



Universiteit
Leiden
The Netherlands

B cell modulation in atherosclerosis

Douna, H.

Citation

Douna, H. (2019, June 6). *B cell modulation in atherosclerosis*. Retrieved from <https://hdl.handle.net/1887/73833>

Version: Not Applicable (or Unknown)

License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/73833>

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

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/73833> holds various files of this Leiden University dissertation.

Author: Douna, H.

Title: B cell modulation in atherosclerosis

Issue Date: 2019-06-06

B cell modulation in atherosclerosis

Hidde Douna

Cover design: Rinske Douna

Thesis lay-out: Optima, Rotterdam, The Netherlands

Printing: Optima, Rotterdam, The Netherlands

© Copyright, Hidde Douna, 2019

ISBN: 978-94-6361-274-6

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

B cell modulation in atherosclerosis

Proefschrift

Ter verkrijging van de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. C.J.J.M. Stolker,
volgens besluit van het College voor Promoties te verdedigen op donderdag 6 juni
2019
klokke 15.00 uur

door

Hidde Douma
Geboren te Hoorn, Nederland
In 1988

Promotor: prof. dr. J. Kuiper

Co-promotor: dr. A.C. Foks and dr. G.H.M. van Puijvelde

Promotiecommissie

prof. dr. Irth – LACDR (voorzitter)

prof. dr. J.A. Bouwstra – LACDR (secretaris)

prof. dr. E. Lutgens

prof. dr. P.H.A. Quax

prof. dr. C.J. Binder

The research described in this thesis was performed at the division of Biotherapeutics of the Leiden Academic Centre for Drug Research (LACDR), Leiden University (Leiden, The Netherlands).

Financial support by the Dutch Heart Foundation for the publication of this thesis is gratefully acknowledged.

The research was also financially supported by:

- Leiden University

Table of contents

1. General introduction	7
2. Novel B cell subsets in atherosclerosis	35
3. Bidirectional effects of IL-10 ⁺ regulatory B cells in <i>Ldlr</i> ^{-/-} mice	49
4. TIM-1 mucin domain-mutant mice display exacerbated atherosclerosis	71
5. IFN γ -stimulated B cells inhibit T follicular helper cells and protect against atherosclerosis	91
6. BTLA stimulation protects against atherosclerosis by regulating follicular B cells	113
7. General discussion	147
Nederlandse samenvatting	161
Scientific publications	177
PhD portfolio	179
Curriculum vitae	181

