



Universiteit
Leiden
The Netherlands

Posterior heart field and epicardium in cardiac development : PDGFR α and EMT

Bax, N.A.M.

Citation

Bax, N. A. M. (2011, January 13). *Posterior heart field and epicardium in cardiac development : PDGFR α and EMT*. Retrieved from <https://hdl.handle.net/1887/16330>

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/1887/16330>

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

Posterior heart field and epicardium in cardiac development

PDGFR α and EMT

Noortje A.M. Bax

Colofon

Posterior heart field and epicardium in cardiac development

PDGFR α and EMT

Noortje Anna Maria Bax

The research presented in this thesis was carried out at the Department of Anatomy and Embryology of the Leiden University Medical Center, Leiden, The Netherlands

Cover Image: Heart-shaped cloud, made by Tom van Rooij, august 2010.

Lay-out: www.wenzid.nl

Printed by: Proefschriftmaken.nl | Printyourthesis.com

Published by: Uitgeverij BOXPress, Oisterwijk

©2011 Noortje Anna Maria Bax, Breda

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

ISBN: 978-90-8891-218-4

Posterior heart field and epicardium in cardiac development

PDGFR α and EMT

PROEFSCHRIFT

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van de Rector Magnificus Prof. Mr. P.F. van der Heijden,
volgens besluit van het College voor Promoties
te verdedigen op 13 januari 2011
klokke 16.15 uur

door

Noortje Anna Maria Bax

geboren te Eindhoven
in 1981

PROMOTIECOMMISSIE

Promotor

Prof. Dr. A.C. Gittenberger-de Groot

Co-promotor

Dr. M-J. Goumans

Overige leden

Prof. P. Ten Dijke

Prof. N.A. Blom

Dr. J. Bakkers (Hubrecht Instituut, Utrecht)

Financial support of the Netherlands Heart Foundation and the J.E. Jurriaanse Stichting for the publication of this thesis is gratefully acknowledged.

Publication of this thesis is further supported by Lead Pharma.

Alles wat een begin heeft,

heeft ook een einde.

Sluit daar vrede mee

en alles komt goed.

CONTENTS

Chapter 1	General Introduction	9
<i>Part I</i>	<i>Platelet-derived growth factors (PDGFs) in the development of second heart field-derived cardiac structures</i>	
Chapter 2	Platelet-Derived Growth Factor is involved in the differentiation of second heart field-derived cardiac structures in chicken embryos <i>Developmental Dynamics 2009;238:2658-2669</i>	27
Chapter 3	Cardiac malformations in <i>Pdgfra</i> mutant embryos are associated with increased expression of WT1 and Nkx2.5 in the second heart field <i>Developmental Dynamics 2010;239:2307-17</i>	53
Chapter 4	Dysregulation of the <i>PDGFRA</i> gene causes inflow tract anomalies including TAPVR: Integrating evidence from human genetics and model organisms <i>Human Molecular Genetics 2010; 19:1286-301</i>	83
<i>Part II</i>	<i>EPDCs in epithelial-to-mesenchymal transformation and cardiomyocyte differentiation</i>	
Chapter 5	Epicardium-derived cells enhance proliferation, cellular maturation and alignment of cardiomyocytes <i>Journal of Molecular and Cellular Cardiology 2010; 49:606-16</i>	117
Chapter 6	<i>In vitro</i> epithelial-to-mesenchymal transformation in human adult epicardial cells is regulated by TGFβ-signalling and WT1 <i>Submitted for publication</i>	151

Chapter 7	Epithelial-to-mesenchymal transformation alters electrical conductivity of human epicardial cells	187
	<i>Submitted for publication</i>	
Chapter 8	General Discussion	209
	Summary	223
	Samenvatting	228
	Curriculum Vitae	233
	Acknowledgements	235
	List of Publications	237