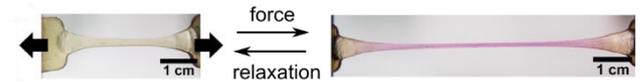
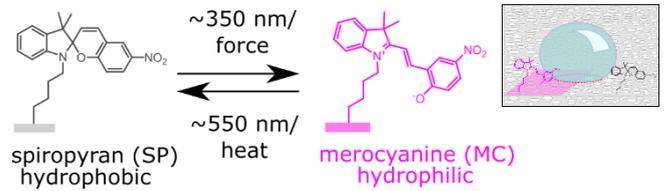


# Wetting of Switchable Spiropyran Surfaces

Surfaces with switchable wetting properties are a useful tool for manipulating droplets on surfaces. With a surface that can be switched between hydrophilic and hydrophobic states compartments can be dynamically introduced that restrict droplet movement (“virtual wells”) that enable massively parallelized reactions in droplets on flat surfaces. Photoswitching is a convenient method for spatially controlled switching by light. Spiroyrans are a class of molecules well-known for their switching properties between hydrophobic spiropyran and hydrophilic merocyanine form (purple). Based on previously reported spiropyran surface functionalization protocols, you will try to enhance spiropyran wetting properties by introducing a bulk or surface roughness into spiropyran-containing polymers and test the wetting properties of spiropyran gels.



Exemplary switching reported by Schenderlein *et al.*, *Langmuir*, **2013**, 29 (14), pp 4525–4534 and Kim *et al.*, *ACS Macro Lett.* **2016**, 5, 1312–1316.

In the course of this work you will:

- synthesize mono- and bifunctional spiropyran monomers to produce spiropyran-containing polymers
- produce foamed spiropyran containing polymers by introducing porogens into the polymerization mixture
- test the switching of the surfaces under UV light, test the formation of patterns
- test the switching of the contact angle on the unfoamed and foamed surfaces
- test the formation of a photorheological spiropyran gel, analyse the gel properties

## Requirements

**Professional skills:** studies in chemistry or materials science, well-grounded knowledge of chemical lab work (synthesis and analysis), knowledge of polymer chemistry and surface analysis.

**Personal skills:** You should be interested in pursuing your own ideas and expanding your knowledge by extensive reading. You should enjoy scientific discussions and be eager to present and publish your results.

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