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*Microbiomics and breathomics in asthma phenotyping*

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**Omic-guided precision medicine:  
microbiomics and breathomics in asthma  
phenotyping**

Mahmoud Ismael Abdelaziz Ibrahim

## **Colophon**

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# **Omics-guided precision medicine: microbiomics and breathomics in asthma phenotyping**

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor  
aan de Universiteit van Amsterdam  
op gezag van de Rector Magnificus  
prof. dr. ir. K.I.J. Maex

ten overstaan van een door het College voor Promoties ingestelde commissie,  
in het openbaar te verdedigen in de Agnietenkapel  
op woensdag 19 januari 2022, te 16.00 uur

door  
Mahmoud Ismael Abdelaziz Ibrahim  
geboren te Assiut

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Faculteit der Geneeskunde

To my dearest family; Nariman, Yassin and Younus

To my beloved parents, peace be upon them

## Table of Contents

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<b>Part 1: Introduction</b>		9
Chapter 1.1	General introduction	11
Chapter 1.2	Omics for the future in asthma	23
<b>Part 2: The microbiome in asthma phenotyping</b>		53
Chapter 2.1	The crosstalk between microbiome and asthma: Exploring associations and challenges	55
Chapter 2.2	Sputum microbiome profiles identify severe asthma phenotypes of relative stability at 12-18 months	93
Chapter 2.3	A multi-omics approach to delineate sputum metagenomics and eicosanoids-associated asthma inflammatory phenotypes	121
Chapter 2.4	Association of endopeptidases, involved in SARS-CoV-2 infection, with microbial aggravation in sputum of severe asthma	179
<b>Part 3: The breathome in asthma phenotyping</b>		189
Chapter 3.1	eNose breath prints as a surrogate biomarker for classifying patients with asthma by atopy	191
Chapter 3.2	Cross-sectional biomarker comparisons in asthma monitoring using a longitudinal design: The eNose premise	215

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<b>Part 4: General discussion and summary</b>	225
Chapter 4.1 General discussion	227
Chapter 4.2 Summary	249
Chapter 4.3 Nederlandse samenvatting	257

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<b>Appendices</b>	
PhD portfolio	266
List of publications	268
Curriculum vitae	272
Acknowledgments	274