

Press release

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Basic information

Name: Lasse Reimer Email: lasse.reimer@biomed.au.dk Phone: 42728451

Department of: Choose one

Main supervisor: Poul Henning Jensen

Title of dissertation: Inflammation activated kinase PKR directly targets diseasemodifying residues within α -synuclein and tau for phosphorylation

Date for defence: 14/6-19 at (time of day): 13.00 Place: Lille Anatomisk auditorium (Bygning 1231, lok. 424)

Press release (Danish)

Ny viden om sammenhængen mellem hjerneinflammation og neurodegenerative sygdomme

Et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Lasse Reimer, der forsvarer det d. 14/6-19

Parkinsons sygdom og Alzheimers sygdom er de to mest udbredte neurodegenerative lidelser. Begge sygdomme er karakteriseret ved sen sygdomsforekomst, tilstedeværelse af hyperfosforylerede proteinrige inklusioner i specifikke hjerneceller og bestemte hjerneregioner, og i begge sygdomme eksisterer kun begrænsede palliative behandlingsmetoder. Hjerneinflammation ledsager, og går ofte forud for, den observerede patologi og hyperfosforylering i neurodegenerative lidelser. Alligevel er viden om bidraget af inflammation i ætiologien af Parkinsons sygdom og Alzheimers sygdom begrænset. Dette ph.d projekt har haft til formål netop at undersøge og kortlægge denne sammenhæng.

Vi har rettet fokus på en bestemt kinase, Protein kinase R (PKR), som er specifikt aktiveret i forbindelse med infektioner og inflammation i hjernen. Vi viser, at PKR effektivt og direkte fosforylerer de vigtigste proteiner associeret med hjerneinklusioner i Parkinsons sygdom og Alzheimers sygdom, henholdsvis α -synuclein og tau på kendte såvel som nye aminosyrerester. Disse fosforyleringer påvirker vigtige funktioner af α -synuclein and tau proteiner såsom lipid- og mikrotubulbinding samt aggregering, og forklarer en ny biologi hvor inflammation kan spille en rolle i sygdomsudbrud. Samlet set bringer disse opdagelser os potentielt et skridt nærmere en forståelse af ætiologien og forværring af neurodegenerative sygdomme.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 14/6-19 kl. 13 i Lille Anatomisk auditorium (Bygning 1231, lok. 424), Aarhus Universitet, Wilhelm Meyers Allé 3, Aarhus C. Titlen på projektet er "XX". Yderligere oplysninger: Ph.d.-studerende Lasse Reimer, e-mail: lasse.reimer@biomed.au.dk, tlf. 42728451.

Bedømmelsesudvalg:

Assoc.prof. Peter Bross - chairman for bedømmelsesudvalget og moderator af PhD forsvaret
Research Unit for Molecular Medicine, Dept. of Clinical Medicine, HEALTH, Aarhus University,
Aarhus, Denmark

Assoc. prof. Hilal Lashuel

Laboratory of Molecular and Chemical Biology of Neurodegeneration, Brain Mind Institute, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

Assoc. prof. Kostas Vekrellis

Center for Neurosciences, Biomedical Research Foundation of Academy of Athens, Greece

Press release (English)

Novel insight into the connection between brain inflammation and neurodegenerative disorders

The project was carried out by Lasse Reimer, who is defending his dissertation on 14/6-19.

Parkinson's disease (PD) and Alzheimer's disease (AD) are the two most prevalent neurodegenerative disorders. Both diseases are characterized by late age of onset, the appearance of hyperphosphorylated protein-rich inclusions in specific brain cells and distinct brain regions, and in both cases only limited palliative treatment exist. Brain inflammation often accompany and even precede the pathology and hyper-phosphorylation observed in these neurodegenerative disorders. Yet, the contribution of neuro-inflammation, in the etiology of PD and AD remain poorly understood. The purpose of this PhD project has been to investigate and map this connection.

We have directed our focus on a particular kinase, Protein kinase R (PKR) that is specifically activated upon infection and inflammation, and found that PKR efficiently and directly phosphorylate the major proteins associated with brain inclusions in PD and AD, namely α -synuclein and tau on known as well as novel sites. These phosphorylations affect important properties of such as lipid- and microtubule binding as well as aggregation of α -synuclein and tau proteins, in a way not previously described, and explain a new biology wherein inflammation could participate in disease onset. These findings potentially bring us one step closer understanding the etiology and worsening of specific neurodegenerative diseases.

The defence is public and takes place on 14/6-19 at 13.00 in Lille Anatomisk auditorium (Bygning 1231, lok. 424), Aarhus Universitet, Wilhelm Meyers Allé 3, Aarhus C. The title of the project is XX. For more information, please contact PhD student Lasse Reimer, email: lasse.reimer@biomed.au.dk, Phone +45 42728451.

Assessment committee:

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