University of Groningen

DNA methylation in type 2 diabetes and metabolic health

Walaszczyk, Eliza

DOI:
[10.33612/diss.180629925](https://doi.org/10.33612/diss.180629925)

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:
2021

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

Citation for published version (APA):
Walaszczyk, E. (2021). *DNA methylation in type 2 diabetes and metabolic health*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.180629925>

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.

DNA methylation in type 2 diabetes and metabolic health

Eliza Fraszczyk

Eliza Fraszczyk

DNA methylation in type 2 diabetes and metabolic health

PhD dissertation University of Groningen, the Netherlands

The publication of this thesis was financially supported by University of Groningen, University Medical Center Groningen, Science in Healthy Ageing and healthcaRE (SHARE) Research institute, and Graduate School of Medical Sciences (GSMS). This research was financially supported by the National Institute for Public Health and the Environment (RIVM), under the Strategic Research Programme [grant number S/132005].

Cover design: kasela.design

Lay-out: Publiss | www.publiss.nl

Print: Ridderprint | www.ridderprint.nl

© Copyright 2021: E.Fraszczyk

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, by photocopying, recording, or otherwise, without the prior written permission of the author.

university of
groningen

DNA methylation in type 2 diabetes and metabolic health

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
Monday 11 October 2021 at 9.00 hours

by

Eliza Fraszczyk

born on 28 April 1990
in Gorzów Wielkopolski, Polen

Supervisor

Prof. H. Snieder

Co-supervisors

Dr. M. Lijten

Dr. A.M.W. Spijkerman

Dr. J.V. van Vliet-Ostaptchouk

Assessment Committee

Prof. H.M. Boezen

Prof. B.T. Heijmans

Prof. C. Ling

Paranymphs

Elnaz Naderi

Chris Thio

Contents

Chapter 1.	General introduction and outline of this thesis	9
Chapter 2.	DNA methylation markers associated with type 2 diabetes, fasting glucose and HbA1c levels: a systematic review and replication in a case-control sample of the Lifelines study	21
Chapter 3.	Epigenome-Wide Association Study of Incident Type 2 Diabetes: a meta-analysis of five prospective European cohorts	53
Chapter 4.	DNA methylation trajectories and accelerated epigenetic aging in incident type 2 diabetes: a nested case-control study in the Doetinchem Cohort	83
Chapter 5.	An epigenome-wide association study identifies multiple DNA methylation markers of exposure to endocrine disruptors	107
Chapter 6.	The effects of bariatric surgery on clinical profile, DNA methylation and ageing in severely obese patients	131
Chapter 7.	General Discussion	157
Chapter 8.	Summary	182
	Nederlandse samenvatting	185
	Streszczenie	189
	About the author	192
	Acknowledgments	193
	Other SHARE dissertations	196