



## Anthony Cesnik

Postdoctoral Scholar, Bioengineering

### Bio

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#### BIO

I am advancing the vision of enabling an understanding of biology at the proteoform level, peering into the cellular machinery in a way that reveals precisely which molecule is acting in the biological system. Recently, I have been working in Emma Lundberg's lab on understanding how the expression of these molecules varies between individual cells in space and time. Emma Lundberg's group has a wealth of experience in using microscopy to yield biological images that paint a picture of this cell-to-cell heterogeneity of protein expression information, and joining her lab has deepened my expertise in integrating datasets to perform innovative analyses of single-cell protein expression. I hope to extend this towards analyzing single-cell proteoform expression, understanding the heterogeneity and flux between these proteoforms in space and time, and digging into the fundamental insights about human biology these data may reveal.

#### HONORS AND AWARDS

- Gary Parr Memorial Award, University of Wisconsin - Madison (2018)
- Richard and Joan Hartl Award for Research Excellence in Analytical Chemistry, University of Wisconsin - Madison (2017)
- Computation and Informatics in Biology and Medicine, Predoctoral Trainee, University of Wisconsin - Madison (2014-2017)
- Stephen Morton Research Award, University of Wisconsin - Madison (2015)
- Gerhard T. Alexis Scholarship, Gustavus Adolphus College (2011)

#### PROFESSIONAL EDUCATION

- Doctor of Philosophy, University of Wisconsin Madison (2018)
- Bachelor of Science, Gustavus Adolphus College (2012)

#### STANFORD ADVISORS

- Emma Lundberg, Postdoctoral Faculty Sponsor

### Publications

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#### PUBLICATIONS

- **The Blood Proteoform Atlas: A reference map of proteoforms in human hematopoietic cells.** *Science (New York, N.Y.)*  
Melani, R. D., Gerbasi, V. R., Anderson, L. C., Sikora, J. W., Toby, T. K., Hutton, J. E., Butcher, D. S., Negrao, F., Seckler, H. S., Srzentic, K., Fornelli, L., Camarillo, J. M., LeDuc, et al  
1800; 375 (6579): 411-418
- **MetaNetwork Enhances Biological Insights from Quantitative Proteomics Differences by Combining Clustering and Enrichment Analyses.** *Journal of proteome research*  
Carr, A. V., Frey, B. L., Scalf, M., Cesnik, A. J., Rolfs, Z., Pike, K. A., Yang, B., Keller, M. P., Jarrard, D. F., Shortreed, M. R., Smith, L. M.  
1800

- **Proteomics Standards Initiative's ProForma 2.0: Unifying the Encoding of Proteoforms and Peptidoforms.** *Journal of proteome research*  
LeDuc, R. D., Deutsch, E. W., Binz, P. A., Fellers, R. T., Cesnik, A. J., Klein, J. A., Van Den Bossche, T., Gabriels, R., Yalavarthi, A., Perez-Riverol, Y., Carver, J., Bittremieux, W., Kawano, et al  
2022
- **Spatiotemporal dissection of the cell cycle with single-cell proteogenomics.** *Nature*  
Mahdessian, D., Cesnik, A. J., Gnann, C., Danielsson, F., Stenstrom, L., Arif, M., Zhang, C., Le, T., Johansson, F., Shuttan, R., Backstrom, A., Axelsson, U., Thul, et al  
2021; 590 (7847): 649–54
- **Illuminating nongenetic cellular heterogeneity with spatial proteomics** *Trends in Cancer*  
Gnann, C., Cesnik, A. J., Lundberg, E.  
2021; 7 (4): 278-282
- **Mapping the nucleolar proteome reveals a spatiotemporal organization related to intrinsic protein disorder.** *Molecular systems biology*  
Stenstrom, L., Mahdessian, D., Gnann, C., Cesnik, A. J., Ouyang, W., Leonetti, M. D., Uhlen, M., Cuylen-Haering, S., Thul, P. J., Lundberg, E.  
2020; 16 (8): e9469
- **Comprehensive Detection of Single Amino Acid Variants and Evaluation of Their Deleterious Potential in a PANC-1 Cell Line.** *Journal of proteome research*  
Tan, Z. n., Zhu, J. n., Stemmer, P. M., Sun, L. n., Yang, Z. n., Schultz, K. n., Gaffrey, M. J., Cesnik, A. J., Yi, X. n., Hao, X. n., Shortreed, M. R., Shi, T. n., Lubman, et al  
2020
- **Spritz: A Proteogenomic Database Engine.** *Journal of proteome research*  
Cesnik, A. J., Miller, R. M., Ibrahim, K. n., Lu, L. n., Millikin, R. J., Shortreed, M. R., Frey, B. L., Smith, L. M.  
2020
- **Analysis of the Human Protein Atlas Image Classification competition.** *Nature methods*  
Ouyang, W. n., Winsnes, C. F., Hjelmare, M. n., Cesnik, A. J., Åkesson, L. n., Xu, H. n., Sullivan, D. P., Dai, S. n., Lan, J. n., Jinmo, P. n., Galib, S. M., Henkel, C. n., Hwang, et al  
2019; 16 (12): 1254–61
- **Comprehensive in vivo identification of the cMyc mRNA protein interactome using HyPR-MS RNA**  
Spiniello, M., Steinbrink, M. I., Cesnik, A. J., Miller, R. M., Scalf, M., Shortreed, M. R., Smith, L. M.  
2019; 25: 1337–1352
- **HyPR-MS for Multiplexed Discovery of MALAT1, NEAT1, and NORAD lncRNA Protein Interactomes** *JOURNAL OF PROTEOME RESEARCH*  
Spiniello, M., Knoener, R. A., Steinbrink, M. I., Yang, B., Cesnik, A. J., Buxton, K. E., Scalf, M., Jarrard, D. F., Smith, L. M.  
2018; 17 (9): 3022-3038
- **Long Noncoding RNAs AC009014.3 and Newly Discovered XPLAID Differentiate Aggressive and Indolent Prostate Cancers** *TRANSLATIONAL ONCOLOGY*  
Cesnik, A. J., Yang, B., Truong, A., Etheridge, T., Spiniello, M., Steinbrink, M. I., Shortreed, M. R., Frey, B. L., Jarrard, D. F., Smith, L. M.  
2018; 11 (3): 808-814
- **ProForma: A Standard Proteoform Notation** *JOURNAL OF PROTEOME RESEARCH*  
LeDuc, R. D., Schwammle, V., Shortreed, M. R., Cesnik, A. J., Solntsev, S. K., Shaw, J. B., Martin, M. J., Vizcaino, J. A., Alpi, E., Danis, P., Kelleher, N. L., Smith, L. M., Ge, et al  
2018; 17 (3): 1321-1325
- **Expanding Proteoform Identifications in Top-Down Proteomic Analyses by Constructing Proteoform Families** *ANALYTICAL CHEMISTRY*  
Schaffer, L. V., Shortreed, M. R., Cesnik, A. J., Frey, B. L., Solntsev, S. K., Scalf, M., Smith, L. M.  
2018; 90 (2): 1325-1333
- **Identification and Quantification of Murine Mitochondrial Proteoforms Using an Integrated TopDown and IntactMass Strategy** *Journal of Proteome Research*  
Schaffer, L. V., Rensvold, J. W., Shortreed, M. R., Cesnik, A. J., Jochem, A., Scalf, M., Frey, B. L., Pagliarini, D. J., Smith, L. M.  
2018; 17: 3526–3536
- **Proteoform Suite: Software for Constructing, Quantifying, and Visualizing Proteoform Families** *JOURNAL OF PROTEOME RESEARCH*

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Cesnik, A. J., Shortreed, M. R., Schaffer, L. V., Knoener, R. A., Frey, B. L., Scalf, M., Soltsev, S. K., Dai, Y., Gasch, A. P., Smith, L. M.

2018; 17 (1): 568-578

- **Proteomics in non-human primates: utilizing RNA-Seq data to improve protein identification by mass spectrometry in vervet monkeys** *BMC GENOMICS*  
Proffitt, J., Glenn, J., Cesnik, A. J., Jadhav, A., Shortreed, M. R., Smith, L. M., Kavanagh, K., Cox, L. A., Olivier, M.  
2017; 18: 877
- **Elucidating Escherichia coli Proteoform Families Using Intact-Mass Proteomics and a Global PTM Discovery Database** *JOURNAL OF PROTEOME RESEARCH*  
Dai, Y., Shortreed, M. R., Scalf, M., Frey, B. L., Cesnik, A. J., Soltsev, S., Schaffer, L. V., Smith, L. M.  
2017; 16 (11): 4156-4165
- **HyCCAPP as a tool to characterize promoter DNA-protein interactions in Saccharomyces cerevisiae** *GENOMICS*  
Guillen-Ahlers, H., Rao, P. K., Levenstein, M. E., Kennedy-Darling, J., Perumalla, D. S., Jadhav, A. L., Glenn, J. P., Ludwig-Kubinski, A., Drigalenko, E., Montoya, M. J., Goring, H. H., Anderson, C. D., Scalf, et al  
2016; 107 (6): 267-273
- **Elucidating Proteoform Families from Proteoform Intact-Mass and Lysine-Count Measurements** *JOURNAL OF PROTEOME RESEARCH*  
Shortreed, M. R., Frey, B. L., Scalf, M., Knoener, R. A., Cesnik, A. J., Smith, L. M.  
2016; 15 (4): 1213-1221
- **Human Proteomic Variation Revealed by Combining RNA-Seq Proteogenomics and Global Post-Translational Modification (G-PTM) Search Strategy** *JOURNAL OF PROTEOME RESEARCH*  
Cesnik, A. J., Shortreed, M. R., Sheynkman, G. M., Frey, B. L., Smith, L. M.  
2016; 15 (3): 800-808
- **Proteogenomics: Integrating Next-Generation Sequencing and Mass Spectrometry to Characterize Human Proteomic Variation** *ANNUAL REVIEW OF ANALYTICAL CHEMISTRY, VOL 9*  
Sheynkman, G. M., Shortreed, M. R., Cesnik, A. J., Smith, L. M., Bohn, P. W., Pemberton, J. E.  
2016; 9: 521-545
- **Electrochemical Synthesis of Binary and Ternary Niobium-Containing Oxide Electrodes Using the p-Benzoquinone/Hydroquinone Redox Couple** *LANGMUIR*  
Papa, C. M., Cesnik, A. J., Evans, T. C., Choi, K.  
2015; 31 (34): 9502-9510