

University of Groningen

Translational multiple sclerosis research in primates

Dunham, Jordon Tyler-Nathan

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:

2017

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

Citation for published version (APA):

Dunham, J. T-N. (2017). Translational multiple sclerosis research in primates: Mind the gap [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).

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.

Translational multiple sclerosis research in primates

Mind the gap

Translationeel multiple sclerose onderzoek in primaten

Denk aan de kloof

Jordon Tyler-Nathan Dunham



Translational multiple sclerosis research in primates

Mind the gap

PhD thesis

to obtain the degree of PhD at the
 University of Groningen
 on the authority of the
 Rector Magnificus Prof. E. Sterken
 and in accordance with
 the decision by the College of Deans.

This thesis will be defended in public on

Wednesday 18 October 2017 at 12.45

by

Jordon Tyler-Nathan Dunham

born on 21 August 1986
 in Marion, Indiana, USA



Supervisors

Prof. J.D. Laman

Prof. B.A. 't Hart

Co-supervisor

Dr. Y.S. Kap

Assessment Committee

Prof. J.J.G. Geurts

Prof. O.C.M. Sibon

Prof. T. van Laar



*"It's a funny thing about coming home. Looks the same, smells the same, and feels the same.
You realized what has changed is you."*

F. Scott Fitzgerald



The research described in this thesis was performed at the Dept. of Immunobiology at the Biomedical Primate Research Centre, Rijswijk, the Netherlands and University Medical Center, Dept. of Neuroscience, at the University of Groningen, The Netherlands.

Financial support was provided by the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 31672 (Neurokine).

Financial support for publication of this thesis was provided by the Biomedical Primate Research Centre, U-CyTech and the University Medical Center, Groningen.

Illustrations: F. van Hassel, H. van Westbroek and J. Dunham
Lay-out: F. van Hassel
Printed by: Ridderprint BV
ISBN: 978-94-034-0037-2

© Jordon Dunham, 2017. No parts of this thesis may be reproduced or transmitted, in any form, without permission in writing from the author.



Table of Contents

1. Introduction	9
1.1 General introduction	11
1.2 The common marmoset as an indispensable animal model for immunotherapy development in multiple sclerosis	39
1.3 Aims and outline of thesis	53
2. Peripheral mechanisms	57
2.1 Blockade of CD127 exerts a dichotomous clinical effect in marmoset experimental autoimmune encephalomyelitis	59
2.2 Analysis of the cross-talk between Epstein-Barr virus-infected B cells and T cells in the marmoset	79
3. Into the CNS	103
3.1 Oxidative injury and iron redistribution are pathological hallmarks of marmoset experimental autoimmune encephalomyelitis	105
3.2 A qualitative and quantitative analysis of grey matter demyelination in different experimental autoimmune encephalomyelitis induction protocols in marmosets	125
3.3 Severe oxidative stress in an acute inflammatory demyelinating model in the rhesus monkey	145
4. General Discussion	161
Appendices	177
Abbreviations	178
Summary	181
Samenvatting	183
Acknowledgements	185
Curriculum vitae	189
List of publications	190



Introduction

Multiple Sclerosis
Inflammation
Neurodegeneration
Progressive MS
EAE
Grey Matter
Axon
Mitochondria
TH17
Sclerosis
Damage
Erosion



