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FACULTEIT GENEESKUNDE EN FARMACIE

**Doctoraat in de Farmaceutische
Wetenschappen**

Academiejaar 2011-2012

UITNODIGING

Voor de openbare verdediging van het
doctoraatsproefschrift van

Joery DE KOCK

maandag 14 mei 2012

U wordt vriendelijk uitgenodigd op de openbare verdediging van het proefschrift van

Joery DE KOCK

'Differentiation of adult progenitor cells (human, rat) into functional hepatocyte-like cells: potential new in vitro models for preclinical research'

Op **maandag 14 mei 2012** om **17 uur** in auditorium **P. Brouwer** van de Faculteit Geneeskunde & Farmacie Laarbeeklaan 103, 1090 Brussel

Situering van het proefschrift

Although the use of stem cells holds great promise for *in vitro* toxicology as well as for clinical application, enormous challenges are still ahead. Yet, significant progression is made over the last years. In the framework of the current doctoral thesis the broad applicability of an innovative (patent n° EP1824965B1) three-step hepatic differentiation strategy that mimics *in vitro* the *in vivo* liver embryogenesis could be shown. Furthermore, it was reported that the intrinsic properties of the investigated stem/progenitor cell population might have a significant impact on its differentiation potential as well as the strategy needed to produce the desired target cells. In this context, it was confirmed that a stem cell population that exhibits a higher intrinsic expression of pluripotency markers and a lower commitment to the endodermal lineage i.e. human skin-derived precursors, can be differentiated into hepatic cells as long as the *in vitro* differentiation strategy mimics the earliest stages of liver development *in vivo*. In addition, it was shown for the first time that human skin-derived precursor cells have the ability to generate hepatic progeny *in vivo* and exhibit favorable immunological properties suggesting their potential for further exploration in the treatment of various liver diseases. Finally, a significant reduction of the amount of time required to decellularize whole rat livers was achieved. This technology could provide a novel standard as bioengineering platform to further promote differentiation and maturation of stem cells into fully functional hepatocyte-like cells, thereby opening new possibilities for organ re-engineering and transplantation.

Curriculum Vitae

Joery De Kock was born on July 15, 1981 in Boom, Belgium. In 1999 he started the study of Pharmaceutical Sciences at the Vrije Universiteit Brussel (VUB). His Master's thesis, entitled 'Karakterisatie op proteïnen-niveau van het differentiatieproces van ratepitheelcellen van biliare oorsprong naar hepatische cellen' was carried out at the Department of Toxicology, Dermato-Cosmetology and Pharmacognosy (FAFY) at the VUB, under supervision of Dr. Sarah Snykers and promotorship of Prof. V. Rogiers. In 2006, he graduated with high distinction. He subsequently started a PhD (IWT-bursary) in Pharmaceutical Sciences on '*In vitro* hepatic differentiation of postnatal stem/progenitor cells' at the Department of Toxicology, VUB, under promotorship of Prof. V. Rogiers and Prof. Tamara Vanhaecke. During his PhD, he assisted in the practical courses of Toxicology, Physical Pharmacy and Project Education, and was co-promoter of 6 Master theses in Pharmaceutical Sciences.

In 2007, he stayed at the MaRS Center, Toronto, Canada (Prof. F. Miller) to learn the isolation and cultivation of skin-derived precursor cells and went to the VU Medical Center in Amsterdam (Drs. W. Jurgens) to learn the isolation technique of adipose tissue-derived stem cells. He is first author of 11 publications in international peer-reviewed journals of which 2 are in the submitted state. He is also co-author of 10 other publications and 1 patent submission, and was invited speaker at several (inter)national congresses and training programs.