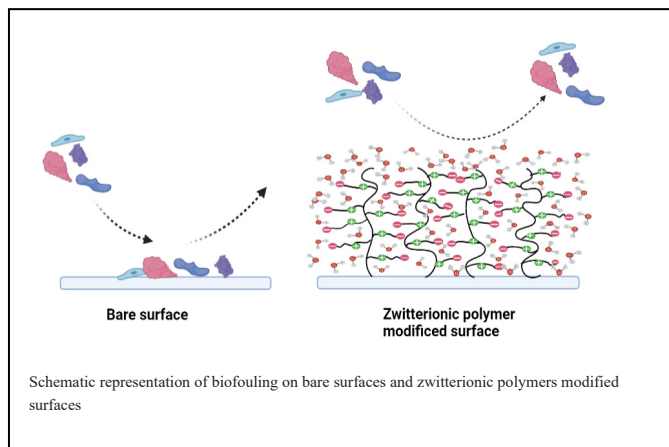


**Group**            **Interactive Surfaces**  
**Project:**        Development of stable and antifouling coatings  
**Supervisors:**   Zhen Yang, Dr. Maarten Smulders and Prof. Han Zuilhof

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**Keywords:** Organic/polymer synthesis, surface modification, self-assembly monolayers, RAFT technique, antifouling coatings

## Introduction



Antifouling coatings are effective to prevent unwanted fouling happens. The antifouling coatings composed of zwitterionic polymers are super hydrophilic due to the abundant cations and anions along their polymer chains, the hydration layer around polymers can inhibit proteins and other microorganisms' adsorption and makes them work well in physiological conditions.

In this project, students will be focusing on developing stable, robust antifouling coatings that are compatible with complex matrices. For achieving this, the stability of self-assembly monolayers (SAMs), where the antifouling coatings subsequently grow from, is rather critical. So anchoring molecules based on different bonding types will also be investigated.

The overall project mainly consists of two parts: 1). synthesis of stable anchoring molecules; 2). formation of antifouling coatings & characterization of modified surfaces. For the first part, students are supposed to design the structures and synthetic protocols of the target anchoring molecules, followed by organic synthesis to obtain the desired molecule(s). In the second part, surface modification and subsequent "graft from" polymerization will be performed, then characterized using multiple techniques, such as water contact angle, XPS, IRRAS, ellipsometry, QCM-D, and SPR.

## Techniques to be used

- General organic/polymer synthetic techniques such as reaction set-up, TLC, column chromatography, NMR, and MS.
- Surface modification and surface characterization techniques such as water contact angle measurements, ellipsometry, XPS, AFM and IRRAS, QCM-D, and SPR.

## More information

Zhen Yang, room Helix 8038, e-mail: [zhen.yang@wur.nl](mailto:zhen.yang@wur.nl)

Dr. Maarten Smulders, room Helix 8057, e-mail: [maarten.smulders@wur.nl](mailto:maarten.smulders@wur.nl)

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