

Lance Michael Hellman

Assistant Professor of Health and Human Sciences

Nevada State College

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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; Health and Human 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

Teaching and Mentoring

- 2019** Guest lecturer: Principles of Biochemistry; University of Notre Dame
2012-Current Elementary Chemistry; Indiana University of South Bend
2012-Current Research mentor for undergraduate research students; University of Notre Dame
2009-2010 University of Kentucky; Lecturer BCH611: Nucleic Acids
2008-2010 Mentored NSF Research Education for Undergraduates (REU) student
2007 University of Kentucky; Teaching Assistant BCH401: Biochemistry
2006-2007 Mentored two University of Kentucky Agricultural Biotechnology students

Publications

NCBI biography:

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

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. PubMed PMID: [31130956](https://pubmed.ncbi.nlm.nih.gov/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(2): 300-313. PubMed 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(10): 934-942. PubMed 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(4):996-1007. PubMed 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(2): 311-325. PubMed 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(11): 1411-1424. PubMed 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. USA*. 114(24): E4792-E4801. PubMed PMID: [28572406](#)
21. Dik, D.A., Dominguez-Gil, T., Lee, M., Hesek, 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(4): 1448-1451. PubMed PMID: [28079369](#)
20. Riley, T.P., Ayres, C.M., **Hellman, L.M.**, Singh, N.K., Cosiano, M., Cmons, 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(12): 595-606. PubMed PMID: [27624308](#); PubMed PMCID: [PMC5181382](#)
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(3): 545-557. PubMed PMID: [26921345](#); PubMed PMCID: [PMC4982612](#)
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: 95-101. PubMed PMID: [26906089](#); PubMed PMCID: [PMC4837003](#)
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(5): 627-639. PubMed 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(12): 5637-5647. PubMed PMID: [26561547](#); PubMed PMCID: [PMC4670825](#)
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(2): 5637-5647. PubMed PMID: [25544560](#); PubMed PMCID: [PMC4337892](#)
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(15): 9781-9791. PubMed PMID: [25080506](#); PubMed PMCID: [PMC4150771](#)
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(2). PubMed PMID: [24550723](#); PubMed PMCID: [PMC3923660](#)
*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(50): 35726-35735. PubMed PMID: [24178297](#); PubMed PMCID: [PMC3861624](#)
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(34): 12604-12607. PubMed PMID: [23931161](#); PubMed PMCID: [PMC3842012](#)
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(28): 10318-10321. PubMed PMID: [23819763](#); PubMed PMCID: [PMC3775653](#)

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(12): 5819-5823. PubMed PMID: [22611242](#); PubMed PMCID: [PMC3375328](#)

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(6): 3014-3026. PubMed PMID: [22238299](#); PubMed PMCID: [PMC3302302](#)

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(6): 3003-3013. PubMed PMID: [22238302](#); PubMed PMCID: [PMC3302297](#)

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(1): 31-38. PubMed PMID: [21187151](#); PubMed PMCID: [PMC3090473](#)

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(19): 4068-4075. PubMed PMID: [20387901](#); PubMed PMCID: [PMC2868107](#)

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(2): 237-245. PubMed PMID: [20036207](#); PubMed PMCID: [PMC2832190](#) **This paper was cited by Faculty of 1000:** Faculty of 1000 Biology: evaluations for Zhao C et al *Anal Biochem* 2009 Dec 28

3. **Hellman, L.M.**, Rodgers, D.W., & Fried, M.G. (2010) Phenomenological Partial-Specific Volumes for G-Quadruplex DNAs. *European Biophysical Journal*. 39(3): 389-396. PubMed PMID: [19238377](#); PubMed PMCID: [PMC2813399](#)

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: 65-81. PubMed PMID: [21609858](#)

1. **Hellman, L.M.** & Fried, M.G. (2007) Electrophoretic Mobility Shift Assay (EMSA) for Detecting Protein-Nucleic Acid Interactions. *Nature Protocols*. 2(8): 1849-1861. PubMed PMID: [17703195](#); PubMed PMCID: [2757439](#)

Patents

Molecular Constructs and Uses Thereof; Brian Baker, **Lance Hellman**, Brian Pierce, Zhiping Weng; PCT/US2015/41625 (**Pending**)

Protein Folding and Methods for Using Same; Brian Baker, **Lance Hellman**; PCT/US2015/24628 (**Pending**)

Oral Presentations

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

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 (\$2000)

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)

Academic Honors

1992 Dean's Honor List, University of South Carolina, Columbia, SC

1990 Dean's Honor List, University of South Carolina, Columbia, SC

1988 Dean's Honor List, University of South Carolina, Columbia, SC

1987 Dean's Honor List, University of South Carolina, Columbia, SC

Professional Memberships

American Society of Clinical Pathologists
Gibbs Society of Biothermodynamics

Professional Service

- 2019** Judge; Northern Indiana Regional Science & Engineering Fair
- 2013-current** Safety Committee; University of Notre Dame Department of Chemistry and Biochemistry
- 2015-current** Autoclave maintenance and Ultracentrifuge contact for Harper and Raclin-Carmichael Halls
- 2007-current** Manuscript reviewing (Biochemistry, Journal of Biological Chemistry, Biopolymers, others)
- 2016-2017** Regional Judge; The Siemens Competition in Math, Science & Technology
- 2015-current** Judge; Harper Cancer Research Institute Annual Research Day
- 2014-2015** Committee member for Masters of Science in Patent Law, University of Notre Dame (2 students)
- 2011-2012** Committee member for Masters of Entrepreneurship, University of Notre Dame
- 2010-2012** Academic Advisory Committee; University of Kentucky; Department of Molecular and Cellular Biochemistry
- 2010** Chair; University of Kentucky Department of Molecular and Cellular Biochemistry Spring Research Conference; Corbin, KY
- 2009-2010** Organizer; Student Data Club; University of Kentucky; Department of Molecular and Cellular Biochemistry
- 2008-2009** Organizer; Student Journal Club; University of Kentucky; Department of Molecular and Cellular Biochemistry
- 2008** Chair; University of Kentucky Department of Molecular and Cellular Biochemistry Summer Research Conference; Pineville, KY