Lyla Atta

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EDUCATION

Johns Hopkins University (JHU) School of Medicine: MD-PhD Candidate at JEFworks Lab

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

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

RELEVANT EXPERIENCE

Graduate Student: JEFworks Lab, JHU Biomedical Engineering *(Aug. 2020 –).*

- Developing computational methods to analyze single-cell data.
- VeloViz: RNA-velocity informed 2D embeddings for visualizing cellular trajectories.

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.*, Fan J. VeloViz: RNA-velocity informed 2D embeddings for visualizing cellular trajectories [submitted]

Atta L.*, Kothakonda A.*, 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 preparation].

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 *(2020)* [submitted].

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 (2019)* [submitted].

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).*

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POSTERS AND PRESENTATIONS [* Poster, ** Presentation]

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 – Oct. 2020).*

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

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