Marc Havens Wadsworth II

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EDUCATION

Massachusetts Institute of Technology
Cambridge, MA, USA
Doctorate of Philosophy, Chemistry, February 2020 (Expected)
Advisor: Prof. Alex K. Shalek (Chemistry & HST)

Miami University
Oxford, OH, USA
Bachelor of Science, Chemistry, *Cum Laude*, 2014

RESEARCH & TEACHING EXPERIENCE

Graduate Research Associate **2014 – Present**
Prof. Alex K. Shalek
MIT
Design and utilize single-cell technologies to investigate system-level cellular behavior in infectious diseases. In particular, dissecting the infection trajectories of HIV, M. tuberculosis and malaria, and identifying factors that govern cell heterogeneity and response to these pathogens.

Teaching Fellow **2014 - 2017**
Biological Chemistry I (5.07 – Fall 2017): Professor Elizabeth M. Nolan & Professor Alexander M. Klibanov, MIT
Laboratory Techniques (5.310 – Fall 2014): Professor John J. Dolhun, MIT

Undergraduate Research Associate **2011 – 2014**
Prof. Jonathan Scaffidi
Miami University
Designed, tested, and implemented portable Surface-Enhanced Raman Spectroscopy (SERS) technologies to identify environmental contaminates at part per billion (ppb) concentrations.

LEADERSHIP

Massachusetts Institute of Technology, **Cambridge, MA, USA** **June 2015 - Present**
Co-Project Leader, MIT & the Bill & Melinda Gates Foundation

- Managed 3 international collaborations with the African Health Research Institute (AHRI).
- Discussed findings and results at 4 internationally-attended scientific conferences.
- Designed and executed over 50 multi-omic experiments studying HIV, TB, and malaria.
- Trained over 160 scientists from 16 countries on how to use single-cell technologies in their laboratories.

Massachusetts Institute of Technology, **Cambridge, MA, USA** **September 2017 – September 2018**
Co-Project Leader, MIT & Novartis

- Managed an academic and industry collaboration focused on discovering new melanoma drug targets.
- Presented my results in 4 meetings with the former bioinformatics Global Head of Oncology (now Vice President of Data Sciences at bluebird bio).
- Leveraged new computational methods to recreate a cellular differentiation directory, identifying unique biomarkers of two cellular sub-populations that could be targeted for melanoma drug treatment.

Miami University, **Oxford, OH, USA** **January 2013 – January 2014**
Executive Chair, Miami University Student Foundation

- Elected as 1 of 3 student representatives on the University Foundation Board.
- Collaborated with a team of 6 to manage a $580,000 endowment and fundraised over $20,000 for student scholarships.

RELEVANT SKILLS

- **Research Techniques**: Next-Generation Sequencing; Single-Cell mRNA Preparation; RNA-FISH; Gel Electrophoresis; Spectrometry; Surface-enhanced resonance Raman scattering (SERRS)
- **Software Experience**: Programming in R, Python, Unix, IGOR; Cloud Computing; Proficient working with large datasets; Expertise in the Adobe Suite; Expertise in Microsoft Office Suite

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AWARDS & HONORS

1. Top Junior Investigator Award, Bill & Melinda Gates Foundation, 2019
2. Harvey Fellowship, Mustard Seed Foundation, 2017-Present
3. Dumbros Fellowship, Massachusetts Institute of Technology, 2014-Present
4. Analytical Chemistry Undergraduate Award, The American Chemical Society, 2013
5. Undergraduate Summer Scholars Grant, Miami University, 2013
6. William H Schwarz Scholarship, Miami University, 2013
7. Elsa & Bruce Weidner Scholarship, Miami University, 2012-3
8. L. Scott & Margaret T. Bailey Scholarship, Miami University, 2012-3
9. Miami University General Scholarship, Miami University, 2010-3
10. Tom & Carol Tierney Piano Award, Miami University, 2011
11. Eagle Scout, Boy Scouts of America, 2010

PEER REVIEW PUBLICATIONS

1. Hughes, T.K.*, Wadsworth II, M.H.*, et al., 'Highly Efficient, Massively-Parallel Single-Cell RNA-Seq Reveals Cellular States and Molecular Features of Human Skin Pathology,' *BioRxiv*, (2019).
2. Waldman, B.S.*, Schwarz, D., Wadsworth II, M.H., et al., 'Identification of a master regulator of differentiation in *Toxoplasma*," *BioRxiv*, (2019).
3. Aicher, T.P., Carroll, S., Raddi, G., Gierahn, T., Wadsworth, M.H. II, et al., 'Seq-Well: A Sample-Efficient, Portable Picowell Platform for Massively Parallel Single-Cell RNA Sequencing,' *Single Cell Methods. Methods in Molecular Biology*, vol 1979 (2019).
4. van Galen, P.*, Hovestadt, V.*, Wadsworth II, M.H., et al., "Single-Cell RNA-Seq Reveals AML Hierarchies Relevant to Disease Progression and Immunity," *Cell,* **176**, 1-17 (2019).
5. Ordovas-Montanes, J.*, Dwyer, D.F.*, Nyquist, S.K., Buchheit, K.M., Deb, C., Wadsworth II, M.H., et al, "Reduced cellular diversity and an altered basal progenitor cell state inform epithelial barrier dysfunction in human type 2 immunity," *Nature*, **560**, 649-654 (2018).
6. Mead, B.E.*, Ordovas-Montanes, J.*, Braun, A.P., Levy, L.E., Bhargava, P., Szucs, M.J., Ammendolia, D.A., MacMullan, M.A., Yin, X., Hughes, T.K., Wadsworth II, M.H., et al., " Harnessing single-cell genomics to improvethe physiological fidelity of organoid-derived cell types," *BMC Biology*, **16**, 62 (2018).
7. Ordovas-Montanes, J.*, Dwyer, D.F.*, Nyquist, S.K., Buchheit, K.M., Deb, C., Wadsworth II, M.H., et al, "Reduced cellular diversity and an altered basal progenitor cell state inform epithelial barrier dysfunction in human type 2 immunity," *BioRxiv*, (2017).
8. Gierahn, T.M.*, Wadsworth II, M.H.*, et al., "Seq-Well: A Portable, Low-cost Platform for Single-Cell RNA-Seq of Low-Input Samples." *Nature Methods*, Advance Online Publication (2017).
9. Tirosh, I.*, Izar, B.*, Prakadan, S.M., Wadsworth II, M.H., et al., "Dissecting the multicellular ecosystem of metastatic melanoma by single-cell RNA-seq," *Science*, **352**, 189 (2016).
10. Wadsworth II, M.H.*, Hughes, T.K.*, and Shalek, A.K., "Marrying microfluidics and microwells for parallel, throughout single-cell genomics," *Genome Biology*, **16**, 129 (2015).

PATENTS

1. Functionalized Solid Support. WO2019084058A2 (2019).
2. Calling Genetic Variation from Single-Cell. WO2019084055A1 (2019).
3. Single Cell Analysis. US20190218607A1 (2019).
4. Semi-Permeable Arrays for Analyzing Biological Systems and Methods of Using Same. WO2017/124101 (2017).
5. Tumor and microenvironment gene expression, compositions of matter and methods of use thereof. WO2017/004153Al (2015).

INVITED TALKS

1. Malaria Research Community Retreat, Broad Institute, Cambridge, Massachusetts, 2019.
2. CTVD, Gates Foundation, Seattle, Washington, 2019.
3. Single Cell Workshop, UCSF, San Francisco, California, 2019.
4. Single Cell Workshop, University of Michigan, Ann Arbor, Michigan, 2018.
5. Single Cell Europe Conference, BIOCEV, Prague, Czech Republic, 2018.
6. Single Cell Workshop, Mahidol University, Bangkok, Thailand, 2017.
7. Single Cell Symposium, University of Helsinki, Finland, 2017.
8. Single Cell Genomics Day, New York Genome Center, New York, New York, 2016.
9. Single Cell Genomics, Sanger Institute, Hinxton, UK, 2016.
10. Klarman Cell Observatory Retreat, Broad Institute, Cambridge, Massachusetts, 2015.

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SERVICE

- Assisted Alex K. Shalek in reviewing papers for *Nucleic Acids Research*

ACTIVITIES & VOLUNTEERING

- *Volunteer*, **Cambridge Health Alliance (CHA) Hospitals**, Cambridge, MA — Fall 2018 – Present
- *Member*, **MIT American Jiu-Jitsu Club**, Cambridge, MA — Summer 2015 – Present

REFERENCES

Prof. Alex K. Shalek
Pfizer-Laubach Career Development Assistant Professor
Assistant Professor, Department of Chemistry, MIT
Core Member, Institute for Medical Engineering & Science, MIT
Extramural Member, Koch Institute for Integrative Cancer Research
Associate Member, Ragon Institute of MGH, MIT, & Harvard
Associate Member, Broad Institute of MIT & Harvard
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Prof. J. Christopher Love
Raymound A. (1921) and Helen E. St. Laurent Professor of Chemical Engineering, MIT
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