



Arrhythmia in the Diabetic Heart

Background

Cardiovascular disease is the leading cause of morbidity and mortality in patients with type-2 diabetes mellitus. Over the recent decades, the prevalence of diabetes, in particular type-2 diabetes has increased significantly. Patients with diabetes have increased risk of developing cardiovascular diseases, including coronary artery disease, hypertension and heart failure. Recently, we have used a mouse model of early-stage type-2 diabetes to study the cardiac electrophysiological remodeling that occurs in the disease. We have documented that diabetic mice acutely stressed by adrenergic agonists develop acute and severe sinoatrial node dysfunction. In the present project, we wish to study the mechanism behind the observed sinoatrial node dysfunction.

Hypothesis and experimental plan

It is the aim to elucidate the electrophysiological impairments of the sinoatrial node. The hypothesis is that:

The diabetic sinus node develops aberrant conduction block upon adrenergic stimulation

We will use hearts from diabetic and control mice to study the effect of autonomic modulation on heart rate. By isolating and retrogradely perfusing the hearts, we can record the electrical activity of the heart in the absence of autonomic modulation for many hours. We will use contact electrophysiological mapping of the right atrium to see if we can describe the function of the sinus node before and during adrenergic stimulation. We will use advanced electrical pacing to probe for conduction block at exit of the sinoatrial node.

Qualifications

I am looking for a brilliant student with an interest in integrated cardiac electrophysiology. You are flexible, ambitious and can work independently. You are prepared to participate actively in shaping for your own project. You have a license and/or the motivation to work with animals.

Contact

The project is available at the Department of Biomedical Sciences, Faculty of Health and Medical Sciences, The Panum Institute. For further information and application, please contact:

Associate professor, Morten B Thomsen (phone: 2383 9884; e-mail: mbthom@sund.ku.dk)

<http://bmi.ku.dk/english/research/cardiac-electrophysiology/>