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PhD in Medical Sciences  
2016-2017

INVITATION to the Public defence of

**Neelke DE MUNCK**

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

**Oocyte vitrification: efficiency and safety in an oocyte donation programme**

**Tuesday 20 December 2016**

Auditorium **Piet. Brouwer**, 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>

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## Summary of the dissertation

At the start of this thesis in 2008, oocyte vitrification just grew out of its infancy. Since the first report of a pregnancy from a frozen-thawed human oocyte in 1986, many efforts were made to improve the efficiency of the cryopreservation protocol, for both slow-freezing and vitrification. It was only in 2005 that an efficient and reproducible protocol was described with the use of an open vitrification device. However, national guidelines have encouraged the use of closed devices in order to prevent cross-contamination. The present thesis aimed (i) to optimize the efficiency of an oocyte vitrification protocol with the use of a closed vitrification device and (ii) to test the safety of the developed protocol.

By analysing different warming rates, it appeared that a high warming rate is necessary to obtain high survival rates and developmental competence up to the blastocyst stage. Also, gradual or direct exposure to cryoprotective agents was analysed, showing that both methods can be successfully applied on oocytes. After a successful protocol was obtained with a closed vitrification device, this protocol was compared on oocytes vitrified with an open device, generating much higher cooling rates. Though the survival rate was not different between the open and closed device, it appeared that the embryological development is faster when oocytes are vitrified with an open device. Concerning the safety; the chromosomal meiotic constitution, developmental kinetics and DNA (hydroxy)methylation were compared between fresh and vitrified sibling donor oocytes and showed comparable results. Finally, obstetric and neonatal data from all oocyte donation cycles performed with the use of a closed vitrification device were retrospectively analysed and are similar to other reports after oocyte vitrification.

## Curriculum Vitae

Neelke De Munck was born on the 1<sup>st</sup> of February 1982, in Dendermonde. She graduated from the University of Ghent, Belgium: Biomedical Science in 2005 and Molecular Medical Biotechnology in 2006. In 2008, she started her PhD on human oocyte vitrification at the Vrije Universiteit Brussel. From 2010 she is working as a clinical embryologist at the Centre for Reproductive Medicine, Universitair Ziekenhuis Brussel, Belgium. While working as a clinical embryologist she continued her PhD project. She is a member of the 'Vlaamse Vereniging Klinische Embryologie' (VVKE), of the 'Belgian Society for Reproductive Medicine' (BSRM) and of the 'European Society of Human Reproduction and Embryology' (ESHRE). Her main focus is oocyte vitrification, optimizing embryo culture conditions and her cute little daughter Marilou.