Press release

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Basic information

Name: Christina Demuth Email: demuth@clin.au.dk Phone: 51 88 62 07

Department of: Clinical Medicine

Main supervisor: Professor Boe Sandahl Sørensen

Title of dissertation: "Erlotinib resistance and ctDNA monitoring in non-small cell lung cancer"

Date for defence: June 15th at (time of day): 3 pm Place: J116-113, AUH Skejby

Press release (Danish)

Behandlingsresistens og -monitorering i lungekræft

Lungekræft udgør verden over den største andel af nye kræftdiagnoser og er samtidig også skyld i flest kræftrelaterede dødsfald. Over det sidste årti er der gjort store fremskridt i behandlingen af lungekræft, bl.a. med introduktion af tyrosine-kinase hæmmeren erlotinib. Erlotinib hæmmer vækstfaktorreceptoren EGFR, og for patienter med mutationer der giver ændringer i dette protein, har behandlingen stor effekt. Desværre udvikler behandlede patienter med tiden resistens. For at bedre forståelsen for hvad der sker når behandlingsresistens udvikles, har vi opsat en cellemodel med resistens mod erlotinib. Vi kan se at cellerne parallelt udvikler to forskellige, kendte resistensmekanismer. Vi kan desuden se, at resistensudviklingen har betydning for udtrykket af proteiner der er afgørende for effekten af immuneterapi. Begge dele bidrager til en bedre forståelse af, hvorfor de resistente patienter kan være svære at behandle.
Udover bedre forståelse for behandlingsresistens er det også vigtigt hurtigere at kunne se, når patienterne ikke har gavn af en given behandling. Vi har undersøgt, om det var muligt at gøre dette ved at kigge på mængden af kræft-DNA i blodprøver. Alle kroppens celler sender små stykker DNA ud i blodbanen, og den del der stammer fra kræftceller, indeholder mutationer tilsvarende dem der findes i cellerne. Ved at måle på mængden af kræft-DNA i blodet, kunne vi indirekte følge udviklingen af kræften og evaluere om den aktuelle behandling havde effekt eller ej.
Resultaterne er sammenfattet i et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Christina Demuth, der forsvarer det d. 15/6

Forsvaret af ph.d.-projektet er offentligt og finder sted den 15/6-18 kl. 15 i auditorium J116-113, Aarhus Universitetshospital, Palle Juul-Jensens Boulevard 99, Aarhus N. Titlen på projektet er ”Erlotinib resistance and ctDNA monitoring in non-small cell lung cancer”. Yderligere oplysninger: Ph.d.-studerende Christina Demuth, e-mail: demuth@clin.au.dk, tlf. 51886207.

Bedømmelsesudvalg:
Professor Hans Jürgen Hoffmann, Aarhus Universitetshospital
Associate Professor Stephen Finn, Trinity School of Medicine, Irland
Associate Professor Morten Gjerstorff, Syddansk Universitet

Press release (English)

Treatment resistance and monitoring in lung cancer

Lung cancer is the most frequently diagnosed cancer world wide, and is also the major cause of cancer-related deaths. During the past decade, major advanced in treatment has been made, including the introduction of the tyrosine-kinase inhibitor erlotinib. Erlotinib inhibits the growth factor receptor EGFR, and patients with mutations that causes changes of EGFR benefit greatly from this treatment. Unfortunately, all patients develop resistance. To increase our understanding of erlotinib resistance,

we developed a cell model of erlotinib resistance. We find that two distinct resistance mechanisms develop in parallel, and also that resistance development may impact the expression of the biomarker currently used for selecting patient for treatment with immunotherapy. These findings contribute with knowledge on, why patients who developed resistance are hard to treat.
Besides better understanding of treatment resistance, it is also important to be able to detect situations were patients do not respond to the given treatment. We investigated whether this was possible by detecting cancer-DNA in blood samples. All cells in the body shed DNA into the blood stream, and the fraction originating from cancer cells are imprinted with cancer-specific mutations. By measuring the abundance of cancer-DNA in the blood we were able to get an estimate of the development of the cancer, and to evaluate whether the given treatment was efficient or not.
The project was carried out by Christina Demuth, who is defending her dissertation on June 15th.

The defence is public and takes place on June 15th at 3 pm in auditorium J116-113, Aarhus University Hospital, Palle Juul-Jensens Boulevard, Aarhus N. The title of the project is "Erlotinib resistance and ctDNA monitoring in non-small cell lung cancer. For more information, please contact PhD student Christina Demuth, email: demuth@clin.au.dk, Phone +4551886207.

Assessment committee:
Hans Jürgen Hoffmann, Aarhus University Hospital
Associate Professor Stephen Finn, Trinity School of Medicine, Ireland
Associate Professor Morten Gjerstorff, University of Southern Denmark

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