

EDUCATION

Johns Hopkins University (JHU) School of Medicine:

MD-PhD Student in Biomedical Engineering, Jean Fan Group, jefworks.com

Massachusetts Institute of Technology (MIT): B.Sc. Biological Engineering, Graduated June 2017

Major: Biological Engineering (BE), Minor: Statistics and Data Science, GPA: 4.8.

Coursework: Cell Biology ♦ Python Programming ♦ Differential Equations ♦ Analysis of Biomolecular Systems ♦ Computational Biology ♦ Statistical and Computational Applications ♦ Deep learning in Systems Biology.

RELEVANT EXPERIENCE

Graduate Student: Jean Fan Group, JHU Biomedical Engineering (Aug. 2020 –).

- [VeloViz: RNA-velocity informed 2D embeddings for visualizing cellular trajectories](#).
- Developing statistical and computational software for the analysis of spatially resolved transcriptomics data.

Graduate Rotation Student: Joel Bader Group, JHU Biomedical Engineering (June 2020 – Aug. 2020).

- Used RNA velocity to investigate molecular drivers of breast cancer metastasis in organoid models.

Graduate Rotation Student: Elana Fertig Group, JHU Biomedical Engineering (July. 2019 – Aug. 2019).

- Used statistical models to simulate immune cell single-cell RNA sequencing.

Research Associate: Scott Manalis Group, MIT Bioengineering (June 2017 – June 2018).

- Lead a collaboration between Manalis Group and Boland Group (Massachusetts General Hospital) to measure the single-cell mass, growth rate, and mRNA profiles of primary T-cells from patients with melanoma receiving immune checkpoint inhibitor therapy.

Undergraduate Researcher: Douglas Lauffenburger Group, MIT Bioengineering (Mar. 2016 – June 2017).

- Tested the dose dependent effects of drug combinations on Triple Negative Breast Cancer cells.
- Developed a mathematical framework in Matlab to better compare growth phenotypes of Triple Negative Breast Cancer cells after treatment with drug combinations.
- Analyzed global gene expression data to identify mediators of intrinsic resistance to EGFR pathway inhibitors.

Teaching Assistant: Quantitative Analysis and Modeling of Biomolecular Systems, MIT (Fall 2016)

- Developed and taught lesson plans, created supplementary course notes, problem set and exam solutions for an undergraduate core biological engineering class.

Network Analysis of Phosphoproteomic Data in Proneural Glioblastoma, Coursework (Fall 2016)

- Collaborated to create graphical models of signaling interactions based on receptor tyrosine kinase phosphorylation level data collected from a glioblastoma mouse model.
- Implemented network analysis approaches to identify differences between tumor and control network models.
- Identified significant changes in overall signaling network architecture between tumor and control networks and identified key cytoskeletal players marking these changes in architectures.

Undergraduate Researcher: Ron Weiss Group, MIT Synthetic Biology Center (Nov. 2014 – Mar. 2016).

- Designed an antibody-based extracellular platform for *in vivo* detection of arbitrary 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 framework for the automatic, distribution-based clustering and gating of flow cytometry data in Matlab.

PUBLICATIONS [* equal contributions]

Atta L.*, Sahoo A., Fan J, VeloViz: RNA velocity informed embeddings for visualizing cellular trajectories (2021) [in review].

Atta L.*, Fan J, Computational challenges in spatially resolved transcriptomics data analysis (2021) [in review].

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, Suvà 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].

Kothakonda A.*, **Atta L.***, Plana D., Yang H., Cramer A., Freake J., Sinha M.S., Yu S.H., LeBoeuf N.R., Linville-Engler B., Sorger P.K. De novo Powered Air-Purifying Respirator Design and Manufacture to Address Commercial Supply Shortages (2020) [in review].

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).

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).

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).

POSTERS AND PRESENTATIONS [* Poster, ** Presentation]

VeloViz: RNA velocity informed 2D embeddings for visualizing cellular trajectories*, Women of Whiting Symposium, Johns Hopkins University, April 2021

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

Prediction of BET Bromodomain Inhibitor Sensitization to Targeted Cancer Drugs**, Znaty-Merck Prize for Research in BE, May 2017

Using Native Transcriptomics to Predict RTK Response to Targeted Cancer Drugs**, Undergraduate BE Research Symposium, May 2017

Transcriptome Changes as Mediators of Intrinsic Cancer Drug Resistance*, MIT Amgen Scholars Posters Session, Aug. 2016.

B-Cell Receptor-Based Genetic Sensor for Extracellular Biomarker Detection*, MIT Center for Biomedical Innovation's Cell and Gene Therapy Biomanufacturing Summit, Nov. 2015.

β -Amyloid Detection for Alzheimer's Diagnosis and Therapy**, Institute of Biological Engineering, Mar. 2015.

RECOGNITIONS AND AWARDS

3rd Place, Znaty-Merck Undergraduate BE Research Prize (2017) ♦ 2nd Place Presenter in Undergraduate BE Research Symposium (2017) ♦ Biological Engineering Outstanding Service Award (2017) ♦ MIT Amgen Scholar (2016) ♦ Jeffrey and Felice Hu Scholar (2013-2016)

EXTRACURRICULARS

Volunteer, Greater Boston Pandemic Fabrication Team, panfab.org (Mar. 2020 –).

- Co-led the design and testing of a Powered Air-Purifying Respirator to address PPE shortages during COVID-19.

Volunteer, Center for Radical Innovation for Social Change, University of Chicago (July 2020 –).

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

Independent Student Analysis committee member, JHUSOM (Mar. 2020 –).

- Analyzed student administered survey to identify strengths and areas of improvement in student medical school experience as part of the Liaison Committee on Medical Education re-accreditation process.
- Recommended strategies to improve student medical school experience in various areas (pre-clinical curriculum, diversity and inclusion, student mistreatment) based on student survey results.

Qualified Bilingual Staff Speaker (Mar. 2020 –).

- Qualified to communicate medical information in Arabic with patients within the scope of my clinical student role.

Student Curriculum Review Team member, JHUSOM (Aug. 2018 – Mar. 2020).

- Analyzed evaluations for medical school pre-clinical curriculum courses to identify strengths and weaknesses.
- Organized and facilitated a student town hall to solicit student feedback and suggestions to improve pre-clinical Genetics and Metabolism courses.
- Collaborated to design and analyze a student survey assessing effectiveness of the Student Curriculum Review Team in facilitating curricular improvements (Kumar et. al.)

Medical School Peer Advising Leader, JHUSOM (Mar. 2019 – Mar. 2020).

- Coordinated matching of 120 first-year medical school students to second-year mentors.
- Organized events to increase second-year student participation as mentors in peer advising program.
- Organized social and educational events to facilitate exchange of advice and experience through multiple

transitions in the medical school pre-clinical curriculum.

President of the Biological Engineering Undergraduate Board, MIT (*Feb. 2016 – Mar. 2017*).

- Led a team of student executive board members to facilitate communication between faculty and students to establish programs addressing undergraduate needs.
- Established first annual BE Research Symposium for students to present their research.
- Planned, administered, and analyzed the first senior feedback survey and forum to solicit feedback from graduating seniors in BE and presented results to the MIT BE undergraduate faculty committee.
- Planned and 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.
- Organized the Bioengineering Career Expo connecting life science majors to biotechnology employers.

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.