Stanford



Moritz Schaefer

Postdoctoral Scholar, Immunology and Rheumatology

Bio

BIO

Moritz Schaefer builds AI systems that let scientists and clinicians interrogate biomedical data in plain language, and uses them to understand why cancer patients stop responding to therapy. He is a postdoctoral scholar at Stanford University and a Cancer Research Institute Immuno-Informatics Postdoctoral Fellow, working with Zinaida Good (Immunology and Rheumatology; Computational Medicine) and Jure Leskovec (Computer Science), and affiliated with the Center for Cancer Cell Therapy at the Stanford Cancer Institute.

He trained first as a computer scientist (B.Sc. and M.Sc., TU Berlin) and then as a biologist (Dr. sc. ETH Zurich in Systems Biology, with Constance Ciaudo), generating his own wet-lab data alongside the methods he built for it. As a postdoctoral researcher with Christoph Bock at the Medical University of Vienna and CeMM, he developed CellWhisperer, a model that links transcriptomes to the text describing them and lets biologists explore single-cell datasets by asking questions instead of writing code (Nature Biotechnology, 2025). The work was covered by The Scientist and recognized with Researcher of the Month at the Medical University of Vienna; he described it in an invited Tools of the Trade article in Nature Reviews Genetics.

At Stanford he extends this from cells to tissues, and from exploring data to explaining it. SpatialWhisperer annotates cells in histopathology images through language (ICML 2026), and AI agents reason across imaging, genomics and clinical records to propose why CAR T cell therapy fails in some patients with large B cell lymphoma and not others. His earlier SimulateGPT showed that large language models can act as biomedical simulators (Computers in Biology and Medicine, 2024). His models, training pipelines and benchmarks are released openly.

Website: https://www.moritzs.de

Google Scholar: https://scholar.google.com/citations?user=9S9SsvEAAAAJ

GitHub: https://github.com/moritzschaefer

HONORS AND AWARDS

- Immuno-Informatics Postdoctoral Fellowship (CRI17992), Cancer Research Institute (2026 - 2029)
- Researcher of the Month, Medical University of Vienna (2026)
- Deutschlandstipendium National Scholarship, German Federal Ministry of Education and Research / General Electric Germany (2016 - 2018)
- Deutschlandstipendium National Scholarship, German Federal Ministry of Education and Research / Carmeq GmbH (2015 - 2016)
- Ferry Porsche Prize for outstanding achievement in mathematics and physics, Ferry Porsche Foundation (2011)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Reviewer, Nature Methods; Bioinformatics (2026 - present)
- Area Chair, AIDaR Workshop (AI Data Readiness for Scientific Discovery), NeurIPS (2026 - 2026)
- Reviewer, ICML; NeurIPS workshops (FM4LS, ICBINB-BIO) (2025 - present)
- Member, EU-LIFE Postdoc Working Group (2024 - 2025)
- Postdoc Representative, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences (2023 - 2025)
- Reviewer, ELLIS PhD and Postdoc Program application screening (2022 - 2024)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, Technische Universitat Berlin (2021)
- Master of Science, Technische Universitat Berlin (2018)
- Bachelor of Science, Technische Universitat Berlin (2016)
- Doctor of Philosophy, Eidgenossische Technische Hochschule (ETH Zurich) (2022)
- Dr. sc. ETH Zurich, ETH Zurich, Switzerland , Biology - Systems Biology (2022)
- M.Sc., Technical University of Berlin, Germany , Computer Science (2018)
- B.Sc., Technical University of Berlin, Germany , Computer Science (2016)

STANFORD ADVISORS

- Jure Leskovec, Postdoctoral Research Mentor
- Zina Good, Postdoctoral Faculty Sponsor

LINKS

- Personal website: https://www.moritzs.de
- Google Scholar: https://scholar.google.com/citations?user=9S9SsvEAAAAJ
- GitHub: https://github.com/moritzschaefer
- LinkedIn: https://www.linkedin.com/in/moritzschaefer

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I build AI systems that can be asked a question about biomedical data in ordinary language and that show their work well enough to be checked. Two lines of research feed into each other: multimodal models that connect measurements of cells and tissues to the language describing them, and AI agents that use those models to carry an analysis through from raw data to a mechanistic claim.

Language-multimodal models for cells and tissues. CellWhisperer (Nature Biotechnology, 2025) embeds one million RNA-sequencing profiles together with AI-curated text descriptions, so a single-cell dataset can be interrogated by asking rather than by writing code; in a head-to-head comparison it reached the same conclusions as a conventional analysis roughly four times faster. SpatialWhisperer (ICML 2026) carries the approach into histopathology, annotating individual cells in tissue images through language, and SpotWhisperer links what a histopathology image shows to the molecular state underneath it. Models, training pipelines and benchmarks are released openly.

Agentic AI for therapy resistance. CAR T cell therapy cures some patients with large B cell lymphoma and fails in others, and the evidence that would explain the difference is scattered across pathology images, genomics and the clinical record. I develop AI agents that assemble that evidence across

modalities and propose resistance mechanisms specific enough to be tested at the bench. This follows from SimulateGPT (Computers in Biology and Medicine, 2024), which showed that a language model prompted as a simulator outperforms direct inference at predicting gene essentiality and patient survival.

Underneath both lines is the same commitment: an AI system that a biologist or clinician cannot interrogate, and whose reasoning they cannot inspect, is not usable for a decision that matters. Building models that explain themselves in language is the most direct route to that, and it is what my future lab will be built around.

LAB AFFILIATIONS

- Zina Good, Good Lab (6/1/2025)
- Jure Leskovec, Stanford Network Analysis Project (SNAP) (6/1/2025)

Publications

PUBLICATIONS

- **Multimodal learning enables chat-based exploration of single-cell data** *NATURE BIOTECHNOLOGY*
  Schaefer, M., Peneder, P., Malzl, D., Lombardo, S., Peycheva, M., Burton, J., Hakobyan, A., Sharma, V., Krausgruber, T., Sin, C., Menche, J., Tomazou, E. M., Bock, et al
  2025
- **Systematic discovery of CRISPR-boosted CAR T cell immunotherapies** *NATURE*
  Datlinger, P., Pankevich, E. V., Arnold, C. D., Pranckevicius, N., Lin, J., Romanovskaia, D., Schaefer, M., Piras, F., Orts, A., Nemc, A., Biesaga, P. N., Chan, M., Neuwirth, et al
  2025
- **GPT-4 as a biomedical simulator.** *Computers in biology and medicine*
  Schaefer, M., Reichl, S., Ter Horst, R., Nicolas, A. M., Krausgruber, T., Piras, F., Stepper, P., Bock, C., Samwald, M.
  2024; 178: 108796