Stanford



Tino Pleiner

Assistant Professor of Molecular and Cellular Physiology

NIH Biosketch available Online Curriculum Vitae available Online

CONTACT INFORMATION

- **Administrative contact**

  Maria De Lourdes Ramirez Cervantes - RA1 and Operations Support Specialist

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Bio

BIO

Tino obtained his Ph.D. in Molecular Biology from the University of Göttingen in Germany. He did his graduate work with Dirk Görlich, Ph.D at the Max Planck Institute for Multidisciplinary Sciences. During his time at Max Planck, Tino established an on-site alpaca farm and developed techniques to engineer alpaca-derived nanobodies as precision tools for structural and cellular biology. For example, he developed anti-IgG secondary nanobodies that replace conventional animal-derived secondary antibodies. This work was awarded the ‘animal welfare research prize’ by the German government. Tino then went on to join the lab of Rebecca Voorhees, Ph.D, at the California Institute of Technology as her first postdoc to study membrane protein biogenesis and assembly at the human endoplasmic reticulum (ER). His work was supported by a Caltech Ross fellowship and a postdoc fellowship of the German Research Foundation (DFG). In collaboration with other lab members, his work resulted in the first structure of the ER membrane protein complex (EMC), which is crucial for the biogenesis of a vast set of different endogenous as well as viral membrane proteins. He also used the EMC as a model system to understand the regulation of membrane protein complex assembly and discovered a moonlighting, regulatory role for the kinase WNK1 as an EMC assembly factor.

His lab combines molecular, cellular and structural biology to study the pathways and molecular machines that regulate protein homeostasis, with a particular focus on membrane proteins. The Pleiner lab also develops nanobodies as tools to study and reverse failure of protein homeostasis under disease conditions. Tino is a First Generation college graduate and provides mentorship to other First Generation students as part of Stanford's First Generation Mentorship program.

ACADEMIC APPOINTMENTS

- Assistant Professor, Molecular and Cellular Physiology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Baxter Faculty Scholar, Donald E. and Delia B. Baxter Foundation (2024)
- Postdoctoral fellowship of the German research foundation, Deutsche Forschungsgemeinschaft (2019)
- 37th Animal welfare research prize, German Federal Ministry for Food and Agriculture (2018)
- Ross postdoctoral fellowship, California Institute of Technology (2018)
- Fellowship by International Max Planck Research School, IMPRS for Molecular Biology Göttingen (2010)
- Study prize for best Bachelor of Science Biochemistry degree, University of Leipzig (2010)
- Fellowship of the German Academic Scholarship Foundation, Studienstiftung des deutschen Volkes (2009)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Society for Biochemistry and Molecular Biology (ASBMB) (2023 - present)
- Member, German Society for Biochemistry and Molecular Biology (GBM) (2008 - present)

PROFESSIONAL EDUCATION

- B.Sc., University of Leipzig , Biochemistry (2010)
- M.Sc., Georg-August-University Göttingen (Max Planck Institute for Multidisciplinary Sciences) , Molecular Biology (2012)
- PhD, Georg-August-University Göttingen (Max Planck Institute for Multidisciplinary Sciences) , Molecular Biology (2016)

LINKS

- Lab website: https://www.pleinerlab.org

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The Pleiner lab combines mechanistic cell biology, structural biochemistry and protein engineering to dissect the pathways and molecular machines that mature human membrane proteins to a fully functional state. We also develop alpaca-derived and synthetic nanobodies as tools to modulate intracellular pathways that globally regulate protein homeostasis in health and disease.

Teaching

COURSES

2026-27

- Imaging: Biological Light Microscopy: MCP 222 (Win)

2025-26

- Imaging: Biological Light Microscopy: BIO 152, MCP 222 (Win)

2024-25

- Imaging: Biological Light Microscopy: BIO 152, MCP 222 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Carlo Armijo, Katie DeLong, Kyle Trinh, Xinyu Xiang

Postdoctoral Faculty Sponsor

Mahamaya Biswal, Andreas Blaha, Yingjie Hu

Doctoral Dissertation Advisor (AC)

Caroline Scheuing, Gerardo Vargas

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biophysics (PhD Program)
- Molecular and Cellular Physiology (PhD Program)

Publications

PUBLICATIONS

- **EMC chaperone activity is required for cotranslational calcium channel assembly.** *Nature structural & molecular biology*
  Stanton, M., Scheuing, C. E., Biswal, M., Singal, B., Agarwal, M., Vargas, G. D., Gao, A., Brademan, D. R., Hüttenhain, R., Gifford, C. A., Pleiner, T.
  2026
- **Phage terminase recognition by the bacterial immune sensors Avs2 and Upx.** *Nature communications*
  Evans, S. A., Chiu, C., Wilkinson, M. E., Li, D. B., Biswal, M., Strecker, J., Pleiner, T., Zhang, F., Gao, A.
  2026; 17 (1)
- **The ER membrane protein complex acts as a chaperone to promote the biogenesis of multi-bundle membrane proteins.** *bioRxiv : the preprint server for biology*
  Stanton, M., Singal, B., Biswal, M., Agarwal, M., Scheuing, C. E., Vargas, G. D., Gao, A., Gifford, C. A., Pleiner, T.
  2026
- **Role of a holo-insertase complex in the biogenesis of biophysically diverse ER membrane proteins.** *Molecular cell*
  Page, K. R., Nguyen, V. N., Pleiner, T., Tomaleri, G. P., Wang, M. L., Guna, A., Hazu, M., Wang, T. Y., Chou, T. F., Voorhees, R. M.
  2024
- **A checkpoint function for Nup98 in nuclear pore formation suggested by novel inhibitory nanobodies.** *The EMBO journal*
  Solà Colom, M., Fu, Z., Gunkel, P., Güttler, T., Trakhanov, S., Srinivasan, V., Gregor, K., Pleiner, T., Görlich, D.
  2024
- **A nanobody-based strategy for rapid and scalable purification of human protein complexes.** *Nature protocols*
  Stevens, T. A., Tomaleri, G. P., Hazu, M., Wei, S., Nguyen, V. N., DeKalb, C., Voorhees, R. M., Pleiner, T.
  2023
- **A selectivity filter in the ER membrane protein complex limits protein misinsertion at the ER** *JOURNAL OF CELL BIOLOGY*
  Pleiner, T., Hazu, M., Tomaleri, G., Nguyen, V. N., Januszyk, K., Voorhees, R. M.
  2023; 222 (8)
- **WNK1 is an assembly factor for the human ER membrane protein complex.** *Molecular cell*
  Pleiner, T., Hazu, M., Tomaleri, G. P., Januszyk, K., Oania, R. S., Sweredoski, M. J., Moradian, A., Guna, A., Voorhees, R. M.
  2021; 81 (13): 2693-2704.e12
- **Structural basis for membrane insertion by the human ER membrane protein complex.** *Science (New York, N.Y.)*
  Pleiner, T., Tomaleri, G. P., Januszyk, K., Inglis, A. J., Hazu, M., Voorhees, R. M.
  2020; 369 (6502): 433-436
- **Xpo7 is a broad-spectrum exportin and a nuclear import receptor.** *The Journal of cell biology*
  Aksu, M., Pleiner, T., Karaca, S., Kappert, C., Dehne, H. J., Seibel, K., Urlaub, H., Bohnsack, M. T., Görlich, D.
  2018; 217 (7): 2329-2340
- **A toolbox of anti-mouse and anti-rabbit IgG secondary nanobodies.** *The Journal of cell biology*
  Pleiner, T., Bates, M., Görlich, D.
  2018; 217 (3): 1143-1154
- **Strong signal increase in STED fluorescence microscopy by imaging regions of subdiffraction extent.** *Proceedings of the National Academy of Sciences of the United States of America*

Göttfert, F., Pleiner, T., Heine, J., Westphal, V., Görlich, D., Sahl, S. J., Hell, S. W.
2017; 114 (9): 2125-2130

- **Nanobodies: site-specific labeling for super-resolution imaging, rapid epitope-mapping and native protein complex isolation.** *eLife*
  Pleiner, T., Bates, M., Trakhanov, S., Lee, C. T., Schliep, J. E., Chug, H., Böhning, M., Stark, H., Urlaub, H., Görlich, D.
  2015; 4: e11349
- **Crystal structure of the metazoan Nup62•Nup58•Nup54 nucleoporin complex.** *Science (New York, N.Y.)*
  Chug, H., Trakhanov, S., Hülsmann, B. B., Pleiner, T., Görlich, D.
  2015; 350 (6256): 106-10
- **Well-defined biomimetic surfaces to characterize glycosaminoglycan-mediated interactions on the molecular, supramolecular and cellular levels.** *Biomaterials*
  Migliorini, E., Thakar, D., Sadir, R., Pleiner, T., Baleux, F., Lortat-Jacob, H., Coche-Guerente, L., Richter, R. P.
  2014; 35 (32): 8903-15