

## **MSc-project**

**Title:** In vitro monitoring of allergic reactions

**Description:** The prevalence of allergic diseases is increasing worldwide, especially in low and middle income countries. Allergic diseases comprehend life-threatening anaphylaxis, food allergies, certain forms of asthma, rhinitis, conjunctivitis, eczema, angioedema, urticarial, eosinophilic disorders, drug and insect allergies. The World Allergy Organization estimated that 20-30% of the world population suffered from some form of allergic disease in 2003, with the greatest burden for children and young men. One tenth of the world population suffers for drug allergies and 400 million for rhinitis, 300 million people suffer from asthma and about 250 million are allergic to some kind of food.

Although a lot of research has been conducted to investigate the mechanisms behind allergic reactions there is still a lack of knowledge on several fundamental phenomena related to allergy. Here, we propose the development of an in vitro model which could provide real-time electrochemical monitoring of degranulation of mast cells triggered by allergic reactions. Carbon microelectrodes will be fabricated in the Danchip cleanroom. Mast cells will be cultured on the electrodes and the release of histamine upon mast cell activation will be studied. The long-term vision is to develop a new type of allergy test. The project is conducted as a collaboration between DTU Nanotech and Gentofte Hospital.

**Required qualifications:** Basic knowledge in biochemistry (cell assays)

**Responsible institution:** DTU Nanotech

**Contact information:** Associate Professor Stephan Sylvest Keller, Biomaterial Microsystems group, DTU Nanotech, Technical University of Denmark;  
[stephan.keller@nanotech.dtu.dk](mailto:stephan.keller@nanotech.dtu.dk), Tel: +45 45255846

**Allowed no of students per report:** 1

**Suggested DTU supervisor:** Assoc. Prof. Stephan Sylvest Keller