Modeling vascular diseases using human induced pluripotent stem cells

Cao, X.

Modeling Vascular Diseases Using Human Induced Pluripotent Stem Cells

Xu Cao

曹旭

Colophon

Modeling Vascular Diseases Using Human Induced Pluripotent Stem Cells

PhD thesis

This thesis was prepared at the department of Anatomy and Embryology of the Leiden University Medical Center, Leiden, the Netherlands

The research in described in this thesis was supported by the European Research Council and a grant from Moller Foundation.

ISBN: 978-94-92597-43-4
Printed by Boekendeal, The Netherlands.

Cover: Oil-red O staining of M1 macrophages derived from human induced pluripotent stem cells. The background image was granted by Pixabay (from Paul McManus) https://pixabay.com/zh/illustrations/fibres-fibers-fibre-fiber-organic-4113337/.

Modeling Vascular Diseases Using Human Induced Pluripotent Stem Cells

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

woensdag 09 september 2020

klokke 10.00 uur

door

Xu Cao

geboren te Linyi, China in 1990

Promotor: Prof. dr. C. L. Mummery

Co-promoter: Dr. V. V. Orlova

Promotiecommissie:

Prof.dr. M.J.T.H. Goumans
Prof.dr. P.C.J.J. Passier
Dr. S. Semrau
Prof.dr. F.J.T. Staal
Prof. dr. D. Salvatori (Universiteit Utrecht)

Table of Contents

Chapter 1
General Introduction ..... ***- 7 -***
Chapter 2
Differentiation and Functional Comparison of Monocytes and Macrophages from hiPSCs with Peripheral Blood Derivatives ..... ***- 45 -***
Chapter 3
Generation and Functional Characterization of Monocytes and Macrophages Derived from Human Induced Pluripotent Stem Cells ..... ***- 81 -***
Chapter 4
Transcriptional Dynamics During Segregation of Endothelial and Myocardial Lineages from Cardiac Mesoderm ..... ***- 123 -***
Chapter 5
Vascular defects associated with Hereditary Hemorrhagic Telagiestasia revealed in patient-derived isogenic iPSCs ..... ***- 155 -***
Chapter 6
Pseudomyogenic hemangioendothelioma recapitulated in endothelial cells from human induced pluripotent stem cells engineered to express the SERPINE1-FOSB translocation ..... ***- 191 -***
Appendix Chapter 6:
Follow up bioinformatics analysis of hiPSC-endothelial cells expressing the SERPINE1-FOSB translocation ..... ***- 224 -***
Chapter 7
Discussion and Future Perspectives ..... ***- 233 -***
APPENDIX ..... ***- 250 -***
SUMMARY ..... ***- 252 -***
SAMENVATTING ..... ***- 254 -***
CURRICULUM VITAE ..... ***- 255 -***
LIST OF PUBLICATIONS ..... ***- 249 -***
ACKNOWLEDGMENTS ..... ***- 259 -***