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**PhD in Pharmaceutical Sciences
2018-2019**

INVITATION to the Public defence of

Yannick Van Wanseele

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

Miniaturized UHPLC-MS/MS for the *in vivo* quantification of neuropeptides in microdialysis samples - *Strategies to increase method sensitivity.*

Tuesday 4 December 2018

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>

Summary of the dissertation

To better understand the physiological and pathophysiological conditions underlying health and disease, an increasing amount of research has been performed to monitor endogenous molecules, such as peptides, present in the body. One organ receiving a lot of interest in particular is the central nervous system (CNS). Hand in hand with the increasing life expectancy, expanding population and better diagnostics, neuroscience is a continuously expanding field of research comprising a lot of unrevealed questions today. Currently, the focus on signaling molecules within the CNS is shifting from traditional neurotransmitters, e.g. norepinephrine, dopamine, serotonin, towards peptides and proteins. Their possible involvement in a series of neurological pathologies such as e.g. Alzheimer's disease, depression and Parkinson's disease makes them and their receptors attractive subjects of scientific research. In order to obtain better insights into the central peptidergic effects, it is essential to monitor their concentration in the brain whereby these compounds are sampled by microdialysis. The analysis of neuropeptides in microdialysis samples is challenging due to their low abundance and intrinsic physicochemical properties resulting in reduced stability and adsorption behavior. As such very sensitive miniaturized liquid chromatography methods coupled to mass spectrometric detection are often used for their quantification. This dissertation focuses on several strategies which can be exploited for increasing the method sensitivity for peptide analysis. A first part focuses on the chromatographic conditions for the separation of a set of neuropeptides. This is followed by an assessment of different additives that can be used for modifying the charging of peptides during electrospray ionization. In addition, the use of a novel ionization source is discussed and compared to electrospray ionization for the ionization of peptides before detection by mass spectrometry. Furthermore, a part of the dissertation focuses on the adsorption of peptides to microdialysis syringes and the consequences for their administration.

Curriculum Vitae

Yannick Van Wanseele was born in herk-De-Stad on March 12th, 1990. He attended the Onze-Lieve-Vrouw Instituut in Sint-Genesius-Rode and majored in Science. In 2008 he started at the VUB and graduated as master in drug development/pharmacist in 2013. After his studies he obtained a PhD fellowship grant from the Flemisch Research Foundation (FWO) to start a PhD at the department of Pharmaceutical Chemistry, Drug Analysis and Drug Information at the VUB under the supervision of Ann Van Eeckhaut. He combined his PhD with the courses required to obtain the title of Qualified Person in the pharmaceutical industry. Since March 2018, Yannick is working as an operational support project engineer at Pfizer.