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VRIJE UNIVERSITEIT BRUSSEL

PhD in Medical Sciences
2023-2024

INVITATION to the Public defence of

Diedert Luc DE PAEP

To obtain the academic degree of

'DOCTOR OF MEDICAL SCIENCES'

Donor pancreas conditions that preserve therapeutic potential of human islet cell preparations

The public defence will take place on

Tuesday, **19 December 2023 at 5 p.m.**

In Auditorium Vanden Driessche
Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

and can be followed online, accessible through the following link**:**

https://gf.vub.ac.be/redirects/PhD_defense_Diedert_De_Paep.php

Summary of the dissertation

Beta cell transplantation can restore a functional beta cell mass in patients with diabetes but its metabolic effect remains variable and limited in time, and depends on the beta cell number of the transplanted islet cell graft. In this thesis, we use this in vitro parameter to identify donor and procurement conditions that lead to islet cell preparations with therapeutic potential.

It allowed us to demonstrate in multivariate analysis an independent correlation with acirculatory warm ischemia time in donors after controlled circulatory death. While donation after circulatory death leads to a 30% reduction in beta cell number, limiting acirculatory warm ischemia time and using Institut Georges Lopez-1 as cold preservation solution were identified as conditions that preserve beta cell yield. Under these conditions, donation after euthanasia leads to islet cell preparations containing a higher beta cell number when compared to matched donors after controlled circulatory death or donors after brain death.

We also used a hyperglycemic clamp test to determine functional beta cell mass after autologous islet cell transplantation and demonstrated its correlation with the beta cell number in the autograft and functional beta cell mass before pancreatectomy. As such it can be part of the assessment when counselling patients for pancreatectomy followed by autologous islet cell transplantation.

In summary, we used beta cell number as an intermediary parameter for restoring a functional beta cell mass to study and identify donor and procurement conditions that preserve beta cell number and therapeutic potential of islet cell preparations.

Curriculum Vitae

Diedert De Paep graduated in 2014 as a Medical Doctor after obtaining his bachelor's and master's degrees "magna cum laude" at the Universities of Hasselt and Antwerp. At Vrije Universiteit Brussel he continued his academic and professional education, and was certified as a specialist in general surgery in 2023.

In 2017 he started a research project as PhD student at the Center for Beta Cell Therapy in Diabetes and the Diabetes Research Center of the VUB medical campus. He became an active collaborator of the clinical islet cell isolation facility and now takes responsibility for the UZ Brussel Beta Cell Bank. Diedert has a special interest in autologous islet cell transplantation after total pancreatectomy and is playing a leading role in further developing this multidisciplinary and multicenter program.

Together, these activities led to multiple publications in high impact journals that form the basis for this thesis. His academic merit is further supported by his preclinical work at the lab, teaching activities, copromoting master theses, and memberships of multiple national and international scientific organizations.