

Surjeet Kumar Arya, Ph.D.

Functional Genomics | Computational Biology | Pest Management Solutions

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Professional Summary

A results-driven Research Scientist with over 10 years of experience translating complex biological questions into actionable scientific insights. Expertise in functional genomics, single-cell technologies, and bioinformatics for insect science. Proven ability to lead projects from experimental design to publication, developing novel tools and datasets that directly support the creation of innovative pest control strategies. Seeking to apply a multidisciplinary skill set to a challenging research and development role focused on crop protection and sustainable agriculture in the industry.

Core Competencies

- **Genomic & Computational Biology:** Single-cell RNA-seq & ATAC-seq, Functional Genomics, Transcriptomics, Bioinformatics Pipelines (Seurat, Cell Ranger, DESeq2), RNAi Target Identification.
- **Programming & Data Analysis:** R, Python, Machine learning, Statistical Analysis, Data Visualization, Biological Database Curation & Development (Shiny).
- **Molecular & Lab Techniques:** High-Throughput Sequencing Library Prep (NEB Ultra), Single-cell Isolation Protocols, PCR/qPCR, RNA/DNA Manipulation, Protein Expression, Advanced Microscopy (Fluorescence, SEM).
- **Cell Culture Management:** Expertise in maintaining and analyzing a diverse portfolio of over eight distinct insect cell lines.

Professional Experience

Research scientist | University of Kentucky, Lexington, KY | Mar 2025 – Present

- Directs a key project on the epigenetic regulation of hormonal signaling in insects, identifying novel mechanisms for potential disruption of pest life cycles.
- Manages the end-to-end workflow of chromatin accessibility (ATAC-seq) and transcriptomic (RNA-seq) profiling to generate high-quality datasets for analysis.
- Mentors junior scientists, fostering a collaborative and productive research environment while supporting the successful acquisition of NIH grant funding.

Postdoctoral Research Scientist | University of Kentucky/USDA | Mar 2020 – Mar 2025

- Pioneered single-cell sequencing of pest insect midguts (Hemiptera & Lepidoptera), establishing optimized protocols that uncovered novel gene targets for next-generation insecticides.
- Engineered a publicly accessible Shiny App to deploy reproducible bioinformatics workflows, increasing research efficiency for the broader scientific community.
- Initiated, developed, and curated the Insect Cell Line Database (ICDB), creating a vital public resource that centralizes critical data for insect science and biotechnology.
- Led a comparative transcriptomic and proteomic analysis of 8 insect cell lines, providing foundational data for selecting optimal systems for RNAi screening.

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

- Investigated the impact of gut microbiota on host gene expression in fruit flies, providing insights into host-symbiont interactions relevant to pest fitness.

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

- Successfully identified and validated novel RNAi-based gene targets in mealybugs through integrated transcriptomic and proteomic approaches.
- Developed robust in-vitro bioassays that accelerated the screening and validation of potential insecticidal genes.

Education

- **Ph.D. in Biological Sciences (Computational Biology)** | CSIR-NBRI, India | 2019
- **M.Sc. in Biotechnology** | University of Hyderabad, India | 2012
- **B.Sc. (Hons) in Biomedical Sciences** | Delhi University, India | 2010

Selected Publications

- Arya, S.K., & Palli, S.R. (2025). NAA40-mediated chromatin remodeling in TcA cells. *Insect Biochem Mol Biol*.
- Arya, S.K., et al. (2024). Single-cell analysis of *Spodoptera* midgut. *Genomics*.
- Chen, X., Arya, S.K., et al. (2024). Role of Chinmo in larval development. *PNAS*.
- Arya, S.K., et al. (2024). A database of crop pest cell lines. *In Vitro Cell & Dev*.
- Arya, S.K., et al. (2022). Single-cell analysis of *Spodoptera* midgut cell line. *J of Pest Science*.

Honors & Professional Activities

- Invited Speaker: ESA & CAMTech Conferences (2022–2024)
- Featured in *Entomology Today* (US)
- CSIR-UGC Research Fellowship (India)