Abigail Margaretha Jackson

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EDUCATION

Harvard-MIT Health Sciences and Technology, Cambridge, MA — Sept. 2022 – Present
PhD Program in Medical Engineering and Medical Physics
Concentration: Biological Engineering

University of Southern California, Los Angeles, CA — May 2020
B.S. in Computational Neuroscience
B.A. in Philosophy
GPA: 3.9 (Magna Cum Laude)

RESEARCH EXPERIENCE

Graduate Research Assistant*, The Ragon Institute* — July 2023 – Present
Alejandro B. Balazs, PhD

- Design *in vitro* experimental system for the study of HIV viral evolution
- Investigate role of antibody pressure on HIV viral evolution

Graduate Research Assistant, *Harvard Medical School* — July 2023 – Present
Debora Marks, PhD (Department of Systems Biology)

- Apply machine learning and computational model systems to the novel HIV context
- Improve lab's computational model systems to improve mutation prediction capacity for HIV

Research Technician, *The Scripps Research Institute* — Aug. 2020 – Aug. 2022
Andrew B. Ward, PhD (Integrative Structural and Computational Biology Department)

- Initiated a whole-virion electron microscopy-based polyclonal epitope mapping (EMPEM) program for analysis of immune responses against AAV
- Led EMPEM studies for 9 cohorts of convalescent and immunized SARS-CoV-2 donors and presented data to industry partners including Moderna/NIH Vaccine Research Center and Novavax
- Collaborated with internal and external teams to perform polyclonal analysis of HIV and Influenza vaccine clinical trial samples

Undergraduate Laboratory Technician, *University of Southern California* Nov. 2019 – May 2020
Don B. Arnold, PhD (Molecular and Computational Biology Department)

- Prepared recombinant DNA for primary neuronal cell culture transfection
- Executed immunochemistry, imaging, and analysis of neuronal cell culture samples

Laboratory Intern, *Lonza Biologics* May 2019 – Aug. 2019
Upstream Manufacturing Science and Technology (Portsmouth, NH)

- Independently planned, coordinated, and executed an interdepartmental comparability study for bioreactor pH probes
- Presented data to internal customer representatives for technology transfer into a new midscale mammalian manufacturing suite
- Performed aseptic cell culture operations and daily bioreactor monitoring for customer technology transfer and process development studies

Research Assistant, *USC Brain and Creativity Institute* Aug. 2018 – Nov. 2019

- Coded scripts in MATLAB and Python to efficiently and accurately analyze large data sets containing results for over 100 participants
- Collected behavioral and EEG data for a longitudinal study in the Brain and Music Lab

Laboratory Intern, *Lonza Biologics* May 2018 – Aug. 2018
Quality Control Microbiology (Portsmouth, NH)

- Performed assays according to SOPs for daily process monitoring of biopharmaceuticals in a cGMP laboratory
- Validated an inline bioburden monitoring system to work towards a closed manufacturing process

FELLOWSHIPS

Fulbright Research Grant Recipient* 2020
Country: Germany
Project Title: "Optimization of Oncolytic Virus Design and Production Using a Perfusion Model"
Max Planck Institute for Dynamics of Complex Technical Systems
**Note: Grant was canceled due to the COVID-19 pandemic*

PUBLICATIONS

de la Pena, A.T., Sewall, L.M., Rocha, R., **Jackson, A.M.**, Pratap, P.P., Bangaru, S., Cottrell, C.A., Mohanty, S., Shaw, A.C., and Ward, A.B. (2023) "Increasing sensitivity of antibody-antigen interactions using photo-cross-linking." ***Cell Reports Methods***, 3(6). DOI: 10.1016/j.crmeth.2023.100509

Tas, J.M.J., Koo, J.H., Lin, Y.C., Xie, Z., Steichen, J.M., **Jackson, A.M.**, Hauser, B.M., Wang, X., Cottrell, C.A., Torres, J.L, et al. (2022) "Antibodies from primary humoral responses modulate the recruitment of naïve B cells during secondary responses." ***Immunity***, 55, 1-16. DOI: 10.1016/j.immuni.2022.07.020

Bangaru, S., Antanasijevic, A., Kose, N., Sewall, L.M., **Jackson, A.M.**, Suryadevara, N., Zhan, X., Torres, J.L., Copps, J., del la Peña, et al. (2022) "Structural mapping of antibody landscapes to human betacoronavirus spike proteins." ***Science Advances***, 8(18): 1-11. DOI: 10.1126/sciadv.abn2911

Hurlburt, N.K.*, Homad, L.J.*, Sinha, I., Jennewein, M.F., MacCamy, A.J., Wan, Y., Boonyaratanatornkit, J., Sholukh, A.M., **Jackson, A.M.**, Zhou, P., et al. (2022) "Structural definition of a pan-sarbecovirus neutralizing epitope on the spike S2 subunit." ***Communications Biology***, 5(1):1-13. DOI: 10.1038/s42003-022-03262-7 (*contributed equally to this study)

Yuan, M.*, Huang, D.*, Lee, C.D.*, Wu, N.C.*, **Jackson, A.M.**, Zhu, X., Liu, H., Pend, L., van Gils, M.J., Sanders, R.W., et al. (2021) "Structural and functional ramifications of antigenic drift in recent SARS-CoV-2 variants." ***Science***, 373(6556):818-823. DOI: 10.1126/science.abh1139 (*contributed equally to this study)

Gu, M., Torres, J.L., Li, Y., Van Ry, A., Greenhouse, J., Wallace, S., Chiang, C., Pessaint, L., **Jackson, A.M.**, Porto, M., et al. (2021) "One dose of COVID-19 nanoparticle vaccine REVC-128 protects against SARS-CoV-2 challenge at two weeks post-immunization." ***Emerging Microbes & Infections***, 10(1): 2016-2029. DOI: 10.1080/22221751.2021.1994354

PRESENTATIONS

Jackson, A.M. and Perrett, H.R. "Science, Simplified: SARS-CoV-2" 2021
Scripps Research Community Symposium

SERVICE & OUTREACH

Graduate Mentor, MIT Summer Research Program June 2023 – Present
Massachusetts Institute of Technology

- Mentored a "pod" of eight undergraduate students as a "pod leader" to provide social, emotional, and research support as the navigated their summer research program at MIT

Mentor, Scripps Research Summer Program Application Mentors Sep. 2021 – Aug. 2022
The Scripps Research Institute

- Mentored local community college students to help them earn paid summer undergraduate research fellowships in an effort to promote diversity and equity in science

Team Leader, SMILE K-8 Outreach Program Mar. 2021 – Aug. 2022
The Scripps Research Institute

- Directed a team of 6 technicians, graduate students, and postdocs from the Andrew Ward Lab to design science and engineering lessons for middle school students in the San Diego area

- Taught 50-minute lessons to middle school science classes on viruses, vaccines, and microscopy, using creative methods like origami to teach complex scientific concepts to a younger scientific audience

Judge, Greater San Diego Science & Engineering Fair Mar. 2021

Professional Society Judging for The Scripps Research Institute

- Collaborated with a team of 4 postdocs and graduate students to evaluate over 200 science and engineering projects by local high school students
- Selected three students in the biochemistry and translational medicine categories to present their research at the *Scripps Research Community Symposium*

HONORS AND AWARDS

USC Renaissance Prize Recipient	2020
USC Provost's Undergraduate Research Fellow	Spring and Summer 2019
Dean's List, USC Dornsife College of Letters, Arts, and Sciences	2017 – 2020
USC Town and Gown Scholar	2016 – 2020

MEMBERSHIPS

Phi Beta Kappa	Inducted Spring 2019
International Baccalaureate Diploma Recipient	2016

SKILLS

Laboratory Methods:	Industrial aseptic technique training, BSL-2+ operations and safety strategies, BSC operations, assay optimization, serum processing, FPLC, electron microscopy, negative staining, cryo-EM grid preparation, cloning and protein purification, mammalian cell culture, neuronal cell culture, 5S laboratory strategies, immunocytochemistry, SDS-PAGE, light microscopy
Software and Computation:	MATLAB, RELION, cryoSPARC, single-particle reconstruction, neural network design, Adobe Illustrator, Microsoft Office Suite
Other:	Public speaking, technical communication, writing