

## **Open Internship Positions for Master Students**

### **Department Systems Chemistry, Prof dr. Daniela Wilson**

The field of nanomedicine aims at developing systems at the nanoscale, capable of delivering drugs in a smart and more efficient way than f.e common antibiotics, which are known to induce resistance buildup and increase the growth of multidrug resistant strains.

Join me for an internship at developing a bacterial biofilm targeting nanomotor. By self-assembling an amphiphilic diblock polymer we are capable of creating nanoscale vesicle shapes. These stomatocytes can easily be tuned and modified. Encapsulating an enzyme causes this vesicle to be able to sense and move towards chemical gradients.

I aim at designing a system that autonomously targets and penetrates into a biofilm formed by *P. aeruginosa*. The internship can be fine-tuned to go into a more molecular biology path or a more chemical analytical path for example with one of the below research questions:

1. Assess the influence of the system on biomass formation and transcription factors of bacteria. For that Crystal Violet staining and qRT-PCR would be employed as well as other tools
2. Which other enzymes can be encapsulated to cause motion towards a biofilm or degrade the biofilm by destroying different components of it? What are encapsulation efficiencies and enzyme activity levels? For this I would like to try ICP-MS as well as Nanoparticle tracking microscopy.

Independent of the path we choose you will get to conduct bacterial work at ML2 level as well as microscopy including Transmission Electron Microscopy, Confocal etc.

Feel free to write an email with some info about courses you had and interests to see if we can incorporate them.

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