

University of Groningen

Induced pluripotent stem cells

Czepiel, Marcin

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:

2015

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

Citation for published version (APA):

Czepiel, M. (2015). Induced pluripotent stem cells: therapeutic potential for multiple sclerosis [S.l.]: [S.n.]

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.

**INDUCED
PLURIPOTENT
STEM CELLS:
THERAPEUTIC
POTENTIAL
FOR MULTIPLE
SCLEROSIS**

MARCIN CZEPIEL

Printing of this thesis was supported by:

University of Groningen, Faculty of Medical Sciences, UMCG, Research School of Behavioural and Cognitive Neurosciences (BCN) and Stichting MS Research



Copyright © 2014 by M. Czepiel. All rights reserved. No parts of this book may be reproduced or transmitted in any form or by any means without prior permission of the author.

Cover design, layout and printing:



Lovebird design & printing solutions
www.lovebird-design.com

ISBN: 978-90-367-7540-3

ISBN (ebook): 978-90-367-7539-7



university of
 groningen

Induced Pluripotent Stem Cells: therapeutic potential for multiple sclerosis

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

Monday 12 January 2015 at 11.00 hours

by

Marcin Rafał Czepiel

born on 2 August 1984
in Żywiec, Poland

Supervisor

Prof. H.W.G.M. Boddeke

Co-supervisor

Dr. J.C.V.M. Copray

Assessment committee

Prof. S. Amor

Prof. W. Brück

Prof. M.S. van der Knaap

CONTENTS:

CHAPTER 1	General introduction	7
CHAPTER 2	Application of human oligodendrocytes in (re) myelination research	29
CHAPTER 3	Differentiation of induced pluripotent stem cells into functional oligodendrocytes	55
CHAPTER 4	Overexpression of polysialylated neural cell adhesion molecule improves the migration capacity of iPSC-derived oligodendrocyte precursors	75
CHAPTER 5	Functionality of human induced pluripotent stem cell derived oligodendrocytes	99
CHAPTER 6	Optimization of human induced pluripotent stem cells (hiPSC)-based remyelination cell therapy in a nonhuman primate model for multiple sclerosis (MS) – a pilot study	125
CHAPTER 7	Discussion and Summary	147
CHAPTER 8	Nederlandse Samenvatting	163
	Polish Summary	168
	Acknowledgements	174
	Curriculum Vitae	179
	Common Abbreviations	180

