



Tobias Lanz

Assistant Professor of Medicine (Immunology and Rheumatology)

Medicine - Immunology & Rheumatology

 Curriculum Vitae available Online

Bio

BIO

Tobias Lanz, MD is an Assistant Professor at the Institute for Immunity, Transplantation, and Infection and the Division of Immunology and Rheumatology at Stanford. His research focuses on B cell biology in neuroimmunological diseases and rheumatic diseases with neurological manifestations. He uses high-throughput screening technologies, and methods from structural and cell biology to identify new autoantigens and to understand how certain self-reactive B cells escape tolerance mechanisms. He is particularly interested in molecular mechanisms that explain the association between Epstein Barr Virus (EBV) and autoimmunity.

Tobias went to medical school at the Eberhard Karls University in Tübingen, Germany and at the University College of London. He wrote his MD thesis at Dr. Michael Platten's laboratory at the Hertie Institute for Clinical Brain Research in Tübingen, Germany before joining Dr. Lawrence Steinman's neuroimmunological laboratory at Stanford as a research scholar. After medical school he pursued his scientific and clinical training at the German Cancer Research Center (DKFZ) and the Department of Neurology at the University Hospital in Heidelberg, Germany. In 2015 he joined Dr. William Robinson's lab at Stanford, where he investigated environmental triggers of autoimmunity, including viruses and milk consumption. In his most recent work, he characterized the B cell repertoire in the spinal fluid of patients with multiple sclerosis (MS) and identified molecular mimicry between EBV EBNA1 and the glial cellular adhesion molecule GlialCAM as a driver of neuroinflammation (Lanz et al., Nature, 2022). His long term objective is to leverage these newly discovered mechanistic insights to develop next-generation biomarkers and therapeutics for autoimmune diseases.

ACADEMIC APPOINTMENTS

- Assistant Professor, Medicine - Immunology & Rheumatology
- Member, Bio-X

HONORS AND AWARDS

- Oppenheim Award for Multiple Sclerosis Research, Novartis (2017)
- Postdoc Scholarship, German Research Foundation (2015 - 2017)
- Carl Liebermeister Prize for outstanding medical doctoral thesis, University of Tübingen, Germany (2011)
- Postdoc Scholarship, University of Heidelberg, Germany (2010 - 2012)
- Academic Scholarship, German National Academic Foundation (Studienstiftung des Deutschen Volkes) (2007 - 2010)
- IZKF Poster Prize, Interdisciplinary Center of Clinical Research (IZKF), Tübingen, Germany (2006)
- Research Scholarship, Interdisciplinary Center of Clinical Research (IZKF), University of Tübingen, Germany (2006 - 2007)

PROFESSIONAL EDUCATION

- MD, Eberhard Karls University of Tübingen, Germany , Medicine (2010)
- Cand Med, University College of London, UK , Neurology (2009)

- Research Scholar, Stanford School of Medicine , Neuroimmunology (2008)

LINKS

- Lanz Lab Website: <https://www.lanzlab.com>

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Alison Barrett, Saurabh Gawde

Publications

PUBLICATIONS

- **Clonally Expanded B Cells in Multiple Sclerosis Bind EBV EBNA1 and GlialCAM.** *Nature*
Lanz, T. V., Brewer, R. C., Ho, P. P., Moon, J. S., Jude, K. M., Fernandez, D., Fernandes, R. A., Gomez, A. M., Nadj, G. S., Bartley, C. M., Schubert, R. D., Hawes, I. A., Vazquez, et al
2022
- **BNT162b2 vaccine induces divergent B cell responses to SARS-CoV-2 S1 and S2** *NATURE IMMUNOLOGY*
Brewer, R., Ramadoss, N. S., Lahey, L. J., Jahanbani, S., Robinson, W. H., Lanz, T.
2021
- **Autoantibodies against central nervous system antigens in a subset of B cell-dominant multiple sclerosis patients.** *Proceedings of the National Academy of Sciences of the United States of America*
Kuerten, S. n., Lanz, T. V., Lingampalli, N. n., Lahey, L. J., Kleinschnitz, C. n., Mäurer, M. n., Schroeter, M. n., Braune, S. n., Ziemssen, T. n., Ho, P. P., Robinson, W. H., Steinman, L. n.
2020
- **Single-Cell High-Throughput Technologies in Cerebrospinal Fluid Research and Diagnostics.** *Frontiers in immunology*
Lanz, T. V., Pröbstel, A. K., Mildnerberger, I., Platten, M., Schirmer, L.
2019; 10: 1302
- **Immunomodulatory receptors are differentially expressed in B and T cell subsets relevant to autoimmune disease.** *Clinical immunology (Orlando, Fla.)*
Murphy, K. A., Bhamidipati, K. n., Rubin, S. J., Kipp, L. n., Robinson, W. H., Lanz, T. V.
2019: 108276
- **Tryptophan-2,3-Dioxygenase (TDO) deficiency is associated with subclinical neuroprotection in a mouse model of multiple sclerosis.** *Scientific reports*
Lanz, T. V., Williams, S. K., Stojic, A., Iwantscheff, S., Sonner, J. K., Grabitz, C., Becker, S., Böhrer, L. I., Mohapatra, S. R., Sahm, F., Küblbeck, G., Nakamura, T., Funakoshi, et al
2017; 7: 41271
- **Protein kinase C beta as a therapeutic target stabilizing blood-brain barrier disruption in experimental autoimmune encephalomyelitis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Lanz, T. V., Becker, S., Osswald, M., Bittner, S., Schuhmann, M. K., Opitz, C. A., Gaikwad, S., Wiestler, B., Litzenburger, U. M., Sahm, F., Ott, M., Iwantscheff, S., Grabitz, et al
2013; 110 (36): 14735-14740
- **Angiotensin II sustains brain inflammation in mice via TGF-beta** *JOURNAL OF CLINICAL INVESTIGATION*
Lanz, T. V., Ding, Z., Ho, P. P., Luo, J., Agrawal, A. N., Srinagesh, H., Axtell, R., Zhang, H., Platten, M., Wyss-Coray, T., Steinman, L.
2010; 120 (8): 2782-2794
- **Oral mucosal breaks trigger anti-citrullinated bacterial and human protein antibody responses in rheumatoid arthritis.** *Science translational medicine*
Brewer, R. C., Lanz, T. V., Hale, C. R., Sepich-Poore, G. D., Martino, C., Swafford, A. D., Carroll, T. S., Kongpachith, S., Blum, L. K., Elliott, S. E., Blachere, N. E., Parveen, S., Fak, et al
2023; 15 (684): eabq8476

- **Roadmap for understanding mechanisms on how Epstein-Barr virus triggers multiple sclerosis and for translating these discoveries in clinical trials.** *Clinical & translational immunology*
Lanz, T. V., Robinson, W. H., Ho, P. P., Steinman, L.
2023; 12 (2): e1438
- **RNA-seq characterization of histamine-releasing mast cells as potential therapeutic target of osteoarthritis.** *Clinical immunology (Orlando, Fla.)*
Zhao, X., Younis, S., Shi, H., Hu, S., Zia, A., Wong, H. H., Elliott, E. E., Chang, T., Bloom, M. S., Zhang, W., Liu, X., Lanz, T. V., Sharpe, et al
2022: 109117
- **Rheumatoid Arthritis Patient-derived Anti-citrullinated Protein Antibodies (ACPAs) Ameliorate Joint Inflammation in Early Collagen-antibody Induced Arthritis (CAIA)**
Gomez, A., Brewer, C., Moon, J., Acharya, S., Lanz, T. V., Wang, Q., Min-Oo, G., Niedziela-Majka, A., Robinson, W.
WILEY.2022: 69-70
- **SARS-CoV-2 infection of monocytes: balancing acts of antibodies and inflammasomes.** *Signal transduction and targeted therapy*
Brewer, R. C., Robinson, W. H., Lanz, T. V.
2022; 7 (1): 250
- **Antibody cross-reactivity between casein and myelin-associated glycoprotein results in central nervous system demyelination.** *Proceedings of the National Academy of Sciences of the United States of America*
Chunder, R., Weier, A., Maurer, H., Lubner, N., Enders, M., Lubner, G., Heider, T., Spitzer, A., Tacke, S., Becker-Gottot, J., Kurts, C., Iyer, R., Ho, et al
2022; 119 (10): e2117034119
- **Neutralizing Anti-Interleukin-1 Receptor-Antagonist Autoantibodies Induce Inflammatory and Fibrotic Mediators in IgG4-Related Disease.** *The Journal of allergy and clinical immunology*
Jarrell, J. A., Baker, M. C., Perugino, C. A., Liu, H., Bloom, M. S., Maehara, T., Wong, H. H., Lanz, T., Adamska, J. Z., Kongpachith, S., Sokolove, J., Stone, J. H., Pillai, et al
2021
- **Hypoxia Routes Tryptophan Homeostasis Towards Increased Tryptamine Production.** *Frontiers in immunology*
Mohapatra, S. R., Sadik, A. n., Sharma, S. n., Poschet, G. n., Gegner, H. M., Lanz, T. V., Lucarelli, P. n., Klingmüller, U. n., Platten, M. n., Heiland, I. n., Opitz, C. A.
2021; 12: 590532
- **CD52 Is Elevated on B cells of SLE Patients and Regulates B Cell Function.** *Frontiers in immunology*
Bhamidipati, K. n., Silberstein, J. L., Chaichian, Y. n., Baker, M. C., Lanz, T. V., Zia, A. n., Rasheed, Y. S., Cochran, J. R., Robinson, W. H.
2020; 11: 626820
- **Hepatocyte-intrinsic type I interferon signaling reprograms metabolism and reveals a novel compensatory mechanism of the tryptophan-kynurenine pathway in viral hepatitis.** *PLoS pathogens*
Lercher, A. n., Popa, A. M., Vicenczova, C. n., Kosack, L. n., Klavins, K. n., Agerer, B. n., Opitz, C. A., Lanz, T. V., Platten, M. n., Bergthaler, A. n.
2020; 16 (10): e1008973
- **Dietary tryptophan links encephalogenicity of autoreactive T cells with gut microbial ecology.** *Nature communications*
Sonner, J. K., Keil, M., Falk-Paulsen, M., Mishra, N., Rehman, A., Kramer, M., Deumelandt, K., Rowe, J., Sanghvi, K., Wolf, L., von Landenberg, A., Wolff, H., Bharti, et al
2019; 10 (1): 4877
- **Suppression of Th1 differentiation by tryptophan supplementation in vivo.** *Amino acids*
Lanz, T. V., Becker, S., Mohapatra, S. R., Opitz, C. A., Wick, W., Platten, M.
2017
- **General control non-derepressible 2 (GCN2) in T cells controls disease progression of autoimmune neuroinflammation.** *Journal of neuroimmunology*
Keil, M., Sonner, J. K., Lanz, T. V., Oezen, I., Bunse, T., Bittner, S., Meyer, H. V., Meuth, S. G., Wick, W., Platten, M.
2016; 297: 117-26
- **Normal mast cell numbers in the tissues of AhR-deficient mice** *EXPERIMENTAL DERMATOLOGY*
Pilz, C., Feyerabend, T., Sonner, J., Redaelli, C., Peter, K., Kunze, A., Haas, K., Esser, C., Schaekel, K., Wick, W., Rodewald, H., Lanz, T. V., Platten, et al
2016; 25 (1): 62-63
- **Toxicity of teriflunomide in aryl hydrocarbon receptor deficient mice.** *Biochemical pharmacology*

Redaelli, C., Gaffarogullari, E. C., Brune, M., Pilz, C., Becker, S., Sonner, J., Jäschke, A., Gröne, H., Wick, W., Platten, M., Lanz, T. V.
2015; 98 (3): 484-492

● **Aryl hydrocarbon receptor control of a disease tolerance defence pathway** *NATURE*

Bessede, A., Gargaro, M., Pallotta, M. T., Martino, D., Servillo, G., Brunacci, C., Bicciato, S., Mazza, E. M., Macchiarulo, A., Vacca, C., Iannitti, R., Tissi, L., Volpi, et al
2014; 511 (7508): 184-?

● **Immature mesenchymal stem cell-like pericytes as mediators of immunosuppression in human malignant glioma** *JOURNAL OF NEUROIMMUNOLOGY*

Ochs, K., Sahm, F., Opitz, C. A., Lanz, T. V., Oezen, I., Couraud, P., von Deimling, A., Wick, W., Platten, M.
2013; 265 (1-2): 106-116

● **Clinically isolated syndrome** *NERVENARZT*

Platten, M., Lanz, T., Bendszus, M., Diem, R.
2013; 84 (10): 1247-1257

● **Mouse Mesenchymal Stem Cells Suppress Antigen-Specific TH Cell Immunity Independent of Indoleamine 2,3-Dioxygenase 1 (IDO1)** *STEM CELLS AND DEVELOPMENT*

Lanz, T. V., Opitz, C. A., Ho, P. P., Agrawal, A., Lutz, C., Weller, M., Mellor, A. L., Steinman, L., Wick, W., Platten, M.
2010; 19 (5): 657-668

● **Blocking angiotensin-converting enzyme induces potent regulatory T cells and modulates TH1-and TH17-mediated autoimmunity** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

Platten, M., Youssef, S., Hur, E. M., Ho, P. P., Han, M. H., Lanz, T. V., Phillips, L. K., Goldstein, M. J., Bhat, R., Raine, C. S., Sobel, R. A., Steinman, L.
2009; 106 (35): 14948-14953

● **Toll-Like Receptor Engagement Enhances the Immunosuppressive Properties of Human Bone Marrow-Derived Mesenchymal Stem Cells by Inducing Indoleamine-2,3-dioxygenase-1 via Interferon-beta and Protein Kinase R** *STEM CELLS*

Opitz, C. A., Litzénburger, U. M., Lutz, C., Lanz, T. V., Tritschler, I., Koeppel, A., Tolosa, E., Hoberg, M., Anderl, J., Aicher, W. K., Weller, M., Wick, W., Platten, et al
2009; 27 (4): 909-919