University of Groningen

Advancing systems medicine based methods to predict drug response in diabetic kidney disease

Mulder, Skander

DOI:
[10.33612/diss.143946661](https://doi.org/10.33612/diss.143946661)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2020

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Mulder, S. (2020). *Advancing systems medicine based methods to predict drug response in diabetic kidney disease*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.
<https://doi.org/10.33612/diss.143946661>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

university of
 groningen

Advancing systems medicine based methods to predict drug response in diabetic kidney disease

PhD thesis

to obtain the degree of PhD at the
 University of Groningen
 on the authority of the
 Rector Magnificus Prof. C. Wijmenga
 and in accordance with
 the decision by the College of Deans.

This thesis will be defended in public on

Tuesday 3 November 2020 at 11.00 hours

by

Skander Tahar Mulder

born on 30 March 1988
 in Hoorn

Supervisors

Prof. H.J. Lambers Heerspink
Prof. M. Kretzler
Dr. M. Pena

Assessment Committee

Prof. S.J.L. Bakker
Prof. B.H.R. Wolffenbuttel
Prof. M. Gomez

RIJKSUNIVERSITEIT GRONINGEN

**Integrative bioinformatic analysis of omics in diabetic
kidney disease**

Skander T. Mulder

Promotores: Prof. dr. H.J. Lambers Heerspink

Prof dr Matthias Kretzler

Co promotores: Dr. M. Pena

Table of Contents

		Page
Chapter 1	Introduction, aims and outline of this thesis <i>Published in adapted form: Diabetes Obes Metab 2018 Oct;20 Suppl 3:6-13</i>	4
Chapter 2	Multi-omics Data Integration to Identify Molecular Pathways and Biomarkers Associated with Progression of Diabetic Kidney Disease <i>Submitted</i>	28
Chapter 3	Baseline urinary metabolites predict albuminuria response to spironolactone in type 2 diabetes <i>Translational Research 2020 In Press</i>	66
Chapter 4	The effects of dapagliflozin on urinary metabolites in patients with type 2 diabetes <i>Diabetes Obes Metab. 2019 ;21(11):2422-2428</i>	96
Chapter 5	A metabolomics based molecular pathway analysis for how the SGLT2-inhibitor dapagliflozin may slow kidney function decline in patients with diabetes <i>Diabetes Obes Metab. 2020 Mar 1. doi: 10.1111</i>	114
Chapter 6	Canagliflozin reduces inflammation and fibrosis biomarkers: a potential mechanism of action for beneficial effects of SGLT2 inhibitors in diabetic kidney disease <i>Diabetologia 2019;62(7): 1154-1166.</i>	146
Chapter 7	Summary and future perspectives	178
	Nederlandse samenvatting en toekomstperspectieven	191
	Dankwoord	199