



Universiteit
Leiden

The Netherlands

Gut microbial metabolomics to understand allergies in early life

Savova, M.V.

Citation

Savova, M. V. (2026, March 17). *Gut microbial metabolomics to understand allergies in early life*. Retrieved from <https://hdl.handle.net/1887/4297014>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/4297014>

Note: To cite this publication please use the final published version (if applicable).

Gut Microbial Metabolomics to Understand Allergies in Early Life

Mariyana Valentinova Savova

Марияна Валентинова Савова

Cover design: Alexandra Polyakova

Thesis lay-out: Mariyana Valentinova Savova

Printing: Gildeprint

© Copyright, Mariyana Valentinova Savova, 2026

ISBN: 978-94-6496-542-1

All rights reserved. No part of this book may be reproduced in any form or by any means without permission of the author.

Gut Microbial Metabolomics to Understand Allergies in Early Life

Proefschrift

ter verkrijging van

de graad van doctor aan de Universiteit Leiden,

op gezag van rector magnificus prof. dr. S. de Rijck,

volgens besluit van het college voor promoties

te verdedigen op dinsdag 17 maart 2026

klokke 13:00 uur

door

Mariyana Valentinova Savova

geboren te Gorna Oryahovitsa, Bulgarije

in 1995

Promotor

Prof. dr. T. Hankemeier

Co-promotores

Dr. A.C. Harms

Dr. A.S.D. Kindt

Promotiecommissie

Prof. dr. M. van Eck

Prof. dr. E.C.M. de Lange

Prof. dr. H.P. Spaink

Prof. dr. J. Bouwman

Prof. dr. A. P. Zhernakova

University of Groningen, the Netherlands

Prof. dr. T. Hyötyläinen

Örebro University, Sweden

The research described in this thesis was performed at Metabolomics and Analytics Center (MAC) of the Leiden Academic Centre for Drug Research (LACDR), Leiden University (Leiden, The Netherlands). The research was financially supported as indicated in each chapter.

Contents

Chapter 1	General introduction and scope	1
Chapter 2	Current insights into cow's milk allergy in children: microbiome, metabolome and immune response – a systematic review <i>Pediatric Allergy and Immunology (2024)</i>	11
Chapter 3	Fecal metabolome alterations in infants at risk of developing allergies during the first year of life <i>Metabolomics (Under revision)</i>	49
Chapter 4	Exploring the fecal metabolome in infants with cow's milk allergy: The distinct impacts of cow's milk protein tolerance acquisition and of synbiotic supplementation <i>Molecular Nutrition & Food Research (2025)</i>	75
Chapter 5	Cytokine-induced barrier dysfunction and lipid signaling in a gut-on-chip model <i>The FASEB Journal (2025)</i>	103
Chapter 6	Conclusion and perspectives	133
Appendix	Summary	142
	Samenvatting	145
	Curriculum vitae	149
	List of Publications	150
	Acknowledgements	151