Role of nuclear receptor Nur77 during inflammation

Hamers, A.A.J.

Citation for published version (APA):
Hamers, A. A. J. (2015). Role of nuclear receptor Nur77 during inflammation
Anouk Anna Johanna Hamers was born in Tilburg, The Netherlands, on August 31, 1984. After graduating from the Atheneum in 2002 she obtained her Master's degree in Biomedical Sciences in 2008 at the UMC St Radboud in Nijmegen.

During a second internship at the Toxicology department of the Netherlands Forensic Institute under the supervision of Dr Ingrid Bosman and Dr Rianne Vincenten she studied whether the postmortem interval could be more accurately determined by volatile compounds such as ethanol and acetone. In April 2009 Anouk started her PhD research at the Paranimfen of Paradontology & Biomaterials under the supervision of Dr Sander CG Leeuwenburgh, investigating the response of osteoblast-like cells on electrosprayed alkaline phosphatase/nano-apatite composite coatings.

In March 2015 Anouk will start her postdoctoral research on monocytes in the lab of Prof Catherine Hedrick at the La Jolla Institute of Allergy and Immunology in San Diego. Her Master Thesis, performed at the department of Experimental Vascular Medicine studying the role of Nuclear Receptor Nur77 during inflammation, resulted in the response of endothelial cells on electrosprayed Bionamel.}

The Inaugural Speech of Dr Anouk Hamers will take place on Thursday February 19, 2015 at 14:00 at the Agnietenkapel, Oudezijds Voorburgwal 231, 1012 EZ Amsterdam.
Role of Nuclear Receptor Nur77 during Inflammation
ROLE OF NUCLEAR RECEPTOR NUR77 DURING INFLAMMATION

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Universiteit van Amsterdam op gezag van de Rector Magnificus prof. dr. D.C. van den Boom ten overstaan van een door het college voor promoties ingestelde commissie, in het openbaar te verdedigen in de Agnietenkapel

op donderdag 19 februari 2015, te 14:00 uur

door

Anouk Anna Johanna Hamers
geboren te Tilburg
Promotiecommissie

Promotor:      Prof. dr. C.J.M. de Vries
Co-promotor:   Dr. V. de Waard

Overige leden: Prof. dr. W.J. de Jonge
                Prof. dr. T. van der Poll
                Prof. dr. M. van Eck
                Dr. E. Kalkhoven
                Dr. M. van Eijk

Faculteit der Geneeskunde

The research described in this thesis was conducted at the department of Medical Biochemistry, Academic Medical Center, University of Amsterdam.

The research described in this thesis was supported by a grant of the Dutch Heart Foundation (DHF-2008B037). This support is greatfully acknowledged.
“Research is what I’m doing when I don’t know what I’m doing.”
-Wernher Von Braun-

“I believe in intuition and inspiration. Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution. It is, strictly speaking, a real factor in scientific research.”
-Albert Einstein-

aan mijn dierbaren
# Table of contents

## Chapter 1
- General introduction and outline of the thesis
- *Section I* Inflammation, Peritonitis & Sepsis, Inflammatory Bowel Disease  
  - 11
- *Section II* Nuclear Receptors in atherosclerosis: A superfamily with many ‘goodfellas’  
  - 25
- *Section III* NR4A nuclear receptors in immunity and atherosclerosis.  
  - 41

## Chapter 2
- Bone Marrow-specific Deficiency of Nuclear receptor Nur77 Enhances Atherosclerosis  
  - 49

## Chapter 3
- Limited role of Nuclear receptor Nur77 in *Escherichia coli*-Induced Peritonitis  
  - 71

## Chapter 4
- Deficiency of Nuclear Receptor Nur77 aggravates mouse experimental colitis by increased NFkB activity in macrophages  
  - 87

## Chapter 5
- 6-Mercaptopurine Reduces Macrophage Activation and Gut Epithelium Proliferation through Inhibition of GTPase Rac1  
  - 115

## Chapter 6
- Nur77-deficiency in bone marrow-derived macrophages modulates inflammatory responses, extracellular matrix homeostasis, phagocytosis and tolerance  
  - 127

## Chapter 7
- General Discussion  
  - 165

## Appendices
- Summary  
  - 185
- Samenvatting  
  - 191
- PhD portfolio including publication list  
  - 195
- Dankwoord  
  - 201