RCB – Kolloquium

Donnerstag, 4. Dezember 2025 14.00 Uhr
Neubau Biologie H 53

Dr. Ing. Ammar Al-Shameri

Technical University of Munich
Chemistry of Biogenic Resources

From Hydrogenases to Biohybrid Networks: Bridging Catalysis and Enzyme Encapsulation

Over the past years, my research has focused on harnessing the catalytic power of hydrogenases to drive biocatalytic cascades for the sustainable production of fine chemicals and biohydrogen. This work has deepened our understanding of enzyme integration in multi-step reactions and the optimization of redox balance in synthetic pathways.
In addition, I led the development of a novel strategy for enzyme encapsulation using sol-gel matrices under mild, biocompatible conditions. This approach preserves enzymatic activity while enhancing stability and reusability, opening new avenues for applications in biosensing, biocatalysis, and drug delivery.
In this talk, I will present key findings from my work on hydrogenase-driven systems and outline my future research direction, which centers on advancing enzyme and RNA encapsulation technologies. Pending a positive evaluation of my Emmy Noether application at the University of Regensburg, I aim to investigate the mechanism of sol-gel enzyme encapsulation, substrate diffusion, and kinetics, and to understand how tailored sol-gel systems can spatially organize and protect complex enzyme networks. Ultimately, this will enable the development of robust and scalable platforms for drug delivery, RNA stabilization, and biocatalysis.

Host: Prof. Dr. Reinhard Sterner
Institute for Biophysics and Physical Biochemistry
Reinhard.Sterner@ur.de

Universität Regensburg
Biochemie-Zentrum Regensburg

SFB 960