Press release

Please fill in this form and return it to graduateschoolhealth@au.dk in Word format no later than three weeks prior to your defence.

Basic information

Name: Sarah Østrup Jensen Email: soj@clin.au.dk Phone: 784 55313

Department of: Clinical Medicine

Main supervisor: Claus Lindbjerg Andersen

Title of dissertation: "Early detection of colorectal cancer using circulating tumor DNA methylation markers"

Date for defence: August 19th 2019 at (time of day): 11 am Place: Molekylær Medicinsk Afdeling, Brendstrupgårdsvej 21, Auditoriet i stueetagen.

Press release (Danish)

Ny blodtest til tidlig opdagelse af tarmkræft.

Et nyt ph.d.-projekt fra Aarhus Universitet, Health, har udviklet og valideret en ny blodbaseret test til tidlig opdagelse af tarmkræft. Projektet er gennemført af Sarah Østrup Jensen, der forsvarer det d. 19. august 2019.

Hvert år dør mere end 890.000 mennesker af tyk- og endetarmskræft (tarmkræft), som er den anden hyppigste årsag til kræft-relaterede dødsfald på verdensplan. Den høje dødelighed skyldes primært at sygdommen diagnosticeres for sent til at kunne helbredes. Opdages tarmkræft derimod tidligt, er behandlingen langt mere effektiv og overlevelsen væsentlig bedre. Tarmkræftscreening har vist sig at være effektivt til at opdage sygdommen tidligt. Derfor har man i flere lande indført nationale tarmkræftscreeningsprogrammer; flere af disse er baseret på en immunologisk test for usynligt blod i afføring. Desværre er deltagelsen i disse screeningsprogrammer dog ofte begrænset, måske fordi mange finder afføringstests frastødende. Alternativt til afføringstests har nyere forskning vist, at blodbaserede tests muligvis accepteres bedre i befolkningen. Derfor forskes der nu intensivt i blod-baserede metoder til tidlig opdagelse af kræft. Blodet indeholder mange komponenter der kan bruges som kræftmarkører, bl.a. cirkulerende celle-frit DNA. I kræftpatienter kommer en mindre del af disse fragmenter fra kræftsvulsten (såkaldt cirkulerende tumor DNA). Formålet med dette PhD projekt var, at identificere tarmkræft-specifikke DNA methyleringsmønstre og benytte disse til at spore cirkulerende tumor DNA i blodet for at opdage tarmkræft tidligt.

I dette projekt har vi udviklet et panel af tarmkræft-specifikke DNA methyleringsmarkører og undersøgt disse i blod fra tarmkræftpatienter med forskellig stadie sygdom samt raske kontroller. Resultaterne fra studiet har vist, at tarmkræft-specifikke DNA methyleringsmarkører kan benyttes til at skelne mellem blod fra tarmkræftpatienter og raske kontroller. Selvom yderligere valideringsstudier er nødvendige for at kunne vurdere om disse markører har potentialle til at blive brugt i klinikken, har dette projekt demonstreret muligheden for at benytte DNA methyleringsmarkører til sensitiv og specifik opsporing af cirkulerende tumor DNA i blodet hos patienter med tarmkræft i tidligt stadie. Forhåbentlig vil dette på sigt medvirke til, at en større andel af befolkningen deltager i tarmkræftscreening og dermed medføre en øget overlevelse, fordi flere kræfttilfælde opdages tidligt.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 19. august 2019 kl. 11 auditoriet i stueetagen, Molekylær Medicinsk Afdeling, Brendstrupgårdsvej 21, 8200 Aarhus N. Titlen på projektet er ”Early detection of colorectal cancer using circulating tumor DNA methylation markers”. Yderligere oplysninger: Ph.d.-studerende Sarah Østrup Jensen, e-mail: soj@clin.au.dk, tlf. 78455313.

Bedømmelsesudvalg:
Lise Lotte Hansen, Associate Professor, Aarhus Universitet, Danmark
Ellen Heitzer, Associate Professor, Medical University of Graz, Østrig.

Per Guldberg, Professor, Kræftens Bekæmpelse, Danmark,

Press release (English)

A novel blood test for early detection of colorectal cancer

A new PhD project at Aarhus University, Health have developed and validated a blood-test for early detection of colorectal cancer. The project was carried out by Sarah Østrup Jensen, who is defending her dissertation on August 19th 2019.

Colorectal cancer (CRC) claims more than 890,000 lives each year and is the second leading cause of cancer-related deaths worldwide. The main reason for the high mortality rate of CRC is its propensity to be in an advanced disease stage at diagnosis. Yet, patient prognosis and survival can be improved if CRC is detected at an earlier disease stage, where treatment is more effective. CRC screening using Fecal Immunological Testing has been shown to detect the disease early and increase survival rates, and therefore many countries have established population-based screening programs. However, compliance in CRC screening programs is suboptimal, most likely due to the unpleasantness of fecal sampling. The development of a blood-based screening approach may alleviate these problems.
The overall aim of this PhD project was to develop an approach for early detection of CRC using circulating tumor DNA.

In this project we developed a panel of CRC-specific DNA methylation markers and evaluated these in plasma from CRC patients and cancer-free controls using methylation-specific droplet digital PCR. Results demonstrated an ability of these markers to discriminate between plasma from CRC patients and controls. While further validation studies are needed, this project has demonstrated the potential utility of DNA methylation markers for sensitive and specific blood-based detection of early-stage CRC. This may have a high impact on the cost-effectiveness of CRC screening programs and could potentially benefit CRC survival rates in the future.

The defence is public and takes place on August 19 at 11 am in the auditorium on the ground floor at the Department of Molecular Medicine, Aarhus University Hospital, Brendstrupgårdsvej 21, 8200 Aarhus N. The title of the project is "Early detection of colorectal cancer using circulating tumor DNA methylation markers." For more information, please contact PhD student Sarah Østrup Jensen, email: soj@clin.au.dk, Phone +45 784 55313.

Assessment committee:
Lise Lotte Hansen, Associate Professor, Aarhus University, Denmark
Ellen Heitzer, Associate Professor, Medical University of Graz, Austria.
Per Guldberg, Professor, Danish Cancer Society, Denmark,

Permission

By sending in this form:

- I hereby grant permission to publish the above Danish and English press releases.
- I confirm that I have been informed that any applicable inventions shall be treated confidentially and shall under no circumstances whatsoever be published, presented or mentioned prior to submission of a patent application, and that I have an obligation to inform my head of department and the university's Patents Committee if I believe I have made an invention in connection with my work. I also confirm that I am not aware that publication violates any other possible holders of a copyright.