

LYLA ATTA

MD-PhD Student, Johns Hopkins University

lylaatta@jhmi.edu lylaatta.github.io @lylaatta

EXPERIENCE

Graduate Student

JEFworks Lab, Biomedical Engineering, JHU. *Aug. 2020 - present*

Developing statistical and computational tools for the analysis of spatially resolved transcriptomics data.

VeloViz: RNA-velocity informed embeddings for visualizing cellular trajectories.

bioRxiv, May 2021

Computational challenges and opportunities in spatially resolved transcriptomic data analysis. *Nature Communications, September 2021*

Graduate Rotation Student

Elana Fertig Lab, JHU.

Jul. - Aug. 2019

Statistical models to simulate immune cell single-cell RNA sequencing.

Research Associate

Scott Manalis Lab, MIT.

Jun. 2017 - Jun. 2018

Investigated single cell biophysical measurements and gene expression as markers of immune checkpoint inhibitor therapy in melanoma.

Undergraduate Researcher

Douglas Lauffenburger Lab, MIT.

Mar. 2016 - Jun. 2017

Tested dose dependent effects of drug combinations on TNBC cell lines.

Developed mathematical growth model to compare response of TNBC cell lines to drug combinations.

Analyzed bulk gene expression to identify mediators of intrinsic resistance to EGFR pathway inhibitors.

Teaching Assistant

Biological Engineering, MIT.

Fall 2016

Undergraduate core biological engineering course: mechanistic modeling of biomolecular reactions using differential equations in Matlab.

Developed and taught lesson plans, created supplementary course notes, problem set and exam solutions.

Network Analysis of Phosphoproteomic Data in Glioblastoma

Coursework, Statistics and Data Science, MIT.

Fall 2016

Created graphical models of protein signaling interactions based on receptor tyrosine kinase phosphorylation data from GBM mouse models.

Implemented network analysis approaches to identify differences between tumor and control network models.

Identified significant changes in signaling networks between tumor and control and identified cytoskeletal proteins marking these changes.

Undergraduate Researcher

Ron Weiss Lab, MIT.

Nov. 2014 - Mar. 2016

Designed an antibody-based extracellular platform for in vivo detection of biomarkers and transduction of an intracellular response.

Collaborated to build detection platform using recombinant gene cloning techniques and tested functionality in Human Embryonic Kidney cells using flow cytometry and confocal microscopy.

Created pipeline for the automated, distribution-based clustering and gating of flow cytometry data in Matlab.

MENTORSHIP

Medical School Peer Advisor (2019-2020); Biological Engineering Associate Advisor (2015-2016); Mentor at Saturday Engineering Enrichment and Discovery Academy; Mentor at DynaMIT STEM summer program.

EDUCATION

Johns Hopkins University (JHU)

MD-PhD Student *August 2018 - present*

Massachusetts Institute of Technology (MIT)

Bachelors of Science *2013 - 2017*

Major: Biological Engineering

Minor: Statistics and Data Science

ACTIVITIES AND PROJECTS

JHU Medical School Admissions Committee

JHU School of Medicine

Aug. 2021 - Mar. 2022

Interviewed n JHUSOM applicants and provided input to faculty admissions committee.

Greater Boston Pandemic Fabrication Team

panfab.org

Mar. 2020 - Sep. 2021

Co-led design and testing of Powered Air-Purifying Respirators to address COVID-19 PPE shortages.

Center for RISC

University of Chicago

Jul. 2020 - Sep. 2020

Adapted data science curriculum for use by students with limited programming experience.

Independent Student Analysis Committee

JHU School of Medicine

Mar. 2020

Analyzed student survey to identify strengths and areas of improvement in medical school experience for LCME re-accreditation process.

Recommended strategies to improve pre-clinical curriculum, diversity and inclusion, student mistreatment based on student survey results.

Student Curriculum Review Team

JHU School of Medicine

Aug. 2018 - Mar. 2020

Analyzed evaluations for medical school pre-clinical courses to identify strengths and weaknesses.

Organized student town hall to solicit student feedback to improve pre-clinical Genetics and Metabolism courses. Designed and analyzed a student survey assessing effectiveness of the Student Curriculum Review Team in facilitating curricular improvements. (Kumar *et. al.*)

Medical School Peer Advising Leader

JHU School of Medicine

Mar. 2019 - Mar. 2020

Coordinated matching of 120 first-year medical school students to second-year mentors.

Organized social and educational events facilitating exchange of advice through multiple transitions in medical school pre-clinical curriculum.

Qualified Bilingual Staff Speaker

Johns Hopkins Medicine

Mar. 2020 - present

Qualified to communicate in Arabic with patients within the scope of clinical student role.

Undergraduate Board President

Biological Engineering, MIT

Feb. 2016 Mar. 2017

Established first annual BE Research Symposium for students to present their research.

Planned, administered, and analyzed the first feedback survey and forum soliciting feedback from graduating seniors and presented results to faculty committee.

Led a weeklong Freshman Pre-orientation Program for students interested in biological engineering.

Created a sophomore orientation program for students starting the Biological Engineering major.

PUBLICATIONS

Graduate

- **Atta L.***, Sahoo A., Fan J, VeloViz: RNA velocity-informed embeddings for visualizing cellular trajectories. *Bioinformatics*, 2021.
- **Atta L.***, Fan J, Computational challenges in spatially resolved transcriptomics data analysis. *Nature Communications*, 2021.
- Hara T, Chanoch-Myers R, Mathewson ND, Myskiw C, **Atta L.**, Bussema L, Eichhorn SW, Greenwald AC, Kinker GS, Rodman C, Gonzalez Castro LN, Wakimoto H, Rozenblatt-Rosen O, Zhuang X, Fan J, Hunter T, Verma IM, Wucherpennig KW, Regev A, Suv ML, Tirosh I. Interactions between cancer cells and immune cells drive transitions to mesenchymal-like states in glioblastoma. *Cancer Cell*, 2021.
- Miller B, **Atta L.**, Sahoo A, Huang F, Fan J. Reference-free cell-type deconvolution of pixel-resolution spatially resolved transcriptomics data. (2021) [in review].

Addressing COVID-19 PPE shortages

- Kothakonda A.*, **Atta L.***, Plana D., Ward F., Davis C., Cramer A., Moran R., Freake J., Tian E., Mazor O., Gorelik P., Van C., Hansen C., Yang H., Li Y., Sinha M.S., Li J., Yu S.H., LeBoeuf N.R., Linville-Engler B., Sorger P.K. De Novo Powered Air-Purifying Respirator Design and Fabrication for Pandemic Response. *Front. bioeng. biotechnol.*, 2021.
- Antonini M.J., Plana D., Srinivasan S., **Atta L.**, Achanta A., Yang H., Cramer A., Freake J., Sinha M.S., Yu S.H., LeBoeuf N.R., Linville-Engler B., Sorger P.K. A Crisis-Response Framework for Medical Device Development During the COVID-19 Pandemic. *Frontiers in Digital Health*, 2021.
- Tyan K., Levin A., Avalos-Pacheco A., Plana D., Rand E.A., Yang H., Maliszewski L.E., Chylek L.A., **Atta L.**, Tye M.A., Carmack M.M., Oglesby N.S., Burgin S., Yu S.H., LeBoeuf N.R., Kemp J.M. Considerations for the Selection and Use of Disinfectants Against SARS-CoV-2 in a Healthcare Setting. *Open Forum for Infectious Disease*, 2020.

Medical Education

- Kumar P., Pickering C.M., **Atta L.**, Burns AG, Chu RF, Gracie T, Qin CX, Whang KA, Goldberg HR, Student Curriculum Review Team, 8 Years Later. *Medical Teacher*, 2021.

Undergraduate

- Claas A.M., **Atta L.**, Gordonov S., Meyer A.S., Lauffenburger D.A. Systems Modeling Identifies Divergent Receptor Tyrosine Kinase Reprogramming to MAPK Pathway Inhibition. *Cell. Mol. Bioeng.*, 2018.

PRESENTATIONS AND POSTERS

- VeloViz: RNA velocity-informed 2D embeddings for visualizing cellular trajectories. *Broad Institute Single-Cell Working Group April 2021. Presentation.*
- VeloViz: RNA velocity-informed 2D embeddings for visualizing cellular trajectories. *Women of Whiting Symposium, Johns Hopkins University, April 2021. Poster.*
- De novo Powered Air-Purifying Respirator Design and Manufacture to Address Commercial Supply Shortages. *Pandemic Response: Resilience and Recovery in the Era of COVID-19, Harvard-MIT Center for Regulatory Science, June 2020. Presentation.*
- Prediction of BET Bromodomain Inhibitor Sensitization to Targeted Cancer Drugs. *Znaty-Merck Prize for Research in BE, May 2017. Presentation.*
- Using Native Transcriptomics to Predict RTK Response to Targeted Cancer Drugs. *Undergraduate BE Research Symposium, May 2017. Presentation.*
- Transcriptome Changes as Mediators of Intrinsic Cancer Drug Resistance. *MIT Amgen Scholars Program, Aug. 2016. Poster.*
- B-Cell Receptor-Based Genetic Sensor for Extracellular Biomarker Detection. *MIT Center for Biomedical Innovations Cell and Gene Therapy Biomanufacturing Summit, Nov. 2015. Poster.*
- Beta-amyloid Detection for Alzheimers Diagnosis and Therapy. *Institute of Biological Engineering, Mar. 2015. Presentation.*