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

**Title**: Paper based sensor for the quantitative measurement of creatinine in urine

**Description**:

Kidney failure is a relatively common health problem, with a prevalence of about 10%. Kidney failure is life threatening and kidney function needs to be monitored regularly.

Creatinine is a chemical waste product in the blood, a by-product of normal muscle function, that passes through the kidneys to be filtered and eliminated in urine. High levels of creatinine in urine or blood indicate that the kidneys are not filtering waste efficiently. Creatinine can be measured in blood but this alone cannot diagnose or monitor kidney function. Creatinine clearance tests measure how much creatinine is cleared out of the body in urine collected over a period of 24 hours.

Our collaborators in this project will be Measurelet, which is a company developing smart toilets for hospitals. The idea is that the toilet itself is equipped with sensors that can measure volume and content of urine automatically.

This project will focus on the development of a creatinine sensor to be incorporated in a smart toilet. The detection method will be based on electrochemical or colorimetric sensing, depending on the number of students and the time constraints for the project. The sensor should be able to measure creatinine quantitatively in the relevant clinical range.

**Required qualifications**: Some background within biotechnology would be preferred

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**Allowed no of students per report**: 2

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