Noorsher Ahmed

PhD Candidate

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EDUCATION

University of California San Diego, La Jolla - *PhD in Biomedical Sciences*
SEP 2017 - JAN 2024

Occidental College, Los Angeles - *BA in Biophysics*
AUG 2013 - MAY 2017

GRANTS AND AWARDS

LINDAU NOBEL LAUREATE MEETING FELLOW
2021

UC SAN DIEGO GENETICS TRAINING GRANT
2018 for years G3-G4; Supported by NIGMS T-32 training grant

HARRY & GRACE STEELE FOUNDATION SCHOLARSHIP
2016

THEODORE S. & EDITH NEWELL BROWN SCHOLARSHIP
2014

W.M. KECK FOUNDATION SCHOLARSHIP
2014

EXPERIENCE

Emma Lundberg Lab, Stanford University, Stanford, CA - *Postdoctoral Researcher*
AUG 2024 - Present

- Generative computer vision models for spatial proteomics

Stealth Co., La Jolla, CA - *Co-founder, Advisor*
FEB 2023 - Present

- Full Description pending legal approval

Gene Yeo Lab, UC San Diego, La Jolla, CA - *Postdoctoral Researcher*
APR 2024 - JUL 2024

- Optofluidic robotic automation for scaling up of novel spatial method developed during PhD work
- Novel computer vision models for cell segmentation for spatial transcriptomics

Gene Yeo Lab, UC San Diego, La Jolla, CA - *Graduate Researcher*
JAN 2018 - MAR 2024

- Developing novel *in situ* sequencing technology to interrogate mRNA localization at transcriptome scale with single-molecule resolution and sequence architecture information

AbbVie, inc., Redwood City, CA - *Research Intern*
MAY 2017 - AUG 2017

- Experimented with fluorescent barcoding for multiplexed PK/PD flow studies
- Prototyped machine learning methods for assessing multiplexed flow cytometry data
- Full Description pending legal approval

MioKun Biotechnologies, Berkeley, CA - *Consultant*
DEC 2016 - JAN 2017

- Commercialization of technology I developed in the Abate lab
- Full Description pending legal approval

Tierra Biosciences (previously Synvitrobio, Inc.), San Francisco, CA - *Research Intern*

MAY 2016 - AUG 2016

- Early prototyping of rapid protein synthetic engineering in cell-free systems
- Optimized cell-free TX/TL system production
- Aided in completion of NSF STTR Phase I and DARPA SBIR Phase II grant-funded projects

Abate Lab, UCSF, San Francisco, CA - *Research Intern*

JUNE 2014 - JANUARY 2016

- Developed a novel centrifuge-based microfluidic platform for microfluidic commercialization applications such as digital-PCR, digital-ELISA, and Drop-seq kits
- Developed a novel method of double emulsion formation that eliminated the need for complex hydrophobic patterning in microfluidic devices, making microfluidic technologies that utilize double emulsions cheaper and more widely adoptable
- Aided in the development of a novel single-cell genome sequencing technology (SiC-seq) for use in antibiotic drug discovery from diverse unculturable microbial communities
- Mentored a high school student during the summer

Baran Lab, Occidental College, Los Angeles, CA - *Student Research Assistant*

AUG 2014 - MAY 2017

- Studied *zer-1(rb2)*, a suppressor of *tba-1(ju89)*, a neurodegenerative disease causing mutation that modifies microtubule dynamics in *C. elegans*, utilizing cloning and molecular biology techniques
- Studied the role of a microtubule-severing protein, Katanin, in neurodegenerative disease leveraging CRISPR/Cas9 gene editing technology.

TEACHING EXPERIENCE

Cold Spring Harbor Laboratory -Single Cell Analysis - *Lecturer*

JUL 2019, JUL 2022, JUL 2023, JUL 2024

- Helped teach advanced graduate students and postdoctoral fellows from across the country on spatial transcriptomic methods as well as the analysis of spatial data.
- Held daily office hours to help students gain proficiency in programming and to understand the mathematics and science behind different analysis in *scanpy* and *seurat* software.

UC San Diego - BIOM200C - *Guest Lecturer*

FEB 2021

- Introduced concepts in computational techniques for studying RNA localization, including basic computer vision methods (*opencv, scikit-image*) and more recent advances for analyzing data generated by highly-multiplexed fluorescent *in-situ* hybridization methods (*starfish, scanpy*)

UC San Diego - BIPN-BMS Bioinformatics Bootcamp - *Guest Lecturer*

AUG 2020

- Introduced incoming first-year graduate students in BIPN and BMS programs to high-throughput microscopy image analysis methods ranging from basic GUI programs such as ImageJ and CellProfiler, to more advanced tools leveraging the Keras deep learning framework in Jupyter notebooks.

UC San Diego - BIOM200C - *Guest Lecturer*

MAR 2020

- Introduced concepts in computational techniques for studying RNA localization, including basic computer vision methods (*opencv, scikit-image*) and more recent advances for analyzing data generated by highly-multiplexed fluorescent *in-situ* hybridization methods (*starfish, scanpy*)

UC San Diego - BIPN150 - *Teaching Assistant*

JAN 2020 - MAR 2020

- Assisted in teaching an upper division undergraduate course on the diseases of the nervous system (ALS/SMA, Autism, Retts Syndrome, Prion disease, Alzheimer's and Parkinson's, etc.)
- Taught undergraduate students how to critically read and analyze recent published literature on novel therapeutics for neurological diseases
- Held weekly office hours

UC San Diego - BIOM200 - *Guest Lecturer*

OCT 2018

- Helped teach a class to first-year graduate students introducing concepts in bioinformatics
- Focused specifically on the usage of Python, R and bioinformatics pipelines such as STAR and bowtie2 to analyze sequencing data

University of Saint-Katherine - *Guest Lecturer*

APR 2018

- Taught an introduction to genomics
- Introduced methods for studying genomic expression such as single-cell sequencing and mutagenesis screens
- Taught students about CRISPR/Cas9 and its applicability to whole genome knockout screens

Critical Making Studio, Occidental College, Los Angeles - *Student Teacher*

JAN 2016 - MAY 2017

- Taught students AutoCAD as well as helped teach Python coding workshops
- Aided students in projects that involved the usage of Arduino, 3D printing, and CAD modelling

PUBLICATIONS

- Mah C.K.*, **Ahmed, N***, Lopez N., Lam, D., Monell, A., Kern, C., Han, Y., Prasad., G., Cesnik, A.J., Lundberg, E., Zhu, Q., Carter, H., Yeo, G.W. *Bento: A toolkit for subcellular analysis of spatial transcriptomics data*. **Genome Biology** (2024).

- Le, P., **Ahmed N.**, Yeo, G.W. *Illuminating RNA biology through imaging*. **Nature Cell Biology** (2022)

- Boyle E.A., Goldberg, G., ... , **Ahmed N.**, ..., Yeo, G.W. *Junior scientists spotlight social bonds in seminars for diversity, equity, and inclusion in STEM*. **Plos one** (2023)

- Morgan SC, Aigner S, Anderson C, [and 107 others, including **Ahmed N**]. *Automated, miniaturized, and scalable screening of healthcare workers, first responders, and students for SARS-CoV-2 in San Diego County*. **Cell Reports Medicine** [In Review]. 2021

- Wheeler EC, Vu AQ, Einstein JM, DiSalvo M, **Ahmed N**, Van Nostrand EL, Shishkin AA, Jin W, Allbritoton NL, Yeo GW. *Pooled CRISPR screens with imaging on microraft arrays reveals stress granule-regulatory factors*. **Nat Methods**. 2020 PMID: 32393832

- Lan F, Demaree B, **Ahmed N**, Abate AR. *Single-cell genome sequencing at ultra-high-throughput with microfluidic droplet barcoding*. **Nat Biotechnol**. 2017. PMID: 28553940

- Sukovich DJ, Kim SC, **Ahmed N**, Abate AR. *Bulk double emulsification for flow cytometric analysis of microfluidic droplets*. **Analyst**. 2017. PMID: 29131209

- **Ahmed N**, Sukovich D, Abate AR. *Operation of droplet-microfluidic devices with a lab centrifuge*. **Micromachines** 2016. PMID: 30404331

POSTERS & PRESENTATIONS

- **Ahmed N,** Pong A, Yeo GW. *RNA-Masala: A High-Performance Multi-task Generative Model for Cell Segmentation of Spatial Transcriptomic Data*. Poster presented at the Gordon Single Cell Conference, Les Diablaretes, Switzerland, 2024

- **Ahmed N,** Mah C, Lopez N, Yeo GW. *Exploring Cardiotoxicity at the Subcellular Scale*. Talk presented at the Resolve Biosciences *Spatial Day*, San Diego, CA, 2022

- **Ahmed N,** Mah C, Yeo GW. *Bento: A toolkit for subcellular RNA localization analysis*. Poster presented at the Gordon Single Cell Conference, Les Diablaretes, Switzerland, 2022

- **Ahmed N,** Mah C, Yeo GW. *Bento: A toolkit for subcellular RNA localization analysis*. Talk presented at the Genetics Training Program Retreat, San Diego, CA, 2022

- **Ahmed N,** Mah C, Yeo GW. *Bento: A toolkit for subcellular RNA localization analysis*. Talk presented at the Biomedical Sciences Program Retreat, Carlsbad, CA, 2022

- **Ahmed N**, Vu AQ, Fürth D, Lee JH, Yeo GW. *In-situ sequencing of RNA in phase-seperated granules localized in sub-cellular compartments*. Poster presented at the Genetics Training Program Retreat, La Jolla, CA, 2020

- **Ahmed N**, Vu AQ, Yeo GW. *Elucidating stress granule protein spatial relationships with Expansion Microscopy*. Poster presented at the Genetics Training Program Retreat, La Jolla, CA, 2019

- **Ahmed N**, Graham M, Poster title confidential. Poster presented at AbbVie, Inc. Redwood City, CA, 2017.

CERTIFICATIONS & PROGRAMS

Nucleate Activator Program, 2022 cohort
SPRING 2022

Rady School of Business, Micro-MBA
AUG 2018

Coursera, Neural Networks and Deep Learning
NOV 2017; License SVJFCSENDLGX

STUDENT LEADERSHIP

UCSD Diversity and Science Lecture Series - *Student organiser and Co-host*
OCT 2020 - *PRESENT*

- Co-hosted and organised lecture series that highlights two graduate or postdoctoral researchers from diverse backgrounds on their journey to scientific research and an overview of their work
- Built and managed the DASL series website

UCSD Biomedical Sciences Diversity Committee - *Committee member*
NOV 2019 - *PRESENT*

- Council of students working with faculty, advocating for programs to improve diversity in our graduate program as well as support current URM students with mentorship and resources for academic and research success

UCSD Biomedical Sciences Admissions Committee - *Committee member*

OCT 2019 - JAN 2020

- Read and scored student applications
- Was on the student diversity sub-committee and read and advocated for URM applicants
- Helped organize and run the programs two recruitment weekends

UCSD Biomedical Sciences Welcome Committee - *Committee member*

MAY 2018 - MAY 2019

- Ensured incoming graduate students received all available resources for both moving to San Diego as well as finding research lab rotations
- Matched students with mentors and potential labs

People of Color in STEM, Occidental College - *Co-President*

NOVEMBER 2015 - MAY 2017

- Founded a student organisation to create new opportunities and provide resources such as mentorship programs and an exclusive textbook share program to help underrepresented minorities excel in the sciences.
- Advocated for the creation of programs to increase the diversity in research labs on campus by giving minority underclassmen a spot in a research lab, including an early start program the summer before they matriculate to the college.

TECHNICAL SKILLS

Laboratory Skills

- Confocal microscopy
- Tissue Culture
- Microfluidic chip fabrication
- Droplet microfluidics
- In-situ sequencing
- FISH Imaging
- Single-cell sequencing
- MERFISH
- STARmap

Software Skills

- Autodesk AutoCAD & Fusion360
- Adobe Photoshop, InDesign, and Illustrator
- Python
- Pytorch
- MLOps (Neptune.ai, WandB, Pytorch, Paperspace/AWS)

REFERENCES

Eugene Yeo, Ph.D.

Professor of Cellular and Molecular Medicine

Department of Cellular and Molecular Medicine

University of California, San Diego

geneyeo@ucsd.edu

Further references available upon request