

Lance Michael Hellman

Assistant Professor of Human Health Sciences

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Education

- 2010-2013** University of Notre Dame (Notre Dame, IN); Post-Doctoral training
2006-2011 University of Kentucky (Lexington, KY); Ph.D. Biochemistry
1992-1993 Medical University of South Carolina (Charleston, SC); B.S. Cytotechnology
1987-1992 University of South Carolina (Columbia, SC); B.S. Biology

Professional Experience

- 2019-current** Assistant Professor; Nevada State College; Department of Physical and Life Sciences
2017-2019 Research Assistant Professor; University of Notre Dame; Department of Chemistry and Biochemistry
2013-2017 Research Scientist I in the laboratory of Dr. Brian Baker; University of Notre Dame; Department of Chemistry and Biochemistry
2012-2019 Adjunct Assistant Professor; Indiana University South Bend; Department of Chemistry and Biochemistry
2011-2013 Post-Doctoral Scholar in the laboratory of Dr. Brian Baker; University of Notre Dame; Department of Chemistry and Biochemistry
2001-2006 Staff cytotechnologist at Gettysburg Hospital, Gettysburg, PA
2000-2001 Part-time staff cytotechnologist at Holy Spirit Hospital, Camp Hill, PA
1993-1999 Staff cytotechnologist at Holy Spirit Hospital, Camp Hill, PA

Publications

NCBI biography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/lance.hellman.1/bibliography/48115792/public/?sort=date&direction=ascending>

33. Singh, N.K., Alonso, J.A., Devlin, J.R., Keller, G.L.J., Davencaze, L.M., Arbuiso, A.G., Weiss, L.I., Rosenberg, A.M., **Hellman, L.M.**, Nishimura, M.I., & Baker, B.M. (2022) A Class-Mismatched TCR Bypasses MHC Restriction Via an Unorthodox but Fully Functional Binding Geometry. *Nature Communications* **13**, 7189. PMID: [36424374](#)

32. Liu, C., Song, Q., Liu, H., Dasgupta, M., **Hellman, L.M.**, Zhang, X., Qu, K., Xue, H., Wang, Y., Fan, F., Peng, M., Li, N., Xu, B., Chang, Q., Yu, D., Ge, L., Zhang, Y., Cui, Z., Zhang, P., Heller, B., Zhang, H., Shi, B., Baker, B.M., & Liu, C. (2022) Validation and Promise of a TCR Mimic Antibody for Cancer Immunotherapy of Hepatocellular Carcinoma. *Scientific Reports* **12**, 12068. PMID: [35840635](#)

31. Ma, J., Ayers, C.M., **Hellman, L.M.**, Devlin, J.R., & Baker, B.M. (2021) Dynamic Allosteric Controls the Peptide Sensitivity of the Ly49C Natural Killer Receptor. *Journal of Biological Chemistry* **296**, 100686. PMID: [33891944](#)

30. Smith, A.R., Alonso, J.A., Ayres, C.M., Singh, N.K., **Hellman, L.M.**, & Baker, B.M. (2021) Structurally Silent Peptide Anchor Modifications Allosterically Modulate T Cell Recognition in a Receptor Dependent Manner. *Proceedings of the National Academy of Science* **118**, e2018125118. PMID: [33468649](#)
29. Singh, N.K., Alonso, J.A., Harris, D.T., Anderson, S.D., Ma, J., **Hellman, L.M.**, Rosenberg, A.M., Kolawole, E.M., Evavold, B.D., Kranz, D.M., & Baker, B.M. (2020) An Engineered T Cell Receptor Variant Realizes the Limits of Functional Binding Modes. *Biochemistry* **59**, 4163. PMID: [33074657](#)
28. Ayres, C.C., Abualrous, E.T., Bailey, A., Abraham Arega, C., **Hellman, L.M.**, Corcelli, S.A., Elliott, T., & Baker, B.M. (2019) Peptide-Dependent Tuning of Class I MHC Protein Global Flexibility. *Frontiers in Immunology* **10**, 966. PMID: [31130956](#)
27. **Hellman, L.M.**, Foley, K.C., Singh, N.K., Alonso, J.A., Riley, T.P., Devlin, J.R., Ayres, C.M., Keller, G.L.J., Zhang, Y., Vander Kooi, C.W., Nishimura, M.I., & Baker, B.M. (2019) Improving T Cell Receptor on Target Specificity Via Structure-Guided Design. *Molecular Therapy* **27**, 300. PMID: [30617019](#)
26. Riley, T.P., **Hellman, L.M.**, Gee, M.H., Mendova, J.L., Alonso, J.A., Foley, K.C., Nishimura, M.I., Vander Kooi, C.W., Garcia, K.C., & Baker, B.M. (2018) Dramatic pMHC Adaptability in the Absence of Molecular Mimicry Expands TCR Cross-Reactivity. *Nature Chemical Biology* **14**, 934. PMID: [30224695](#)
25. Spear, T.T., Wang, Y., Simms, P.E., Garrett-Mayer, E., **Hellman, L.M.**, Baker, B.M., & Nishimura, M.I. (2018) Altered Peptide Ligands Impact the Diversity of Polyfunctional Phenotypes in T Cell Receptor Gene-Modified T Cells. *Molecular Therapy* **26**, 996. PMID: [29503203](#)
24. Moore, T., Regan, C., Scurti, G.M., Hutchens, K.A., Godellas, C., Clark, A.L., Kolawole, E.M., **Hellman, L.M.**, Singh, N.K., Huyke, F.A., Wang, S.-Y., Moxley, K.M., Embree, H.D., Orentas, R., Shirai, K., Dellacecca, E., Garrett-Mayer, E., Li, M., Eby, J.M., Stiff, P., Evavold, B.D., Baker, B.M., Le Poole, C., Dropulic, B., Clark, J.I., & Nishimura, M.I. (2017) Metastatic Melanoma Patients Treated with Autologous Melanoma-Reactive TCR-Transduced T Cells Have Clinical, Biological, and Immunological Responses. *Cancer Immunology Immunotherapy* **67**, 311. PMID: [29052782](#)
23. Spear, T.T., Wang, Y., Foley, K.C., Murray, D.C., Scurti, G.M., Simms, P.E., Barrett-Mayer, E., **Hellman, L.M.**, Baker, B.M., & Nishimura, M.I. (2017) Critical Biological Parameters Can Modulate Affinity as a Determinant of Function in T Cell Receptor Gene-Modified T Cells. *Cancer Immunology Immunotherapy* **66**, 1411. PMID: [28634816](#)
22. Wang, Y., Singh, N.K., Spear, T.T., **Hellman, L.M.**, Piepenbrink, K.H., Vander Kooi, C.W., Rosen, H.R., Nishimura, M.I., & Baker, B.M. (2017) How an Alloreactive T Cell Receptor Achieves Peptide and MHC Specificity: Implications for Alloreactivity and Immunotherapy. *Proceedings of the National Academy of Science* **114**, e4792. PMID: [28572406](#)
21. Dik, D.A., Dominguez-Gil, T., Lee, M., Heseck, D., Byun, B., Fishovitz, J., Boggess, B., **Hellman, L.M.**, Fisher, J.F., Hermoso, J.A., & Mobashery, S. (2017) Muropeptide Binding and the X-ray Structure of the Effector Domain of the Transcriptional Regulator AmpR of *Pseudomonas aeruginosa*. *Journal of American Chemical Society* **139**, 1448. PMID: [28079369](#)

20. Riley, T.P., Ayres, C.M., **Hellman, L.M.**, Singh, N.K., Cosiano, M., Cimon, J.M., Anderson, M.J., Piepenbrink, K.H., Pierce, B.G., Weng, Z., & Baker, B.M. (2016) A Generalized Framework for Computational Design and Mutational Scanning of T Cell Binding Interfaces. *Protein Engineering, Design, and Selection* **29**, 595. PMID: [27624308](#)
19. Spear, T.T., Riley, T., Lyons, G.E., Callender, G.G., Roszkowski, J.J., Wang, Y., Simms, P.E., Scurti, G.M., Foley, K.C., Murray, D.C., **Hellman, L.M.**, McMahan, R.H., Rosen, H.R., Baker, B.M., & Nishimura, M.I. (2016) Hepatitis C Virus NS3-Reactive TCRs Transfer Recognition of Multiple Naturally Occurring Mutant Epitopes to T Cells. *Journal of Leukocyte Biology* **100**, 545. PMID: [26921345](#)
18. **Hellman, L.M.**, Yin, L., Wang, Y., Blevins, S.J., Riley, T.P., Belden, O.S., Spear, T.T., Nishimura, M.I., Stern, L.J., & Baker, B.M. (2016) Differential Scanning Fluorimetry Facilitates High Throughput Assessment of Class I Peptide/MHC Binding and Thermal Stability. *Journal of Immunological Methods* **432**, 95. PMID: [26906089](#)
17. Chicka, M.C., Ren, Q., Richards, D., **Hellman, L.M.**, Zhang, J., Fried, M.G., & Whiteheart, S.W. (2015) Role of Munc13-4 as a Ca²⁺-Dependent Tether During Platelet Secretion. *Biochemical Journal* **473**, 627. PMID: [26637270](#)
16. Thompson, M.G., Larson, M., Vidrine, A., Barros, K., Navarro, F., Meyers, K., Simms, P., Prajapati, K., Chitsike, L., **Hellman, L.M.**, Baker, B.M., & Watkins, S.K. (2015) FOXO3-NF-κB Protein Complexes Reduces Pro-Inflammatory Cell Signaling and Function. *Journal of Immunology* **195**, 5637. PMID: [26561547](#)
15. Raththagala, M., Brewer, M.K., Parker, M.W., Sherwood, A.R., Wong, B.K., Hsu, S., Bridges, T.M., Paasch, B.C., **Hellman, L.M.**, Husodo, S., Meekins, D.A., Taylor, A.O., Turner, B.D., Auger, K.D., Dukhande, V.V., Chakravarthy, S., Sanz, P., Woods, V.V., Li, S., Vander Kooi, C.W., & Gentry, M.S. (2015) Structural Mechanism of Laforin Function in Glycogen Dephosphorylation and Lafora Disease. *Molecular Cell* **57**, 5637. PMID: [25544560](#)
14. **Hellman, L.M.**, Spear, T.J., Koontz, C.J., Melikishvili, M., & Fried, M.G. (2014) Repair of O⁶-Methylguanine Adducts in Human Telomeric G-Quadruplex DNA by O⁶-Alkylguanine-DNA Alkyltransferase. *Nucleic Acids Research* **42**, 9781. PMID: [25080506](#)
13. Pierce, B.G.*, **Hellman, L.M.***, Hossain, M., Singh, N.K., Vander Kooi, C.W., Weng, Z., & Baker, B.M. (2014) Computational Design of the Affinity and Specificity of a Therapeutic T Cell Receptor. *PLOS Computational Biology* **10**. PMID: [24550723](#) *Co-first authors
12. Smith, E.C, Smith, S.E., Carter, J.R., Webb, S.R., Gibson, K.M., **Hellman, L.M.**, Fried, M.G., & Dutch, R.E. (2013) Trimeric Transmembrane Domain Interactions in Paramyxovirus Fusion Proteins: Roles in Protein Folding, Stability, and Function. *Journal of Biological Chemistry* **288**, 35726. PMID: [24178297](#)
11. Lee, M., Artola-Recolons, C., Martínez-Caballero, C., Heseck, D., Spink, E., Lastochkin, E., Zhang, W., **Hellman, L.M.**, Boggess, B., Hermoso, J.A., & Mobashery, S. (2013) Cell-Wall Remodeling by the Zinc-Protease AmpDH3 from *Pseudomonas aeruginosa*. *Journal of American Chemical Society* **135**, 12604. PMID: [23931161](#)

10. Martínez-Caballero, S., Lee, M., Artola-Recolons, C., Carrasco-López, C., Heseck, D., Spink, E., Lastochkin, E., Zhang, W., **Hellman, L.M.**, Boggess, B., Mobashery, S., & Hermoso, J.A. (2013) Reaction Products and the X-ray Structure of AmpDh2, a Virulence Determinant of *Pseudomonas aeruginosa*. *Journal of American Chemical Society* **135**, 10318. PMID: [23819763](#)
9. Hawse, W.F., Champion, M.C., Joyce, M.V., **Hellman, L.M.**, Hossain, M., Ryan, V., Pierce, B.G., Weng, Z., & Baker, B.M. (2012) Cutting Edge: Evidence for a Dynamically Driven T Cell Signaling Mechanism. *Journal of Immunology* **188**, 5819. PMID: [22611242](#)
8. Popa, A., Carter, J.R., Smith, S.E., **Hellman, L.**, Fried, M.G., & Dutch, R.E. (2012) Residues in the Hendra Fusion Protein Transmembrane Domain Are Critical for Endocytic Recycling. *Journal of Virology* **86**, 3014. PMID: [22238299](#)
7. Smith, E.C., Culler, M.R., **Hellman, L.M.**, Fried, M.G., Creamer, T.P., & Dutch, R.E. (2012) Beyond Anchoring: The Expanding Role of the Hendra Virus Fusion Protein Transmembrane Domain in Protein Folding, Stability, and Function. *Journal of Virology* **86**, 3003. PMID: [22238302](#)
6. **Hellman, L.M.**, Zhao, C., Melikishvili, M., Tao, X., Hopper, J.E., Whiteheart, S.W., & Fried, M.G. (2011) Histidine-Tag-Directed Chromophores for Tracer Analyses in the Analytical Ultracentrifuge. *Methods* **54**, 31. PMID: [21187151](#)
5. Parker, M.W., **Hellman, L.M.**, Xu, P., Fried, M.G., & Vander Kooi, C.W. (2010) Furin Processing of Semaphorin 3F Determines Its Anti-Angiogenic Activity by Regulating Direct Binding and Competition for Neuropilin. *Biochemistry* **49**, 4068. PMID: [20387901](#)
4. Zhao, C., **Hellman, L.M.**, Zhan, X., Bowman, W.S., Whiteheart, S.W., & Fried, M.G. (2010) Hexahistidine-Tag-Specific Optical Probes for Analyses of Proteins and Their Interactions. *Analytical Biochemistry* **399**, 237. PMID: [20036207](#) (Cited by Faculty of 1000)
3. **Hellman, L.M.**, Rodgers, D.W., & Fried, M.G. (2010) Phenomenological Partial-Specific Volumes for G-Quadruplex DNAs. *European Biophysical Journal* **39**, 389. PMID: [19238377](#)
2. Melikishvili, M., **Hellman, L.M.**, & Fried, M.G. (2009) Use of DNA Length Variation to Detect Periodicities in Positively Cooperative, Nonspecific Binding. *Methods in Enzymology* **466**, 65. PMID: [21609858](#)
1. **Hellman, L.M.** & Fried, M.G. (2007) Electrophoretic Mobility Shift Assay (EMSA) for Detecting Protein-Nucleic Acid Interactions. *Nature Protocols* **2**, 1849. PMID: [17703195](#)

Patents

Molecular Constructs and Uses Thereof; Brian Baker, **Lance Hellman**, Brian Pierce, Zhiping Weng; US10526391B2

Protein Folding and Methods for Using Same; Brian Baker, **Lance Hellman**; US20160039907A1

Oral Presentations

Nevada State College Environmental Science Colloquium; April 20, 2020

Improving T-Cell Receptor on Target Specificity Via Structure-Guided Design; 47th Annual Autumn Immunology Conference; Chicago, IL; November 16-19, 2018

Engineering T-Cell Receptors to Optimize Anti-Tumor Immunity; 46th Annual Autumn Immunology Conference; Chicago, IL; November 17-20, 2017

Engineering T-Cell Receptors to Optimize Anti-Tumor Immunity; 43rd Annual Autumn Immunology Conference; Chicago, IL; November 21-24, 2014

Engineering T-Cell Receptors to Optimize Anti-Tumor Immunity; FASEB Immunoreceptors Conference; Steamboat Springs, CO; June 15-20, 2014

Enhanced Peptide Flexibility Leads to Diminished Antigenicity and the Failure of a Cancer Vaccine; 42st Annual Autumn Immunology Conference; Chicago, IL; November 22-25, 2013

Engineering Anti-Tumor Immunity; 41st Annual Autumn Immunology Conference; Chicago, IL; November 16-19, 2012

Engineering Anti-Tumor Immunity; 26th Annual Gibbs Conference on Biothermodynamics; Carbondale, IL; September 22-25, 2012

Engineering Anti-Tumor Immunity; IUSM/Keck/Harper Seminar Series; Indiana University School of Medicine; South Bend, IN; July 30, 2012

Grants and Fellowships (Funded)

2023-2024 INBRE Pilot PLUS Grant (\$19,710)

2022-2024 INBRE RAIN Grant (\$26,000)

2022-2023 INBRE Pilot PLUS Grant (\$46,378)

2020-2021 INBRE Pilot Grant (\$13,000)

2020-2021 SEED Award (\$1,000)

2017-2018 American Cancer Society Institutional Research Grant IRG-14-195-01 (\$30,000)

2010-2011 University of Kentucky Dissertation Year Fellowship (\$20,000)

2009-2010 Max Steckler Fellowship (\$2,000)

2009-2010 University of Kentucky Research Challenge Trust Fund I Fellowship (\$23,500)

2008-2009 University of Kentucky Research Challenge Trust Fund I Fellowship (\$23,500)