

University of Groningen

## Renal heparan sulfate proteoglycans

Talsma, Ditmer

**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:*

2018

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

*Citation for published version (APA):*

Talsma, D. T. (2018). Renal heparan sulfate proteoglycans: A double edged sword [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.

# **Renal heparan sulfate proteoglycans**

A double edged sword

Ditmer Tjitze Talsma

2017

**Ditmer T. Talsma**

Renal heparan sulfate proteoglycans. A double edged sword



rijksuniversiteit  
groningen

SouthernBiotech



University Medical Center Groningen



Hycult<sup>®</sup>Biotech



The financial support for this research by the University of Groningen, University Medical Center Groningen, Junior Scientific Masterclass, Graduate School of Drug Exploration is gratefully acknowledged.

Financial support for printing this thesis was kindly provided by:  
(Sponsors)

ISBN (printed): 978-94-034-0276-5

ISBN (electronic): 978-94-034-0275-8

© **Copyright D.T. Talsma (Groningen, 2017)**

All rights reserved. No part of this publication may be reproduced, modified, stored on a retrieval system, or transmitted in any form or by any means, without explicit prior permission of the author



rijksuniversiteit  
 groningen

# Renal heparan sulfate proteo- glycans

A double edged sword

## Proefschrift

ter verkrijging van de graad van doctor aan de  
Rijksuniversiteit Groningen  
op gezag van de  
rector magnificus prof. dr. E. Sterken  
en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

woensdag 10 januari 2018 om 12.45 uur

door

**Ditmer Tjitze Talsma**

geboren op 7 september 1989  
te Leeuwarden

**Promotores**

Prof. dr. C.A. Stegeman

Prof. dr. M.R. Daha

**Copromotores**

Dr. J. van den Born

Dr. M.A.J. Seelen

**Beoordelingscommissie**

Prof. dr. P. Heeringa

Prof. dr. C. van Kooten

Prof. dr. H.J. Lambers Heerspink

<b>Chapter 1</b>	<b>7</b>
General Introduction	
<b>Chapter 2</b>	<b>19</b>
The Bittersweet Taste of Tubulo-Interstitial Glycans	
<b>Part 1: Endothelial heparan sulfates in renal leukocyte migration</b>	
<b>Chapter 3</b>	<b>39</b>
Endothelial Heparan Sulfate Strongly Contributes to Inflammation and Fibrosis in Murine Diabetic Nephropathy	
<b>Chapter 4</b>	<b>59</b>
Basement Membrane Zone Collagens XV and XVIII/Proteoglycans Mediate Leukocyte Influx in Renal Ischemia/ Reperfusion	
<b>Chapter 5</b>	<b>83</b>
Increased Migration of Antigen Presenting Cells to Newly-Formed Lymphatic Vessels in Transplanted Kidneys by Glycol-Split Heparin	
<b>Part 2: Heparan sulfates in complement mediated renal inflammation</b>	
<b>Chapter 6</b>	<b>111</b>
Heparin/Heparan Sulfate Interactions with Complement – a Possible Target for Reduction of Renal Function Loss?	
<b>Chapter 7</b>	<b>129</b>
Inhibition of Renal Tubular Epithelial Complement Activation by C3 Blocker Compstatin and Properdin Blocker SALP20	
<b>Chapter 8</b>	<b>143</b>
Identification of Glycosaminoglycan-Derived Oligosaccharides that Specifically Inhibit the Lectin Pathway of Complement	
<b>Chapter 9</b>	<b>167</b>
Summary, General Discussion and Future Perspectives	
Nederlandse samenvatting	<b>181</b>
Curriculum Vitea and List of publications	<b>191</b>
Acknowledgements	<b>195</b>

---

