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PhD in Pharmaceutical Sciences 2017-2018

INVITATION to the Public defence of

Bart De Cock

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

Analytical method transfer of capillary electrophoretic methods: development of guidelines to overcome interinstrumental differences.

Wednesday 18 April 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

The increased interest in the separation of peptides, proteins, large immunoglobulins and DNA sequences leads to an increased demand for appropriate analytical methodologies. Because of its specific and unique separation mechanism, capillary electrophoresis (CE) is frequently used in the analysis of these molecules. The more frequent application of capillary electrophoretic methods requires that method transfer (AMT) between laboratories/instruments should be simple and straightforward. Due to the lower precision and robustness of CE methods, the instrumental differences and the greater impact of multiple parameters on the separation, the AMT of CE methods is more complicated and prone to failure than HPLC methods. In order to facilitate and increase the use of CE as separation technique, AMT guidelines, were defined to increase the AMT rate. In a first case study a simple chiral separation of beta-blockers was studied to improve the repeatability of a CE method by a constant current application. This furthermore generated more analogous results during interinstrumental AMT. In a second study instrument-different settings were selected as robustness-test parameters. Critical parameters, prone to variation were identified. The developed guidelines were evaluated for a more complex separation of angiotensin II and five derivatives. However, loss of baseline separation occurred during this AMT and an update of the developed guidelines was needed by equalizing the electrical resistances on both instruments to overcome separation efficiency differences. In a next study, the differences of the detector and data-handling specifications were analysed by means of a second robustness test. Finally, the occasional interinstrumental differences in effective length that occur with fast short-end injection methods were studied and added to the guidelines.

Curriculum Vitae

Bart De Cock was born on 24th September 1987 in Tienen (Belgium). He obtained his pharmacist degree with distinction from the Katholieke Universiteit Leuven (Belgium) in 2011. In 2012 he started his PhD at the Vrije Universiteit Brussel (Belgium) in Pharmaceutical Sciences, centred on the development of guidelines to facilitate interinstrumental method transfer of capillary electrophoretic methods. He was working under the supervision of Prof. Dr. Yvan Vander Heyden and Prof. Dr. Debby Mangelings. During his PhD he spend 5 months at the Laboratoire Sciences Analytiques, Bioanalytiques et Miniaturisation of the ESPCI Paris under supervision of Prof Dr. Valérie Pichon and Dr. Nathalie Delaunay. The results obtained during his doctoral research work were presented at several national and international scientific conferences as both oral and poster presentations. Bart his work has resulted in six scientific publications in international peer-reviewed journals, all of which as first author. Bart was also co-promoter of five master theses.