



Polymers under Multiple Constraints

# Polymer- & Soft-Matter-Seminar

Tuesday,  
7<sup>th</sup> December  
2021

at: 5.15pm

VDP 1 1.26,  
Von-Danckelmann-  
Platz 1  
06120 Halle

## Prof. Dr. Ann-Christin Pöppler

(Institute of Org. Chemistry, University of Würzburg)

*Taking up the chase with NMR Spectroscopy - From structural insights into solid drug-polymer formulations to their fate in bio-relevant media.*

Despite the large number of publications related to drug delivery, recent (critical) comments identified a gap between academic research and benefit to the patient requiring multidisciplinary joint efforts. Through solid-state NMR spectroscopy complemented by quantum chemical calculations, insight into the conformation of guests within copolymer micelles and key intermolecular interactions can be gained. This information enables to hypothesize loading mechanisms, explain pharmaceutically relevant dissolution rates, and derive ideas for improved polymeric carrier materials. Following a drug molecule through the body, drug absorption occurs from biorelevant media. Working in fed state simulating intestinal fluids, NMR spectroscopy in solution complemented by cryo-TEM enables fascinating insights into the rich concentration and composition dependent colloidal assembly of polymer-drug formulations in the presence of bile. This showcases that NMR spectroscopy complemented by other analytical tools is very versatile to chase drug molecules and formulations from their solid form to their behaviour in more biologically relevant environments.



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