

## Press release

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### Basic information

Name: Anita Dittrich      Email: [a.dittrich@clin.au.dk](mailto:a.dittrich@clin.au.dk) Phone: 51787949

Department of: Clinical Medicine

Main supervisor: Henrik Lauridsen

Title of dissertation: The Role of Metabolism During Cardiac Regeneration – the Ultimate Hurdle to Repair the Mammalian Heart?

Date for defence: 14.08/2024 at (time of day): 13.00 Place: Aarhus Universitetshospital, Auditorium J116-113

Press release (Danish)

Samspillet mellem hjerteregneration og stofskiftet – et studie af en regenerationsmester, axolotl-salamanderen

Hjertesygdomme er en førende dødsårsag i den vestlige verden, hovedsagelig fordi det menneskelige hjerte ikke kan reparere sig selv efter en skade så som et hjerteinfarkt. Dette gælder generelt for voksne pattedyr, men er ikke tilfældet under vores fosterliv samt kort tid efter fødslen. På samme måde kan nogle arter som axolotl-salamanderen reparere og dermed regenerere deres hjerte efter skade gennem hele deres levetid. Mekanismerne, der fører til disse vidt forskellige reaktioner på hjerteskaade, er ikke fuldt ud forstået, selvom metabolismen er blevet fremført som en mulig regulatorisk mekanisme. Dette ph.d.-projekt præsenterer en analyse af den aktuelle litteratur omkring hjerteregneration og de potentielle forbindelser til metabolismen. Den eksperimentelle del anvender axolotl-salamanderen som en modelorganisme og inkluderer et studie, der undersøger, hvordan metabolismen ændrer sig, mens de udfører hjerteregneration, efterfulgt af et andet studie, hvor axolotlerne blev udsat for en række temperaturer, som direkte ændrer deres stofskifte, for at undersøge hvordan hjerteregneration påvirkes. Endelig udforsker det sidste studie stressresponset i axolotlen, som har vigtige potentielle forbindelser til både metabolismen og den regenerative proces. Projektet er udført af Anita Dittrich, der forsvare sin afhandling den 14. august.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 14 august, 2024 kl. 13.00 på Aarhus Universitetshospital, auditorium J116-113, Palle Juul-Jensens Boulevard 165, 8200 Aarhus N. Titlen på projektet er "The Role of Metabolism During Cardiac Regeneration – the Ultimate Hurdle to Repair the Mammalian Heart?". Yderligere oplysninger: Ph.d.-studerende Anita Dittrich, e-mail: [a.dittrich@clin.au.dk](mailto:a.dittrich@clin.au.dk), tlf. +45 51787949.

Bedømmelsesudvalg:

Formand:

Professor Christian Aalkjær, MD, DMSc.

Institut for Biomedicin, Aarhus Universitet, Aarhus, Danmark

Senior Forsker Elif Eroglu, PhD.

Institutionen för cell- och molekylärbiologi, Karolinska Institutet, Stockholm, Sverige

Professor Ditte Caroline Andersen, MSc, PhD.

Klinisk Institut, Syddansk Universitet, Odense, Danmark

Press release (English)

The interplay of heart regeneration and metabolism – a study of the master regenerator, the axolotl salamander

Heart disease is a leading cause of death in the western world, largely because the human heart cannot repair itself after an injury like a heart attack. This is generally true for adult mammals, but importantly this is not the case during our fetal and early neonatal life. Similarly, some species like the axolotl salamander can repair and thus regenerate their heart after injury all throughout their lifespan. The mechanisms leading to these vastly different responses to heart injury are not fully understood, although metabolism has been put forward as a possible master regulator. This PhD project presents an analysis of the current literature surrounding heart regeneration and the potential links to metabolism. The experimental portion utilizes the axolotl salamander as a model organism and includes a study exploring how metabolism changes while they perform heart regeneration, followed by another study in which the axolotls were exposed to a range of temperatures, which directly alters their metabolic rate, to investigate how heart regeneration was affected. Finally, the last study explores the stress response in the axolotl, which has important potential links to both metabolism and the regenerative process. The project was carried out by Anita Dittrich, who is defending her dissertation on August 14th.

The defence is public and takes place on August 14th 2024 at 13.00 at Aarhus University Hospital in auditorium J116-113 , Palle Juul-Jensens Boulevard 165, 8200 Aarhus. The title of the project is: “The Role of Metabolism During Cardiac Regeneration – the Ultimate Hurdle to Repair the Mammalian Heart?”. For more information, please contact PhD student Anita Dittrich, email: a.dittrich@clin.au.dk, Phone +45 51787949.

Assessment committee:

Chairman: Professor Christian Aalkjær, MD, DMSc.

Department of Biomedicine, Aarhus University, Aarhus, Denmark

Senior Researcher Elif Eroglu, PhD.

Cell and Molecular Biology Department, Karolinska Institute, Stockholm, Sweden

Professor Ditte Caroline Andersen, MSc, PhD.

Institute of Clinical Research, University of Southern Denmark, Odense, Denmark

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