Institute for Digital Communications

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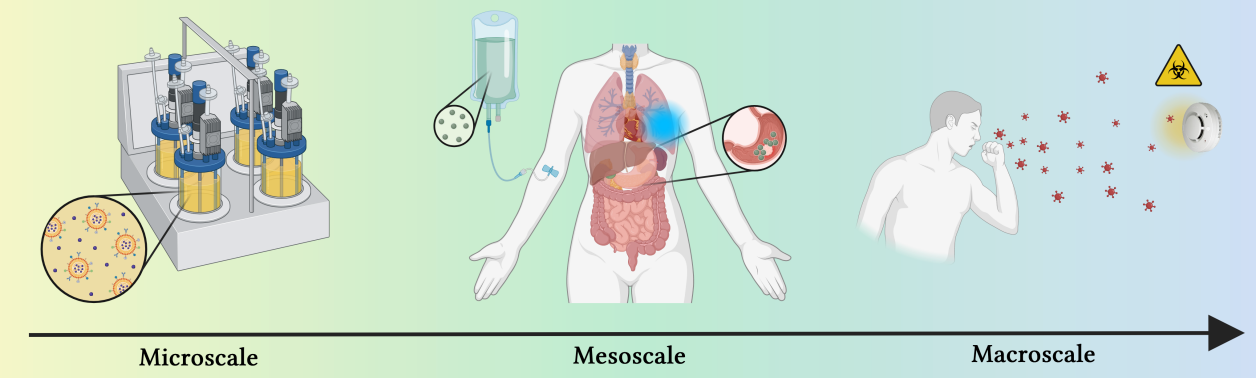
Job Offering

Open HiWi Positions in Molecular Communication

Molecular communication (MC) is an exciting novel research area that leverages chemical signaling to engineer information transmission. Different from conventional communication, e.g., mobile communication, *molecules* instead of electromagnetic waves are utilized in MC to encode and transmit information. This paradigm shift facilitates groundbreaking, novel applications of communication engineering in areas as diverse as *in-body communication* for early disease monitoring and targeted drug delivery, *fine-grained control* of chemical processes for bioprocess engineering applications, and *localization and sensing* of hazardous material or disease markers in the environment.



Molecular communication applications on different scales. Created with BioRender.com.

Research in MC is inherently interdisciplinary, necessitating collaboration between communication engineers on the one side and researchers from fields such as medicine, bioprocess engineering, and chemistry on the other side. To enable this interdisciplinary research, the German Research Foundation (DFG) has recently installed a new research training group, *Synthetic Molecular Communication Across Different Scales (SyMoCADS)*, at FAU that fosters collaboration among various research groups. As one of the research groups involved in this project, the Institute for Digital Communications (IDC) is currently looking for excellent **student research assistants** to work on MC in the context of SyMoCADS.

Prospective applicants should bring enthusiasm for **interdisciplinary research**, strong **analytical skills**, a solid background in **math**, and good **programming skills** (preferably in Python). A solid understanding of **communication theory** is desired.

We offer you the opportunity to work in the paradigm-shifting research field of MC within the worldwide unique interdisciplinary ecosystem of SyMoCADS. As a student researcher you will be integrated into a collaborative team of experienced MC researchers and benefit from the high-standard supervisory culture in the team. The analytical skills you will develop and the wide range of technical tools you will be using, possibly including advanced mathematical modeling and computer simulation tools, beyond-state-of-the-art machine learning tools, etc., will equip you with solid qualifications for future research positions, even beyond the field of MC. In addition, while supervision and guidance is provided by the team, you will have the chance to develop and bring your own ideas into the project; the offered positions are strongly research-oriented and "spin-offs" in the form of research projects and/or master theses are possible.

The exact tasks, working hours per week, and the duration of the employment will be discussed directly with the respective supervisor.

Prerequisites	
Scientific skills	Enthusiasm for interdisciplinary research, strong analytical skills, solid background in math.
Communication systems	Solid understanding of basic communication theory desired.
Programming skills	Practical programming experience (preferably in Python).
Supervisors	Bastian Heinlein, M.Sc., `bastian.heinlein@fau.de` Teena tom Dieck, M.Sc., `teena.tom.dieck@fau.de` Dr.-Ing. Sebastian Lotter, `sebastian.g.lotter@fau.de`
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Start: 01/09/2024
End: TBD

(Prof. Dr.-Ing. R. Schober)