

Press release

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Basic information

Name: Steffen Filskov Sørensen
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Email: steffenfilskov@hotmail.com Phone: +45299379

Department of: Clinical Medicine

Main supervisor: Peter Meldgaard, MD, PhD, Associate Professor, Department of Oncology, Aarhus University Hospital.

Title of dissertation: Clinical Impact of the Programmed Death Receptor-Ligand 1 Pathway in Patients with Non-small Cell Lung Cancer

Date for defence: Friday 07.04.2017 at (time of day): kl. 14.00 Place: K-auditorium, Bld. 7, basement, Aarhus University Hospital, Noerrebrogade 44, 8000 Aarhus C.

Press release (Danish)

Nyudviklet blodanalyse giver vigtig ny viden om lungekræfts undvigelse af immunforsvaret

En følsom blodanalyse med lovende fremtidsperspektiver er blevet udviklet som led i et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Steffen Filskov Sørensen, der forsvarer det d. 7/4-2017.

Lungekræft er en af de hyppigste kræftformer og der diagnosticeres årligt cirka 4.600 nye tilfælde i Danmark. Hovedparten er af undertypen ikke-småcellet lungekræft. Lungekræftcellerne udnytter nogle naturlige bremsemekanismer i immunsystemet til at undvige immuncellernes angreb og skaffe sig en vækstfordel. Én af disse bremsemekanismer består af celleproteinerne PD-1 og PD-L1. Nylige lægemiddelforsøg har vist at såkaldt immunterapi rettet mod én af disse bremsemekanismer kan reaktivere immunsystemets angreb mod kræftcellerne. Behandlingen medfører mindskning af kræftkuderne og forlænget overlevelse hos nogle patientgrupper med ikke-småcellet lungekræft. Anti-PD-1 immunterapi ser ud til at virke bedst, når der er højt udtryk af PD-L1 proteinet på kræftcellerne. Der mangler imidlertid mere viden om, hvordan udtrykket af PD-L1 og PD-1 undersøges bedst muligt og hvordan en fri cirkulerende form af PD-1 i blodet, kaldet sPD-1, påvirker aktiviteten af PD-1/PD-L1 bremsemekanismen. I dette PhD-projekt blev forskellige analysemetoder anvendt til at måle PD-1, sPD-1 og PD-L1 i vævs- eller blodprøver fra patienter med ikke-småcellet lungekræft. Især analyserne af PD-1 og sPD-1 i blodprøver viste lovende resultater. Koncentrationen i blodet af sPD-1 kunne forudsige prognosen hos nogle patienter med en undertype af ikke-småcellet lungekræft. Gen-udtrykket af PD-1 og sPD-1 i blodets hvide blodlegemer kunne desuden måles med stor analysefølsomhed ved hjælp af en højteknologisk metode kaldet droplet digital PCR. PhD-projektet har resulteret i forøget viden om lungekræfts undvigelse af immunsystemet. Den nyudviklede blodanalyse har meget interessante fremtidsperspektiver og kan potentielt bruges til bedre at definere den patientgruppe for vil få gavn af anti-PD-1 immunterapi.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 7/4-2017 kl. 14 i K-auditorium, Bygning 7, kld., Aarhus Universitetshospital, Nørrebrogade 44, Aarhus. Titlen på projektet er "Clinical Impact of the Programmed Death Receptor-Ligand 1 Pathway in Patients with Non-small Cell Lung Cancer".

Yderligere oplysninger: Ph.d.-studerende Steffen Filskov Sørensen, e-mail: steffenfilskov@hotmail.com tlf. +45 2993 7980.

Press release (English)

A newly developed blood test provides important new knowledge about the immune evasion of lung cancer.

A sensitive blood-based analytical method with promising perspectives has been developed as part of a new PhD project at Aarhus University, Health. The project was carried out by Steffen Filskov Sørensen, who is defending his dissertation on 7/4-2017.

Lung cancer is one of the most common cancers and approximately 4,600 new cases are yearly diagnosed in Denmark. The main subtype is non-small cell lung cancer. Lung cancer cells utilize some natural brake mechanisms of the immune system in order to escape immune attack and to obtain a growth advantage. One of these brake mechanisms consists of the cellular proteins PD-1 and PD-L1. Recent clinical trials have demonstrated that immunotherapy targeting one of these braking mechanisms can reactivate the immune system's attack against cancer cells. This treatment results in tumor reduction and prolonged survival in some groups of patients with non-small cell lung cancer. Anti-PD-1 immunotherapy seems to have highest efficacy when high expression of PD-L1 protein is present on the cancer cells. However, more knowledge is needed on how the expression of PD-L1 and PD-1 is measured and how a free circulating form of PD-1 in the blood, called sPD-1, affects the activity of the PD-1/PD-L1 brake mechanism. In this PhD project, various analytical methods able to measure PD-1, sPD-1 and PD-L1 were used to study tissue or blood samples from patients with non-small cell lung cancer. Especially the analysis in blood of PD-1 and sPD-1 revealed promising results. The blood concentration of sPD-1 could predict prognosis in some patients with a subtype of non-small cell lung cancer. Gene-expression of PD-1 and sPD-1 in the white blood cells could be measured with high sensitivity using a droplet digital PCR method. The PhD-project has resulted in increased knowledge of the immune evasion of lung cancer. The newly developed blood test has very interesting future perspectives and can potentially be used to better define the patient population that will benefit from anti-PD-1 immunotherapy.

The defence is public and takes place on 7/4 at 2 p.m. in Auditorium K, building 7, basement, Aarhus University Hospital, Noerrebrogade 44, Aarhus. The title of the project is "Clinical Impact of the Programmed Death Receptor-Ligand 1 Pathway in Patients with Non-small Cell Lung Cancer". For more information, please contact PhD-student Steffen Filskov Sørensen, email: steffenfilskov@hotmail.com, Phone +45 2993 7980.

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