoters.
- **Key outcome:** **Insect Biochemistry and Molecular Biology (2025).**

Postdoctoral Research Scientist — University of Kentucky, Lexington, KY, USA | Mar 2023 – Mar 2025

- **Project:** Single-cell sequencing of pest insect midgut; reproducibility assessed with Harmony.
- Developed pipelines and deployed a Shiny app (scRNAdb) for standardized analyses.
- **Project:** Multiome (scRNA + scATAC) defining Chinmo programs in lepidopteran tissues and Sf9 cells to dissect Chinmo-regulated transcriptional programs. computed gene activity scores.
- **Key outcome:** **PNAS (2024).**

Postdoctoral Research Scientist — University of Kentucky / USDA (collaboration), Lexington, KY, USA | Mar 2020 – Mar 2022

- Functional genomics of insect cell lines (industry-funded): transcriptomic + proteomic data from 8 cell lines.
- Developed the Insect Cell Line Database (ICDB).
- **Key outcome:** **In Vitro Cellular & Developmental Biology-Animal (2022); featured in Entomology Today (2022).**

Postdoctoral Fellow — Hebrew University of Jerusalem, Rehovot, Israel | Nov 2019 – Mar 2020

- Analyzed RNA-seq to study gut microbiota effects on medfly gene expression; diet-dependent host-microbiota interactions.

Graduate Research Fellow (Ph.D.) — CSIR-NBRI, Lucknow, India | Aug 2013 – Oct 2019

- Identified RNAi targets in cotton mealybug via de novo transcriptomics and functional validation.
- Performed LC-MS/MS proteomics, Trinity assembly, RNAi bioassays, and downstream bioinformatics.
- Publications in **Scientific Reports** (2017, 2018) and **Pest Management Science** (2021).

Publications

- **Arya, S.K., & Palli, S.R.** (2025). NAA40 modulates ecdysteroid action via chromatin remodeling. ***Insect Biochemistry and Molecular Biology***
- Chen, X., Koo, J., **Arya, S.K., Palli, S.R.** (2024). Chinmo maintains larval stages in *Spodoptera*. ***Proceedings of the National Academy of Sciences (PNAS)***
- **Arya, S.K., Douglas, A.H., Palli, S.R.** (2024). Cellular heterogeneity in *Spodoptera* midgut cell line. ***Genomics***
- **Arya, S.K., Douglas, A.H., Palli, S.R.** (2024). Single-cell heterogeneity of the fall armyworm midgut. ***Journal of Pest Science***
- **Arya, S.K., Goodman, C.L., Stanley, D., Palli, S.R.** (2022). A database of crop pest cell lines. ***In Vitro Cellular & Developmental Biology-Animal***
- **Arya, S.K., Singh, S., Upadhyay, S.K., Tiwari, V., Verma, P.C.** (2021). RNAi-based gene silencing in *Phenacoccus solenopsis*. ***Pest Management Science***
- Kaur, G., **Arya, S.K., et al.** (2023). Comparative transcriptional analysis of *Cymbopogon*. ***International Journal of Biological Macromolecules***
- Kaur, G., **Arya, S.K., et al.** (2019). Transcriptome analysis of *Cymbopogon martinii*. ***Industrial Crops & Products***
- **Arya, S.K., Dhar, Y.V., Upadhyay, S.K., Verma, P.C.** (2018). De novo characterization of *Phenacoccus solenopsis* transcriptome. ***Scientific Reports***
- **Arya, S.K., Jain, G., Upadhyay, S.K., Verma, P.C.** (2017). Reference gene validation in *Phenacoccus solenopsis*. ***Scientific Reports***

Book Chapters

- **Arya, S.K., & Palli, S.R.** (2025). Insect Cell Lines and RNAi. ***RNA Interference in Agriculture***. Springer
- **Arya, S.K., Moola, A.K., Balasubramania, S., Gurusamy, D.** (2024). NBS-LRRs in defense signaling. ***Defense-Related Proteins in Plants***. Elsevier
- Balasubramania, S., **Arya, S.K., et al.** (2024). Role of Heat Shock Proteins in abiotic and biotic stress. ***Defense-Related Proteins in Plants***. Elsevier
- Moola, A.K., **Arya, S.K., et al.** (2024). Defensins in Plants: Diversity and role in defense. ***Defense-Related Proteins in Plants***. Elsevier
- Singh, S., **Arya, S.K., et al.** (2019). Role of endosymbionts in sap-sucking insects. ***Molecular Approaches in Plant Biology and Environmental Challenges***. Springer

- **Arya, S.K.**, Shiva, S., Upadhyay, S.K. (2021). Entomotoxic proteins from plant biodiversity. *Bioprospecting of Plant Biodiversity for Industrial Molecules*. Elsevier

Skills

- **NGS Data Analysis:** [RNA-seq](#), [scRNA-seq](#), [scATAC-seq](#), [ATAC-seq](#).
- **Bioinformatics Toolchain:** Trinity, STAR, HISAT2, DESeq2, Seurat, Signac, Scanpy, Cell Ranger, Monocle.
- **Programming:** [Skilled in Python, R, and Bash](#).
- **Data Science:** Applied machine learning for omics ([scikit-learn](#), [pandas](#), [NumPy](#)).
- **High-Performance Computing:** Experienced in [parallelization](#) & [multithreading](#) for NGS pipelines.
- **Workflow & Reproducibility:** Expertise in [Snakemake](#), [Shiny](#), [Singularity](#), [Docker](#), [Conda](#).
- **Data Visualization:** Strong in [ggplot2](#), [matplotlib](#), [seaborn](#), and [Plotly](#).
- **Molecular Biology:** DNA/RNA extraction, PCR/qPCR, dsRNA synthesis, cloning, [NGS library preparations](#).
- **Entomology:** Insect cell line culture (SfMG-0611, SfMG-0617, Aag2, TcA), insect rearing, bioassays.

Fellowships & Achievements

- CSIR-UGC Research Fellowship, India (2013).
- Qualified CSIR-NET (2013–14), SET (2012), GATE Biotechnology (2011, 2013).
- **Invited Speaker:** Entomology Society of America & CAMTech Conferences (2022–2024).
- Featured in Entomology Today (2022).

Certifications, Workshops & Training

- Certificate on **Python Developer Master Program**, Edureka.
- Certificate on Bioinformatics with **Python**, Udemy.
- Certificate on **Python Programming Masterclass**, Udemy.
- Certificate on **R Programming**, Udemy.
- Certificate of Hands-on Bioinformatics Training on "**Basic Bioinformatics, Programming and NGS-MicroBiome**" Organized by ArrayGen Technologies Pvt. Ltd., Pune, India.
- Certificate of participation workshop on "**High-Performance Computing**" held at CSIR-NBRI,
- conducted by CDAC, Pune, and Govt. of India.
- Certification of participation in the "**Transcriptome data analysis**" workshop in PGI, Lucknow
- conducted by Sandoor Life Sciences.
- Certificate in **HTML programming** from NIIT.