THOMAS HÖFLER, PHD

Evolutionary Geneticist | Molecular Biologist | Virologist

hoeft@ksu.edu | Mosier Hall, 1800 Denison Ave, 66506 Manhattan, KS, USA | @Hoef_Th
hoeflet.github.io | Thomas Höfler | hoeflet | 0000-0001-7486-5582

SCIENTIFIC INTERESTS

My main interests entail the **molecular** and **evolutionary genetics** of microorganism, with special interest in **genetic conflict** between host and viruses, within viral populations as well as within viral genomes. Using **hypermutator viruses**, I study multiple aspects of **viral evolution** including **drug and vaccine resistance**, **host spillovers**, **speciation events**, **virulence**, **immune evasion**, **genomic evolution**, **evolvability** and **group dynamics**. State of the art molecular biology methods - including **next generation sequencing**, **single-cell RNA sequencing**, **proteomics**, **cell culture assays**, **fluorescence microscopy** and **genetic manipulations** are employed to characterize new and emerging phenotypes in detail.

EXPERIENCE

Postdoctoral Scholar

Kansas State University, Department for Diagnostic Medicine and Pathobiology

09 2024 – Ongoing | Manhattan, KS, USA

Working group of Prof. Dr. Jakob Trimpert
Focus on genetic conflict, adaptability and social evolution in viral populations. Hypermutator viruses - established during my PhD - were utilized to accelerate viral evolution and to study complicated phenotypes.

Reviewer

BMC Microbiology & Computational and Structural Biotechnology Journal

09 2024 – Ongoing

PhD Student

Freie Universität Berlin, Institut für Virologie

06 2020 – 11 2024 | Berlin, Germany

Working group of Prof. Dr. Klaus Osterrieder
Study of hypermutation in herpesviruses.

Teaching Assistant

Freie Universität Berlin, Institut für Virologie

07 2022 – 08 2024 | Berlin, Germany

Teaching viral diagnostics to veterinary students

Master Student

Universität Graz, Institut für Molekulare Biowissenschaften

05 2019 – 04 2020 | Graz, Austria

Working group of Prof. Dr. Joachim Reidl
Study of virulence gene regulation in *Vibrio cholerae*.

EDUCATION

Ph.D. in Biomedical Sciences

Freie Universität Berlin

06 2020 – 11 2024

Thesis title: "On Fidelity, Adaptation and Reproduction: A Study of Hypermutation in Herpes Simplex Virus 1" **summa cum laude**

M.Sc. in Molecular Microbiology

Universität Graz

11 2018 – 04 2020

Thesis title: "Complexity of Porin Regulation in *rpoE* Suppressor Mutant Background in *Vibrio cholerae*" **with honors**

B.Sc. in Molecular Biology

Universität Graz

03 2016 – 11 2018

Thesis title: "P_Y promoter activation by TraJ" **with honors**

ACHIEVEMENTS

Graduation from the International Max Planck Research School for Infection Biology and Immunology

Recipient of two merit based scholarships from the Universität Graz

Nominee for the Austrian federal prize for an outstanding master thesis

Student's Teaching Assistant

Universität Graz, Institut für Molekulare Biowissenschaften

10 2019 – 02 2020 Graz, Austria

Teaching bacterial genetics to molecular biology students

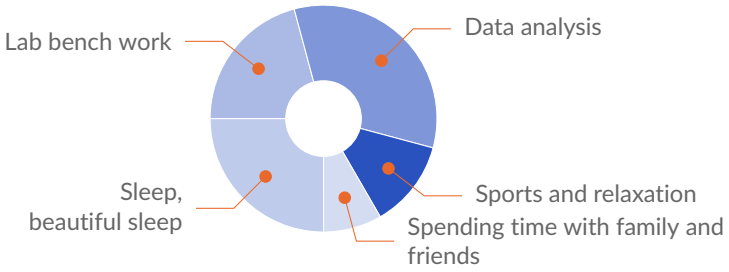
Learning Coach

Technology Transfer Center Weiz

11 2016 – 05 2020 Graz, Austria

Tutoring high school students in mathematics, chemistry, physics and electrical engineering

A DAY OF MY LIFE



PUBLICATIONS

PhD Thesis

- **Höfler, T.** (2024). ***On Fidelity, Adaptation and Reproduction: A Study of Hypermutation in Herpes Simplex Virus 1***. doi:10.17169/refubium-45455

Journal Articles

- Friedrich, V. D., Pennitz, P., Wyler, E., Adler, J. M., Postmus, D., Müller, K., … **Höfler, T.**, et al. (2024). **Neural network-assisted humanisation of COVID-19 hamster transcriptomic data reveals matching severity states in human disease**. *EBioMedicine*. doi:10.1016/j.ebiom.2024.105312
- **Höfler, T.**, Nascimento, M. M., Zeitlow, M., Kim, J. Y., & Trimpert, J. (2024). **Evolutionary Dynamics of Accelerated Antiviral Resistance Development in Hypermutator Herpesvirus**. *Molecular Biology and Evolution*. doi:10.1093/molbev/msae119
- Brunialti, M., **Höfler, T.**, Nascimento, M., & Trimpert, J. (2023). **Suicidal Phenotype of Proofreading-Deficient Herpes Simplex Virus 1 Polymerase Mutants**. *Journal of Virology*. doi:10.1128/jvi.01359-22
- Leeks, A., Bono, L. M., Ampolini, E. A., Souza, L. S., **Höfler, T.**, Mattson, C. L., … Díaz-Muñoz, S. L. (2023). **Open questions in the social lives of viruses**. *Journal of Evolutionary Biology*. doi:10.1111/jeb.14203
- Xing, N., **Höfler, T.**, Hearn, C. J., Nascimento, M., Camps Paradell, G., McMahon, D. P., … Trimpert, J. (2022). **Fast-forwarding evolution—Accelerated adaptation in a proofreading-deficient hypermutator herpesvirus**. *Virus Evolution*. doi:10.1093/ve/veac099

STRENGTHS

Hard-working | Detail oriented | Leader | Project management | Team worker

Python | R | LaTeX | C++ ,C# | imageJ

LANGUAGES

German ●●●●●

English ●●●●◐

Spanish ●○○○○

French ●○○○○

REFEREES

Prof. Dr. Jakob Trimpert
@ jtrimpert@vet.k-state.edu
1800 Denison Ave, 66506 Manhattan, KS, USA
Kansas State University, Department for Diagnostic Medicine and Pathobiology

Prof. Dr. Klaus Osterrieder
@ klaus.osterrieder@tiho-hannover.de
Bünteweg 2, 30559 Hannover, Germany
Tierärztliche Hochschule Hannover

Prof. Dr. Joachim Reidl
@ joachim.reidl@uni-graz.at
Humboldtstraße 50, 8010 Graz, Austria
Universität Graz, Institut für Molekulare Biowissenschaften

- Nouailles, G., Wyler, E., Pennitz, P., Postmus, D., Vladimirova, D., Kazmierski, J., … **Höfler**, **T.**, et al. (2021). **Temporal omics analysis in Syrian hamsters unravel cellular effector responses to moderate COVID-19**. *Nature communications*. doi:10.1038/s41467-021-25030-7
- Trimpert, J., Dietert, K., Firsching, T. C., Ebert, N., Thao, T. T. N., Vladimirova, D., … **Höfler**, **T.**, et al. (2021). **Development of safe and highly protective live-attenuated SARS-CoV-2 vaccine candidates by genome recoding**. *Cell Reports*. doi:10.1016/j.celrep.2021.109493
- Bischof, K., Schiffer, D., Trunk, S., **Höfler**, **T.**, Hopfer, A., Rechberger, G., & Koraimann, G. (2020). **Regulation of R1 Plasmid Transfer by H-NS, ArcA, TraJ, and DNA Sequence Elements**. *Frontiers in Microbiology*. doi:10.3389/fmicb.2020.01254
- Lembke, M., **Höfler**, **T.**, Walter, A.-N., Tutz, S., Fengler, V., Schild, S., & Reidl, J. (2020). **Host stimuli and operator binding sites controlling protein interactions between virulence master regulator ToxR and ToxS in *Vibrio cholerae***. *Molecular Microbiology*. doi:10.1111/mmi.14510
- Pennetzdorfer, N., **Höfler**, **T.**, Wölflingseder, M., Tutz, S., Schild, S., & Reidl, J. (2020). **RpoE controlled regulation of porin OmpU in *Vibrio cholerae***. *Molecular Microbiology*. doi:10.1111/mmi.14669