Injectable hydrogels

Hydrogels, particularly those derived from polysaccharides, have gained significant attention in biomedical applications due to their biocompatibility and tunable physical properties. However, achieving precise control over hydrogel properties, especially in terms of gelation kinetics, remains often a challenge. Conventional thiol-maleimide chemistry, while widely used, lacks control over gelation kinetics, hindering the controlled crosslinking into homogeneous polysaccharide-based hydrogels. To address this issue, the development of an injectable polysaccharide hydrogel based on enzymatically deprotectable thiols is proposed.
Our goal is to create a new enzymatically deprotectable thiol to precisely regulate the formation of polysaccharide hydrogels through thiol-maleimide chemistry. This involves synthesizing the responsive thiol, studying its characteristics, and integrating it into a polysaccharide-based hydrogel system. By carefully managing the thiol incorporation process, we aim to customize the hydrogel's mechanical and chemical properties for specific biomedical applications.

Project goal
Develop an enzymatically in-situ gelating injectable hydrogel.

During this project you carry out:
Synthesis of functionalized polymers and small molecules
Development of an in-situ gelating hydrogel based on thiol deprotection
Preparation and analysis of hydrogels
Cell culture and biocompatibility tests