AARHUS UNIVERSITY

Press release

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Basic information

Name: Anne Tranberg Madsen Email: atm@clin.au.dk Phone: 23957509

Department of: Clinical Medicine

Main supervisor: Professor Boe Sandahl Sørensen

Title of dissertation: Applications of cell-free DNA in cancer – Insights into biological variation and treatment monitoring

Date for defence: October 21st at (time of day): 13 PM Place: J116-113, Aarhus University Hospital

Press release (Danish)

Lungekræft er den kræftform, der kræver flest liv på verdensplan, og mere end halvdelen af patienterne er uhelbredeligt syge ved diagnose. Over det sidste årti er der dog gjort store fremskridt i behandlingen af lungekræft, og en gruppe af patienter har stor gavn af skræddersyet behandling mod specifikke genetiske forandringer i deres kræftceller. Alle mennesker har små stykker frit DNA (cfDNA) i cirkulationen og en brøkdel af cfDNA i kræftpatienter udgøres af DNA fra kræftcellerne (ctDNA). Dermed kan ændringer i kræftcellerne og behandlingsrespons monitoreres via blodprøver. Formålet med dette ph.d.-studie var at få indblik i den basale biologi samt anvendelsen af cfDNA og ctDNA til evaluering af behandlingsrespons.
Vi har undersøgt den biologiske variation af cfDNA og ctDNA niveauer i raske individer og lungekræftpatienter og observerede væsentlige variationer af niveauerne i begge studiegrupper. Dette har potentielt store konsekvenser for, hvordan ctDNA resultater skal fortolkes og rapporteres. Ydermere evaluerede vi anvendeligheden af ctDNA analyse i en gruppe af lungekræftpatienter under skræddersyet behandling mod ALK proteinet. Vi viser, at ctDNA analyse har stort potentiale som et værktøj til at forudsige og monitorere effekten af behandling, samt til at identificere eventuelle resistensmekanismer.

Resultaterne er sammenfattet i et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Anne Tranberg Madsen, der forsvarer det d. 21/10.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 21/10 kl. 13 i Auditorium J116-113, Aarhus Universitet Hospital, Palle Juul-Jensens Boulevard 99, Aarhus N. Titlen på projektet er "Applications of cell-free DNA in cancer - Insigts into biological variation and treatment monitoring". Yderligere oplysninger: Ph.d.-studerende Anne Tranberg Madsen, e-mail: atm@clin.au.dk, tlf. 23957509.

Bedømmelsesudvalg:
Professor Jan Alsner, Department of Experimental Clinical Oncology, Aarhus University Hospital, Denmark
Professor Rafał Dziadziuszko, Department of Oncology and Radiotherapy, Medical University of Gdansk, Poland
Klinisk lektor Henrik Hager, Department of Pathology, Vejle Hospital, Denmark

Press release (English)

Lung cancer is the leading cause of cancer-related deaths worldwide and more than half of the patients have incurable disease at diagnosis. However, advances in targeted therapies directed

against specific genomic tumor alterations have improved survival for these patients. Small cell-free DNA (cfDNA) fragments can be found in the circulation of all individuals. In cancer patients, a minute amount is tumor-derived and known as circulating tumor DNA (ctDNA). Thus, cancer evolution and treatment efficiency can be monitored simply by using blood samples. The aim of this PhD study was to gain further insights into the biology and utility of cfDNA and ctDNA for evaluating treatment response.
We investigated the inherent biological variation of cfDNA and ctDNA levels in healthy subjects and lung cancer patients and observed marked variations in the levels in both healthy and diseased subjects. This may have large implications for how ctDNA results should be interpreted and reported.
Furthermore, the utility of ctDNA analysis was evaluated in a cohort of lung cancer patients during therapy targeted against the ALK protein. We show that ctDNA analysis holds great promise as a tool for predicting and monitoring treatment response, as well as for identifying potential mechanisms of resistance. The project was carried out by Anne Tranberg Madsen, who is defending her dissertation on October 21st.

The defence is public and takes place on 21/10 at 13 PM in J116-113, Aarhus University Hospital, Palle Juul-Jensens Boulevard 99, Aarhus N. The title of the project is ”Applications of cell-free DNA in cancer - Insigts into biological variation and treatment monitoring”. For more information, please contact PhD student Anne Tranberg Madsen, email: atm@clin.au.dk, Phone +45 23957509

Assessment committee:
Professor Jan Alsner, Department of Experimental Clinical Oncology, Aarhus University Hospital, Denmark
Professor Rafał Dziadziuszko, Department of Oncology and Radiotherapy, Medical University of Gdansk, Poland
Clinical Associate Professor Henrik Hager, Department of Pathology, Vejle Hospital, Denmark

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