

Press release

Please fill in this form and return it to graduateschoolhealth@au.dk in Word format no later than three weeks prior to your defence.

Basic information

Name: Stine Thyssen Email: sths@forens.au.dk Phone: 26312527

Department of: Forensic Medicine

Main supervisor: Mogens Johannsen

Title of dissertation: Novel Post-Translational Modifications Derived From Ketone Body Metabolism

Date for defence: March 7th 2019 at (time of day): 9:00 AM Place: Auditorium C114-101, Aarhus University Hospital

Press release (Danish)

Nye post-translationelle modifikationer afledt af ketonstof metabolismen

Ketonstoffer er en vigtig energikilde og dannelsen af disse stofskifteprodukter stiger, når niveauet af kulhydrat er lavt, f.eks. ved kalorierestriktion, ketogene diæter og faste. Kalorierestriktion, ketogene diæter og faste er blevet kædet sammen med gavnlige virkninger for aldringsprocessen og aldersrelaterede sygdomme. Udover at være en vigtig energikilde, er ketonstoffer også kendt for at have en beskyttende virkning mod flere sygdomme, heriblandt cancer. Mekanismen bag disse gavnlige effekter er mindre kendt, men kan muligvis skyldes protein modifikationer. I et nyt ph.d.-projekt fra Aarhus Universitet, Health, er disse modifikationer blevet studeret. Projektet er gennemført af Stine Thyssen, der forsvare det d. 7/3-2019.

I dette Ph.d.-studie har vi studeret hvordan stofskifteprodukter fra ketonstofskefte kan modificere proteiner. Disse nye modifikationer blev studeret i isolerede proteiner såvel som i proteiner fra opdyrket celler. Til disse studier anvendte vi en chemoproteomic strategi og benyttede en kemisk probe, der strukturelt ligner stofskifteprodukterne. Vores resultater viste, at flere forskellige proteiner kunne modificeres af stofskifteprodukterne og at modifikationerne til dels var afhængig af et mild oxidativ stress niveau. Dette er, af vores overbevisning, det første studie der demonstrerer at disse stofskifteprodukter kan reagere med aminosyrer i proteiner.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 7/3 kl. 09:00 i Auditorium C114-101, Aarhus Universitets Hospital, Palle Juul-Jensens Boulevard 35, 8200 Aarhus N. Titlen på projektet er "Nye post-translationelle modifikationer afledt af ketonstof metabolismen". Yderligere oplysninger: Ph.d.-studerende Stine Thyssen, e-mail: sths@forens.au.dk, tlf. 26312527.

Bedømmelsesudvalg:

Ordstyrer:

Steen Vang Petersen, Ph.d.

Lektor ved Institut for Biomedicin

Aarhus Universitet, Danmark

Michael Jonathan Davies, Ph.d.

Professor ved Institut for Biomedicin

Københavns Universitet, Danmark

Ruth Birner-Grünenberger, Ph.d.

Lektor ved Institut for Patalogi og Omics Center Graz

Medicinsk Universitet i Graz, Østrig

Press release (English)

Novel Post-Translational Modifications Derived From Ketone Body Metabolism

Ketone bodies are an important energy source, and their biosynthesis increases during conditions of limited carbohydrates, e.g. caloric restriction, ketogenic diets, and fasting. All of these conditions have been associated with beneficial effects on the aging process and age-related diseases. Besides being important energy metabolites, ketone bodies are also known to exhibit a protective role against various diseases, including cancer. The mechanism behind these beneficial effects is not fully understood; however, it is likely that protein modification plays an important role. In a new PhD project from Aarhus University, Health, these modifications have been studied. The project was carried out by Stine Thyssen, who is defending her dissertation on March 7th 2019.

In this PhD study, we have investigated how metabolites from the ketone body metabolism can modify proteins. These novel modifications were studied in isolated proteins as well as proteins from cultured cells. For these studies, we have applied a chemoproteomic approach using a chemical probe which structurally resembles the metabolites. Our results showed that several proteins could be modified and that the modifications to some extent depend on a mild oxidative stress level. This is, to the best of our knowledge, the first study demonstrating that these metabolites can react with amino acids in proteins.

The defence is public and takes place on March 7th 2019 at 9:00 AM in Auditorium C114-101, Aarhus University Hospital, Palle Juul-Jensens Boulevard 35, 8200 Aarhus N. The title of the project is "Novel Post-Translational Modifications Derived From Ketone Body Metabolism". For more information, please contact PhD student Stine Thyssen, email: sths@forens.au.dk, Phone +45 26312527.

Assessment committee:
Chairman of the committee:
Steen Vang Petersen, PhD
Associate Professor at Department of Biomedicine
Aarhus University, Denmark

Michael Jonathan Davies, PhD
Professor at Department of Biomedical Sciences
University of Copenhagen, Denmark

Ruth Birner-Grünenberger, PhD
Associate Professor at Institute of Pathology and Omics Center Graz
Medical University of Graz, Austria

Permission

By sending in this form:

- I hereby grant permission to publish the above Danish and English press releases.
- I confirm that I have been informed that any applicable inventions shall be treated confidentially and shall under no circumstances whatsoever be published, presented or mentioned prior to submission of a patent application, and that I have an obligation to inform my head of department and the university's Patents Committee if I believe I have made an invention in connection with my work. I also confirm that I am not aware that publication violates any other possible holders of a copyright.