

Molecular signaling in the human ovarian follicle mediated by post-transcriptional regulation

Summary

Reproductive biology group at TalTech is recruiting a motivated candidate to join our molecular cell communication studies of the human ovary. Second and third generation sequencing technologies, bioinformatic data analysis and experimental studies will be used to reveal the underlying causes of ovarian disturbances in infertile women.

Research field:	Chemistry and biotechnology
Supervisors:	Agne Velthut-Meikas Paolo Guazzi
Availability:	This position is available.
Offered by:	School of Science Department of Chemistry and Biotechnology
Application deadline:	Applications are accepted between May 03, 2021 00:00 and May 31, 2021 23:59 (Europe/Zurich)

Description

The maturation of an oocyte is a result of a delicate interplay between different cell types and molecular mechanisms of their intercellular communication. The reproductive biology group at TalTech (<https://taltech.ee/bioinformaatika/reproduktiivbioloogia>) is using modern RNA sequencing methods (second and third generation, small RNA, single cell RNA-seq) to generate information about molecular communication between human ovarian cells mediated by RNA expression, post-transcriptional regulation, and RNA shuttling between cells in extracellular vesicles (EV).

Disturbances in such molecular communication are modelled by computational methods to understand ovarian dysfunction in infertile women.

The PhD project will be carried out between the reproductive biology group and HansaBioMed Life Sciences Ltd (HBM-LS) to combine the above-described expertise from the university with the know-how of EV-related methods applied on complex biological samples available at HansaBioMed. In addition, we collaborate with infertility clinics to collect biological material for the studies.

The PhD student will be engaged in determining the role of gene expression changes, post-transcriptional regulation (miRNA silencing and alternative splicing) and RNA signaling via EVs that are observed in the ovarian follicles of women with polycystic ovarian syndrome or poor response to ovarian stimulation. The student will follow the project from sample collection, experimental work to the data analysis and publication of results. In collaboration with HBMLS, the student will participate in developing methods for EV isolation and characterization from follicular fluid samples.

Mentoring will be provided for both, experimental and computational procedures throughout the studies. Completing relevant academic courses and participation at local as well as international scientific conferences will be encouraged.

A suitable applicant has acquired strong knowledge of molecular and cellular biology and an MSc degree in a relevant field. Working in projects related to RNA biology and/or gene expression is a plus. In addition, standard molecular and cell biology laboratory skills with at least 2 years of hands-on experience are expected. Profound interest in



bioinformatic data analysis is a must as approximately half of the scientific activities will be based on computational work. However, the possession of previous bioinformatic skills is not mandatory, but considered as a strong bonus. Strong learning motivation, capability for independent thinking and fluent spoken as well as written English are crucial for the position.



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