

# William E Fondrie, PhD

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## Education

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- 2013–18 **PhD in Molecular Medicine**  
University of Maryland, Baltimore  
Advisors: Dudley Strickland, PhD and David Goodlett, PhD
- 2009–13 **BS in Chemistry**  
University of North Carolina at Chapel Hill

## Employment and Professional Appointments

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- 2019– **University of Washington Data Science Postdoctoral Fellow**
- 2018– **Postdoctoral Fellow**, University of Washington  
Advisor: William Noble, PhD
- 2013–18 **Graduate Research Assistant**, University of Maryland, Baltimore  
Advisors: Dudley Strickland, PhD and David Goodlett, PhD
- 2012–13 **Undergraduate Research Assistant**, University of North Carolina at Chapel Hill  
Advisor: John Papanikolas, PhD

## Awards and Honors

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- 2019– **Ruth L Kirschstein Institutional National Research Service Award**  
NIH T32HG000035, Postdoctoral Trainee
- 2017 **Travel Fellowship to the May Institute on Computation and Statistics for Mass Spectrometry and Proteomics**
- 2017–18 **Ruth L Kirschstein Individual National Research Service Award**  
NIH F31CA213815, PI
- 2016–17 **Ruth L Kirschstein Institutional National Research Service Award**  
NIH T32HL007698, Predoctoral Trainee
- 2012 **Markham Summer Undergraduate Research Award**
- 2009 **Central Carolina's chapter of Phi Beta Kappa Scholarship**

## Peer-Reviewed Publications

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(\* indicates equal contributions)

- (11) **Fondrie WE**, Noble WS. (2020) Machine learning strategy that leverages large datasets to boost statistical power in small-scale experiments. *J Proteome Res* 6;19(3):1267–1274. PMID: 32009418.
- (10) Liang T, Leung LM, Opene B, **Fondrie WE**, Lee YI, Chandler CE, Yoon SH, Doi Y, Ernst RK, Goodlett DR. (2019) Rapid microbial identification and antibiotic resistance detection by mass spectrometric analysis of membrane lipids. *Anal Chem* 91(2):1286–1294. PMID: 30571097.
- (9) **Fondrie WE**, Liang T, Oyler BL, Leung LM, Ernst RK, Strickland DK, Goodlett DR. (2018) Pathogen Identification Direct From Polymicrobial Specimens Using Membrane Glycolipids. *Sci Rep* 8(1):15857. PMID: 30367087.

- (8) Liang T, Schneider T, Yoon SH, Oyler BL, Leung LM, **Fondrie WE**, Yen G, Huang Y, Ernst RK, Nilsson E, Goodlett DR. (2018) Optimized surface acoustic wave nebulization facilitates bacterial phenotyping. *Int J Mass Spectrom* 427:65–72.
- (7) Au DT, Arai AL, **Fondrie WE**, Muratoglu SC, Strickland DK. (2018) Role of the LDL Receptor-Related Protein 1 in Regulating Protease Activity and Signaling Pathways in the Vasculature. *Curr Drug Targets* 19(11):1276–1288. PMID: 29749311.
- (6) Au DT, Ying Z, Hernández-Ochoa EO, **Fondrie WE**, Hampton B, Migliorini M, Galisteo R, Schneider MF, Daugherty A, Rateri DL, Strickland DK, Muratoglu SC. (2018) LRP1 (Low-Density Lipoprotein Receptor-Related Protein 1) Regulates Smooth Muscle Contractility by Modulating Ca<sup>2+</sup> Signaling and Expression of Cytoskeleton-Related Proteins. *Arterioscler Thromb Vasc Biol* 38(11):2651–2664. PMID: 30354243.
- (5) Khan MM, Tran BQ, Jang Y, Park S, **Fondrie WE**, Chowdhury K, Yoon SH, Goodlett DR, Chae S, Chae H, Seo S, Goo YA. (2017) Assessment of the therapeutic potential of persimmon leaf extract on prediabetic subjects. *Mol Cells* 40(7):466. PMID: 28743946.
- (4) Leung LM, **Fondrie WE**, Doi Y, Johnson JK, Strickland DK, Ernst RK, Goodlett DR. (2017) Identification of the ESKAPE pathogens by mass spectrometric analysis of microbial membrane glycolipids. *Sci Rep* 7(1):6403. PMID: 28743946.
- (3) Clark DJ, **Fondrie WE**, Liao Z, Yang AJ, Mao L. (2016) Triple SILAC quantitative proteomic analysis reveals differential abundance of cell signaling proteins between normal and lung cancer-derived exosomes. *J Proteomics* 133:161–169. PMID: 26739763.
- (2) Clark DJ\*, **Fondrie WE\***, Liao Z, Hanson PI, Fulton A, Mao L, Yang AJ. (2015) Redefining the breast cancer exosome proteome by tandem mass tag quantitative proteomics and multivariate cluster analysis. *Anal Chem* 87(20):10462–10469. PMID: 26378940.
- (1) Ma D, Bettis SE, Hanson K, Minakova M, Alibabaei L, **Fondrie W**, Ryan DM, Papoian GA, Meyer TJ, Waters ML, Papanikolas JM. (2013) Interfacial energy conversion in Ru(II) polypyridyl-derivatized oligoproline assemblies on TiO<sub>2</sub>. *J Am Chem Soc* 135(14):5250–5253. PMID: 23514453.

## Additional Publications

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- (1) **Fondrie WE**. Biological Insight from Mass Spectrometry Through Novel Computational Approaches. Ph.D. dissertation. University of Maryland, Baltimore. June, 2018. Advisors: Dudley K. Strickland, Ph.D. and David R. Goodlett, Ph.D.

## Patents

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- (1) Goodlett DR, Ernst RK, Liang T, **Fondrie WE**, Nilsson E. (2018) Methods for Lipid Extraction and Identification of Microbes Using Same Via Mass Spectrometry. US Patent Application 2017066342. Filed 12/14/2017. *Patent Pending*.

## Scientific Software Contributions

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- (10) **mokapot**. A Python package that enables the fast and flexible application of semi-supervised learning to detect peptides in proteomics experiments.  
Homepage: <https://github.com/wfondrie/mokapot>  
Roles: creator and maintainer

- (9) **ppx**. A Python package to retrieve metadata and files for proteomics projects from public repositories through ProteomeXchange.  
Homepage: <https://github.com/wfondrie/ppx>  
Roles: creator and maintainer
- (8) **Crux**. A mass spectrometry toolkit for proteomics data.  
Homepage: <http://crux.ms>  
Roles: contributor
- (7) **Percolator**. Semi-supervised learning for peptide identification from shotgun proteomics datasets.  
Homepage: <http://percolator.ms>  
Roles: contributor
- (6) **dask-ml**. A library for distributed and parallel machine learning using dask.  
Homepage: <https://ml.dask.org>  
Roles: contributor
- (5) **Kojak**. A search engine for cross-linking proteomics.  
Homepage: <http://www.kojak-ms.org>  
Roles: contributor
- (4) **MSToolkit**. A library for interacting with proteomics data formats.  
Homepage: <https://github.com/mhoopmann/mstoolkit>  
Roles: contributor
- (3) **ANN-SoLo**. A spectral library search engine for fast and accurate open modification searching.  
Homepage: <https://github.com/bittremieux/ANN-SoLo>  
Roles: contributor
- (2) **spectrum\_utils**. A Python package for efficient MS/MS spectrum processing and visualization.  
Homepage: [https://github.com/bittremieux/spectrum\\_utils](https://github.com/bittremieux/spectrum_utils)  
Roles: contributor.
- (1) **xComb**. A cross-linked peptide database approach to protein-protein interaction analysis.  
Homepage: <https://github.com/GoodlettLab/xComb>  
Roles: maintainer and contributor

## Talks

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- (3) **Fondrie WE**. Learning from Mass Spectra. Genome Sciences Seminar, August 12, 2020. University of Washington Department of Genome Sciences, Seattle, Washington.
- (2) **Fondrie WE**, Leung LM, Strickland DK, Ernst RK, Goodlett DR. Detecting antibiotic resistance by MALDI-TOF analysis of bacterial membrane glycolipids. 65th American Society for Mass Spectrometry Annual Conference on Mass Spectrometry and Allied Topics, June 4-8, 2017. Indianapolis, IN.
- (1) **Fondrie WE**, Muratoglu SC, Hampton B, Migliorini M, Galisteo R, Strickland DK. LRP1 modulates TGF- $\beta$  signaling in the descending thoracic aorta. Molecular Medicine Research Retreat, October 6, 2016. Baltimore, MD.

## Posters

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- (9) **Fondrie, WE**, Noble WS. Mokapot: Fast and Flexible Semi-Supervised Learning for Peptide Detection. 28th Conference on Intelligent Systems For Molecular Biology, July 13–16, 2020. Montreal, QC, Canada. *Moved online due to COVID-19.*

- (8) **Fondrie, WE**, Noble WS. Boosting statistical power in small-scale experiments with Percolator. US Human Proteome Organization 16th Annual Conference. March 8–11, 2020. Seattle, WA *Moved online due to COVID-19*.
- (7) **Fondrie WE**, Noble WS. Robust Cross-Linked Peptide Detection Using Pretrained Neural Networks. 67th American Society for Mass Spectrometry Annual Conference on Mass Spectrometry and Allied Topics, June 1–6, 2019. Atlanta, GA.
- (6) **Fondrie WE**, Hampton B, Muratoglu SC, Goodlett DR, Strickland DK. Detecting LRP1B protein interactions in glioma. UMB Cancer Biology Research Retreat, June 13, 2017. Baltimore, MD.
- (5) **Fondrie WE**, Muratoglu SC, Hampton B, Migliorini M, Galisteo R, Strickland DK. LRP1 modulates TGF- $\beta$  signaling in the descending thoracic aorta. GenTAC Thoracic Aortic Summit, September 22–23, 2016. Washington, DC.
- (4) **Fondrie WE**, Hampton B, Muratoglu SC, Goodlett DR, Strickland DK. Defining a mechanism of LRP1B tumor suppression in glioblastoma. UMB Cancer Biology Research Retreat, May 23, 2016. Baltimore, MD.
- (3) **Fondrie WE**, Clark DJ, Catania SM, Goo YA, Strickland DK, Goodlett DR. Investigating the regulated intramembrane proteolysis of LRP1B in glioblastoma progression through a proteogenomic approach. Mass Spectrometry in Biotechnology and Medicine, July 5–11, 2015. Dubrovnik, Croatia.
- (2) **Fondrie WE**, Clark DJ, Liao Z, Chen Y, Yang AJ. Novel identification of JAK1/STAT signaling proteins in breast cancer exosomes through shotgun proteomic analysis using multiple protein database search algorithms. UMB Cancer Biology Research Retreat, June 9, 2014. Baltimore, MD.
- (1) **Fondrie WE**, Bettis S, Ma D, Minakova M, Wilger D, Papoian G, Waters M, Papanikolas J. Flexibility matters: The role of scaffold tethers in Ru(II) and Os(II) chromophore separation. Southeastern Regional Meeting of the American Chemical Society, November 14–17, 2012. Raleigh, NC.

## Mentoring

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| 2020– | <b>Elena Romero</b> , PhD student<br>Department of Genome Sciences, University of Washington |
| 2020– | <b>Donovan See</b> , Undergraduate student<br>University of Washington                       |
| 2020– | <b>Lilian Heil</b> , PhD student<br>Department of Genome Sciences, University of Washington  |
| 2019– | <b>Kianna Hales</b> , PhD student<br>Department of Genome Sciences, University of Washington |

## Professional Service

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### Departmental Service

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| 2019–   | UW Genome Sciences Art Committee                         |
| 2018–   | Postdoctoral representative in UW Genome Sciences        |
| 2015–17 | UMB Molecular Medicine Event Planning Committee          |
| 2017    | UMB Cancer Biology Research Retreat Organizing Committee |
| 2016    | UMB Grollman Lecture Organizing Committee                |

**Conference Organization**

2020 Workshop on High Performance Computing, Big Data Analytics and Integration for Multi-Omics Biomedical Data (HPC-BOD 2020) *Program Committee Member*.

**Professional Memberships**

2020– United States Human Proteome Organization (US HUPO)  
2013– American Society for Mass Spectrometry (ASMS)

**Journal Referee:** Scientific Reports

**Conference Referee:** Intelligent Systems for Molecular Biology 2020

**Scientific Blog Posts**

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- (2) **Fondrie WE.** (2019) Using Static Models in Percolator.  
<https://willfondrie.com/2019/11/using-static-models-in-percolator/>
- (1) **Fondrie WE.** (2019) An Intuitive Look at the xcorr Score Function in Proteomics.  
<https://willfondrie.com/2019/02/an-intuitive-look-at-the-xcorr-score-function-in-proteomics/>

**References**

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**Dudley Strickland**

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**David Goodlett**

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