

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

Title: Can the interval between first and second heart sounds be used as an estimate for the QT-interval?

Description:

Background: Sudden cardiac death during sport events during sport events has been reported for both human and horses. In humans it is known that some of these events are due to mutation or drugs that delay the repolarization phase of the cardiac action potential, which is reflected on the ECG as a prolonged QT-interval. This condition has accordingly been coined the Long QT Syndrome (LQTS), and is associated with ventricular fibrillation and sudden cardiac death. Whether LQTS may also be relevant in equine medicine has yet to be established; In larger animals, such as the horse, the deflections on the ECG are not as well defined as in humans and they are often bi- or even triphasic. This makes it challenging to accurately measure the interval between the different peaks.

Our hypothesis is that the interval between heart sounds can be used to estimate the QT interval in larger animals, such as horses

Specific aims

- To build/modify ECG recording devices and electrodes to be used on large animals
- To develop a software program to analyse ECGs and heart sounds, including challenging ECGs like horse ECGs. This will make analysis faster and can be used of veterinarians that are not specialized in cardiology. The results will be compared with measures performed manually
- The devices and program should preferably be able to determine the electrical axis of the animal/human.

Required qualifications: The supervisors in the Molecular Physiology and Cellular Electrophysiology group professor Dan Klærke and associate professor Kirstine Callø, have backgrounds in medicine and human biology, respectively. The candidate for this project should have strong skills in engineering and software programming and be able to work independently.

Responsible institution: University of Copenhagen, Faculty of Health and Medical Sciences, Section for Anatomy, Biochemistry and Physiology.

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Allowed no of students per report: 2

KU supervisor: Professor Dan Klærke