



Master project

Immune modulation of the mucin-derived materials

Project available to start anytime after October 2017

Context.

Biomaterials have been widely used in tissue regeneration field to deliver drugs, and bioactive molecules and cells to improve the outcome of the tissue repair. More and more studies revealed that balanced immune modulation after transplantation of these biomaterials is critical for tissue regeneration. An appropriate immune reaction to materials is necessary for materials integration into organisms, triggering the host cellular responses and initiating the tissue regeneration process. However, a hyper-inflammation can result in rejection of the materials.

Mucins are a group of glycoproteins that have been shown as immune modulators in various species (biopolymersforlife.org/outreach). To utilize the immune modulation capacity of these macromolecules, the current challenge is to develop biomaterials which are rich of mucins. Our group has explored functionalized mucins formed hydrogels by click chemistry.

Your project.

The master thesis project is to investigate the immune reaction of the immune cells towards these mucin hydrogels. A better understanding of these interactions will help in the development of new mucin-based immuno-modulatory materials.

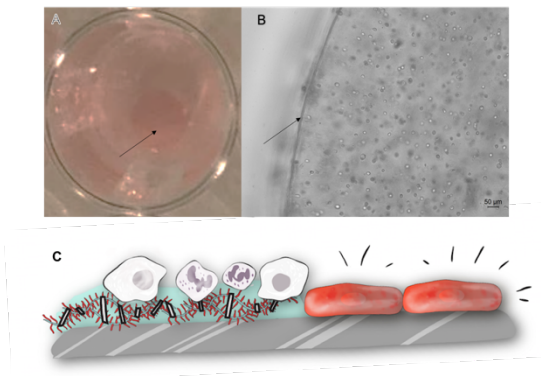


Figure legend: THP-1 monocytes are embedded inside of the mucin hydrogels. A: Image of mucin hydrogel carrying THP-1 cells in 48 well plates (Arrow indicates mucin hydrogel); B: THP-1 monocytes in mucin hydrogels (Arrow indicates the boundary of the mucin hydrogel). C: Illustration of mucin hydrogels coated surface modulate THP-1 immune activity.

Environment.

You will be hosted in the division of glycoscience, in the School of biotechnology of KTH (Stockholm, Sweden) located in AlbaNova. Our laboratory provides the student a dynamic, international, and multidisciplinary research team. The student will perform and gain expertise in mucin material synthesis, 2D and 3D mammalian cell culture, molecule biology technique, immunochemistry staining and imaging. The student will also have the chance to learn FACS sorting technique. Visit our website for more information about the group: biopolymersforlife.org



Requirements MSc students.

We are looking for enthusiastic, motivated students, who enjoy working as part of a team as well as independently. Ideally, candidates have some previous practical experience or interested in learning methods used in molecular biology.

Please send us a short description of your relevant work experience, your CV, and your motivation.

Thomas Crouzier

crouzier@kth.se

visit: biopolymersforlife.org and <https://www.kth.se/profile/crouzier>