

Brian Marshall Baker

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Research Interests

Molecular biophysics and structural biology of receptor-ligand interactions in cellular immunity; cancer immunology and immunotherapy; T cell engineering; vaccine design; autoimmunity; transplantation immunology; force sensing in molecular recognition

Education and Training

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| 1998 – 2001 | Postdoctoral fellowship, Harvard University
Mentor: Don C. Wiley |
| 1993 – 1997 | Ph.D., Biochemistry, University of Iowa
Thesis advisor: Kenneth P. Murphy |
| 1988 – 1992 | B.S., Biochemistry, New Mexico State University |

Academic Positions

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| 2021 – current | Coleman Foundation Endowed Professor of Life Sciences, Department of Chemistry and Biochemistry, University of Notre Dame |
| 2016 – 2021 | John A. Zahm Professor of Structural Biology, Department of Chemistry and Biochemistry, University of Notre Dame |
| 2013 – 2016 | Professor, Department of Chemistry and Biochemistry, University of Notre Dame |
| 2007 – 2013 | Associate Professor, Department of Chemistry and Biochemistry, University of Notre Dame |
| 2001 – 2007 | Assistant Professor, Department of Chemistry and Biochemistry, University of Notre Dame |

Administrative Appointments

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| 2016 – 2022 | Chair, Department of Chemistry and Biochemistry, University of Notre Dame |
| 2015 | Interim Dean, College of Science, University of Notre Dame |
| 2013 – 2016 | Associate Dean for Research and Graduate Studies, College of Science, University of Notre Dame |
| 2012 – 2013 | Associate Dean for Academic Programs, The Graduate School, University of Notre Dame |
| 2011 – 2013 | Co-Founder and Director, Integrated Biomedical Sciences Graduate Program, University of Notre Dame |
| 2008 – 2012 | Director of Graduate Studies, Department of Chemistry and Biochemistry, University of Notre Dame |

Other Positions (External to University of Notre Dame)

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| 2018 – current | Scientific advisory board, <i>T-Cure Bioscience, Inc.</i> |
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2016 – 2022 Founder and board member, *Structured Immunity, Inc.*

Honors, Awards, and Fellowships

2024 Elkin Lecture, Emory University Winship Cancer Center
 2023 Inaugural student-selected endowed speaker, Denison University
 2022 SER-CAT Outstanding Science Award
 2019 Notre Dame All Star Faculty Award
 2018 American Cancer Society Innovation Award
 2017 – 2020 President-elect (2017-18), President (2018-19), Past-President (2019-20), Gibbs Society of Biothermodynamics
 2017 Grand Prize, Notre Dame McCloskey Business Plan Competition
 2017 Harper Cancer Research Institute Distinguished Researcher Award
 2014 Rev. Edwin P. Joyce Award for Excellence in Undergraduate Teaching
 2012 Notre Dame Director of Graduate Studies of the Year
 2005 Research Scholar of the American Cancer Society
 2005 National Science Foundation Early Faculty Career Award
 1998 – 2001 Postdoctoral Fellow of the Cancer Research Institute

National and International Service

2025 Co-organizer (with Eric Sundberg), 8th Molecular Perspectives on Protein-Protein Interactions Conference, Chania, Greece
 2024 – 2025 American Association of Immunologists Abstract Programming Chair (Tumor Immunology)
 2023 Co-organizer (with Eric Sundberg), 7th Molecular Perspectives on Protein-Protein Interactions Conference, Heraklion, Greece
 2022 – current SER-CAT (Southeast Regional Collaborative Access Team) Executive Board
 2021 Session Chair, Tumor Immunotherapy, 2021 Autumn Immunology Conference, Chicago, IL
 2020 – 2022 Chair, NIH Cellular and Molecular Immunology A (CMIA) review panel
 2020 Chair, Mapping the Immune System symposium, Biophysical Society Annual Meeting
 2019 – 2020 Board of Scientific Counselors, National Institute of Allergy and Infectious Diseases
 2017 Co-chair, 2017 Molecular Perspectives on Protein-Protein Interactions Conference, Eilat, Israel
 2016 – 2022 Standing member, NIH Cellular and Molecular Immunology A (CMIA) review panel
 2016 Co-organizer (with Eric Sundberg and Susan Lea), Structural Aspects of Infectious Disease (Biochemical Society Focused Meeting), Cambridge, UK
 2015 Co-organizer (with Eric Sundberg), 2015 American Society for Biochemistry and Molecular Biology Annual Symposium (Theme: *Molecular Mechanisms of Infection and Immunity*)
 2012 Vice Chair, Biomolecular Interactions Gordon Conference, Galveston, TX
 2007 Co-Organizer (with Michael Henzl), 21st Annual Gibbs Conference on Biothermodynamics, Carbondale, IL

2004 – current	Ad-hoc reviewer and Chair for NIH, NSF, and other grant review panels (NIH IHD, ALY, CMIA, HAI, SBCB, and various special emphasis panels; NSF molecular biophysics, Cancer UK; Wellcome Trust; BBSRC; DAAD; Research Corporation, many others)
2004	Co-organizer (with Kenneth P. Murphy), Titration Calorimetry Symposium, Chicago, IL
1998 – current	Ad-hoc reviewer for numerous journals (including <i>Science</i> , <i>Nature</i> , <i>Immunity</i> , <i>Nature Structural & Molecular Biology</i> , <i>Nature Immunology</i> , <i>Science Immunology</i> , <i>PNAS</i> , <i>Cell</i> , <i>Molecular Cell</i> , <i>J. Immunology</i> , <i>J. Biol Chem</i> , many others)

Editorial Boards

2021 – current	Associate Editor, <i>Frontiers in Immunology</i> (T cell biology)
2015 – current	Associate Editor, <i>Frontiers in Molecular Biosciences</i>
2013 – 2017	Associate Editor, <i>Journal of Immunology</i>
2011 – 2021	Review Editor, <i>Frontiers in Immunology</i> (T cell biology and antigen presentation cell biology)
2009 – 2012	Editorial board, <i>Self/Nonself - Immune Recognition and Signaling</i>
2008 – 2017	Editorial Board, <i>Biochemical Journal</i>

University of Notre Dame Committees, Panels, and Other Service

University Level Committees, Panels, and Other Service

2024 – 2025	Bioengineering & Life Sciences Infrastructure Committee (Chair)
2023 – current	Notre Dame Global Faculty Advisory Committee for Ireland
2022 – 2023	University Health and Wellbeing Theme Advisory Committee (Co-chair)
2020 – 2022	President's COVID-19 Faculty Advisory Committee
2020 – 2025	IDEA Center Faculty Advisory Board
2018 – 2019	Keough School of International Affairs Dean Review Panel
2018 – 2019	Science of Wellness Task Force
2018 – current	ESTEEM Graduate Program Steering Committee
2017 – 2018	University Tenure/Promotion Conflict of Interest Committee (Chair, 2018)
2017 – current	Naughton Fellowship Committee (Chair)
2016	Vice President for Innovation Search Committee
2015 – 2019	Harper Cancer Research Institute Executive Committee
2014 – 2019	London Center Faculty Advisory Committee
2014 – 2019	Global Gateway Faculty Advisory Committee
2014	Indiana Global Health Roundtable Committee
2014	Indiana University School of Medicine South Bend Dean Search Committee
2013 – 2014	East Campus Research Complex Design Committee
2013 – 2015	Energy Center Advisory Committee
2013 – 2016	Center for Research Computing Advisory Committee
2013 – 2016	University Limited Submissions Grant Review Committee
2013 – 2016	Institute for Global Development Faculty Advisory Committee
2012 – 2013	Graduate Council

2012	University Committee to Decentralize the Graduate School
2011 – 2012	Principal Developer, Integrated Biomedical Sciences Graduate Program
2011	Graduate School Associate Dean Search Committee
2009 – 2012	Founding Member, Basic Science Proposal Development Team, Indiana Clinical and Translational Sciences Institute

College of Science Committees, Panels, and Other Service

2024 – current	Chemistry, Biochemistry, and Biology Interface (CBBi) Program steering committee
2024	Named University Chair Review Committee
2015 – 2016	Graduate Student Appeal Committee (Chair)
2014 – 2020	Biophysics Committee
2013 – 2022	Dean's Advisory Committee
2013 – 2016	Space Committee (Chair)
2013 – 2016	Graduate Studies Committee (Chair)
2013 – 2022	College Council

Department of Chemistry and Biochemistry Committees, Panels, and Other Service

2025 – current	Executive Committee
2025 – current	Theoretical / Computational Chemistry Faculty Search Committee
2024 – 2025	Computational Biophysics Faculty Search Committee (Chair)
2023 – 2025	Space Committee
2008 – 2012	Graduate Studies Committee (Chair)
2004	Organizer, Notre Dame Biochemistry Retreat
2001 – 2007	Biochemistry Graduate Recruitment Coordinator

Active Professional Memberships

American Association of Immunologists
 Biophysical Society
 Gibbs Society of Biothermodynamics
 American Association for the Advancement of Science

Publications

*Corresponding author indicated by **

Full publication list and citation information available from Google Scholar at <https://bit.ly/4di8BqS>

Peer Reviewed Publications

115. Anngela C. Adams, Anne M. Macy, Elizabeth S. Borden, Lauren M. Herrmann, Chad A. Brambley, Tao Ma, Xing Li, Alysia Hughes, Denise J. Roe, Aaron R. Mangold, Kenneth H. Buetow, Melissa A. Wilson, **Brian M. Baker**, and Karen Taraszka Hastings* (2025) Structural changes from wild-type define tumor-rejecting neoantigens. *Journal for ImmunoTherapy of Cancer*.
<https://doi.org/10.1136/jitc-2025-013148>
114. Mariam M. George, Cory A. Brennick, Adam T. Hagymasi, Tatiana V. Shcheglova, Sahar Al Seesi, Tatiana J. Rosales, **Brian M Baker**, Ion I. Mandoiu, and Pramod K. Srivastava* (2025) A frameshift generated cancer neoepitope that controls tumor burden in

- prophylaxis as well as therapy. *Journal of Immunology*.
<https://doi.org/10.1093/jimmun/vkaf016>
113. Jiaqi Ma, Cory M. Ayres, Chad A. Brambley, Smita S. Chandran, Tatiana J. Rosales, Steven A. Corcelli, Evgenii L. Kovrigin, Christopher A. Klebanoff, and **Brian M. Baker*** (2025) Dynamic allostery in the peptide/MHC complex enables TCR neoantigen selectivity. *Nature Communications*.
<https://doi.org/10.1038/s41467-025-56004-8>
 112. George I. Gray, Tatiana J. Rosales, P. Chukwunalu Chukwuma, Bassant Eldaly, W. W. J. Gihan Perera, Chad A. Brambley, and **Brian M. Baker*** (2025) The evolving T cell receptor recognition code: the rules are more like guidelines. *Immunological Reviews* (peer-reviewed review).
<https://doi.org/10.1111/imr.13439>
 111. Valerie Lin, Melyssa Cheung, Ragul Gowthaman, Maya Eisenberg, **Brian M. Baker**, and Brian G. Pierce* (2024) TCR3d 2.0: expanding the T cell receptor structure database with new structures, tools, and interactions. *Nucleic Acids Research*.
<https://doi.org/10.1093/nar/gkae840>
 110. Stephanie A. Gaglione, Tatiana J. Rosales, Laura Schmidt-Hong, **Brian M. Baker***, and Michael E. Birnbaum* (2024) SARS-CoV-2 Spike does not interact with the T cell receptor or directly activate T cells. *Proceedings of the National Academy of Sciences, USA*.
<https://www.pnas.org/doi/10.1073/pnas.2406615121>
 109. You Min Ahn, Janesha C. Maddumage, Emma J. Grant, Demetra S.M. Chatzileontiadou, W.W.J. Perera Gihan, **Brian M. Baker**, Christopher Szeto, and Stephanie Gras* (2024) The impact of SARS-CoV-2 Spike mutation on peptide presentation is HLA allomorph-specific. *Current Research in Structural Biology*.
<https://doi.org/10.1016/j.crstbi.2024.100148>
 108. Aaron M. Rosenberg, Cory M. Ayres, Angélica V. Medina-Cucurella, Timothy A. Whitehead, and **Brian M. Baker*** (2024) Enhanced T cell receptor specificity through framework engineering. *Frontiers in Immunology*.
<https://doi.org/10.3389/fimmu.2024.1345368>
 107. Victor Mikhaylov*, Chad A. Brambley, Grant L. J. Keller, Alyssa G. Arbuiso, Laura I. Weiss, **Brian M. Baker**, and Arnold J. Levine (2024) Accurate modeling of peptide-MHC structures with AlphaFold. *Structure*.
<https://doi.org/10.1016/j.str.2023.11.011>
 106. Jean M. Custodio, Cory M. Ayres, Tatiana J. Rosales, Chad A. Brambley, Alyssa G. Arbuiso, Lauren M. Landau, Grant L. J. Keller, Pramod K. Srivastava, and **Brian M. Baker*** (2023) Structural and physical features that distinguish tumor-controlling from inactive cancer neoepitopes. *Proceedings of the National Academy of Sciences, USA*.
<https://doi.org/10.1073/pnas.2312057120>
 105. M. Eyad Khorki, Tiffany Shi, Eileen E. Cianciolo, Ashley R. Burg, P. Chuwunalu Chukwuma, Jennifer L. Picarsic, Mary K. Morrice, E. Steve Woodle, Jonathan S. Maltzman, Autumn Ferguson, Jonathan Katz, **Brian M. Baker**, and David A. Hildeman* (2023) Prior viral infection primes cross-reactive CD8+ T cells that respond to mouse heart allografts. *Frontiers in Immunology*
<https://www.frontiersin.org/articles/10.3389/fimmu.2023.1287546/>
 104. Marc A. Gillig, Cory A. Brennick, Mariam M. George, Jeremy L. Balsbaugh, Tatiana V. Shcheglova, Ion I. Mandoiu, Tatiana Rosales, **Brian M. Baker**, Pramod K. Srivastava, and Sukrut H. Karandikar* (2023) CD8+ T cell-dependent anti-tumor activity in vivo of a mass spectrometry-identified neoepitope despite undetectable CD8+ immunogenicity in vitro.

Journal of Immunology.

<https://doi.org/10.4049/jimmunol.2300356>

103. Christopher A. Klebanoff*, Smita S. Chandran, **Brian M. Baker**, Sergio Quezada, and Antoni Ribas (2023). T cell receptor therapeutics: immunologic targeting of the intracellular cancer proteome. *Nature Reviews Drug Discovery* (peer-reviewed review).
<https://doi.org/10.1038/s41573-023-00809-z>
102. Cory M. Ayres, Steve A. Corcelli, and **Brian M. Baker*** (2023). The energetic landscape of catch bonds in T cell receptor interfaces. *Journal of Immunology* (peer-reviewed review).
<https://doi.org/10.4049/jimmunol.2300121>
101. Tiffany Shi, Ashley R. Burg, J. Timothy Caldwell, Krishna Roskin, Cyd M. Castro-Rojas, P. Chukwunalu Chukwuma, George I. Gray, Sara G. Foote, Jesus Alonso, Carla M. Cuda, David A. Allman, James S. Rush, Catherine H. Regnier, Grazyna Wieczorek, Rita R. Alloway, Adele R. Shields, **Brian M. Baker**, E. Steve Woodle, and David A. Hildeman* (2023) Single cell transcriptomic analysis of renal allograft rejection reveals novel insights into intragraft TCR clonality. *Journal of Clinical Investigation* (highlighted in *Science Immunology*).
<https://doi.org/10.1172/JCI170191>
100. Nishant K. Singh, Jesus A. Alonso, Jason R. Devlin, Grant L. J. Keller, Adarsh K. Chiranjivi, Sara G. Foote, Lauren M. Landau, Alyssa G. Arbuiso, Laura I. Weiss, Aaron M. Rosenberg, Lance M. Hellman, Michael I. Nishimura, and **Brian M. Baker*** (2022) A class-mismatched TCR bypasses MHC restriction via an unorthodox but fully functional binding geometry. *Nature Communications*.
<https://doi.org/10.1038/s41467-022-34896-0>
99. Chang Liu, Hong Liu, Moumita Dasgupta, Lance M. Hellman, Xiaogang Zhang, Kai Qu, Hui Xue, Yun Wang, Fenling Fan, Qi Chang, Duo Yu, Linhu Ge, Yu Zhang, Ziyong Cui, Pengbo Zhang, Bradley Heller, Hongbing Zhang, Bingyin Shi, **Brian M. Baker***, and Cheng Liu* (2022) Validation and promise of a TCR mimic antibody for cancer immunotherapy of hepatocellular carcinoma. *Scientific Reports*.
<https://doi.org/10.1038/s41598-022-15946-5>
98. Grant L. J. Keller, Laura I. Weiss, and **Brian M. Baker*** (2022) Physicochemical heuristics for identifying high fidelity, near-native structural models of peptide/MHC complexes. *Frontiers in Immunology*.
<https://doi.org/10.3389/fimmu.2022.887759>
97. Cory M. Ayres and **Brian M. Baker*** (2022) Peptide-dependent tuning of MHC motional properties and the consequences for cellular immunity. *Current Opinion in Immunology* (peer-reviewed review).
<https://doi.org/10.1016/j.coi.2022.102184>
96. Aaron M. Rosenberg and **Brian M. Baker*** (2022) Engineering the T cell receptor for fun and profit: uncovering complex biology, interrogating the immune system, and targeting disease. *Current Opinion in Structural Biology* (peer-reviewed review).
<https://doi.org/10.1016/j.sbi.2022.102358>
95. Smita S. Chandran, Jiaqi Ma, Martin G. Klatt, Friederike Dundar, Chaitanya Bandlamudi, Pedram Razavi, Hannah Y. Wen, Britta Weigelt, Paul Zumbo, Si Ning Fu, Lauren B. Banks, Watchain D. Bestman, Alexander Drilon, Doron Betel, David A. Scheinberg, **Brian M. Baker**, and Christopher A. Klebanoff* (2022) Immunogenicity of a public neoantigen derived from mutated PIK3CA. *Nature Medicine*.
<https://doi.org/10.1038/s41591-022-01786-3>
94. Katherine A Richards, Courtney Lavery, Grant L. J. Keller, Jim Miller, **Brian M. Baker**, and Andrea J. Sant* (2022) A previously unappreciated polymorphism in the beta chain of I-As

expressed in autoimmunity-prone SJL mice: Combined impact on antibody, CD4 T cell recognition and MHC class II dimer structural stability. *Molecular Immunology*.
<https://doi.org/10.1016/j.molimm.2021.12.022>

93. Tiffany Shi, Krishna Roskin, **Brian M. Baker**, E. Steve Woodle and David Hildeman* (2021) Genomics-Based Approaches for Defining Allograft Rejection with Single Cell Resolution. *Frontiers in Immunology* (peer-reviewed review).
<https://doi.org/10.3389/fimmu.2021.750754>
92. Hakimeh Ebrahimi-Nik, Marmar Moussa, Ryan P. Englander, Summit Singhaviranon, Justine Michaux, HuiSong Pak, Hiroko Miyadera, William L. Corwin, Grant L. J. Keller, Adam T. Hagymasi, Tatiana V. Shcheglova, George Coukos, **Brian M. Baker**, Ion I. Mandoiu, Michal Bassani-Sternberg, and Pramod K. Srivastava* (2021) Reversion analysis reveals the immunogenicity *in vivo* of a poorly MHC I binding cancer neoepitope. *Nature Communications*.
<https://doi.org/10.1038/s41467-021-26646-5>
91. Clarety Kaseke, Ryan Park, Nishant K. Singh, Dylan Koundakjian, Arman Bashirova, Wilfredo Garcia Beltran, Christian Overbeck, Jiaqi Ma, Fernando Senjobe, Anusha Nathan, Rhoda Tano-Menka, Ashok Khatri, Alicja Piechocka-Trocha, Michael Waring, **Brian M. Baker**, Mary Carrington, Bruce D. Walker, and Gaurav D. Gaiha* (2021) HLA class-I-peptide stability mediates CD8+ T cell immunodominance hierarchies and facilitates HLA-associated immune control of HIV. *Cell Reports*.
<https://doi.org/10.1016/j.celrep.2021.109378>
90. Jesus A. Alonso, Angela R. Smith, and **Brian M. Baker*** (2021) Tumor rejection properties of gp100₂₀₉-specific T cells correlate with T cell receptor binding affinity towards the wild type rather than anchor-modified antigen. *Molecular Immunology*.
<https://doi.org/10.1016/j.molimm.2021.05.001>
89. Jiaqi Ma, Cory M. Ayres, Lance M. Hellman, Jason R. Devlin, and **Brian M. Baker*** (2021) Dynamic allostery controls the peptide sensitivity of the Ly49C natural killer receptor. *Journal of Biological Chemistry*.
<https://doi.org/10.1016/j.jbc.2021.100686>
88. Angela R. Smith, Jesus A. Alonso, Cory M. Ayres, Nishant K. Singh, Lance M. Hellman, and **Brian M. Baker*** (2021) Structurally silent peptide anchor modifications allosterically modulate T cell recognition in a receptor dependent manner. *Proceedings of the National Academy of Sciences, USA*.
<https://doi.org/10.1073/pnas.2018125118>
87. Julien Schmidt, Angela R. Smith, Morgane Magnin, Julien Racle, Jason R. Devlin, Sara Bobisse, Julien Cesbron, Victor Bonnet, Santiago J. Carmona, Florian Huber, Giovanni Ciriello, Daniel E. Speiser, Michal Bassani-Sternberg, George Coukos, **Brian M. Baker***, Alexandre Harari*, and David Gfeller* (2021) Prediction of neo-epitope immunogenicity reveals TCR recognition determinants and immunoediting in human cancer. *Cell Reports Medicine*.
<https://doi.org/10.1016/j.xcrm.2021.100194>
86. Cory A. Brennick, Mariam M. George, Hakimeh Ebrahimi-Nik, Adam T. Hagymasi, Tatiana V. Shcheglova, Marmar Moussa, Grant L.J. Keller, John Sidney, Alessandro Sette, **Brian M. Baker**, Andrea Schietinger, Ion I. Mandoiu* and Pramod K. Srivastava* (2021) An unbiased approach to defining bona fide tumor neoepitopes that mediate anti-cancer immune responses. *Journal of Clinical Investigation*.
<https://doi.org/10.1172/JCI142823>

85. Tyler Borrmann, Brian G. Pierce, Thom Vreven, **Brian M. Baker**, Zhiping Weng* (2020) High-throughput modeling and scoring of TCR-pMHC complexes to predict cross-reactive peptides. *Bioinformatics*.
<https://doi.org/10.1093/bioinformatics/btaa1050>
84. Nishant K. Singh, Jesus A. Alonso, Daniel T. Harris, Scott D. Anderson, Jiaqi Ma, Lance M. Hellman, Aaron M. Rosenberg, Elizabeth M. Kolawole, Brian D. Evavold, David M. Kranz, and **Brian M. Baker*** (2020) A engineered T cell receptor variant realizes the limits of functional binding modes. *Biochemistry*.
<https://doi.org/10.1021/acs.biochem.0c00689#>
83. Jason R. Devlin, Jesus A. Alonso, Cory M. Ayres, Grant L. J. Keller, Sara Bobisse, Craig W. Vander Kooi, George Coukos, David Gfeller, Alexandre Harari, and **Brian M. Baker*** (2020) Structural dissimilarity from self drives neoepitope escape from immune tolerance. *Nature Chemical Biology*.
<https://doi.org/10.1038/s41589-020-0610-1>
82. Marion Tarbe, John J. Miles, Emily S.J. Edwards, Kim M. Miles, Andrew K. Sewell, **Brian M. Baker**, and Stéphane Quideau* (2020) Synthesis and biological evaluation of haptent-clicked analogues of the antigenic peptide Melan-A/MART-1_{26(27L)-35}. *ChemMedChem*.
<https://doi.org/10.1002/cmdc.202000038>
81. Timothy T. Spear*, Brian D. Evavold, **Brian M. Baker**, and Michael I. Nishimura (2019) Understanding TCR affinity, antigen specificity, and cross-reactivity to improve TCR gene-modified T cells for cancer immunotherapy. *Cancer Immunology, Immunotherapy* (peer-reviewed review).
<https://doi.org/10.1007/s00262-019-02401-0>
80. Nishant K. Singh, Esam T. Abualrous, Cory M. Ayres, Frank Noé, and **Brian M. Baker*** (2019). Geometrical characterization of T cell receptor binding modes reveals class-specific binding to maximize access to antigen. *Proteins: Structure, Function, and Bioinformatics*. <https://doi.org/10.1002/prot.25829>
79. Emma McGrath, Dieter Waschbusch, **Brian M. Baker**, and Amir R. Khan* (2019) LRRK2 binds to the Rab32 subfamily in a GTP-dependent manner via its armadillo domain. *Small GTPases*.
<https://doi.org/10.1080/21541248.2019.1666623>
78. Timothy P. Riley, Grant L. J. Keller, Angela Smith, Jason R. Devlin, Lauren M. Davencaze, Alyssa Arbuiso, and **Brian M. Baker*** (2019). Structure based prediction of neoantigen immunogenicity. *Frontiers in Immunology*.
<https://doi.org/10.3389/fimmu.2019.02047>
77. Hakimeh Ebrahimi-Nik, Justine Michaux, William L Corwin, Grant L.J. Keller, Tatiana Shcheglova, HuiSong Pak, George Coukos, **Brian M. Baker**, Ion I Mandoiu, Michal Bassani-Sternberg*, and Pramod K Srivastava* (2019) Mass spectrometry driven deep exploration of tumor-rejecting neoepitopes in a mouse sarcoma reveals novel characteristics of neoepitope-driven anti-tumor immunogenicity. *Journal of Clinical Investigation Insight*.
<https://doi.org/10.1172/jci.insight.129152>
76. Cory M. Ayres, Esam T. Abualrous, Alistair Bailey, Christian Abraham, Lance M. Hellman, Steven A. Corcelli, Frank Noé, Tim Elliott, and **Brian M. Baker*** (2019). Dynamically driven allostery in MHC proteins: peptide-dependent tuning of class I MHC global flexibility. *Frontiers in Immunology*.
<https://doi.org/10.3389/fimmu.2019.00966>

75. Lance M. Hellman, Kendra C. Foley, Nishant K. Singh, Jesus A. Alonso, Timothy P. Riley, Jason R. Devlin, Cory M. Ayres, Grant L. J. Keller, Yuting Zhang, Craig W. Vander Kooi, Michael I. Nishimura, and **Brian M. Baker*** (2019) Improving T cell receptor on-target specificity via structure-guided design. *Molecular Therapy*.
<https://doi.org/10.1016/j.ymthe.2018.12.010>
74. Jonathan M. Eby, Angela R. Smith, Timothy P. Riley, Christopher M. Ankney, Cormac Cosgrove, Steven W. Henning, Chrystal M. Paulos, Elizabeth Garrett-Mayer, Rosalie M. Luiten, Michael I. Nishimura, **Brian M. Baker**, and I. Caroline Le Poole* (2019). Molecular properties of gp100-reactive T cell receptors drive the cytokine profile and antitumor efficacy of transgenic host T cells. *Pigment Cell & Melanoma Research*.
<https://doi.org/10.1111/pcmr.12724>
73. Timothy P. Riley, Lance M. Hellman, Marvin H. Gee, Juan L. Mendoza, Jesus A. Alonso, Kendra C. Foley, Michael I. Nishimura, Craig W. Vander Kooi, K. Christopher Garcia, and **Brian M. Baker*** (2018). T cell receptor cross-reactivity expanded by dramatic peptide/MHC adaptability. *Nature Chemical Biology* (Highlighted in *Nature Chemical Biology News and Views*).
<https://doi.org/10.1038/s41589-018-0130-4>
72. Timothy T. Spear*, Yuan Wang, Patricia E. Simms, Elizabeth Garrett-Mayer, Lance M. Hellman, **Brian M. Baker**, and Michael I. Nishimura (2018). Altered peptide ligands impact the diversity of polyfunctional phenotypes in T cell receptor gene-modified T cells. *Molecular Therapy*.
<https://doi.org/10.1016/j.ymthe.2018.01.015>
71. Timothy P. Riley and **Brian M. Baker*** (2018). The intersection and affinity and specificity in the development and optimization of T cell receptor based therapeutics. *Seminars in Cell and Developmental Biology* (peer-reviewed review).
<https://doi.org/10.1016/j.semcdb.2017.10.017>
70. Tamson Moore*, Courtney Regan, Gina M. Scurti, Kelli A. Hutchens, Constantine Godellas, Ann Lau Clark, Elizabeth Motunrayo Kolawole, Lance Hellman, Nishant K. Singh, Fernando A. Huyke, Siao-Yi Wang, Kelly M. Moxley, Heather D. Embree, Rimas Orentas, Keisuke Shirai, Emilia Dellacecca, Elizabeth Garrett-Mayer, Mingli Li, Jonathan M. Eby, Patrick Stiff, Brian D. Evavold, **Brian M. Baker**, I. Caroline Le Poole, Boro Dropulic, Joseph I. Clark, and Michael I. Nishimura (2018). Metastatic Melanoma Patients Treated with Autologous Melanoma-Reactive TCR-Transduced T Cells Have Clinical, Biological, and Immunological Responses. *Cancer Immunology, Immunotherapy*.
<https://doi.org/10.1007/s00262-017-2073-0>
69. Timothy T. Spear*, Yuan Wang, Kendra C. Foley, David C. Murray, Gina M. Scurti, Patricia E. Simms, Elizabeth Garrett-Mayer, Lance M. Hellman, **Brian M. Baker**, and Michael I. Nishimura (2017). Critical biological parameters modulate affinity as a determinant of function in T cell receptor gene-modified T cells. *Cancer Immunology, Immunotherapy*.
<https://doi.org/10.1007/s00262-017-2032-9>
68. Nishant K. Singh, Timothy P. Riley, Sarah Catherine Baker, Zhiping Weng, and **Brian M. Baker*** (2017) Emerging concepts in T cell receptor specificity: rationalizing and (maybe) predicting outcomes. *Journal of Immunology* (peer-reviewed review).
<https://doi.org/10.4049/jimmunol.1700744>
67. Cory M. Ayres, Timothy P. Riley, Steve A. Corcelli*, and **Brian M. Baker*** (2017). Modeling sequence dependent fluctuations in immunologic recognition. *Journal of Chemical Information and Modeling*.
<https://doi.org/10.1021/acs.jcim.7b00118>

66. Cory M. Ayres, Steven A. Corcelli, and **Brian M. Baker*** (2017) Peptide and peptide-dependent motions in MHC proteins: immunological implications and biophysical underpinnings. *Frontiers in Immunology* (peer-reviewed review).
<https://doi.org/10.3389/fimmu.2017.00935>
65. Yuan Wang, Nishant K. Singh, Timothy T. Spear, Lance M. Hellman, Kurt H. Piepenbrink, Rachel H. McMahan, Hugo R. Rosen, Craig W. Vander Kooi, Michael I. Nishimura, and **Brian M. Baker*** (2017). How an alloreactive T cell receptor achieves peptide and MHC specificity. *Proceedings of the National Academy of Sciences, USA*.
<https://doi.org/10.1073/pnas.1700459114>
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<https://doi.org/10.1021/bi049807k>
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1. **Brian M. Baker** and Kenneth P. Murphy* (1996) Evaluation of linked protonation effects in protein binding reactions using isothermal titration calorimetry. *Biophysical Journal*.
[https://doi.org/10.1016/S0006-3495\(96\)79403-1](https://doi.org/10.1016/S0006-3495(96)79403-1)

Non Reviewed Publications

12. Chad A. Brambley and **Brian M. Baker*** (2025) Immune tolerance in peripheral CD4+ T cells is cooperatively regulated by PD-1 and CD73. *Nature Immunology* (invited News & Views commentary).
<https://doi.org/10.1038/s41590-024-02039-w>
11. Ali Afzal, Muhammad B. Khawar*, Weijuan Gong*, **Brian M. Baker***, and Haibo Sun* (2025) Editorial: Specific Targeting of MHC Antigens for Immune Cells in Human Disease. *Frontiers in Immunology* (invited editorial).
<https://doi.org/10.3389/fimmu.2024.1540449>
10. Dinler A. Antunes*, **Brian M. Baker**, Markus Cornberg and Liisa K. Selin (2024) Editorial: Quantification and prediction of T-cell cross-reactivity through experimental and computational methods. *Frontiers in Immunology* (invited editorial).
<https://doi.org/10.3389/fimmu.2024.1377259>
9. Tatiana J. Rosales and **Brian B. Baker*** (2022). Chaperoning the dance of antigen presentation. *Nature Chemical Biology* (invited commentary).
<https://doi.org/10.1038/s41589-022-01069-5>
8. **Brian M. Baker*** and Brian D. Evavold* (2017). MHC bias by T cell receptors: genetic evidence for MHC and TCR co-evolution. *Trends in Immunology* (invited commentary).
<https://doi.org/10.1016/j.it.2016.11.003>
7. Nishant K. Singh and **Brian M. Baker*** (2016) Ligand-based selection of T cell receptors in celiac disease. *Structure* (invited commentary).
<https://doi.org/10.1016/j.str.2016.09.004>
6. Timothy P. Riley, Nishant K. Singh, Brian G. Pierce, Zhiping Weng*, and **Brian M. Baker*** (2016) Computational modeling of TCR-pMHC complexes. *Methods in Molecular Biology* (invited chapter).
https://doi.org/10.1007/978-1-4939-3569-7_19
5. Timothy P. Riley, Nishant K. Singh, Brian G. Pierce, **Brian M. Baker***, and Zhiping Weng* (2016). Computational reprogramming of T cell antigen receptor binding properties. *Methods in Molecular Biology* (invited chapter).
https://doi.org/10.1007/978-1-4939-3569-7_18
4. Kurt. H. Piepenbrink, Brian E. Gloor, Kathryn M. Armstrong, and **Brian M. Baker*** (2009) Methods for quantifying T cell receptor:pMHC binding thermodynamics and kinetics. *Methods in Enzymology* (invited chapter).
[https://doi.org/10.1016/S0076-6879\(09\)66015-8](https://doi.org/10.1016/S0076-6879(09)66015-8)
3. **Brian M. Baker**, Yuan-Hua Ding, David N. Garboczi, William E. Biddison, and Don C. Wiley* (2000) Structural, biochemical, and biophysical studies of HLA-A2/alterd peptide

ligands binding to viral-peptide specific human T-cell receptors. *Cold Spring Harbor Symposium on Quantitative Biology* **64**, 235 (invited manuscript).
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2. **Brian M. Baker** and Kenneth P. Murphy* (1998) Prediction of binding energetics from structure using empirical parameterization. *Methods in Enzymology* (invited chapter).
[https://doi.org/10.1016/S0076-6879\(98\)95045-5](https://doi.org/10.1016/S0076-6879(98)95045-5)
1. Kenneth P. Murphy*, **Brian M. Baker**, Stephen P. Edgcomb, and James R. Horn (1999) Structural energetics of serine protease inhibition. *Pure and Applied Chemistry* (invited chapter).
<https://doi.org/10.1351/pac199971071207>

Manuscripts Submitted

2. Inaki Etxeberria, W. W. J. Gihan Perera, Olga Lyudovik, Martin G. Klatt, Smita S. Chandran, Lauren B. Banks, Michael V. Gormally, Korbinian N. Kropp, Fei Yi, Arianna Correa, Bryan Novak, Alexander Drilon, Michael Postow, Taha Merghoub, Jedd D. Wolchok, Benjamin Greenbaum, **Brian M. Baker**, and Christopher A. Klebanoff* (2026) Immunogenic landscape and therapeutic targeting of NRAS public neoantigens.
1. Bassant Eldaly and **Brian M. Baker*** (2026) Dynamic allostery in T cell receptor specificity: a role for MHC polymorphisms in allosterically tuning immune recognition (invited peer-reviewed review).

Preprints (not yet submitted)

1. Jiaqi Ma, Cory M. Ayres, Chad A. Brambley, Bassant Eldaly, W. W. J. Gihan Perera, James A. Lazar, Evgenii L. Kovrigin, Smita S. Chandran, Christopher A. Klebanoff, and **Brian M. Baker*** (2026) HLA micropolymorphisms confine neoantigen conformational adaptability and guide T cell receptor selectivity.
<https://doi.org/10.64898/2025.12.22.696040>

Research Support

Active Grants as a PI

Bringing alloreactivity into focus with the lens of TCR cross-reactivity (R21AI91060)
 National Institutes of Health (NIAID), 7/2025 – 6/2027
 Role: PI (Multi PI with David Hildeman, Cincinnati Children's Hospital)
 Total costs (Baker portion only): \$459,500

Structural biophysics and molecular design in cellular immunity (R35GM118166)
 National Institutes of Health (NIGMS), 5/2016 – 4/2026
 Role: PI
 Total costs: \$3,828,002

Mechanisms and manipulation of force dependent behavior in T cell biology (R01AI176665)
 National Institutes of Health (NIAID), 3/2023 – 2/2028
 Role: PI (Multi PI with Brian Evavold, University of Utah)
 Total costs (Baker portion only): \$1,908,675

Learning the structural features, dynamics, and ligandability of autoimmune disease-associated MHCs
 Pfizer, Inc, 12/2024 – 11/2026
 Role: PI
 Total costs: \$326,126

Identification of antigens driving transplant rejection via immunopeptidomics

Indiana CTSI, 9/2025 – 8/2027
 Role: PI
 Total costs: \$10,000

Active Grants as a co-I

Molecular mechanisms of T cell responses to a clonal neoantigen resulting from mutated driver oncogenes (R37CA259177)

National Institutes of Health (NCI), 4/2021 – 3/2026

Role: co-I (PI: Christopher Klebanoff, Memorial Sloan Kettering Cancer Center)

Total costs (Baker portion only): \$784,435

Defining how TCR strength of signal modulates Treg function (R01AI169835)

National Institutes of Health (NIAID), 11/2022 – 10/2027

Role: co-I (PI: Brian Evavold, University of Utah)

Total costs (Baker portion only): \$235,060

Novel cell therapy approaches for molecularly defined subsets of therapy-resistant melanoma (R01CA286507)

National Institutes of Health (NCI), 9/2023 – 8/2028

Role: co-I (PI: Christopher Klebanoff, Memorial Sloan Kettering Cancer Center)

Total costs (Baker portion only): \$970,300

IMPACT: Immunoengineering Microgravity Platform for Accessible Cell-based Therapies

University of Notre Dame (BELS team science award), 1/2025 – 12/2027

Role: co-I (PI: Meenal Datta, Notre Dame)

Total costs (Baker portion only): \$75,000 (est)

Completed Grants

Computational Analysis of Antibody Structures and Binding to Antigens Based on the TCR-mimic Antibody ET1402-AFP/MHC Complex Structure

Protein Design Technologies, Inc, 12/2024 – 11/2025

Role: PI

Total costs: \$90,000

Decoding human T cell allospecificity (R21AI169863)

National Institutes of Health (NIAID), 11/2022 – 10/2024

Role: PI (Multi PI with David Hildeman, Cincinnati Children's Hospital)

Total costs (Baker portion only): \$374,054

*Illuminating the centrality of HLA-B*51 in Behçet's Syndrome*

University of Notre Dame (College of Science), 9/2023 – 8/2025

Role: PI

Total costs: \$63,000

CD8 T cell antigen recognition during chronic infection (R01AI147641)

National Institutes of Health (NIAID), 3/2020 – 2/2025

Role: co-I (PI: Brian Evavold, University of Utah)

Total costs (Baker portion only): \$202,256

Interrogating SARS-CoV-2 CTL antigens for immunobiology

Indiana CTSI, 6/2020 – 5/2022

Role: PI

Total costs: \$15,000

Safer and more effective T cells for immunotherapy of viral-associated hematological malignancies

Leukemia and Lymphoma Society, 7/2019 – 6/2022

Role: PI (Multi PI with Eduardo Davila, University of Colorado)
Total costs: \$460,000

Structural properties of a TCR mimic antibody complex
Eureka Therapeutics, 4/2019 – 3/2021
Role: PI
Total costs: \$127,698

Structural and physical basis for myosin motility in health and disease
Naughton Foundation, 2/2017 – 8/2019
Role: PI (Multi PI with Amir Khan, Trinity College Dublin)
Total costs: \$120,000

Building better T cell receptors for targeted immunotherapy (R01AI129543)
National Institutes of Health (NIAID), 12/2016 – 11/2022
Role: PI (Multi PI with Michael Nishimura, Loyola University)
Total costs: \$3,600,752

Structural and dynamic assessments of tumor neo-epitopes for cancer vaccines
University of Connecticut Comprehensive Cancer Center, 1/2015 – 12/2017
Role: PI
Total costs: \$194,509

Crystallization and characterization of the HCV-reactive TCR 1406
Harper Cancer Research Institute, 5/2015 – 4/2016
Role: PI
Total costs: \$20,000

Targeting the FOXO3/NF- κ B interaction for enhancement of cancer immunotherapy
Trinity Healthcare, 1/2014 – 12/2014
Role: PI (Multi PI with Stephanie Watkins, Loyola Stritch School of Medicine)
Total costs: \$50,000

Development of a computational framework for TCR engineering (R01GM103773)
National Institutes of Health (NIGMS), 4/2013 – 3/2017
Role: PI (Multi PI with Zhiping Weng, UMass Medical School)
Total costs: \$1,218,676

Biophysical analysis of protein-drug conjugates
Pfizer, Inc., 3/2013 – 5/2014
Role: PI
Total costs: \$75,000

Engineering T cells to optimize anti-tumor immunity
Walther Cancer Research Foundation, 8/2011 – 7/2014
Role: PI (Multi PI with Peter Velazquez, Indiana University School of Medicine)
Total costs: \$200,000

Evaluation of affinity improved TCR variants for T cell mediated gene therapy of cancer
Indiana Clinical/Translational Sciences Institute, 8/2011 – 7/2012
Role: PI
Total costs: \$20,000

Mass spectrometry for T cell receptor dynamics and assembly
Indiana Clinical/Translational Sciences Institute, 8/2011 – 7/2014
Role: PI
Total costs: \$5,000

ARRA supplement for physical basis for T cell receptor binding and activity
(R01GM067079S1)

National Institutes of Health (NIGMS), 9/2009 – 8/2012

Role: PI

Total costs: \$336,407

Development of a supraphysiological T cell receptor for the immunological treatment of melanoma

Indiana Clinical Sciences and Translational Institute, 2/2009 – 01/2011

Role: PI (Multi PI with Samy Meroueh, Indiana University School of Medicine)

Total costs: \$75,000

Structure and thermodynamically guided design of improved cancer vaccines (RSG-05-202-01-GMC)

American Cancer Society, 6/2005 – 5/2010

Role: PI

Total costs: \$720,000

Assembly and dynamics of class I peptide/MHC complexes (MCB-0448298)

National Science Foundation, 2/2005 – 1/2011

Role: PI

Total costs: \$711,710

Physical Basis for T cell receptor binding and activity (R01GM067079)

National Institutes of Health (NIGMS), 1/2003 – 7/2016

Role: PI

Total costs: \$3,458,533

Funded Instrumentation Grants

GPU-based computing for structural biophysics in immune recognition (R35GM118166-08-S1)

National Institutes of Health, 6/2023

Total costs: \$230,415

Biacore T200 SPR for the Notre Dame Biophysics Instrumentation Facility (1S10OD028553)

National Institutes of Health, 7/2020

Role: PI

Total costs: \$342,782

Flow cytometry and cell sorting for structural biophysics in immune recognition (R35118166-05-S1)

National Institutes of Health, 6/2020

Role: PI

Total costs: \$211,853

High capacity protein purification for structural immunology (R35118166-01-S1)

National Institutes of Health, 8/2016

Role: PI

Total costs: \$76,931

Crystallization robotics for structural immunology (R01GM067079-10-S1)

National Institutes of Health, 6/2015

Role: PI

Total costs: \$100,080

Structural and dynamic assessments of tumor neo-epitopes for cancer vaccines

University of Connecticut Carol and Ray Neag Cancer Center, 1/2015

Role: PI

Total costs: \$197,677

A Fluorescence detection system for the analytical ultracentrifuge
 Notre Dame Equipment Restoration and Renewal Program, 5/2014
 Role: PI
 Total costs: \$200,000

Acquisition of an ITC 200 isothermal titration calorimeter for the University of Notre Dame
 (S10RR027898)
 National Institutes of Health, 11/2009
 Role: PI
 Total costs: \$125,000

Acquisition of the Notre Dame Biocomplexity Computer Cluster (DBI-0420980)
 National Science Foundation, 8/2004
 Role: PI (with Mark Alber)
 Total costs: \$160,000

Renewal of shared liquid chromatography equipment in the Department of Chemistry and Biochemistry
 Notre Dame Equipment Restoration and Renewal Program, 1/2004
 Role: PI (with Victor Krchnak)
 Total costs: \$190,000

Funded Trainee Grants

Revealing the structural determinants of TCR cross-recognition via extended positional scanning
 NIH/NIAID, 4/2025 – 3/2027
 Postdoctoral fellowship for Chad Brambley
 Total costs: \$156,277

Structural and biophysical properties of KRAS neoantigen specific T cell receptors
 Berthiaume Institute for Precision Medicine, 6/2025 – 9/2025
 Predoctoral fellowship for W.W.J. Gihan Perera
 Total costs: \$10,508

Unlocking the potential of KRAS-G12D: towards a novel immunotherapeutic approach for targeting resistant KRAS mutations
 Notre Dame CBBI, 8/2024 – 7/2025
 Predoctoral fellowship for Bassant Eldaly
 Total costs: \$74,000

Evaluating T cell allospecificity in acute cellular rejection of transplanted tissues
 Notre Dame CBBI, 8/2023 – 7/2025
 Predoctoral fellowship for P. Chukwunalu Chukwuma
 Total costs: \$74,000

Interrogating the clinically relevant T cell receptor TIL1383i
 Indiana CTSI, 7/2019 – 6/2021
 Predoctoral fellowship for Aaron Rosenberg
 Total costs: \$50,640

Determinants of antigenicity in tumor neoepitopes for the development of personalized peptide vaccines
 Indiana CTSI, 7/2019 – 6/2021
 Predoctoral fellowship for Grant Keller
 Total costs: \$71,628

Enhancing T cell therapy

University of Notre Dame, 8/2018 – 5/2019

Research Like a Champion Award for Lauren Davancaze

Total costs: \$12,500

Diversity supplement: building better T cell receptors

NIH/NIAID, 6/2018 – 6/2021

Postdoctoral fellowship for Jesus Alonso

Total costs: \$220,286

Engineering enhanced TCRs for melanoma immunotherapy

Indiana CTSI, 4/2018 – 3/2021; extended to 6/2022.

Postdoctoral fellowship support for Jesus Alonso

Total costs: \$63,720

Determinants of neoantigen immunogenicity

Indiana CTSI, 7/2018 – 6/2020

Predoctoral fellowship for Jason Devlin

Total costs: \$67,721

MHC independent antigen recognition by the CTL11C T cell receptor: a new paradigm for immunotherapy

American Cancer Society, 10/2017 – 9/2019

Traineeship for Lance Hellman

Total costs: \$35,000

Structural characterization of vitiligo associated T cell receptors

Walther Cancer Research Foundation, 2017-2019

Predoctoral fellowship for Angela Smith

Total costs: \$68,650

Modeling and design of the HCV1406 T cell receptor

Indiana CTSI, 8/2015 – 7/2017

Predoctoral fellowship for Timothy Riley

Total costs: \$64,432

Molecular flexibility in T cell receptor specificity and cross-reactivity

American Cancer Society, 6/2011 – 5/2014

Postdoctoral fellowship for William Hawse

Total costs: \$150,000

Molecular recognition by anti-tumor TCRs

Walther Cancer Research Foundation, 1/2008 – 12/2009

Postdoctoral fellowship for Sujatha Santhanagopalan

Total costs: \$35,000

T cell receptor loop dynamics and antigen discrimination

Notre Dame CBBI, 8/2008 – 7/2009

Predoctoral fellowship for Daniel Scott

Total costs: \$25,000

Peptide dynamics and cellular immunity

Notre Dame CBBI, 8/2006 – 7/2009

Predoctoral fellowship for Francis Insaideo

Total costs: \$50,000

Structural basis for cancer vaccine design

Walther Cancer Research Foundation, 7/2004 – 6/2006

Postdoctoral fellowship for Oleg Borbulevych

Total costs: \$60,000

Funded Educational and Training Grants

GAANN Fellowships to Increase Diversity and Promote Academic Careers in the University of Notre Dame Department of Chemistry and Biochemistry

Department of Education, 8/2013 – 8/2017

Role: PI (with Ken Henderson and Steve Corcelli [multi-PI])

Total costs: \$670,860

Enhancing Collaborative Science through Cultural Exchange

University of Notre Dame / Pontificia Universidad Catolica Collaborative Science Award

Luksic Foundation, 6/2014 – 5/2015

Role: PI

Total costs: \$20,000

Consulting / Corporate advising

2024	Merck
2023 – current	Pfizer
2022	Amgen
2022 – 2023	EnaraBio
2020	Bluebird Bio
2020	Informa Pharma
2019	McBee, Moore, Woodward & Vanik
2019 – current	Eureka Therapeutics
2019	AbbVie
2018 – current	T-cure Biosciences
2018	Roger Williams Medical Center
2015	Third Rock Ventures
2014 – 2015	The Implementation Group
2014	VenBio
2013 – 2015	Amgen
2012 – 2014	Pfizer
2005	Boehringer-Ingelheim Pharmaceuticals
2004 – 2005	Transform Pharmaceuticals

Entrepreneurship

Patents

4. Identification of immunologically protective neo-epitopes for the treatment of cancers (USP 11338026, 12311017)
3. Molecular constructs and uses thereof (USP 10526391)
2. Protein folding and methods of using same (USP 10457716)
1. High-affinity DMF5 T cell receptor variants (USP 9717758)

Entrepreneurship education (students advised)

2016 – 2017	David Hardwicke, MS ESTEEM
2015	VaNae Hamilton, MS Patent Law

2014	Sarbani Bhattachaya, MS Patent Law
2014 – 2015	Lynn Roy, MS Patent Law
2011 – 2012	Duy-Tan Ngo, MS, ESTEEM

Commercialization

2016 – 2021	Founder, board member, and chief scientific advisor, <i>Structured Immunity, Inc.</i>
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Trainees

Current postdoctoral fellows

1. Chad Brambley (6/2022 –)

Former postdoctoral fellows

11. Jiaqi Ma (8/2023 – 7/2024)
Current position: Postdoctoral fellow, Westlake University
10. Aaron Rosenberg (1/2024 – 6/2024)
Current position: Postdoctoral fellow, University of Notre Dame
9. Moumita Dasgupta (9/2018 – 8/2023)
Current position: Postdoctoral fellow, University of Massachusetts
8. Jean Custodio (8/2021 – 8/2023)
Current position: Senior Medical and Scientific Advisor, IQVIA
7. Adarsh Chiranjivi (12/2021 – 3/2023)
Current position: Research Associate, Translational Health Science and Technology Institute, Faridabad India
6. Jesús Alonso (1/2018 – 12/2021)
Current position: Senior Scientist II, AbbVie
5. Cory Ayres (1/2018 – 12/2021)
Current position: Research Assistant Professor, University of Notre Dame
4. Lance M. Hellman (7/2011 – 9/2013)
Current position: Associate Professor, Nevada State University
3. William Hawse (7/2009 – 8/2013)
Current position: Assistant Professor, University of Pittsburgh
2. Sujatha Santhanagopalan (5/2007 – 7/2009)
Current position: Adjunct Professor, Kean University
1. Oleg Y. Borbulevych (12/2003 – 8/2008)
Current position: Staff Scientist, QuantumBio, Inc.

Current graduate students

8. Namrata Pokharel (PhD program in Biochemistry, 8/2025 –)
7. Álvaro Medina (PhD program in Biochemistry, 8/2025 –)
6. Phoebe Miller (PhD program in Biochemistry, 8/2025 –)
5. Jasmine Singh (PhD program in Biochemistry, 8/2023 –)
4. Ryan Schurr (PhD program in Biochemistry, 8/2023 –)
3. Bassant Eldaly (PhD program in Integrated Biomedical Sciences, 8/2022 –)

2. P. Chukwunalu Chukwuma (PhD program in Integrated Biomedical Sciences, 8/2021 –)
1. W.W.J. Gihan Perera (PhD program in Biochemistry, 8/2021 –)

Former graduate students

21. George Gray, PhD, Biochemistry, 8/2019 – 7/2025
 Thesis: *Decoding T cell receptor cross-reactivity*
 Current position: Instructor and Laboratory Manager, Earlham College
20. Tatiana Rosales, PhD, Biophysics, 8/2019 – 5/2025
 Thesis: *Biophysical characterization of novel protein dynamics in the adaptive immune system*
 Current position: Product Specialist, Implen, Inc.
19. Aaron M. Rosenberg, PhD, Biochemistry, 8/2017 – 12/2023
 Thesis: *Interrogating the effects of T cell receptor engineering strategies on TCR specificity*
 Current position: Postdoctoral fellow, University of Notre Dame
18. Jiaqi Ma, PhD, Biochemistry, 8/2017 – 8/2023
 Thesis: *Understanding peptide-specific recognition between immune receptors and peptide-major histocompatibility complexes*
 Current position: Postdoctoral fellow, Westlake University
17. Grant L. J. Keller, PhD, Biochemistry, 8/2016 – 3/2022
 Thesis: *Computational Characterization of Peptide-Major histocompatibility Complex Antigen Structure*
 Current position: Senior Scientist, Amgen, Inc.
16. Samantha O'Conner, MS, Biochemistry, 8/2019 – 5/2021
 Thesis: *Rational Design of the $\alpha\beta$ TCR A6 for Immunotherapy of HTLV-1-Associated Cancer*
 Current position: unknown
15. Angela R. Smith, PhD, Biochemistry, 8/2016 – 5/2021
 Thesis: *Peptide anchor modifications modulate T cell receptor recognition of a melanoma-associated antigen*
 Current position: Scientist, APC Proteins, Inc.
14. Jason R. Devlin, PhD, Biochemistry, 8/2015 – 5/2020
 Thesis: *Structural and biophysical characterization of cancer-relevant T cell receptor-peptide/MHC interactions*
 Current position: Research Scientist, University of Nebraska
13. Nishant Singh, PhD, Biochemistry, 8/2012 – 12/2018
 Thesis: *Structural drivers of antigen specificity by T cell receptors*
 Current position: Co-founder and CTO, Fletcher Biosciences
12. Timothy P. Riley, PhD, Biochemistry, 8/2013 – 12/2017
 Thesis: *Structure guided design and computational screening in cellular immunity*
 Current position: Co-founder and CEO, Stealth startup
11. Yuan Wang, PhD, Biochemistry, 8/2012 – 12/2017
 Thesis: *Understanding the molecular basis for an alloreactive T cell receptor to achieve peptide and MHC specificity*
 Current position: Staff Analytical Scientist, Regeneron
10. Cory M. Ayres, PhD, Biochemistry, 8/2011 – 12/2017 (co-mentored with Steven Corcelli)
 Thesis: *Investigation of the differential dynamics of T cell receptors and their ligands: the role of dynamics in immunological recognition*
 Current position: Research Assistant Professor, University of Notre Dame

9. Ruth Nelson, MS, Biochemistry, 8/2014 – 5/2016
Thesis: *Homology modeling of cancer neoantigens.*
Current position: unknown
8. Sydney J. Blevins, PhD, Biochemistry, 8/2010 – 5/2016
Thesis: *Analysis of T cell receptor structure and dynamics and their role in antigen recognition*
Current position: Senior Scientist, Foghorn Therapeutics
7. Daniel R. Scott, PhD, Chemistry, 8/2007 – 5/2012 (co-mentored with Steven Corcelli)
Thesis: *The influences of conformational dynamics on T cell receptor specificity and cross-reactivity*
Current position: Senior Scientist, Novavax
6. Brian Gloor, PhD, Biochemistry, 8/2007 – 8/2012
Thesis: *Understanding the local backbone dynamics of the pMHC and kinetics of the TCR/pMHC binding interaction*
Current position: Director of Employee Experience, District of Columbia Public Schools
5. Moushumi Hossain, PhD, Biochemistry, 8/2005 – 5/2013
Thesis: *Molecular description of how MART-1 specific T-cell receptors recognize structurally diverse melanoma antigens*
Current position: Microbiology CAPA Supervisor, Abbot Laboratories
4. Kurt Piepenbrink, PhD, Biochemistry, 8/2005 – 8/2011
Thesis: *Understanding the energetic basis for T-cell receptor recognition*
Current position: Associate Professor, University of Nebraska
3. Francis Insaiddo, PhD, Biochemistry, 8/2004 – 5/2010
Thesis: *Dynamics of peptides bound to class I major histocompatibility complex proteins implications for T cell receptor recognition in the immune response*
Current position: Associate Principal Scientist, Merck & Co.
2. Kathryn M. Armstrong, PhD, Biochemistry, 8/2003 – 12/2008
Thesis: *Investigations into the thermodynamic, kinetic, and structural properties of TCR-peptide/MHC interactions*
Current position: Chief Science Officer, USANA
1. Rebecca Davis-Harrison, PhD, Biochemistry, 8/2001 – 5/2007
Thesis: *Biophysical investigation of the TCR-PEP/MHC interaction: a comparative study of the interactions of the A6 and B7 T cell receptors with their Tax/HLA-A2 ligand*
Current position: Research Scientist, Ely Lilly, Inc.

Undergraduate trainees (n=57)

Kristina Nitis	8/2025 – current	Sara Foote*	8/2021 – 5/2024
Susanne Schmidt	8/2025 – current	Dominic Stoner	8/2021 – 5/2022
Camilla Castaneda	1/2025 – current	Lauren Martin	8/2021 – 5/2022
Kolton Lee	1/2025 – 12/2025	Hayden Ousley	8/2021 – 5/2022
Katherine Sopko	8/2024 – 8/2025	Laura Weiss*	1/2020 – 5/2023
Joe Blum	8/2023 – 1/2025	Antonio Franco	8/2019 – 5/2020
Livi Edwards	8/2023 – 5/2024	Robert Koniuta	1/2019 – 8/2019
Alexandra Pelikan	8/2023 – 5/2024	Elise Wellman	1/2019 – 12/2019
David Corcelli	6/2023 – 8/2023	Alyssa Arbuiso*	8/2018 – 5/2022
Monica Bradford	7/2023 – 8/2023	Christian Abraham*	8/2017 – 12/2018
James Lazar*	1/2023 – current	Lauren Davancaze*	1/2017 – 5/2019

Richard Felli	8/2016 – 8/2018	Scott Barton	1/2010 – 8/2010
Michael Anderson*	6/2015 – 8/2018	Alex Deak	8/2008 – 5/2010
Salvador Mascarenas	6/2015 – 12/2016	Priscilla Do*	1/2008 – 5/2010
Sarah Cate Baker*	1/2015 – 5/2015	Gregory Antell	8/2008 – 3/2010
Emma Guiberson	1/2015 – 5/2015	Clare Desmond*	8/2007 – 8/2008
John Szigety	1/2015 – 5/2016	Brandon Lynch	8/2006 – 5/2008
Jennifer Cimon*	1/2015 – 5/2017	Ruth Somesse*	8/2005 – 8/2008
Fernando Huyke	8/2014 – 12/2016	Peter Power	8/2004 – 5/2005
Neil Jairath	8/2014 – 5/2016	Sarah Dunn	1/2005 – 5/2005
Jonathan Baker	1/2014 – 5/2014	Melissa Galindo	8/2004 – 5/2005
Michael Cosiano*	8/2013 – 5/2015	Elizabeth Klein	8/2002 – 5/2004
Orrin Beldin*	1/2013 – 5/2015	Catherine Poholek	8/2002 – 5/2003
Julienne Louters	8/2012 – 8/2013	Jennifer Disse	3/2003 – 8/2003
Elizabeth Nuter*	8/2012 – 5/2013	Mike Pykosz	8/2002 – 8/2004
Michael Attanasi	1/2012 – 5/2012	Anna Binz*	8/2003 – 8/2004
Andrew McKernan	1/2012 – 5/2013	John Beck	8/2002 – 5/2003
Kevin Kho*	8/2011 – 9/2013	David Miller	8/2001 – 5/2002
Veronica Ryan*	1/2011 – 8/2013		

*Co-authored at least one manuscript (n=18)

Active Scientific Collaborations

María Rodríguez Martínez, Yale School of Medicine (computational biophysics)
Michael Birnbaum, MIT (immunoengineering)
Pramod Srivastava, University of Connecticut (cancer immunology)
Steve Corcelli, University of Notre Dame (computational biophysics)
Michael Nishimura, Loyola School of Medicine (cellular and cancer immunology)
Brian Evavold, University of Utah (mechanobiology)
Christopher Klebanoff, Memorial Sloan Kettering Cancer Center (cancer immunology)
David Hildeman, University of Cincinnati (transplant immunology)
Jonathan Maltzman, Stanford University (transplant immunology)
Chirag Krishna, Pfizer (immunoinformatics)
Karen Hastings, Arizona State University (cancer immunology)
Cheng Liu, Eureka Therapeutics (cancer immunology)
Meenal Datta, University of Notre Dame (mechanobiology)

Invited Seminars and Oral Conference Presentations

117. November 2025: “Decoding the specificity and inherent cross-reactivity of T cell mediated immunity”, University of Oxford Immunology Network, Oxford, UK
116. June 2025: “The underpinnings of T cell specificity” at the University of Connecticut Neag Comprehensive Cancer Center.

115. June 2025: “Integrating structural modeling and AI-driven scoring for identifying T cell targets in transplantation and autoimmunity” at the 2nd Artificial Intelligence/Human Intelligence in Immunoinformatics Workshop, Providence, Rhode Island
114. February 2025: “The underpinnings of T cell specificity: lessons from targeting tumor antigens” at the University of Colorado Cancer Center, Aurora, Colorado
113. November 2024: “Understanding the specificity and inherent cross-reactivity of T cell mediated immunity” at the Winship Cancer Institute, Emory University (Elkin lecturer)
112. October 2024: “Structural biophysics in cellular immunity” at the Department of Biochemistry and Molecular Biology, University of Georgia
111. July 2024: “The structural biophysics of specificity in cellular immunity” at the Institute of Chemistry and Biochemistry, Freie Universität Berlin, Germany
110. June 2024: “T cell receptor sensitivity through dynamic allostery” at the FASEB Immunoreceptors and Immunotherapy conference, St. Paul, Minnesota.
109. June 2024: “T cell receptor sensitivity through dynamic allostery” at the La Trobe Institute for Molecular Sciences, La Trobe University, Melbourne, Australia
108. May 2024: “T cell receptor sensitivity through dynamic allostery” at the 24th Antigen Processing and Presentation Workshop, Cairns, Australia
107. April 2024: “T cell sensitivity through dynamic allostery” at the 21st Annual SER-CAT Symposium, University of Georgia
106. February 2024: “T cell antigen recognition, specificity, and cross-reactivity” at the Merck T cell Engager meeting, San Francisco, California
105. November 2023: “Structural basis for the immunogenicity and therapeutic targeting of a public cancer neoantigen from phosphatidylinositol 3-kinase” at the 20th Annual SER-CAT Symposium, University of Alabama (award lecture)
104. September 2023: “The (un)rules of T cell receptor recognition” at the Connecting Mechanisms of Antigen Presentation to Translational Research Workshop, at the Freie Universität Berlin, Germany
103. June 2023: “Solving the enigma: how TCRs are both specific and cross-reactive” at the DecodeImmuneAI Symposium, Massachusetts Institute of Technology
102. May 2023: “The structural biophysics of specificity in cellular immunity” at the 2023 Prague Protein Meeting, Prague, Czech Republic
101. March 2023: “Structural and physical underpinnings of specificity in cellular immunity” at EnaraBio, Oxford, UK (virtual)
100. March 2023: “Structural biophysics of specificity in cellular immunity” at the Department of Chemistry and Biochemistry, Northern Illinois University
99. March 2023: “Biophysics of molecular recognition in the cellular immune system” at the Department of Chemistry and Biochemistry, Denison University
98. December 2022: “Structural and physical underpinnings of specificity in cellular immunity” at the Center for Computational and Genomic Medicine, Children’s Hospital of Pennsylvania Research Institute
97. November 2022: “Structural and physical underpinnings of specificity in cellular immunity” at the Specificity Determinants of Biomolecular Interactions Workshop at the Weizmann Institute of Science, Israel

96. October 2022: “How a class switching therapeutic TCR bypasses the logic of MHC restriction” at the Understanding TCR Structure and Signaling for Effective Immunotherapy Workshop in Baeza, Spain
95. June 2022: “Molecular recognition in cellular immunity and cancer immunotherapy” at the Harper-NUIG Biseach retreat, Galway, Ireland
94. March 2022: “Structural properties of the ET1402L1: a TCR mimic antibody for cellular therapy of liver cancer” at Eureka Therapeutics, Emeryville, California
93. March 2022: “Structural and physical underpinnings of specificity in T cell antigen recognition” in the 2021-2022 Mechanistic and translational aspects of antigen presentation seminar series (virtual)
92. March 2022: “The specificity of cellular immunity” at the Department of Biochemistry, Emory University
91. November 2021: “Structural and physical underpinnings of specificity in cellular immunity” at the University of Houston (virtual)
90. October 2021: “Safer and more effective T cells for immunotherapy of viral associated hematological malignancies” at the 2021 Leukemia and Lymphoma Society Meeting (virtual)
89. October 2021: “Protein biophysics vs. the immune system, or why the fundamentals always matter” at the Gibbs Conference on Biothermodynamics (keynote speaker, virtual)
88. April 2021: “Dynamic allostery in class I MHC proteins” at the Advanced Physical and Computational Techniques to Investigate Protein Dynamics Conference in Berlin, Germany (virtual)
87. March 2021: “Structural and physical underpinnings of specificity in cellular immunity” at the Athens Conference on Advances in Chemistry, Athens, Greece (keynote speaker, virtual)
86. February 2021: “How T cells see tumor neoantigens”, at the Harper Cancer Research Institute, University of Notre Dame (virtual)
85. February 2020: “Demystifying cross-reactivity in cellular immunity” at the Mapping the Immune System symposium at the 64th Annual Meeting of the Biophysical Society, San Diego, California
84. November 2019: “Structural and physical underpinnings of specificity in cellular immunity” at the Center for Vaccines and Immunology, University of Georgia
83. October 2019: “A structural dynamic model for catch bond behavior in T cell receptor interfaces” at the Third Annual Physical Concepts and Computational Models in Immunology Symposium, Massachusetts Institute of Technology, Cambridge, Massachusetts
82. October 2019: “Structural and physical underpinnings of specificity in cellular immunity” at the Institute of Molecular Biophysics, Florida State University
81. September 2019: “Square pegs, round holes: structural biophysics in cellular immunity” at the Indiana University Biochemistry Graduate Retreat, Nashville, Indiana (keynote speaker)
80. May 2019: “Rationalizing and engineering immune specificity” at the Department of Molecular Microbiology and Immunology, University of Missouri School of Medicine
79. April 2019: “Specificity in cellular immunity” at the Department of Immunology, St. Jude Children’s Research Hospital
78. March 2019: “Specificity and cross-reactivity in cellular immunity” at AbbVie, Inc., North Chicago, Illinois
77. December 2018: “Understanding receptor specificity in T cell immunity” at the Department of Biochemistry, University of Washington

76. April 2018: "Predictive immunology from structural biology: rationalizing receptor specificity and amino acid preferences in antigenic epitopes" at the Department of Biochemistry and Molecular Biophysics, Kansas State University
75. March 2018: "Predictive immunology from structural biology: rationalizing receptor specificity and amino acid preferences in antigenic epitopes" at the Department of Chemistry and Biochemistry, University of California Santa Cruz
74. January 2018: "Predictive immunology from structural biology: rationalizing specificity and antigenicity for immunotherapy" at the Indiana University School of Medicine Brown Center for Immunotherapy
73. December 2017: "Rationalizing specificity and cross-reactivity in T cell receptor binding" at the 2017 Molecular Perspectives on Protein-Protein Interactions conference, Eilat, Israel
72. October 2017: "Rational modulation and prediction of T cell receptor specificity" at the Cancer Immunotherapy Working Group, Medical University of South Carolina
71. August 2017: "Predictive immunology from structural biology: rationalizing TCR specificity and amino acid preferences in antigenic epitopes" at the Ludwig Institute for Cancer Research, Lausanne, Switzerland
70. February 2017: "Structural biology in cancer immunotherapy" at the USC Norris Comprehensive Cancer Center, University of Southern California
69. October 2016 "Structural biophysics of molecular recognition in cellular immunity" at the Department of Microbiology & Immunology, University of Oklahoma
68. September 2016 "Structural biology of immune recognition" at the Department of Chemistry, Pontificia Universidad Católica de Chile, Santiago, Chile
67. September 2016 "Structural biophysics of molecular recognition in cellular immunity" at the Departments of Chemistry and Microbiology & Immunology, Emory University
66. August 2016: "Determinants of T cell receptor binding geometries" at the Structural Aspects of Infectious Disease Conference, Robinson College, Cambridge, UK
65. March 2016: "Translational structural immunology" at the Indiana Statewide Structural Biology Symposium, Indianapolis, Indiana
64. November 2015: "High Resolution, High Throughput Structural Modeling of T Cell Receptor Specificity and Cross-Reactivity: Implications for Immunotherapy" at the Biophysics in the Understanding, Diagnosis and Treatment of Infectious Diseases meeting, Stellenbosch, South Africa
63. November 2015: "Structural biophysics of T cell receptor recognition" at the Department of Microbiology and Immunology", Department of Biochemistry, University of Illinois Urbana Champaign
62. July 2015: "Structural biophysics of T cell receptor recognition" at the 6th Annual Structural Biology and Biophysics conference, University of Nebraska Medical Center, Omaha, Nebraska
61. April 2015: "Structural biophysics of T cell receptor recognition" at the Department of Microbiology and Immunology", St. Louis University
60. March 2015: "T cell receptor recognition of the composite peptide/MHC surface" at the American Society for Biochemistry and Molecular Biology Annual Symposium, Boston, Massachusetts
59. October 2014: "The composite peptide/MHC surface and T cell receptor recognition" at the Third CD8 Club meeting, Massachusetts Institute of Technology

58. June 2014: "Conformational selection and the importance of the peptide/MHC composite surface in T cell receptor recognition" at the 2014 FASEB Immunoreceptors and Immunotherapy conference, Steamboat Springs, Colorado
57. July 2013: "Molecular flexibility in T cell receptor recognition of antigen" at the Biomolecular Technology Interaction Center Symposium on Antibody Recognition, University of New Hampshire
56. June 2013: "Molecular Recognition by $\alpha\beta$ T cell Receptors" at the Department of Immunology, University of Connecticut
55. May 2013: "Molecular Recognition by $\alpha\beta$ T cell Receptors" at the Oncology Research Institute, Loyola University
54. March 2013: "Peptide-dependent tuning of MHC molecular flexibility" at the Chinese Academy of Sciences Laboratory of Pathogenic Microbiology and Immunology
53. December 2012: "Molecular Recognition by $\alpha\beta$ T cell receptors" at the Department of Pathology, University of Massachusetts Medical School
52. December 2012: "Biophysics of Molecular Recognition by $\alpha\beta$ T cell receptors" at the Department of Chemistry, Vanderbilt University
51. November 2012: "Molecular Recognition by $\alpha\beta$ T cell receptors" at the Department of Molecular Biosciences, University of Kansas
50. October 2012: "Molecular Recognition by $\alpha\beta$ T cell receptors" at the Department of Immunology, Mayo Clinic
49. September 2012: "Molecular Recognition by $\alpha\beta$ T cell receptors" at the Gibbs Conference of Biothermodynamics, Carbondale, Illinois
48. April 2012: "Calorimetric studies of molecular recognition in cellular immunity" at the Thermal Analysis and Microcalorimetry Symposium, New Orleans, Louisiana
47. October 2011: "Flexibility and specificity in T cell receptor recognition" at the Department of Chemistry, University of Toledo
46. May 2011: "Mechanisms of T cell receptor cross-reactivity" at the Department of Biochemistry, Medical College of Wisconsin
45. February 2011: "Mechanisms of T cell receptor recognition and cross-reactivity" at the Department of Biochemistry and Molecular Biology, MD Anderson Cancer Center
44. February 2011: "Mechanisms of T cell receptor recognition and cross-reactivity" at the Department of Biochemistry, University of Iowa
43. November 2010: "Reducing entropic penalties as a natural strategy for T cell receptor selection in cellular immune responses" at the Molecular Perspectives of Protein-Protein Interactions meeting, Costa de Brava, Spain
42. October 2010: "Structure and thermodynamically guided control of T cell receptor recognition" at the 2010 Asian Crystallographic Association Conference, Pusan, South Korea
41. May 2010: "Mechanisms of T cell receptor cross-reactivity" at the Department of Biochemistry and Molecular Biology, University of Texas Medical Branch
40. May 2010: "Mechanisms of T cell receptor cross-reactivity" at the Center for Advanced Research in Biotechnology, University of Maryland
39. March 2010: "T cell receptor cross-reactivity" at the European Institute for Chemical Biology, University of Bordeaux, Bordeaux, France

38. February 2010: "T cell receptor cross-reactivity directed by antigen dependent tuning of peptide/MHC molecular flexibility" at the Annual Meeting of the Biophysical Society, San Francisco, California
37. January 2010: "T cell receptor cross-reactivity directed by antigen dependent tuning of peptide/MHC molecular flexibility" at the 2010 Biomolecular Interactions Gordon Conference, Galveston, Texas
36. November 2009: "T cell receptor cross-reactivity directed by antigen dependent tuning of peptide/MHC molecular flexibility" at the Department of Molecular Pharmacology and Medicinal Chemistry, Purdue University
35. October 2009: "Multi-instrument approaches for characterizing T cell receptors and their interactions" at the 2009 Microcalorimetry and Biacore Symposium, Baltimore, Maryland
34. July 2009: "Thermodynamics associated with conformational selection in T cell receptor recognition of ligand" at the 64th Annual Calorimetry Conference, Sante Fe, New Mexico
33. July 2009: "Challenges, confusion, and creativity in the structure guided design of vaccine candidates based on cellular immunity" at the 2009 annual meeting of the American Crystallographic Association, Toronto, Canada.
32. June 2009: "T cell receptor cross-reactivity driven by antigen-dependent molecular motion in a peptide/MHC complex" at the Keystone Protein Dynamics, Allostery, and Function meeting, Keystone, Colorado.
31. November 2008: "T cell receptor cross-reactivity via cooperative conformational plasticity" at the Department of Chemistry and Chemical Biology, Indiana University - Purdue University Indianapolis
30. October 2008: "T cell receptor cross-reactivity via cooperative conformational plasticity" at the Department of Biochemistry, Department of Biochemistry, University of Illinois Urbana-Champaign
29. September 2008: "T cell receptor cross-reactivity via cooperative conformational plasticity" at the Department of Biochemistry and Immunology, Trinity College, Dublin, Ireland
28. September 2008: "T cell receptor cross-reactivity via cooperative conformational plasticity" at the Department of Medical Biochemistry, Cardiff University, Cardiff, Wales, UK
27. September 2008: "T cell receptor cross-reactivity via cooperative conformational plasticity" at the Department of Biology, York University, York, UK
26. September 2008: "T cell receptor cross-reactivity via cooperative conformational plasticity" at the Keystone Structural Biology and Activation Mechanisms of Membrane Receptors meeting, St. John's College, Cambridge, UK
25. June 2008: "T cell receptor cross-reactivity requires cooperative conformational plasticity" at the 2nd International Conference on the Molecular Perspectives of Protein-Protein Interactions, Dubrovnik, Croatia
24. May 2008: "Conformational flexibility and conformational changes in T cell receptor recognition of tumor and viral antigens" at the Department of Biochemistry, University of Mississippi Medical Center
23. February 2008: "Molecular dynamics and conformational changes in T cell receptor recognition of ligand" at the Department of Microbiology and Immunology, University of North Carolina Chapel Hill
22. January 2008: "T cell receptor recognition of peptide/MHC – more questions than answers" at the Department of Molecular Genetics, Biochemistry, and Microbiology, University of Cincinnati

21. December 2007: "Conformational changes in TCR-pMHC interactions and the implications for cancer immunotherapy" at the Boston Biomedical Research Institute
20. December 2007: "T cell receptor recognition of peptide/MHC – more questions than answers" at the Department of Biochemistry and Molecular Biology, University of Kansas
19. November 2006: "T cell receptor recognition of ligand" at the Department of Biochemistry, University of Kentucky
18. July 2006: "A complete calorimetric characterization of an entropically driven T cell receptor – ligand interaction" at the 5th Applications of Biocalorimetry Conference, Zaragoza, Spain
17. May 2006: "Structural energetics and conformational dynamics: challenges for computational biology in T cell receptor recognition of ligand" at the Workshop on Multiscale Interactions and Dynamics in Complex Biological Systems, Washington University
16. May 2006: "A 'complete' calorimetric characterization of an entropically driven T cell receptor – ligand interaction" at the Workshop on Biological Thermodynamics, Rio de Janeiro, Brazil
15. January 2006: "Calorimetric characterization of an entropically driven T cell receptor – ligand interaction" at Microcal, Inc
14. January 2006: "Unraveling a TCR 'hot spot' on the surface of HLA-A2: peptide independent binding determinants?" at the National Institute of Neurological Diseases and Stroke, National Institutes of Health
13. October 2005: "T cell receptor - ligand interactions: multiple solutions to the protein docking problem" at Boehringer Ingelheim Pharmaceuticals
12. October 2005: "Increased immunogenicity of an anchor-modified tumor associated antigen is due to the enhanced stability of the peptide/MHC complex: Implications for Vaccine Design" at the 13th Annual Great Lakes Cancer Symposium, University of Notre Dame
11. December 2004: "Deconstructing a hot spot on HLA-A2" at the Department of Microbiology and Immunology, University of Oklahoma
10. November 2004: "T cell receptor - ligand interactions: multiple solutions to the protein docking problem" at the 2004 Trends in Biocalorimetry Symposium, Chicago, Illinois
9. October 2004: "T cell receptor - ligand interactions: multiple solutions to the protein docking problem" at the 18th Gibbs Conference on Biothermodynamics, Carbondale, Illinois
8. December 2003: "Biophysical investigations of ligand recognition by T cell receptors and class I MHC molecules" at the Department of Biochemistry, University of Iowa
7. July 2003: "Comparative studies of different T cell receptors that recognize the same ligand" at the 2003 Microcalorimetry Symposium, Boston, Massachusetts
6. April 2003: "Comparative studies of different T cell receptors that recognize the same ligand" at the 2003 Trends in Biocalorimetry Symposium, Chicago, Illinois
5. February 2003: "Biophysical Chemistry of Molecular Recognition in the Immune System" at the Department of Chemistry, Indiana University South Bend
4. February 2003: "Different but the same: Comparative studies of different T cell receptors that recognize the same ligand" at the 47th Symposium of the Biophysical Society, San Antonio, TX
3. October 2002: "Biophysical considerations of T cell receptor – peptide/MHC interactions" at the 15th International Symposium on Mathematical Theory of Networks and Systems, University of Notre Dame
2. April 2002: "Manipulation of T cell receptor binding and function through structure-based design" at the 2nd Tsinghua International Conference of Protein Sciences, Beijing, China

1. April 2002: "The physical and functional focus of viral peptide specific T cell receptors on the class I MHC HLA-A2" at the Department of Microbiology & Immunology, Indiana University School of Medicine

Non-specialist Presentations

10. October 2020: "Vaccines and immunology of COVID-19", ThinkND, University of Notre Dame
9. May 2019: "Cancer immunology explained" at Riverbend Cancer Services, South Bend, Indiana
8. April 2018: "Dare to cure cancer: imagination, perseverance, and a scientific revolution from the 19th to the 21st century" at TEDx Talk, University of Notre Dame
7. May 2017: "Your immune systems and cancer: new treatments and therapies explained" at the Saint Joseph Health System Cancer Survivorship Program, Mishawaka, Indiana
6. April 2017: "Engineering immunity for cancer therapy" at the ND Nano workshop, Notre Dame, Indiana
5. November 2015: "Cancer immunotherapy" at the Harper Cancer Institute, Notre Dame, Indiana
4. July 2015: "Cancer Immunology & Immunotherapy" at Riverbend Cancer Services, South Bend, Indiana
3. October 2014: "Cancer, biophysics, and immunology" at Talk Science, Notre Dame, Indiana
2. June 2008: "Cancer and your immune system" at the American Cancer Society Relay for Life, Fort Wayne, Indiana
1. April 2008: "Cancer and your immune system" at the American Cancer Society Relay for Life, South Bend, Indiana

Media

2. May 2017: Television interview: "Cancer and your immune system" for ABC News 57
1. August 2009: Television interview: "Vaccines for cancer?" for WNDU NBC News 16

Teaching

Evaluated Courses

Semester	Course	Level	Credit Hours	Enrollment	Evaluation*
S 2026	Chemistry seminar	undergrad	1	13	
F 2025	Special Topics: Biomolecular Logic	grad	3	6	4.6 / 5
S 2025	Chemistry seminar	undergrad	1	12	5 / 5
F 2024	Biochemical Equilibria	grad	1	8	3.8 / 5
S 2024	Chemistry seminar	undergrad	1	12	4.9 / 5
F 2023	Biochemical Equilibria	grad	1	14	4.6 / 5
F 2022	Biochemical Equilibria	grad	1	14	4.6 / 5
F 2021	Biochemical Equilibria	grad	1	23	4.2 / 5
F 2020	Biochemical Equilibria	grad	1	14	4.7 / 5
F 2019	Biochemical Equilibria	grad	1	13	4.6 / 5
F 2018	Biochemical Equilibria	grad	1	6	4.9 / 5
F 2017	Biochemical Equilibria	grad	1	12	4.1 / 5 (4.0)

F 2016	Fundamentals of Biochemistry	undergrad	3	21	4.6 / 5 (4.1)
F 2015	Fundamentals of Biochemistry	undergrad	3	24	4.5 / 5 (4.1)
F 2014	Fundamentals of Biochemistry	undergrad	3	28	4.3 / 5 (4.2)
F 2013	Principles of Biochemistry	undergrad	3	94	4.3 / 5 (3.9)
S 2013	Intermediary Metabolism	undergrad	3	22	4.8 / 5 (3.9)
F 2012	Biochemical Equilibria	grad	1	17	3.4 / 5 (3.6)
S 2012	Intermediary Metabolism	undergrad	3	19	4.5 / 5 (3.8)
F 2011	Biochemical Equilibria	grad	1	17	3.9 / 5 (3.9)
S 2011	Intermediary Metabolism	undergrad	3	19	4.5 / 5 (3.8)
F 2010	Biochemical Equilibria	grad	1	16	4.1 / 5 (3.8)
S 2010	Intermediary Metabolism	undergrad	3	27	3.8 / 5 (3.6)
F 2009	Fundamentals of Biochemistry	undergrad	3	21	4.4 / 5 (4.0)
S 2009	Biomolecular Interactions	grad	2	11	4.0 / 5 (3.9)
F 2008	Fundamentals of Biochemistry	undergrad	3	25	3.9 / 4 (3.8)
S 2008	Intermediary Metabolism	undergrad	3	24	3.4 / 4 (3.4)
F 2007	Fundamentals of Biochemistry	undergrad	3	28	3.4 / 4 (3.3)
S 2007	Intermediary Metabolism	undergrad	3	27	3.4 / 4 (3.4)
F 2006	Fundamentals of Biochemistry	undergrad	3	30	3.1 / 4 (3.2)
S 2006	Intermediary Metabolism	undergrad	3	23	3.8 / 4 (3.3)
F 2005	Molecular Biophysics	grad	3	10	3.7 / 4 (3.2)
S 2004	Intermediary Metabolism	undergrad	3	13	3.7 / 4 (3.4)
F 2003	Molecular Biophysics	grad	3	16	3.7 / 4 (3.2)
S 2003	Intermediary Metabolism	undergrad	3	23	3.8 / 4 (3.4)
F 2002	Molecular Biophysics	grad	3	18	3.2 / 4 (3.2)
F 2001	Fundamentals of Biochemistry	grad	1.5	17	3.3 / 4 (3.3)

* For 2001-2008, the number is the score in "Overall Perception of Teaching" in the Teacher/Course Evaluation (TCE) system in place through Spring 2008. Score is out of 4.0, number in parentheses is the department average. For 2009-2017, the number is the score in "Overall Effectiveness of Teaching" in the Course Instructor Feedback (CIF) system adopted Fall 2008. Score is out of 5.0, number in parentheses is the department average. Changes in the CIF system introduced in academic year 2018-19 replaced the overall effectiveness score with the composite mean of evaluative questions and eliminated reporting of averages. Score is out of 5.0.

Non-evaluated Courses (e.g., Seminars; excludes Research & Dissertation, Special Topics, etc.)

Semester	Course	Level	Hours	Enrollment
F 2021	Research Perspectives	grad	1	38
F 2020	Research Perspectives	grad	1	38
F 2019	Research Perspectives	grad	1	49
F 2018	Research Perspectives	grad	1	42
F 2017	Research Perspectives	grad	1	36
F 2016	Research Perspectives	grad	1	34
F 2013	IBMS Rotations	grad	1	6
S 2013	IBMS Rotations	grad	1	2

S 2013	Biochemistry Seminar	grad	1	13
F 2012	IBMS Rotations	grad	1	2
F 2012	Biochemistry Seminar	grad	1	13
F 2011	Chemistry Seminar	undergrad	1	12
S 2011	Biochemistry Seminar	grad	1	8
F 2010	Chemistry Seminar	undergrad	1	17
S 2007	Special Topics: Molecular Biophysics	grad	3	9
S 2004	Chemistry Seminar	undergrad	1	26
F 2003	Biochemistry Seminar	grad	1	9
S 2003	Biochemistry Seminar	grad	1	10