

## Press release

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### Basic information

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Department of: Clinical Medicine

Main supervisor: Mette Holm

Title of dissertation: The remarkable plasticity of the paediatric immune system

Date for defence: 29.01.2021 at (time of day): 14:00 Place: Auditorium B, Aarhus University Hospital

Press release (Danish)

The remarkable plasticity of the paediatric immune system

HIV-1 infektion er stadig en kronisk infektion og børn med HIV-1 er i livslang behandling for at kontrollere infektionen. Planlagte pauser i den antiretrovirale behandling (PTI) er blevet undersøgt som en behandlingsstrategi hos individer smittet med HIV-1. PTI har blandt andet været anvendt til at booste immunforsvaret ved at øge HIV-1 antigener i blodet. Tidligere resultater (SMART study) har vist at voksne med HIV-1, der modtager PTI, har en signifikant øget risiko for at få opportunistiske infektioner og en øget dødelighed, når man sammenligner med kontinuerlig behandling. Studiet blev derfor afbrudt. I et samtidigt studie (PENTA 11) undersøgte man PTI hos børn med HIV-1. PENTA 11 studiet blev godkendt til at fortsætte på trods af SMART studiets resultater, eftersom børnene var klinisk og immunologisk velbefindende efter PTI var påbegyndt.

Dette projekt er et nyt ph.d.-projekt fra Aarhus Universitet, Health, som har undersøgt børns unikke evne til at gendanne deres immunforsvar efter immunkompression, i modsætning til voksne. Ph.d. projektet viser blandt andet at børn fra PENTA-11 studiet kan gendanne repertoire af naive T celler fra thymus og at PTI medfører et stort antigen drevet T celle respons i respons til HIV-1 og andre latente virus. På trods af de store immunologiske ændringer, som PTI bevirker, demonstrerer børnene en utrolig evne til at returnerer de målte immunologiske parametre til præ-PTI niveauer tre år efter den antiretrovirale behandling blev genstartet.

Dette Ph.d.-projekt belyser således børns enestående immunforsvar, der med en anseelig plasticitet, formår at gendannes efter stor skade og kan medvirke til at danne potentiale for nye fremtidige strategier for T celle baserede immunologiske behandlinger.

Projektet er gennemført af Katrine Schou Sandgaard, der forsvare det d. 29/1

Titlen på projektet er "The remarkable plasticity of the paediatric immune system".

Forsvaret er offentligt og grundet COVID-19 vil forsvaret blive afholdt som et web-forsvar via Zoom.

Kontakt venligst Katrine Schou Sandgaard for online deltagelse.

Yderligere oplysninger: Ph.d.-studerende Katrine Schou Sandgaard, e-mail: [katrineschousandgaard@clin.au.dk](mailto:katrineschousandgaard@clin.au.dk), tlf. 29717498.

Bedømmelsesudvalg:

Pablo Rojo, senior consultant, associate professor, Pediatric Infectious Diseases, Hospital 12 de Octubre, Madrid, Spain

Kristian Assing, consultant, associate professor, Department of Clinical Immunology, Odense University Hospital, Odense, Denmark

Ole Schmeltz Søgaard, professor, Department of Infectious Diseases, Aarhus University Hospital, Denmark

Press release (English)

## The remarkable plasticity of the paediatric immune system

HIV-1 infection is still a chronic infection and children with HIV-1 are treated lifelong to control the infection. Planned antiretroviral treatment interruption (PTI) has been investigated extensively as a treatment strategy in HIV-1 infected individuals. PTI has been explored as a way of boosting anti-HIV-1 immunity by increasing the expression of HIV-1 antigens. A previous trial (The SMART trial) showed that PTI in adults with HIV-1 significantly increased the risk of opportunistic disease or death, as compared with continuous treatment, and was therefore terminated. In contrast, the PENTA 11 trial was a PTI study in children and was allowed to continue as most children remained clinically and immunologically well.

Exactly how this immune recovery took place in the PENTA 11 trial are being presented in this Ph.d. dissertation for the first time. This Ph.d. dissertation explores children's amazing capacity to recover their immune system and it documents profound changes in both the naïve and memory T cell compartments consequent on PTI. The results reveal both a homeostatic replenishment as a result of the decreased T cell subsets to preserve the naïve T cell repertoire, and a strong antigen driven response to HIV-1 itself and/or to increased exposure of additional microbial antigens. Despite major changes following PTI, HIV-1-infected children demonstrated outstandingly robust and almost all measured parameters returned to pre-PTI levels three years after ART was re-initiated.

The profound plasticity of the immune system of children may afford them a better opportunity to deal with immunological stress and the Ph.d. project informs future novel immunological treatment strategies. The project was carried out by Katrine Schou Sandgaard, who is defending the dissertation on 29/01.

The title of the project is "The remarkable plasticity of the paediatric immune system". Due to COVID-19, the defence will be held as a web-defence via Zoom. Please contact Katrine Schou Sandgaard for online attendance. For more information, please contact PhD student Katrine Schou Sandgaard, e-mail: [katrineschousandgaard@clin.au.dk](mailto:katrineschousandgaard@clin.au.dk), Phone: 0045 29717498.

### Assessment committee:

Pablo Rojo, senior consultant, associate professor, Pediatric Infectious Diseases, Hospital 12 de Octubre, Madrid, Spain

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