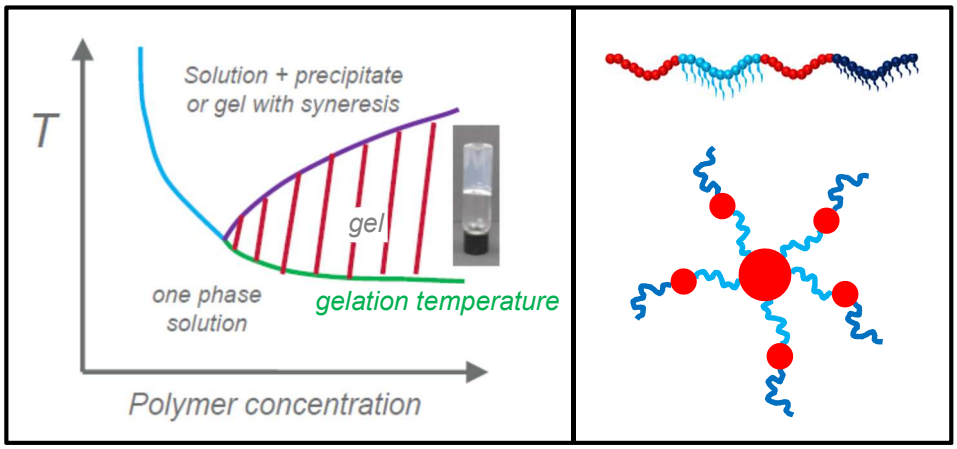
Doctoral student in Polymer Physics:
"Complex, self-assembled hydrogels for 3D bioprinting"

A position for a doctoral student in the field of experimental polymer physics is open at the TUM School of Natural Sciences. Aim of the project is to investigate the structures of self-assembled hydrogels from thermoresponsive tetrablock terpolymers.

The Soft Matter Physics Group at Technical University of Munich investigates complex polymer systems, e.g. nanostructured polymer films, responsive polymers, polymer gels and polymers for medical applications. For studies of the structure, dynamics and kinetics of these systems, we mainly use scattering methods and do experiments at large facilities. Time-resolved scattering experiments at large-scale facilities allow us to investigate rapid structural changes. These experiments are complemented by laboratory methods, such as atomic force microscopy and light scattering.

Topic: The project explores the structures in block copolymers having four blocks, among them thermoresponsive, hydrophilic and hydrophobic ones. Such polymers are of interest for 3D bioprinting for tissue engineering. Tetrablock terpolymers offer a large number of possibilities for gel formation in aqueous environment. You are going to investigate the structures in dependence on polymer architecture using dynamic light scattering as well as small-angle X-ray and neutron scattering, also at large-scale facilities. Modeling of these data will be carried out using existing software. The unique combination of complex polymers, advanced methods for structural investigations and quantitative modeling of the scattering data will provide comprehensive insights into the behavior of such complex hydrogels. These lay the ground for optimizing their properties for 3D bioprinting of different tissues.



Macromolecules **2021**, *54*, 6511. DOI: 10.1021/acs.macromol.1c00349
Macromolecules **2022**, *55*, 1783. DOI: 10.1021/acs.macromol.1c0212
Macromolecules **2018**, *51*, 2169. DOI: 10.1021/acs.macromol.8b00193

Background: A M.Sc. degree in physics is required as well as a background in polymer science, solid state physics or scattering methods, fluent English and commitment to work in a highly diverse and multicultural research group. Applications from underrepresented groups and women are strongly encouraged.

Application: Please send your full CV, motivation letter, reference letter and transcript of records to Prof. Christine M. Papadakis, Technical University of Munich, TUM School of Natural Sciences, Physics Department, Soft Matter Physics Group, James-Franck-Str. 1, 85748 Garching, Tel. +49 89 289 12447, papadakis@tum.de, www.ph.nat.tum.de/softmatter