

University of Groningen

(Genetic) Epidemiology of Inflammation, Age-related Pathology and Longevity

Sas, Arthur Alexander

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:

2019

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

Citation for published version (APA):

Sas, A. A. (2019). *(Genetic) Epidemiology of Inflammation, Age-related Pathology and Longevity*. [Thesis fully internal (DIV), University of Groningen]. Rijksuniversiteit Groningen.

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.

**(Genetic) Epidemiology of Inflammation,
Age-related Pathology and Longevity**



rijksuniversiteit
 groningen

By
 Arthur Alexander Sas

(Genetic) Epidemiology of Inflammation, Age-related Pathology and Longevity

Proefschrift

ter verkrijging van de graad van doctor aan de
 Rijksuniversiteit Groningen
 op gezag van de
 rector magnificus prof. dr. E. Sterken
 en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

maandag 11 februari 2019 om 14.30 uur

door

Arthur Alexander Sas

geboren op 12 mei 1984
 te Raalte

The research and publication of this thesis was financially supported by University of Groningen, Junior Scientific Masterclass (JSM), Graduate Science in Healthy Ageing and healthcaRE (SHARE) and University Medical Center Groningen (UMCG).

Layout, design and printing:

MarkYourMedia

www.markyourmedia.nl

ISBN 978-94-034-1376-1

Promotor

Prof. dr. H. Snieder

Copromotor

Dr. H. Riese

Beoordelingscommissie

Prof. dr. H.M. Boezen

Prof. dr. R. Bruggeman

Prof. dr. F.V. Rijdsijk

Paranimfen

Daniëlle Groot Zwaaftink

Elise Sas

~

In liebevoller Erinnerung an

Dieter Mencke

~

Contents of the thesis

Chapter 1	11
Introduction	
Chapter 2	21
The age-dependency of genetic and environmental influences on serum cytokine levels: a twin study. Published in Cytokine, 2012.	
Chapter 3	29
Genetic and environmental influences on stability and change in baseline levels of C-reactive protein: A longitudinal twin study. Published in Atherosclerosis, 2017.	
Chapter 4	39
The relationship between neuroticism and inflammatory markers: a twin study. Published in Twin Research and Human genetics, 2014.	
Chapter 5	47
Gompertz' survivorship law as an intrinsic principle of aging. Published in Medical Hypothesis, 2012.	
Chapter 6	55
Gompertz' hazard law as a network principle of aging. To be accepted for publication, submitted in 2018.	
Chapter 7	73
General Discussion	
Summary of the thesis Page	93
Samenvatting van de thesis	99
Dankwoord	105
Previous dissertations within Research Institute SHARE	111