Press release

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Basic information

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Department of: Biomedicine

Main supervisor: Søren Riis Paludan

Title of dissertation: The roles of microglia and DNA sensor cGAS in the pathogenesis of herpes simplex encephalitis

Date for defence: Tuesday 18 February 2020 at (time of day): 12:00 Place: Lakeside Lecture Theatres: 1252 - 204 Eduard Biermann (søauditorierne)

Press release (Danish)

Rollerne af mikroglia og DNA-sensor cGAS i patogenesen af herpes simplex encephalitis.

Herpes simplex encephalitis (HSE) er en dødelig sygdom i centralnervesystemet (CNS) og forårsaget af et humant herpesvirus, herpes simplex virus 1 (HSV-1). Selv efter antiviral behandling lider et betydeligt antal HSE-patienter af alvorlig neurologisk svækkelse eller dør af sygdommen. I dette ph.d.-projekt ved Institut for Biomedicin ved Aarhus Universitet er de antivirale responser og cellulære interaktioner i CNS undersøgt ved hjælp af en musemodel af HSE. Projektet blev udført af Georgios Katzilieris-Petras, der forsvarer sin afhandling den 18. februar 2020.

HSE er den mest almindelige form for encephalitis hos mennesker i den vestlige verden. Dets prævalens og dødelighed er signifikant forøget hos patienter med kompromitteret eller umodent immunsystem, sådanne organtransplantationspatienter og nyfødte. Da den primære årsagsfaktor for HSE er HSV-1, som er en DNA-virus, er tilstedeværelsen af DNA-detekterende faktorer såvel som medfødte immunceller i CNS meget vigtig for et positivt sygdomsresultat. Formålet med det aktuelle ph.d.-projekt var at undersøge de medfødte antivirale responser og infiltration af perifere immunceller i CNS i de første infektionsdage ved hjælp af en musemodel af HSE. Virkningerne af fraværet af den vigtigste DNA-sensor, cyklisk GMP-AMP-syntase (cGAS) og den vigtigste CNS-residente immuncelletype, mikroglia, blev undersøgt. En alvorligt forværret sygdomsfænotype blev observeret i fravær af en af eller begge af de faktorer, der er nævnt ovenfor, hvilket beskrev deres betydning for sygdomsresultatet. Projektet identificerer betydelige interaktioner og immunrespons mod HSE, som forhåbentlig vil bidrage til afgrænsningen af nye terapeutiske strategier mod sygdommen.

Forsvaret er offentligt og finder sted den 18/02 på Lakeside Lecture Theatres: 1252 - 204 Eduard Biermann (søauditorierne) på Aarhus Universitet, Bartholin Allé 3, 8000 Aarhus C. Projektets titel er "Rollerne som mikroglia og DNA-sensor cGAS i patogenesen af herpes simplex encephalitis ". For mere information, kontakt ph.d.-studerende Georgios Katzilieris-Petras, e-mail: gkatzp@biomed.au.dk, telefon: 50342610.

Press release (English)

The roles of microglia and DNA sensor cGAS in the pathogenesis of herpes simplex encephalitis.

Herpes simplex encephalitis (HSE) is a fatal disease of the central nervous system (CNS) and caused mainly by a human herpesvirus, herpes simplex virus 1 (HSV-1). Even after antiviral treatment, a significant number of HSE patients suffer from severe neurological impairment or succumb to the disease. In this PhD project at the Department of Biomedicine of Aarhus University, the antiviral responses and cellular interactions in the CNS have been investigated using a mouse model of HSE.

The project was carried out by Georgios Katzilieris-Petras, who is defending his dissertation on February 18, 2020.

HSE is the most common form of encephalitis in humans. Its prevalence and mortality rates are significantly increased in patients with compromised or immature immune system, such organ transplantation patients and neonates. Since the main causative factor of HSE is HSV-1, which is a DNA virus, the presence of DNA-sensing factors as well as innate immune cells in the CNS are of paramount importance for a positive disease outcome. The aim of the current PhD project was to investigate the innate antiviral responses and infiltration of peripheral immune cells in the CNS during the first days of infection using a mouse model of HSE. The effects of the absence of the main DNA sensor, cyclic GMP-AMP synthase (cGAS) and the major CNS-resident immune cell type, microglia, were thoroughly studied. A severely worsened disease phenotype was observed in the absence of either or both of the factors mentioned above, outlining their significance to the disease outcome. The project identifies significant interactions and immune responses against HSE that will hopefully contribute to the delineation of novel therapeutic strategies against the disease.

The defense is public and takes place on 18/02 at Lakeside Lecture Theatres: 1252 - 204 Eduard Biermann (søauditorierne) in Aarhus University, Bartholin Allé 3, 8000 Aarhus C. The title of the project is "The roles of microglia and DNA sensor cGAS in the pathogenesis of herpes simplex encephalitis". For more information, please contact PhD student Georgios Katzilieris-Petras, Email: gkatzp@biomed.au.dk, Phone: +45 50342610.

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