Press release

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Basic information

Name: Martin Fogtmann Berthelsen Email: mfb@clin.au.dk Phone: +4521944497

Department of: Clinical Medicine

Main supervisor: Associate Professor, Martin Kristian Thomsen

Title of dissertation: In vivo cancer models

Date for defence: January 28th 2020 at (time of day): 12 Place: Auditorium 1253-317 (William Scharff) Bartholins Allé 3, 8000 Aarhus C, Denmark

Press release (Danish)
Dyremodeller for kræft

Murine kræftmodeller har leveret essentiel indsigt i kræftbiologi. Ikke desto mindre har disse begrænsninger, især når de bruges til udvikling af nye behandlinger. På baggrund af dette genererede vi en grisekræftmodel, da grise har et tættere slægtskab med mennesker og derfor formodentlig er bedre prækliniske sygdomsmodeller. Indledningsvist klonede vi en transgen minigris ved traditionel introduktion af onkogener via tilfældig integration af transposoner i et forsøg på at fremstille en bugspytkirtelkræftmodel. I disse grise observerede vi hyperplasi i bugspytkirtlen. Traditionelt har udviklingen og brugen af minigrise i kræftstudier været begrænset, da det har vist sig svært at introducere kræft i grisen. Hovedårsagen hertil er, at det er udfordrende at generere flere genetiske ændringer i grisen. Dette ændrede sig med at udviklingen af CRISPR/Cas9-teknologien, der gjorde multiplex genomredigering muligt. Dette førte til, at vi genererede en transgen CRISPR/Cas9-minigris. Hovedformålet med ph.d.-projektet var at strømline tumorinitiering i minigrisen for at generere hurtige og billigere grisekræftmodeller. Vi forsøgte at validere modellen ved induktion af lunge- og hudkræft.
Parallelt udførte vi lignende forsøg i LSL-Cas9-musen, genereret af Feng Zhangs laboratorium, for direkte at kunne sammenligne de to modelorganismer. Fortløbende molekylære analyser vil yderligere adressere de genetiske ændringer induceret med CRISPR/Cas9-teknologien og evaluere, om grisen er en bedre kræftmodel end musen.

Et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet blev udført af Martin Fogtmann Berthelsen, der forsvarer det d. 28/01/2020

Forsvaret af ph.d.-projektet er offentligt og finder sted den 28/01/2020 kl. 12.00 i Søauditorierne - Auditorium 1253-317 (William Scharff), Aarhus Universitet, Bartholins Allé 3, 8000 Aarhus C. Titlen på projektet er ”In vivo cancer models”. Yderligere oplysninger: Ph.d.-studerende Martin Fogtmann Berthelsen, mfb@clin.au.dk, tlf. 21944497.

Bedømmelsesudvalg:
Lektor Anders Lade Nielsen - formand for udvalget og moderator for forsvaret
Institut for Biomedicin, Høegh-Guldbergsgade 10, bygging 1115, 4N, Aarhus Universitet, 8000 Aarhus C Danmark

Leder af MCCA transgen facilitet Ivo Huijbers Det Nederlandske Kræftinstitut, Plesmanlaan 121, 1066 CX Amsterdam, Nederland

Professor Peter M. H. Heegaard DTU, Søltofts Plads, Bygning 224, 2800 Kgs. Lyngby, Denmark

Press release (English)

In vivo cancer models

Murine cancer models have brought critical insights to cancer biology. Nevertheless, murine cancer model have limitations, especially when used for development of new treatments. Therefore, we aimed to generate a porcine cancer model as pigs have a closer kinship with humans and are presumably better pre-clinical disease models. Initially, we cloned a transgenic minipig by traditional introduction of oncogenes via random integration of transposons in an attempt to produce a porcine pancreatic cancer model. In these pigs, we observed hyperplasia in the pancreas. Traditionally, the development and use of minipigs in cancer studies have been limited, as it has proven hard to generate cancer in pigs. The main obstacle is that it is challenging to generate multiple genetic alterations. This changed by harnessing the CRISPR/Cas9 technology that made multiplexed genome editing feasible. This led us to generate a transgenic CRISPR/Cas9 minipig. The main aim of the PhD project was to streamline tumor initiation in the minipig to generate rapid and cheaper porcine cancer models. We attempted to validate the model by induction of lung and skin cancer.
In parallel, similar studies were performed in the LSL-Cas9 mouse generated, Feng Zhang's laboratory, by targeting the same genes for direct comparison of the two model organisms. Ongoing molecular analysis will further address the genetic alterations induced by the CRISPR/Cas9 technology and evaluate if the pig is a better cancer model. The project was carried out by Martin Fogtmann Berthelsen, who is defending his dissertation on 28/01/2020.

The defence is public and takes place on 28/01/2010 at 12:00 in Auditorium 1253-317 (William Scharff), Aarhus University, Bartholins Allé 3, 8000 Aarhus C, Denmark. The title of the project is In vivo cancer models. For more information, please contact PhD student Martin Fogtmann Berthelsen, email: mfb@clin.au.dk, Phone +45 2194 4497.

Assessment committee:
Associate Professor Anders Lade Nielsen - chairman of the committee and moderator of the defence Department of Biomedicine, Høegh-Guldbergsgade 10, building 1115, 4N, Aarhus University, 8000 Aarhus C Denmark

Head of MCCA transgenic facility Ivo Huijbers The Netherlands Cancer Institute, Plesmanlaan 121, 1066 CX Amsterdam, Netherlands

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