

Press release

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Basic information

Name: Emil Hagen Ernst Email: ehernst@biomed.au.dk Phone: +45 29805402

Department of: Biomedicine

Main supervisor: Karin Lykke-Hartmann

Title of dissertation: Gene expression profiles of oocytes and follicles from the first stages of human folliculogenesis

Date for defence: August 17th at (time of day): 13.00 Place: Small Anatomy Auditorium

Press release (Danish)

Ny viden om regulation af den kvindelige ægreserve

I Danmark fødes cirka 10 procent af alle børn som følge af infertilitetsbehandling. På trods af stadig bedre metoder i infertilitetsbehandling er 3-6 procent af kvinder fortsat ufrivilligt barnløse når de fylder 45 år.

Det kvindelige reproduktive potentiale udgøres af puljen af hvilende æg i æggestokken. De hvilende æg aktiveres løbende til vækst med efterfølgende henfald eller ægløsning. Ophør af fertilitet ved overgangsalderen sker som følge af opbrugt ægreserve. Vores viden om de basale molekulære regulatoriske mekanismer ansvarlige for dvale, aktivering og cellulær integritet i æggene er inkomplet. Denne manglende viden forhindrer os i at udnytte ægreserven til fulde i behandling af infertilitet. I samarbejde med forskere fra Imperial College i London og Københavns Universitet ville vi, for første gang nogensinde, studere de cellespecifikke genudtryk i æggene og de omkringliggende støtteceller fra det hvilende og aktiverede humane æg-stadie i et forsøg på at identificere faktorer ansvarlige for dvale, aktivering og cellulær integritet.

Vi benyttede laser mikrodisektion til at isolere humane æg og støtteceller med efterfølgende RNA-sekventering og bioinformatisk bearbejdning med berigelsesanalyser. På basis af disse genudtryksanalyser kan vi nu komme med kvalificerede bud på mulige nøglespillere i reguleringen af den menneskelige ægreserve. Disse fund vil potentielt kunne bruges i udviklingen af nye behandlingsmetoder til infertile par.

Arbejdet udgør et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Emil Hagen Ernst, der forsvare det d. 17/08/2017.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 17/08/2017 kl. 13 i Lille Anatomisk Auditorium, bygn. 1231, lokale 424, Universitetsparken 231, Aarhus Universitet, 8000 Aarhus C. Titlen på projektet er "Gene expression profiles of oocytes and follicles from the first stages of human folliculogenesis". Yderligere oplysninger: Ph.d.-studerende Emil Hagen Ernst, e-mail: ehernst@biomed.au.dk, tlf. +45 29805402.

Bedømmelsesudvalg:

Formand:

Mette Nyegaard, Lektor

Institut for Biomedicin

Aarhus Universitet

Bedømmere:

Eva Hoffmann, Professor

Institut for Cellulær og Molekylær Medicin

Københavns Universitet

Nicholas Stephen Macklon, Professor, Scientific Director
Complete Fertility Centre
University of South Hampton

Press release (English)
New insight into the regulation of the female egg reserve

In Denmark, approximately 10% of all children are born following treatment for infertility. Despite continuous refinement of artificial reproductive technologies, 3-6% of women remain involuntarily childless at age 45.

The female reproductive potential consists of the pool of resting eggs in the ovary. A subset of the eggs is continuously recruited into initial growth with subsequent apoptosis or ovulation. Reproductive senescence, marked by menopause, ensues upon egg depletion. Our knowledge on the basal molecular regulatory mechanisms governing human egg dormancy, activation and integrity is incomplete. This lack of knowledge hinders our ability to utilize the stock of resting eggs in infertility treatment.

In collaboration with researchers from Imperial College in London and University of Copenhagen, we aimed to study, for the first time, the cell specific gene expression profiles in eggs and supportive cells from human dormant and activated follicles in search for factors responsible for egg dormancy, activation and integrity.

Using laser capture microdissection, we isolated eggs and supportive cells from the first stages of human egg development. Following RNA-sequencing and bioinformatical management, enrichment analysis allowed us to identify potential key regulators of the human egg reserve. These findings may contribute to the development of novel treatments for infertile couples.

The work presented is a new PhD project from Aarhus University, Health. The project was carried out by Emil Hagen Ernst, who is defending his dissertation on the 17th of August, 2017.

The defence is public and takes place on the 17th of August, 2017 at 13.00 o'clock in Small Anatomy Auditorium, build. 1231, room 424, The University Park 231, Aarhus University, 8000 Aarhus C. The title of the project is "Gene expression profiles of oocytes and follicles from the first stages of human folliculogenesis". For more information, please contact PhD student Emil Hagen Ernst, email: ehernst@biomed.au.dk, Phone +45 29805402.

Assessment committee:

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Assessors:

Eva Hoffmann, Professor
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Nicholas Stephen Macklon, Professor, Scientific Director
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