



# CMCC Mechanochemistry Discussions

Online Seminar Series

## *Molecular Control of Mechanoresponsive Bioinspired Hydrogels*

Livestreaming at  
10:00 AM (CT)

THURS., March 17, 2022



Dr. Kerstin Blank  
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on the CMCC YouTube Channel:  
<https://www.youtube.com/channel/UC7eCYPKbGTKpgO7W2bNABxg>

### ABSTRACT:

Bioinspired materials utilize a diverse set of protein and peptide building blocks. The thermodynamic, kinetic and mechanical stability of these building blocks crucially determines material assembly, structure and function. From a mechanical point of view, function includes structural stability as well as mechanosensing, actuation and self-healing. In this talk, I will show how we utilize single-molecule force spectroscopy to establish the sequence-structure-MECHANICS relationships of protein-based material building blocks. As an example, I will focus on coiled coils, which are highly abundant building blocks in mammalian tissues. Using a library of molecularly characterized coiled coils as hydrogel crosslinks, we establish bottom up control of the viscoelastic properties of the obtained hydrogels and are thus able to test how the molecular crosslink properties determine bulk material behaviour. The obtained knowledge serves the development of a new platform of smart extracellular matrix mimics that allow for dissecting local and global mechanical processes at the cell-matrix interface.



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