

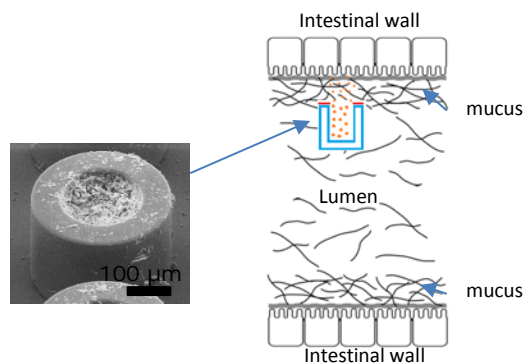
## BSc/MSc-project for students in Biomedical Engineering, DTU/KU

Title: Investigating mucoadhesion of chitosan coated microcontainers for oral drug delivery

### Description:

Oral administration is the most preferred administration route for drug delivery and most drugs are absorbed in the small intestine. The epithelial lining in the small intestine is covered with a viscoelastic hydrogel called mucus. One of the main roles of mucus is to protect underlying epithelial cells from physical and chemical damage. Mucus has a complex structure and can develop multiple interactions with foreign molecules. Especially, this ability is of interest when administering advanced drug delivery systems as the systems can interact with the mucus layer and attach to its surface (mucoadhesion). This can result in a high drug release close to the intestinal wall, which can increase drug absorption. This project will be focusing on the micro sized oral drug delivery systems called microcontainers and their mucoadhesion. One way to improve mucoadhesion of the microcontainers is to coat the open side with a mucoadhesive polymer. This will allow a unidirectional drug release into the mucus layer, which results in a high drug concentration at the intestinal wall. Figure 1 illustrates the concept of this project.

The aim of this project is to investigate the optimal mucoadhesive coating for the microcontainers. Several methods and equipment will be used to investigate this. Among others, spray coating, drug release with a  $\mu$ Diss dissolution apparatus, Texture analyzer to test mucoadhesion and other methods will also be relevant.



**Figure 1:** Illustrates the intestine walls covered with a layer of mucus where the microcontainer is adhering and the drug is slowly being released from it.

Required qualifications: an interest in oral drug delivery and can work with animal tissue

Responsible institution: DTU Nanotech, department of Micro- and Nanotechnology

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Allowed no of students per report: 1-2

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