ANUSHKA GUPTA

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Research Interests

single-cell & spatial multi-omics, cancer heterogeneity, tumor-microenvironment interaction, therapy resistance, immune evasion, personalized medicine, bioinformatics

Education

University of California, Berkeley and University of California, San Francisco, USA — *2016-2021*
Joint PhD in Bioengineering — *GPA: 3.9/4.0*

- **Thesis:** Novel Methods for Investigating Human Adipose Tissue at the Single-Cell Level
- **Research Advisor:** Aaron Streets

Indian Institute of Technology Kharagpur, India — *2011-2016*
B. Tech and M. Tech (Dual Degree Program) in Chemical Engineering — *GPA: 9.1/10.0*

Experience

Scientist 2, In-situ and Spatial Transcriptomics — *2023-2025*
10x Genomics, USA — *Manager: David Sukovich*

Scientist 1, In-situ and Spatial Transcriptomics — *2022-2023*
10x Genomics, USA — *Manager: Sultan Doganay Tuncer*

Graduate Student Researcher — *2016-2021*
UC Berkeley, USA — *Advisor: Aaron Streets*

Undergraduate Research Assistant — *2014-2016*
IIT Kharagpur, India — *Advisor: Parag Deshpande*

Globalink Research Intern — *2015*
University of British Columbia, Canada — *Host: Mina Hoorfar*

Unilever's Future Leader Intern — *2014*
Hindustan Unilever, India — *Manager: Sudheendra U R*

Publications

Preprints/Submitted

1. V Efthymiou, A Ghosh, S Kodani, X Caubit, L Fasano, W Ali, L Poulos, H Camara, **A Gupta**, Y Belaidouni, A Booeshaghi, S Yang, R Rastogi, F Shamsi, A Vernon, A Streets, YH Tseng, M Patti (2024)
   Single-Nucleus Analysis of Human White Adipose Tissue Reveals Adipocyte Subsets with Distinct Metabolic Profiles

Published

8. M Oliveira, J Romero, M Chung, S Williams, A Gottscho, **A Gupta**, S Pilipauskas, S Mohabbat, N Raman, D Sukovich, D Patterson, S Taylor (2025)
   Characterization of immune cell populations in the tumor microenvironment of colorectal cancer using high definition spatial profiling
   Nature Genetics

7. **A. Gupta**, V Efthymiou, S Kodani, F Shamsi, M Patti, Y Tseng, A Streets (2023)
   Mapping the transcriptional landscape of human white and brown adipogenesis using single-nuclei RNA-seq
   Molecular Metabolism

6. **A Gupta,** F Shamsi, N Altemose, G Dorlhiac, A Cypess, A White, N Yosef, M Patti, Y Tseng, A Streets (2022)
   Characterization of transcript enrichment and detection bias in single-nucleus RNA-seq for mapping of distinct human adipocyte lineages
   Genome Research

5. F Shamsi, M Piper, L Ho, T Huang, **A Gupta**, A Streets, M Lynes, Y Tseng (2021)
   Vascular smooth muscle-derived Trpv1+ progenitors are a source of cold-induced thermogenic adipocytes
   Nature Metabolism

4. T Chen*, **A Gupta***, M Zalavadia, A Streets (2020)
   µCB-seq: microfluidic cell barcoding and sequencing for high-resolution imaging and sequencing of single cells
   *Lab on a Chip, * indicates co-first authors*

3. **A Gupta**, G Dorlhiac, A Streets (2019)
   Quantitative imaging of lipid droplets in single cells
   Analyst

2. **A Gupta**, V Kumar, M Padole, M Saharia, K Kumar, P Deshpande (2018)
   Ceria-Based Nanocrystalline Oxide Catalysts: Synthesis, Characterization, and Applications
   Nanomaterials Physical, Chemical, and Biological Applications

1. B Nestor, E Samiei, R Samanipour, **A Gupta**, A Berg, M Derby, Z Wang, H Nejad, K Kim, M Hoorfar (2016)
   Digital microfluidic platform for dielectrophoretic patterning of cells encapsulated in hydrogel droplets
   RSC advances

Patent Applications

4. **A Gupta** (2024)
   Methods, compositions, and kits for spatial detection of target nucleic acids
   US Publication Number US20250369037A1

3. **A Gupta,** P Lund (2023)
   in vitro transcription of spatially captured nucleic acids
   US Publication Number US20250207125A1

2. A Streets, T Chen, **A Gupta** (2021)
   Microfluidic cell barcoding and sequencing
   US Publication Number US 2023/0093891A1

1. A Streets, T Chen, **A Gupta** (2021)
   Microfluidic cell barcoding and sequencing
   International Publication Number WO2021163442A1

Conference Posters & Talks

Talks

5. Mapping tumor-immune interactions in colorectal cancer using high definition spatial transcriptomics
   6th Annual ICGA Meeting, IIT Madras, Chennai, India, November 14-16, 2025

4. Characterization of transcript enrichment and detection bias in single-nuclei RNA-seq for mapping the transcriptional landscape of human adipogenesis
   Single Cell Analyses, Cold Spring Harbor Laboratory, Virtual Conference, November 10-12, 2021

3. Mapping Human Adipose Tissue Heterogeneity using Single-cell and Single-nuclei RNA-sequencing
   Seed Networks for the Human Cell Atlas Annual Meeting, Virtual Conference, November 17-19, 2020

2. Single-cell and single-nuclei RNA-seq reveal molecular heterogeneity in distinct human adipocyte lineages
   UC Berkeley-UCSF Joint PhD in Bioengineering Retreat, Virtual Conference, October 5-6, 2020

1. 3D Cell Patterning using Dielectrophoresis on Digital Microfluidics
   IEEE Engineering in Medicine and Biology Society Conference, Milano, Italy, August 25-29, 2015

Posters

7. Spatiotemporal mapping of neurogenesis in developing mouse brain at single cell scale using Visium HD 3'
   Society for Neuroscience (SFN) Annual Meeting, San Diego, USA, November 15-19, 2025

6. Visium HD enables single cell scale spatial profiling of immune cell populations in the tumor microenvironment of colorectal cancer
   Spatial Biology Summit, Stanford University, Palo Alto, USA, September 10-12, 2024

5. Spatially resolved whole-transcriptome analysis with multiplexed protein detection in human FFPE tissues
   Immunology AAI Annual Meeting, Washington D.C., USA, May 11-15, 2023

4. Extended capability of Visium CytAssist to enable transcriptomic profiling of PFA fixed, OCT embedded biological specimens
   Association of Biomolecular Resource Facilities Annual Meeting, Boston, USA, May 7-10, 2023

3. Technical artifacts in droplet-microfluidics-based single-nuclei RNA-sequencing
   Miniaturized Systems for Chemistry and Life Sciences, Palm Springs, USA, October 10-14, 2021

2. µCB-seq: Microfluidic Cell Barcoding and Sequencing for mapping adipogenesis using coupled imaging and sequencing
   Single Cell Analyses, Cold Spring Harbor Laboratory, New York, USA, November 13 - 16, 2019

1. A microfluidic platform for multimodal single-cell metabolic and molecular fingerprinting
   UC Berkeley-UCSF Joint PhD in Bioengineering, Pacific Grove, CA, USA, October 26-28, 2018

Honors & Awards

Awarded *Special Equity Grant* at 10x Genomics, USA for exceptional research *2022*

Awarded *UC Berkeley Lloyd Fellowship* in Bioengineering at UC Berkeley, USA *2019*

Awarded *Institute Blue* for exceptional performance in academics and sports at IIT Kharagpur, India *2016*

Ranked *2nd i*n the Department of Chemical Engineering, IIT Kharagpur, India *2016*

Selected for the *Unilever's Future Leader Programme* at Hindustan Unilever, India *2016*

Awarded *Mitacs Globalink Research Fellowship* in partnership with the Canadian government *2015*

Awarded *Merit Certificate for being top 0.1% scorers* in Science in All India Secondary School Examination *2010*

Leadership & Service

Peer Reviewer *2023-Present*

PeerJ, PeerJ Computer Science, STAR Protocols, Bioinformatics and Biology Insights, Micromachines, Reproductive Medicine, Biosensors, Cells, Optics, International Journal of Molecular Sciences, Nutrients, Frontiers of Computer Science, Computers in Biology and Medicine, Applied Sciences, Current Issues in Molecular Biology, Frontiers in Genetics, and The AAPS Journal

Assistant Editor *2022-2023*

Rapid Reviews: COVID-19 (RR:C19)

Professional Organizer *2020-2023*
Bay Area Microfluidics Network: Responsible for organizing seminar series with the goal of disseminating latest scientific developments happening in the bioengineering field

Member, Logistics Committee *2016-2018*
Expanding Your Horizon (EYH), UC Berkeley: Logistical planning of a daylong conference, serving to introduce middle school girls to female STEM role models

Coordinator *2011-2016*
Technology Robotix Society, IIT Kharagpur: Coordinated a team of 31 people for promoting the culture of robotics in India by organizing workshops, DIY tutorials, and national competitions

Teaching & Mentorship

Completed Responsible Conduct in Bioengineering Research and in Practice Course (UC Berkeley) *2020*

Teaching

Graduate Student Instructor, BioMEMS and Bio-Nanotechnology Laboratory *2020*
UC Berkeley, USA *Course Instructor: Aaron Streets*

Teaching Assistant, Reaction Engineering Laboratory *2015*
IIT Kharagpur, India *Course Instructor: Parag Deshpande*

List of mentored students

Lorita Boghospor *2024*
Scientist, 10x Genomics, USA

Debashish Chitnis *2024*
Sr. Research Associate, 10x Genomics, USA

Nicole Luk, Kevin Joslin, and Lauren Kim *2018 & 2020*
PhD Student, UC Berkeley, USA

Mansi Zalavadia and Xinyi Zhang *2019-2020*
Undergraduate Student, UC Berkeley, USA

Andre Van den Berg and Maria Diaz de Leon Derby *2014*
Undergraduate Student, University of British Columbia, Canada