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VRIJE UNIVERSITEIT BRUSSEL

PhD in Medical Sciences
2019-2020

INVITATION to the Public defence of

Joeri LAMBRECHT

To obtain the academic degree of **'DOCTOR OF MEDICAL SCIENCES'**

The discovery of novel biomarkers for early stage liver fibrosis.

The defence will take place digitally through TEAMs on Wednesday, 13 May 2020 at 3.30 p.m.

Join Microsoft Teams Meeting

Summary of the dissertation

Liver fibrosis is the result of persistent liver injury (e.g. chronic alcohol abuse, chronic viral hepatitis B or C, and metabolic syndrome) and is characterized by sustained scar formation and disruption of the normal liver architecture. The main cell type that contributes to this scar production is the hepatic stellate cell (HSC) which will undergo an activation process, transforming a quiescent fat storing cell into a fibrogenic, proliferative, migrating, and contractile myofibroblast. Till date, the most sensitive and specific way for the diagnosis and staging of liver fibrosis remains liver biopsy, an invasive diagnostic tool which is associated with high costs and discomfort for the patient. Due to these drawbacks, several non-invasive scoring systems have been developed, of which the interpretation of serum markers and clinical parameters, and measurement of liver stiffness are validated for clinical use. However, these tools are based on late-stage characteristics of liver fibrosis, making them unsuitable to detect early stage liver fibrosis or small changes in the progression or regression of fibrosis. As fibrosis has been identified as major predictor of liver-related mortality, early diagnosis and subsequent intervention could prevent progression to cirrhosis and ultimately reduce morbidity and mortality. In this thesis, we aimed to find novel circulating biomarkers derived from activated HSCs, which could have the potential to identify those patients with liver fibrosis. Hereto, we focused on extracellular vesicles (EVs), small membrane-structures known to be shed by all cell types in the body, including HSCs. In particular, we investigated the potential of the changing cargo of circulating EVs to reflect the presence of activated HSCs in the injured liver.

Curriculum Vitae

Joeri Lambrecht was born on the 13th of December 1991 in Geraardsbergen, Belgium. He started his studies in Biomedical Sciences at the Vrije Universiteit Brussel in 2009. After performing scientific internships at the Institute de Recherche en Biothérapie (Montpellier, France) and the Liver Cell Biology Research Group (Brussels, Belgium), he finished his master in Biomedical Sciences with magna cum laude in 2014. After graduating, he further expanded his expertise in hepatology as PhD-candidate under supervision of prof. Leo van Grunsven and prof. Hendrik Reynaert. His research focused on the development of novel non-invasive diagnostic tools for early stage liver fibrosis. He complemented his research tasks with educational roles, including his faculty-position as teaching assistant for the practical courses of 'Physiology of the Cell and the Body', and by supervising several (Bio-)medical Master students. Joeri's research has led to 5 peer-reviewed publications as first author and 1 patent application. His work was presented through oral- and poster-presentations at multiple (inter)national conferences. He also had the privilege of communicating his obtained results through public outreach activities such as educational contests (VUB PhD cup, de Wetenschapsbattle), newspapers (HLN, l'avenir), radio (Qmusic), and magazines (Knack, EOS). Aside from his scientific and educational tasks, he has been PhD-representative in the Educational Board and the BMWE Departmental Board.