High-throughput quantification and unambiguous identification for metabolomics

Laan, T. van der

CURRICULUM VITAE

Tom van der Laan was born on February 8 1992 in Amersfoort. In 2010, he obtained his high school (Gymnasium) diploma at Johan van Oldenbarnevelt in Amersfoort. After his graduation, he moved to Leiden to continue his studies at Leiden University. He enrolled for the bachelor Biopharmaceutical Sciences in which he was introduced with analytical chemistry for the first time by Peter Lindenburg and Rawi Ramautar. During his bachelor internship, he developed his first bioanalytical platforms using capillary electrophoresis (CE) and mass spectrometry (MS).

In 2014, Tom started the master Biopharmaceutical Sciences, in which he choose the specialization track 'Analytical Biosciences'. His first internship was supervised by Rawi Ramautar and Rosilene Burgos and focused on correlating ultra-weak photon emission with metabolic changes using CE-MS. This research successfully identified seven metabolites which were inversely correlated with ultra-weak photon emission and resulted in his first publication.

For his second internship, Tom moved to Karlsruhe to work at Agilent Technologies. Under the supervision of Christian Wenz and Peter Lindenburg, he developed a method for a new CE-MS interface in which the dilution factor of the sheath liquid was minimized. The evaluation of the new interface demonstrated promising results with regards to the sensitivity of CE-MS analyses.

In 2016, Tom started as a PhD student in the group of Professor Thomas Hankemeier. Under the supervision of his co-promotors Anne-Charlotte Dubbelman and Amy Harms, he focused on the high-throughput quantification and unambiguous identification of metabolites in complex samples. He developed a fast and on-line fractionation technique, which lead to a patent application and a publication in Analytical Chemistry. In collaboration with Sciex, he evaluated different data independent acquisition techniques. He presented these results in a webinar hosted by the Analytical Scientist. In a joined academic and industrial consortium, he developed an identification platform for metabolites in complex samples. For this project, he collaborated with DSM, Unilever and Wageningen University, which lead to the successful identification of five taste-related metabolites in soy sauce.

After his PhD, Tom is going to work in the Analytical Assay group at Janssen Vaccines in Leiden. As a scientist, he will be responsible for the development of analytical methods for the characterization of new vaccines.

ACKNOWLEDGEMENTS

First of all, I would like to highlight the major role of Peter and Rawi during my university studies. They have introduced with me with the beauty of science and inspired me to pursue a scientific career.

Thomas, I admire your vision and your critical mind. I have always been amazed by your drive to explore and implement the power of metabolomics. Our many fruitful discussions have formed me into the researcher that I am today.

Amy, you have supervised me since day one. Your door was always open and you were always willing to discuss the challenges that I faced. Anne-Charlotte, you have done a tremendous job as a first time co-promotor. Our weekly meetings really inspired and motived me to bring our research to the next level and allowed me to see the bigger picture of my PhD.

I would like to thank my students Xiaochun, Joshua, Merve, Isabelle, Firda, Koen and Laurens for contributing to my PhD research and giving me the opportunity to develop my supervision skills. Special thanks to Joshua and Isabelle who performed most of the research of chapter 4.

I am happy to have worked with so many nice colleagues from Analytical Biosciences. The good laughs during lunch, conferences and borrels were a welcome distraction from my scientific activities. Special thanks to fight fight fight, salmon and my other office mates for creating an office that sometimes felt more like a social gathering place than an actual work area. I would also like to emphasize Tim's role in this thesis, since he laid the foundation of chapter 2.

I have also enjoyed the collaborations within the MI3 consortium with Wageningen University, Unilever and DSM as partners. I have learned a lot about the development and implementation of analytical methods for industrial applications.

Very special thanks to Milou, who always created a nice home after an intense day at the lab. She has always been supportive throughout my PhD and very patient in hearing my developments on 'stofjes meten'.

Finally, I would like to thank my parents, Paul and Francie, who have raised me with all the love and freedom I could wish for. Their support has been crucial in my development as a person and scientist.