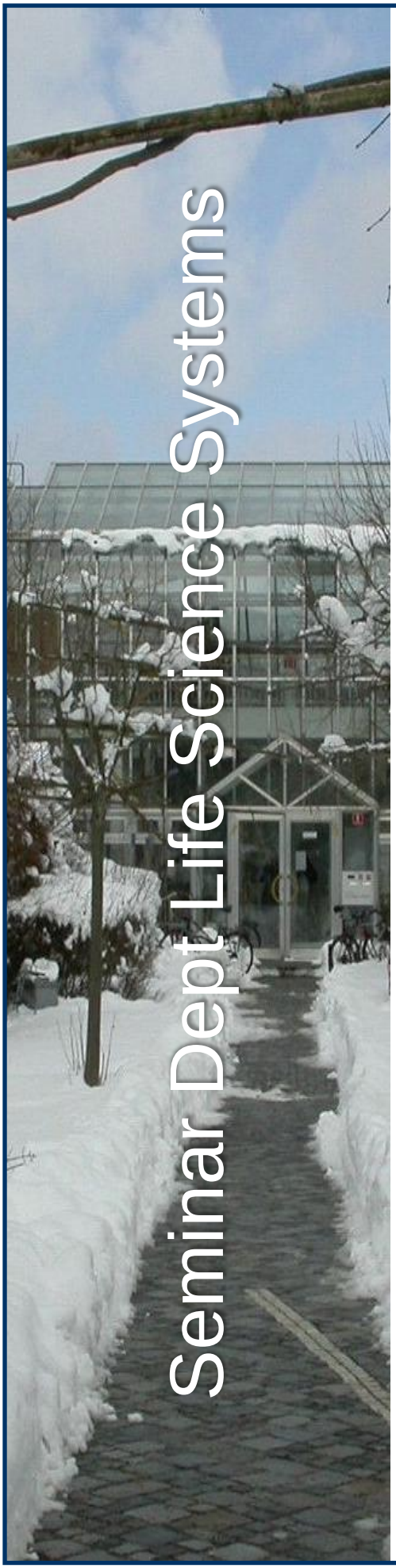

Genomics and AI for one health

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Portable real-time genomics through nanopore sequencing has started to transform molecular biology into a frontline strategy to tackle one health issues such as the emergence of antimicrobial resistance and zoonotic disease at the intersection of environmental, animal, and global health (Urban et al. 2023). This presentation will focus on how the unique characteristics of nanopore sequencing technology in combination with tailored AI algorithms allow us to assess antibiotic resistances (Sauerborn et al. 2024) as well as the virulence of pathogens (Urel et al. 2024). In situ nanopore metagenomics can further be leveraged to rapidly describe the air microbiome of natural and polluted habitats (Reska et al. 2024) and its potential health hazards, and to non-invasively monitor the transmission of zoonotic pathogens in the environment together with changes in the habitats' biodiversity (Perlas et al. 2024).

Perlas, A., … Urban, L. (2024) Latest RNA and DNA nanopore sequencing allows for rapid avian influenza profiling. bioRxiv.

Reska, T., ... Urban, L. (2024) Air monitoring by nanopore sequencing. ISME Communications.

Sauerborn, E., ... Urban, L. (2024) Detection of hidden antibiotic resistance through real-time genomics. Nature Communications 15, 5494.

Urban, L., … van Oosterhout, C. (2023) Real-time genomics for one health. Molecular Systems Biology e11686.

Urel, H., … Urban, L. (2024) Nanopore- and AI-empowered metagenomic viability inference. bioRxiv.

Dept Life Science Systems

Wintersemester 2024/25

Monday, 27.01.2025, 16:15–17:00

https://tum-conf.zoom-x.de/j/69079483987?pwd=elJ6bStBbXo0RHQ4aUJjVGlqRVpLdz09

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