# Liquid secretion on demand

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## Introduction

Liquid Secretion is ubiquitous in all forms of life as it can drastically change properties between surfaces. For example, fishes secrete a protective layer of mucus not only to against the pathogenic microbes, but also to reduce friction between their skin and water to speed up swimming. Synthetic surfaces releasing lubricants are promising in the application of self-cleaning surfaces, adhesion control, anti-icing, reactant release and drug release.

## Project summary

We are aiming to develop smart sponge-like coatings that can release and re-absorb functional liquids upon external stimulus such as light and electricity. Using different stimulus, different principle is employed. Light triggered liquid secretion is taken as an example. Initially, the liquid is stored within porous liquid crystal network. Upon UV light illumination, the network is deformed, and the liquid is squeezed out and secreted at the surface in the form of droplets.

We have been working on secreting various liquids and localizing the secretion at a desired location at the surface by using different techniques.
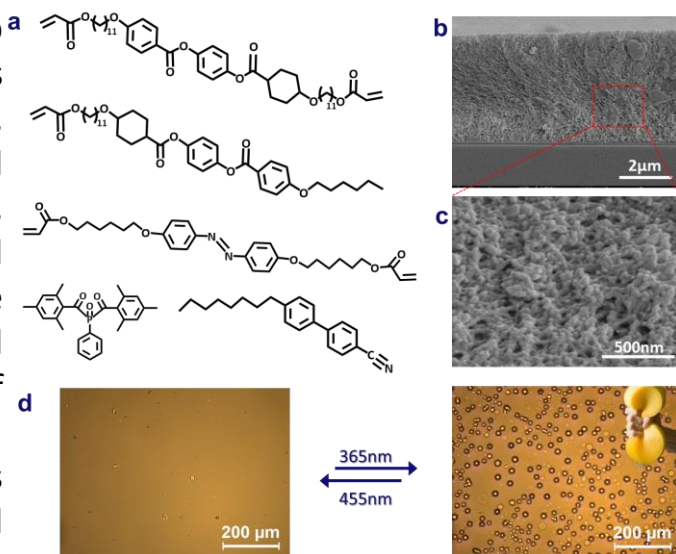
## Project goals

Our goal is to develop on-demand liquid secretion using different triggers, to secrete different types of liquids, and to fabricate flexible skin-like surfaces. Thinking further, it is also possible to integrate these self-lubricating polymer skins within microfluidics and robotics.

## Contact information

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