Stanford



Maximilian Koch

Postdoctoral Scholar, Stanford Cancer Institute

Bio

BIO

I am a physician-scientist and postdoctoral scholar in the Heitzeneder Lab at the Stanford Cancer Institute, within the Center for Cancer Cell Therapy. My goal is to make cellular immunotherapy for children with cancer safer, more durable, and more widely accessible.

I trained in medicine and completed a research doctorate in T cell immunology at the Technical University of Munich (TUM), where I studied how CD8+ T cells recognize and control Helicobacter pylori, the leading cause of gastric cancer. After beginning clinical training in pediatric oncology at TUM, I paused my residency in 2024 to join Stanford, drawn by the opportunity to work with Crystal Mackall and Sabine Heitzeneder on translating cellular immunotherapy from the bench to first-in-human trials.

HONORS AND AWARDS

- Forbes 30 Under 30 Europe – Science & Healthcare, Forbes (April-2026)
- Early Career Investigator Award, Digestive Disease Week (April-2025)
- Walter-Benjamin-Fellowship, Deutsche Forschungsgemeinschaft (Nov-2024)
- Johannes B. Ordner Award for outstanding dissertation, Technical University Munich (Oct-2024)
- Paper of the Month, German Society for Hygiene and Microbiology (DGHM) (Apr-2023)
- M.D. Program Scholarship, German Center for Infection Research (DZIF) (Oct-2018)

PROFESSIONAL EDUCATION

- Dr. med. sci. (M.D.), Technical University Munich , Immunology (2024)
- Approbation (medical license), Technical University Munich , Medicine (2023)

STANFORD ADVISORS

- Sabine Heitzeneder, Postdoctoral Faculty Sponsor

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research asks how the native and therapeutic T cells recognizes engineered and infected cells alike, and how that recognition can be anticipated, measured, and controlled to make cell-based therapies more durable.

Within a Phase 1 trial of GD2-directed CAR T cells for diffuse midline glioma, I helped identify that patients can mount an adaptive immune response against the CAR construct itself, contributing to loss of T cell persistence – a mechanism not previously appreciated for autologous cell therapies.

In parallel, I am leading preclinical development of a CAR T cell therapy for T cell acute lymphoblastic leukemia and apply CRISPR-Cas9 genome engineering to improve the precision and safety of T cell receptor replacement.

This work builds on my doctoral research on CD8+ T cell immunity against H. pylori, where I showed that these T cells target the bacterium's oncogenic virulence factor CagA and shape its evolution.

LAB AFFILIATIONS

- Sabine Heitzeneder, Heitzeneder Lab (11/4/2024)

Publications

PUBLICATIONS

- **Anti-CAR Immunity Drives Acquired Therapeutic Resistance to GD2-CAR T Cell Therapy in Diffuse Midline Glioma.** *medRxiv : the preprint server for health sciences*
  Chen, Y., Reynolds, K., Koch, M. R., Petrakian, C. F., Good, Z., Yamada-Hunter, S., Sotillo, E., Song, K. W., Mahdi, J., Majzner, R., Desai, M. H., Huang, Y. W., Daghagh, et al
  2026
- **COMPLETE ENDOGENOUS TCR ABLATION IS REQUIRED TO ELIMINATE CD3 COMPETITION AND MISPAIRING IN TCR GENE THERAPY**
  Koch, M., Kahveci, H., Ponce, L., Heitzeneder, S.
  SAGE PUBLICATIONS INC.2026: 18S
- **Longitudinal single-cell atlas of GD2-CAR T cell therapy in H3K27M-mutant diffuse midline glioma identifies humoral and cellular anti-CAR immunity**
  Chen, Y., Song, K., Desai, M. H., Huang, Y., Iswari, N., Ehlinger, Z. J., Daghagh, H., Koch, M. R., Reynolds, K., Mo, K. C., Tsui, K. C., Rietberg, S., Hamilton, et al
  AMER ASSOC CANCER RESEARCH.2026
- **EPICYCLE: A confirmatory preclinical study of the anti-rhabdomyosarcoma efficacy of BET bromodomain and cyclin-dependent kinase 9 inhibitors.** *Biomedicine & pharmacotherapy = Biomedecine & pharmacotherapie*
  Haller, B., Richter, G. H., Wachtel, M., Schuler, L., Regina, C., Renz, B., Jens, M., Bechtold, I., Gadasheva, Y., Hamed, E., Kisele, S., Knoblauch, M., Koch, et al
  2025; 192: 118704
- **CagA-dependent Hobit+ gastric tissue-resident memory T cells confer full protection from Helicobacter pylori reinfection.** *Gut*
  Gong, R., Huang, B., Ralser, A., Friedrich, V., Mibus, C., Engelsberger, V., Koch, M. R., Skerhut, M., Giese, T., Andrä, I., Vieth, M., van Gisbergen, K. P., Semper, et al
  2025
- **CagA-specific Gastric CD8+ Tissue-Resident T Cells Control Helicobacter pylori During the Early Infection Phase.** *Gastroenterology*
  Koch, M. R., Gong, R., Friedrich, V., Engelsberger, V., Kretschmer, L., Wanisch, A., Jarosch, S., Ralser, A., Lugen, B., Quante, M., Vieth, M., Vasapolli, R., Schulz, et al
  2023; 164 (4): 550-566