

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

**Title:** The Role of Fibroblasts in Atrial Fibrillation

**Description:**

Atrial fibrillation (AF) is a prevalent disease in the western world that currently affects 2-3% of the population in Europe and North America. Because the risk factors for AF include drinking, smoking and diabetes, the number of patients with AF is projected to rise even further during the coming years. Despite its high prevalence, the diagnosis of AF is challenging as it often remains symptomless. Nevertheless, sustained AF increases the risk for developing heart failure, stroke and dementia – hence early diagnosis and treatment is very important. Current treatment options are purely symptomatic and include anticoagulants, heart rate and rhythm control.

Pathophysiologically, development and progression of atrial fibrosis is a hallmark of the structural remodeling of the atria that is considered the main cause of AF. Although the cardiac arrhythmia in AF is directly linked to the electrical activity of atrial cardiomyocytes, we hypothesise that the fibrotic processes in AF are linked to a dysregulation of atrial fibroblasts. In this project we will study the role of atrial fibroblasts in AF.

In this project, we will study the role of fibroblasts in atrial fibrillation. Fibrosis is thought to be a major substrate for AF perpetuation. We propose to investigate protein expression levels in cardiac fibroblasts and to study how these are regulated in AF. Protein expression will be analyzed using state-of-the-art mass spectrometry technology and changes to cellular bioenergetics will be accessed using the Seahorse technology. In collaboration with other members of the group, you will learn how to perform and analyse proteomics experiments, as well as how to isolate and manipulate fibroblasts from adult mouse heart.

**Required qualifications:**

- Technology & data analysis interested
- Interest in work with primary cell culture
- Knowledge /interest in cardiac biology
- Systems biology approaches

**Responsible institution:** Biomedical Institute (KU)

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

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