Saksham Gupta

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EDUCATION

Indian Institute of Technology Kanpur, India   **July 2019 - May 2023**
Bachelor of Technology in Mechanical Engineering   *Kanpur, UP, India*
Overall CGPA: 8.7/10.0 (with distinction)

RESEARCH INTERESTS

Cancer Biology | Genomics | Computational Biology | Mathematical Modeling | Systems Biology | Epigenetics

RESEARCH EXPERIENCE

Fred Hutch Cancer Center, Human Biology Division   **July 2023 - Present**
Research Technician - I, Fred Hutch Post-baccalaureate Scholar Program   *Seattle, WA, USA*
Principal Investigator: *Dr. Alice Berger, Associate Professor*
Project Aim: Genomic characterization of *RIT1*-driven non-small cell lung cancer
- Characterize developed *RIT1*-driven lung cancer model using single-cell RNA-sequencing (scRNA-seq)
- Perform computational data analysis in python, concluding that lung epithelial cells transdifferentiate to an EMT-like state driving tumorigenesis in *RIT1*-driven tumor model
- Conduct mouse dissections, extraction and dissociation of lung tumors to prepare scRNA-seq libraries
- Monitor tumor growth with microCT and prepare drugs for mouse drug testing experiments
- Standardized a CUT&RUN protocol and using it to explore genome-wide differences in transcription factor binding in lung epithelial cell models to understand RIT1 - YAP synergy

Fred Hutch Cancer Center, Human Biology Division   **May 2022 - July 2022**
Undergraduate Summer Intern   *Seattle, WA, USA*
Principal Investigator: *Dr. Alice Berger, Associate Professor*
Project Aim: Investigation of genetic compensation in paralogs via direct capture Perturb-seq in cell line models
- Constructed gene expression and CRISPR perturbation libraries using 10X single-cell 5' CRISPR screening kit
- Validated genetic compensation of paralog *CCNL2* in PC9 *CCNL1* KO cells using scRNA-seq data analyses

Indian Institute of Technology Kanpur   **Dec 2021 - Dec 2022**
Undergraduate Researcher, Department of Biological Sciences and Bioengineering   *Kanpur, UP, India*
Principal Investigator: *Dr. Hamim Zafar, Assistant Professor*
Project Aim: Benchmarking the impact of hyperparameters on the clustering of scRNA-seq datasets
- Refined clustering pipelines incorporating different similarity metrics, varying resolution, and nearest neighbors
- Found that correlation-based similarity metrics with low-resolution yields the most accurate clustering results

PUBLICATION   *indicates the leading author

- Rominger, M. C.*, **Gupta, S.**, ……, Berger, A., **Mutant RIT1 cooperates with YAP to drive an EMT-like lung cancer state.** 2024 (in revision at Cell Reports, **bioRxiv doi** : 10.1101/2024.11.11.623044)

PRESENTATIONS   *indicates the presenting author

- **Gupta, S.***, Rominger, C., Moorthi, S., Berger, A., **Single-cell profiling of RIT1-mutant tumor model reveals an EMT phenotype**, Post-baccalaureate Scholar Symposium - Fred Hutch Cancer Center, June 2024
- **Gupta, S.*, Single-cell phenotyping of RIT1-driven lung cancer,** Cancer GeVo Seminar Series - Fred Hutch Cancer Center, July 2024

- O'Brien, S.*, **Gupta, S.**, Waldum, A., Berger A., **Dissecting paralog transcriptional adaptation through functional genomics**, Human Biology Retreat - Fred Hutch Cancer Center, September 2023

LABORATORY/COMPUTATIONAL SKILLS

- **Molecular Biology:** Cell Culture | RT-PCR | qPCR | Western Blot | Primer Designing | Flow Cytometry
- **Mouse Techniques:** Mouse Handling and Dissection | Tumor Extraction | Tumor Dissociation | Drug preparation and administration
- **High-throughput Techniques:** CUT&RUN | scRNA-sequencing | Perturb-seq library prep
- **Programming Languages:** Python | R | Matlab
- **Libraries:** Scanpy | NumPy | scVI | Pandas | Matplotlib | Seurat | SuperCell | MetaCell | SEACells

RELEVANT COURSEWORK

- **Biosciences and Bioengineering**: Molecular Cell Biology | Bioinformatics and Computational Biology | Computational Genomics | Tissue Engineering | Biomaterials | Biological Membranes | Biochemistry
- **Mathematics and Computer Science**: Linear Algebra | Fundamental of Computing | Complex Variables | Ordinary Differential Equations | Partial Differential Equations | Applied Numerical Methods
- **Mechanical Engineering:** Bio-MEMS and Microsystems Technology | Design of Machine Elements | Energy Systems-I | Dynamics | Engineering Design and Graphics

OTHER RELEVANT PROJECTS **BSBE is Biological Sciences and Bioengineering*

Indian Institute of Technology Kanpur, Department of BSBE **Jan 2023 - Apr 2023**
Course: *Tissue Engineering* *Kanpur, UP, India*
- Did literature review and came up with a proposal to create a glioblastoma stem cell-on-a-chip model for investigating tumor microenvironment, niche development, differentiation capabilities, and drug testing

Indian Institute of Technology Guwahati, Inter IIT Tech Meet 9.0 **Apr 2021**
Competition: *Bosch Electric Vehicle Simulation* *Guwahati, Assam, India*
- Designed a systems-based mathematical model of Regenerative Braking System for a passenger electric vehicle in Simulink, achieving parameters like battery size, range of the vehicle, and drive cycle

SCHOLASTIC ACHIEVEMENTS

- Achieved All India Rank 1840 in JEE (Advanced) 2019, securing admission to IIT among 0.2 million candidates
- Won Bronze Medal in Bosch Electric Vehicle Simulation in Inter IIT Tech Meet 9.0 organized by IIT Guwahati
- Recipient of Academic Excellence Award, given to top 10% of 1,100 undergraduates for the 2021-22 year
- Awarded a degree with distinction, conferred to students upon graduating with CGPA of 8.5 or higher
- CGPA of 9.1/10.0 in courses offered by the Biological Sciences and Bioengineering Department

LEADERSHIP AND ACTIVITIES

Openscapes Champions Program, Fred Hutch Cancer Center **Aug 2023 - Oct 2023**
- Participated in workshops to learn open data science tools and practices and build collaborative workflows
- Implemented these practices in GitHub issues to better manage day-to-day activities and lab inventory

Volunteer at National Service Scheme (NSS) IIT Kanpur **Aug 2019 - Mar 2020**
- Spearheaded and coordinated an initiative to enroll students in the Navodaya teaching program in rural villages, with an emphasis on increasing participation of girls in STEM by organizing door-to-door awareness efforts
- Collaborated on designing a curriculum to teach fundamental science to primary and middle school students
- Organized and taught weekly math and science classes for approximately 60 underprivileged students