

Press release

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Basic information

Name: Elias Didrik Francis Moll Zachariae Email: eliasz@biomed.au.dk Phone: 51953432

Department of: Biomedicine

Main supervisor: Steen Vang Petersen

Title of dissertation: Regulation of Extracellular Superoxide Dismutase at the Protein Level

Date for defence: 28th of October 2019 at (time of day): 10:00 Place: William Scharff (Søauditorierne) 1253-317

Press release (Danish)

Reguleringen af antioxidant proteinet ekstracellulær superoxid dismutase på protein niveau

Ekstracellulær superoxid dismutase (SOD3) er det eneste kendte protein med antioxidant funktion i miljøet uden for vore celler. Proteinets primære funktion er at beskytte cellemembraner og membranforankret proteiner imod uønskede reaktioner med den skadelige iltart superoxid. Derudover er SOD3 en vigtig kilde til brintoverilte, der benyttes som signalmolekyle af kroppens celler. Disse mangeartede funktioner kræver regulering af proteinet på flere planer, både på gen- og proteinniveau. Til dato er kun få proteinmæssige, regulatoriske mekanismer blevet beskrevet. I et nyt ph.d.-projekt fra Aarhus Universitet, Health er en række regulatoriske strategier undersøgt med henblik på at forklare nogle hidtil uopklarede molekylære kendetegn ved SOD3. Projektet er gennemført af Elias Didrik Francis Moll Zachariae, der forsvare det d. 28. Oktober 2019

I projektet er det undersøgt hvorledes cellen er i stand til at producere to varianter af SOD3, der udover at have forskellig enzymatisk funktion, kun adskiller sig på den rummelige organisering af molekylet. Ydermere er kobbers rolle i regulering af SOD3 blevet undersøgt med henblik på at forklare SOD3's rolle i Menkes sygdom. I tillæg til dette beskrives en ny modifikation af SOD3, der kan vise sig at have indflydelse på proteinets funktion. Samlet set bidrager projektet med molekylær indsigt i nogle lidt kendte regulatoriske strategier benyttet af vores celler, som reaktion mod udefrakommende stimuli.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 28. Oktober kl. 10:00 i William Scharff auditorium, Aarhus Universitet, Bartolins allé 3, 8000, Århus C. Titlen på projektet er "Regulation of Extracellular Superoxide Dismutase at the Protein Level". Yderligere oplysninger: Ph.d.-studerende Elias Didrik Francis Moll Zachariae, e-mail: eliasz@biomed.au.dk, tlf. 51953432.

Bedømmelsesudvalg:

Formand for bedømmelsesudvalget og moderator for forsvaret:
Lektor Christian B. F. Andersen - Institut for Biomedicin, Det Sundhedsfaglige Fakultet, Aarhus Universitet

Professor Martin Högbom - Department of Biochemistry and Biophysics, Stockholm University, Stockholm, Sweden

Professor MSO Clare Louise Hawkins - Department of Biomedical Sciences, Copenhagen University, Copenhagen, Denmark

Press release (English)

Regulation of Extracellular Superoxide Dismutase at the Protein Level

Extracellular Superoxide Dismutase (SOD3) is the only known antioxidant enzyme located to the environment outside our cells. The primary function of the protein is to protect our cell membranes and membrane embedded proteins against harmful reactions with the oxygen species superoxide. In addition to its protective role, SOD3 is also an important source for hydrogenperoxide, which is utilized as a signalling molecule by our cells. These diverse functions of SOD3 warrants regulation at multiple levels - both gene and protein level. To this date only few regulatory strategies at the protein level, have been described. In the project, carried out by Elias Didrik Francis Moll Zachariae, who is defending his dissertation on the 28th of October 2019, Some of these regulatory strategies have been explored at the molecular level in order to explain some molecular features of SOD3.

It has been investigated how the cell is able to produce two variants of SOD3, which, in addition to their enzymatic function, only differ in the spatial arrangement of their amino acids. Furthermore, the role of regulatory role of copper ion SOD3 has been investigated in relation to Menkes disease. Finally the project describes a novel modification of SOD3 that has the potential to have a regulatory role in relation to the function of SOD3. Taken together, the results add to our knowledge on the regulatory strategies employed by our cells in reaction to extracellular stimuli.

The defence is public and takes place on the 28th of October at 10:00 in the William Scharff auditorium, Aarhus University, Bartolins allé 3, 8000 Århus C. The title of the project is: "Regulation of Extracellular Superoxide Dismutase at the Protein Level". For more information, please contact PhD student Elias Didrik Francis Moll Zachariae, email: X, Phone +45 51953432.

Assessment committee:

Chairman of the assessment committee and moderator of the defence:

Associate Professor Christian B. F. Andersen - Department of biomedicine, Faculty of Health, Aarhus University

Professor Martin Högbom - Department of Biochemistry and Biophysics, Stockholm University, Stockholm, Sweden

Professor MSO Clare Louise Hawkins - Department of Biomedical Sciences, Copenhagen University, Copenhagen, Denmark

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