



Universiteit
Leiden
The Netherlands

Immunomodulation of atherosclerosis

Hauer, A.D.

Citation

Hauer, A. D. (2006, March 2). *Immunomodulation of atherosclerosis*. Retrieved from <https://hdl.handle.net/1887/4325>

Version: Corrected 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/1887/4325>

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

Immunomodulation of Atherosclerosis

Immunomodulation of Atherosclerosis

PROEFSCHRIFT

ter verkrijging van de graad van Doctor
aan de Universiteit Leiden, op gezag van de Rector
Magnificus Dr. D.D. Breimer, hoogleraar in de faculteit der
Wiskunde en Natuurwetenschappen en die der
Geneeskunde, volgens besluit van het College voor
Promoties te verdedigen op donderdag 2 maart 2006
klokke 14.15 uur

door

Arnaud Daniël Hauer

geboren te Naarden
in 1977

Promotiecommissie

Promotor: Prof. dr. Th.J.C. van Berkel
Co-promotor: Dr. J. Kuiper
Referent: Prof. dr. G. Pasterkamp
Overige leden: Prof. dr. M. Danhof
Prof. dr. H. ten Cate
Prof. dr. A.J. van Zonneveld

The studies presented in this thesis were supported by grants of the Netherlands Heart Foundation (NHF-2000.198 and NHF-2000D040) and were performed at the Division of Biopharmaceutics, Leiden/Amsterdam Center for Drug Research, Leiden University, Leiden, the Netherlands. Financial support by the Netherlands Heart Foundation for publication of this thesis is gratefully acknowledged.

The realization of this thesis was also financially supported by:

- Leids Universiteits Fonds
- J.E. Jurriaanse Stichting
- Dr. Ir. Van der Laar Stichting
- Matty Brand Stichting
- LACDR

Gutta cavat lapidem, non vi sed saepe cadendo

Ovidius, Ars Amatoria I 475

Aan mijn ouders

Cover: Enduring inflammation in a collar-induced atherosclerotic plaque, indicated by staining of interferon- γ (brown) with haematoxylin counter staining of cell nuclei (blue).

Printing: PrintPartners Ipskamp, Enschede, The Netherlands.

ISBN-10: 90-9020420-2
ISBN-13: 978-90-9020420-8

Hauer, Arnaud Daniël
Immunomodulation of Atherosclerosis
Proefschrift Leiden
Met literatuur opgave – Met samenvatting in het Nederlands

© 2006 Arnaud Daniël Hauer
No part of this thesis may be reproduced or transmitted in any form or by any means, without written permission of the author.

Table of Contents

| | Page |
|--|-------------|
| Chapter 1 General introduction | 9 |
| Section I <i>Chlamydia pneumoniae</i> and Atherosclerosis | 31 |
| Chapter 2 Aggravating effect of <i>Chlamydia pneumoniae</i> on atherosclerosis depends on the moment of infection | 33 |
| Chapter 3 Delivery of <i>Chlamydia pneumoniae</i> to the vessel wall aggravates atherosclerosis in LDLr ^{-/-} mice | 45 |
| Section II Vaccination against Atherosclerosis | 61 |
| Chapter 4 Vaccination against interleukin 17 attenuates atherosclerosis in LDLr ^{-/-} mice | 63 |
| Chapter 5 Blockade of interleukin 12 function by protein vaccination attenuates atherosclerosis | 75 |
| Chapter 6 Induction of cellular immunity against VEGFR2 by DNA vaccination attenuates atherosclerosis | 93 |
| Chapter 7 Induction of cellular immunity against TIE2 by DNA vaccination attenuates atherosclerosis | 111 |
| Chapter 8 Summary and perspectives | 123 |
| Nederlandse samenvatting | 133 |
| Publications | 140 |
| Curriculum vitae | 143 |
| Nawoord | 144 |

