

Harrison Specht

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EDUCATION

Northeastern University, Ph.D. Bioengineering, Graduate Student expected 2021
Cornell University, B.A. Chemistry, *magna cum laude* 2014

RESEARCH EXPERIENCE

Northeastern University

Slavov Lab, Bioengineering & Barnett Institute, Graduate Student 2016–

Merck, Sharpe & Dohme Corporation

Merck Exploratory Sciences Division, Coop Spring 2020

Broad Institute of MIT and Harvard

Proteomics Platform, Research Associate 2014–2016

Cornell University, Ithaca, NY

Petersen Lab, Department of Chemistry, Research Assistant 2012–2014

Zinder Lab, Department of Microbiology, Research Assistant 2010–2011

The Triple Helix, magazine, Executive Editor-in-chief 2013 – 2014

Bermuda Institute for Ocean Sciences

National Science Foundation REU Fellow 2013

Vertex Pharmaceuticals, Boston, MA

Drug Metabolism and Pharmacokinetics, Internship 2013

FELLOWSHIPS AND AWARDS

2021 NSF I-Corps Site Program at Northeastern

2021 Frequency Bio by Pillar VC & Petri pillar.vc/frequency/

2020 Rising Stars in Proteomics and Metabolomics, Journal of Proteome Research.

<https://pubs.acs.org/doi/full/10.1021/acs.jproteome.0c01026>

2019 2nd place in Chemical Biology, Royal Society of Chemistry Twitter Poster Conference

2016– College of Engineering Dean's Distinguished Fellowship, Northeastern University

2013 Best Oral Presentation, Bermuda Institute for Ocean Science NSF REU Program

2013 National Science Foundation REU Fellowship, Bermuda Institute for Ocean Sciences

PUBLICATIONS

Petelski, A.A., Emmott, E., Leduc, A., Huffman, R.G., **Specht, H.**, Perlman, D.H., Slavov, N. Multiplexed single-cell proteomics using SCoPE2. bioRxiv 2021.03.12.435034; doi: <https://doi.org/10.1101/2021.03.12.435034> In press at **Nature Protocols**

Specht, H., Emmott, E., Petelski, A.A. et al. Single-cell proteomic and transcriptomic analysis of macrophage heterogeneity using SCoPE2. Genome Biol 22, 50 (2021). <https://doi.org/10.1186/s13059-021-02267-5>

Specht, H., Slavov, N., 2021. Optimizing accuracy and depth of protein quantification in experiments using isobaric carriers. J. Proteome Res. 20, 880-887. <https://doi.org/10.1021/acs.jproteome.0c00675>

Keshishian et al. Highly multiplexed quantitative phosphosite assay for biology and preclinical studies. bioRxiv 2020.12.08.415281; doi: <https://doi.org/10.1101/2020.12.08.415281> In press at **Molecular Systems Biology**

Huffman, R.G., Chen, A., **Specht, H.**, Slavov, N., 2019. DO-MS: Data-Driven Optimization of Mass Spectrometry Methods. J. Proteome Res. 18, 2493-2500. <https://doi.org/10.1021/acs.jproteome.9b00039>

Specht, H., Harmange, G., Perlman, D.H., Emmott, E., Niziolek, Z., Budnik, B., Slavov, N., 2018. Automated sample preparation for high-throughput single-cell proteomics. bioRxiv 399774. <https://doi.org/10.1101/399774>

Specht, H., Slavov, N., 2018. Transformative Opportunities for Single-Cell Proteomics. J. Proteome Res. 17, 2565-2571. <https://doi.org/10.1021/acs.jproteome.8b00257>

Khajuria, R.K., Munschauer, M., Ulirsch, J.C., Fiorini, C., Ludwig, L.S., McFarland, S.K., Abdulhay, N.J., **Specht, H.**, Keshishian, H., Mani, D.R., Jovanovic, M., Ellis, S.R., Fulco, C.P., Engreitz, J.M., Schütz, S., Lian, J., Gripp, K.W., Weinberg, O.K., Pinkus, G.S., Gehrke, L., Regev, A., Lander, E.S., Gazda, H.T., Lee, W.Y., Panse, V.G., Carr, S.A., Sankaran, V.G., 2018. Ribosome Levels Selectively Regulate Translation and Lineage Commitment in Human Hematopoiesis. Cell 173, 90-103.e19. <https://doi.org/10.1016/j.cell.2018.02.036>

Keshishian, H., Burgess, M.W., **Specht, H.**, Wallace, L., Clauser, K.R., Gillette, M.A., Carr, S.A., 2017. Quantitative, multiplexed workflow for deep analysis of human blood plasma and biomarker discovery by mass spectrometry. Nat Protoc 12, 1683-1701. <https://doi.org/10.1038/nprot.2017.054>

TALKS

2020. Harrison Specht, Edward Emmott, Aleksandra A. Petelski, R. Gray Huffman, David H. Perlman, Marco Serra, Peter Kharchenko, Antonius Koller, Nikolai Slavov. "How to perform quantitative single cell proteomics with SCoPE2." GenomeWeb Webinar Series. *Invited*

2020. Harrison Specht, Edward Emmott, Aleksandra A. Petelski, R. Gray Huffman, David H. Perlman, Marco Serra, Peter Kharchenko, Antonius Koller, Nikolai Slavov. "How to perform quantitative single cell proteomics with SCoPE2." Association of Biomolecular Resource Facilities (ABRF) 2020 Annual Meeting. *Invited*

2019. Harrison Specht, Edward Emmott, Aleksandra A. Petelski, R. Gray Huffman, David H. Perlman, Antonius Koller, Nikolai Slavov. "Design of single cell proteomics experiments." Single

Cell Proteomics Conference. Boston, MA. 2019.

2019. Harrison Specht, Nikolai Slavov. Quantifying proteins by mass spectrometry. Models, Inference, and Algorithms Seminar. Broad Institute of MIT and Harvard. *Chalk-talk*

2018. Harrison Specht, Guillaume Harmange, David H Perlman, Edward Emmott, Zachary Niziolek, Bogdan Budnik, Nikolai Slavov. "Automated sample preparation for high-throughput single-cell proteomics." HUPO 2018.

2018. Harrison Specht, Guillaume Harmange, David H Perlman, Edward Emmott, Zachary Niziolek, Bogdan Budnik, Nikolai Slavov. "Automated sample preparation for high-throughput single-cell proteomics." Single Cell Proteomics Conference. Boston, MA. 2018.

POSTERS

2019. Harrison Specht. "Automated sample preparation for high-throughput single-cell proteomics." Royal Society of Chemistry Twitter Poster Conference. *Twitter poster presenter* Awarded 2nd place in Chemical Biology category.

2018. Hasmik Keshishian, Luke Wallace, **Harrison Specht**, Judit Jan-Valbuena, Rob McDonald, Dale Petterson, Eric Kuhn, Michael Burgess, D. R. Mani, Tomas Rejtar, Javad Golji, Karen Wang, William Sellers, Steven A. Carr. "SigPath300: A high throughput MS-based assay to quantify over 300 phosphosites of known biological relevance in cells and tissues." American Society for Mass Spectrometry Annual Meeting. *Contributor*

2017. Bogdan Budnik, Ezra Levy, **Harrison Specht**, Nikolai Slavov. "Exploring cell division dynamics across single cell proteomes." Cold Spring Harbor Laboratories: Single Cell Analyses. *Poster Presenter*

2017. Harrison Specht, Ezra Levy, Bogdan Budnik, Nikolai Slavov. "Mass-spectrometry of single mammalian cells quantifies proteome heterogeneity during cell differentiation." American Society for Mass Spectrometry Annual Meeting. *Poster Presenter*

2015. Harrison Specht, Hasmik Keshishian, Rajiv K. Khajuria, et al. "Addressing the challenge of ribosomal protein stoichiometry by proteomics." Broad Institute of MIT and Harvard Retreat. *Poster Presenter*

2013. Harrison Specht and Andrew Peters "Investigating North Atlantic Tar in Bermuda: the hydrocarbon composition of North Atlantic pelagic tar and their hydrocarbon leaching into seawater." BIOS NEF REU Program. *Presenter*

PROFESSIONAL AFFILIATIONS, TRAINING & SERVICE

- Volunteer moderator for Single Cell Proteomics Conference (Zoom) 2020
- Volunteer for Single Cell Proteomics Conference 2018, 2019
- Northeastern University Graduate Student Liaison, 2018-2019
- Member of Northeastern University Fencing Club
- Member of Barnett Institute for Chemical and Biological Analysis
- eLife Ambassador, 2018
- ASAPbio Ambassador, 2018
- American Society for Mass Spectrometry
- May Institute on computation and statistics for mass spectrometry and proteomics, 2016
- Lab preprint journal club founder

TECHNIQUES

Coding and Software: R, Shiny, MS-Fragger, DIA-NN, SpectroNaut, MaxQuant, Skyline

Experimental: Single-cell proteomics, triple-quad and orbitrap-based mass spectrometry proteomics, data dependent (DDA) and data independent (DIA) acquisition, protein and peptide N-terminomics, phosphoproteomics, antibody and chemical enrichment of proteins and peptides, reverse-phase and ERLIC liquid chromatography, robotic sample preparation, cell culture, flow cytometry

REFERENCES

Available upon request