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PhD in Medical Sciences
2016-2017

INVITATION to the Public defence of

Mozhdeh SOJOODI

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

The zinc finger transcription factor PW1/PEG3 restrains beta cell cycling in normal and regenerating mouse pancreas.

Friday 28 October 2016

Auditorium **Vanden Driessche**, 17:00

Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

How to reach the campus Jette:

<http://www.vub.ac.be/english/infoabout/campuses>

Summary of the dissertation

Pw1/Peg3 is an imprinted gene encoding a zinc finger transcription factor that is broadly expressed during mouse embryonic development. In the adult, PW1/PEG3 is expressed in multiple somatic stem cell lineages and implicated in regulation of cell death/survival and proliferation. Identification of the mechanisms governing beta cell proliferation are instrumental to developing novel therapies for diabetes patients. Since knowledge on the expression of PW1/PEG3 in pancreas is lacking, the general aim of this thesis is to describe the expression pattern and role of PW1/PEG3 during mouse pancreas development, homeostasis and regeneration, with special emphasis on the beta cell.

The role of PW1/PEG3 was studied in pancreas of nonpregnant and pregnant mice and following injury-induced regeneration by partial pancreatic duct ligation (PDL). PW1/PEG3 is expressed in early pancreatic progenitors but becomes progressively restricted to fully differentiated beta cells as they become established after birth and withdraw from the cell cycle. Notably, PW1/PEG3 expression declines when beta cells are induced to proliferate as occurs during pregnancy and after PDL while loss of PW1/PEG3 function activates the beta cell cycle in isolated beta cells. Efficient elimination of PW1/PEG3 from beta cells of adult transgenic mice increased the beta cell cycle following injury. In addition, beta cell-specific deletion of PW1/PEG3 prevented hyperglycemia in mice with pancreatectomy.

Taken together, these results indicate that PW1/PEG3 restrains the beta cell cycle in normal and regenerating pancreas and can thus be considered as a novel therapeutic target in diabetes.

Curriculum Vitae

Mozhdeh Sojoodi was born on the 16th of August 1986 in Neyriz, Iran. She graduated from Prof. Hesabi High school, in Shiraz, after which she started her studies in Biology at Shiraz University. Mozhdeh studied at Royan institute, Tehran, Iran, and specialized in stem cell biology and their differentiation toward insulin-producing cells during her master years. In 2011, Mozhdeh graduated with master of cell and developmental biology degree and started her PhD research at the Diabetes Research Center, Vrije Universiteit Brussel, under supervision of Prof. Dr. Harry Heimberg and Dr. Paola Bonfanti. She (co-)wrote several peer-reviewed research and review papers. Mozhdeh will be postdoctoral Fellow at the Department of Surgery, Division of Surgical Oncology at Massachusetts General Hospital, Harvard Medical School in Boston, US.