

Board of examiners

Dr. Sandrine Parrot

NeuroDialyTics
University Claude Bernard Lyon 1

Prof. Jean-Michel Kauffmann

Laboratory of Instrumental Analysis and Bioelectrochemistry
Université Libre de Bruxelles

Dr. Sophie Sarre

DGO-SCM – Medicines Control Laboratory
APB – Belgian Pharmaceutical Association

Prof. Debby Mangelings

Department of Analytical Chemistry and Pharmaceutical Technology
Vrije Universiteit Brussel

Prof. Bieke Dejaegher

Department of Analytical Chemistry and Pharmaceutical Technology
Vrije Universiteit Brussel

Prof. Vera Rogiers, chair

Department of *in vitro* Toxicology and Dermato-Cosmetology
Vrije Universiteit Brussel

Prof. Ann Van Eeckhaut, promotor

Department of Pharmaceutical Chemistry, Drug Analysis and Drug Information
Vrije Universiteit Brussel

Prof. Ilse Smolders, co-promotor

Department of Pharmaceutical Chemistry, Drug Analysis and Drug Information
Vrije Universiteit Brussel

PhD in Pharmaceutical Sciences
2015-2016

INVITATION to the Public defence of

Jolien VAN SCHOORS

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

UHPLC with electrochemical detection for *in vivo* monoamine measurements – the quest for selectivity, sensitivity and throughput.

Tuesday 12 January 2015

Auditorium **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>



Vrije Universiteit Brussel

Summary of the dissertation

Monitoring of changes in neurotransmitter concentrations in the brain using *in vivo* microdialysis sampling is an important tool in neuropharmacological research in the quest for new drug candidates. Quantitative determination of these neurotransmitters in the collected samples requires sufficient selectivity, high sensitivity and fast sample throughput. In order to deal with the latest neuropharmacological innovations, such as a multi-target strategy and examination of small challenging brain regions in freely moving laboratory animals, it is necessary to stay up to date with current and promising advances in analytical chemistry.

For the fast and sensitive, simultaneous quantification of the extracellular dopamine, noradrenaline and serotonin levels under basal conditions and in response to a pharmacological manipulation, microbore ultra-high performance liquid chromatography (UHPLC) coupled to electrochemical detection (ECD) is shown to be a convenient and successful analysis technique. Different problems are encountered during method development, for instance stability of the analytes, peak-splitting during fast analyses, extra-column band broadening and sample overloading. By means of smart strategies such as the kinetic plot approach and design of experiments, an optimized and validated UHPLC-ECD method is described for simultaneous monoamine monitoring, next to an application in neuropharmacological research targeting the monoaminergic system.

Along with other upcoming developments in bioanalysis, this work is of particular interest for future contributions to *in vivo* neuropharmacological research.

Curriculum Vitae

Jolien Van Schoors was born on April 2nd 1988 in Aalst, Belgium. In 2006, she started the study of Pharmaceutical Sciences at the Vrije Universiteit Brussel (VUB) and she graduated as a Pharmacist and Master in Drug Development in 2011 with the highest distinction. She was rewarded for her academic achievements with the "Pharmacist and Doctor Nedeljkovic" award by the Belgian Society of Pharmaceutical Sciences. During her master thesis work, performed at the Department of Pharmaceutical Chemistry, Drug Analysis and Drug Information, she showed interest in the development of analytical assays for neurochemical purposes. After her graduation, she obtained a grant from the Agency for Innovation by Science and Technology (IWT) and started her PhD in January 2012 under promotorship of Prof. Ann Van Eeckhaut, Prof. Yvette Michotte and Prof. Ilse Smolders. The first experimental work was conducted in the R&D lab of Antec in Zoeterwoude, The Netherlands. Jolien's core scientific interests and experiences are situated in the field of (bio)analytical chemistry. She is author of six published papers in peer-reviewed journals among which three as first author. Her work was presented at national and international scientific conferences orally and by poster, and she obtained the best poster prize at the COST Action CM1103 Training School in Istanbul, Turkey. In addition, she supervised four master theses in Pharmaceutical Sciences and two master theses in Industrial Pharmacy. After her PhD, she would like to pursue a career within the pharmaceutical industry.