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## **Glycoproteomics characterization of immunoglobulins in health and disease**

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### **Citation**

Plomp, H. R. (2017, May 31). *Glycoproteomics characterization of immunoglobulins in health and disease*. Retrieved from <https://hdl.handle.net/1887/49752>

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**Issue Date:** 2017-05-31

## List of abbreviations

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AA	2-aminobenzoic acid
AAV	ANCA-associated vasculitis
ABC	ammonium bicarbonate
ACN	acetonitrile
ACPA	anti-citrullinated protein antibodies
ADCC	antibody-dependent cellular cytotoxicity
ANCA	anti-neutrophil cytoplasmic antibodies
C1q	complement component 1 q
CDC	complement-dependent cellular cytotoxicity
CE	capillary electrophoresis
CGE-LIF	capillary gel electrophoresis with laser-induced fluorescence
CH	conserved heavy chain
CID	collision-induced dissociation
CMV	cytomegalovirus
CRP	c-reactive protein
DC-SIGN	dendritic cell-specific intercellular adhesion molecule-3 grabbing non-integrin
DHB	2,5-dihydroxybenzoic acid
DTT	dithiothreitol
EGPA	eosinophilic granulomatosis with polyangiitis
ELISA	enzyme-linked immunosorbent assay
Endo S	endoglycosidase S
ER	endoplasmic reticulum
ERLIC	electrostatic repulsion HILIC
ESI	electrospray ionization
ETD	electron-transfer dissociation
FA	formic acid
Fab	fragment antigen binding
Fc	fragment crystallizable
FcεR	Fc-epsilon receptor
FcγR	Fc-gamma receptor
FEIA	fluorescent-enzyme immune assay
FRS	Framingham risk score
GBP	glycan-binding protein
GC	glucocorticosteroid therapy
GDob1	chimeric MN12H2 antibodies with V genes from the human monoclonal IgG2 antibody DOB1
GlcNAc	<i>N</i> -acetylglucosamine
GPA	granulomatosis with polyangiitis
HDLC	high density lipoprotein cholesterol
HEK	human embryonic kidney
Hex	hexose
HexNAc	<i>N</i> -acetylhexosamine
HILIC	hydrophilic interaction liquid chromatography
HIV	human immunodeficiency virus
HPLC	high performance liquid chromatography
HR	hazard ratio

Ig	immunoglobulin
IL	interleukin
IT	ion trap
IVIg	intravenous Immunoglobulin
LC	liquid chromatography
LDLC	low density lipoprotein cholesterol
LEMS	lambert-Eaton Myasthenic Syndrome
MALDI	matrix-assisted laser desorption ionization
MBL	mannose-binding lectin
MPA	microscopic polyangiitis
MPO	myeloperoxidase
MRM	multiple reaction monitoring
MS	mass spectrometry
NCGN	necrotizing glomerulonephritis
NeuAc	<i>N</i> -acetylneuraminic acid
PBS	phosphate buffered saline
PR3	proteinase 3
PNGase F	<i>N</i> -glycosidase F
PTM	post-translational modification
qTOF	quadropole TOF
RA	rheumatoid arthritis
ROC	receiver operating characteristic
RP	reversed phase
RSD	relative standard deviation
SA	sialic acid
SD	standard deviation
SDS-PAGE	sodium dodecyl sulfate polyacrylamide gel electrophoresis
SIGN-R1	specific intercellular adhesion molecule-3 grabbing non-integrin related 1
t-ITP	transient isotachophoresis
T3	triiodothyronine
TC	total cholesterol
TFA	trifluoroacetic acid
TG	triglycerides
TNP	trinitrophenol
TOF	time-of-flight
UHPLC	ultra high performance liquid chromatography
ZIC HILIC	zwitterionic HILIC

## Acknowledgements

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Looking back at the past 5 years, my PhD at the Center for Proteomics and Metabolomics has been a wonderful experience surrounded by great people. I remember having a lot of doubts before I started, wondering whether a PhD was the right fit for me. I can now say I have much enjoyed doing research and it has been a very fulfilling experience. I would like to express my gratitude to the many people who helped me along the way and brought me to where I am now, at the end of my thesis.

First of all I would like to thank my promotor Manfred, for his dedication and his guidance. While he had plenty on his plate, first as head of the glyco group, professor at the VU Amsterdam and finally head of the CPM, he was always available for questions and discussions. When I sent him a manuscript I would always get detailed feedback within a few days, often at odd hours of the night. Thank you for your direction and encouragement!

I would also like to thank André, my original promotor. Although he left soon after I started, from what I've heard he was the driving force behind my selection despite my admittedly not stellar job interview. I would like to thank him for his confidence in me.

I would like to thank Paul, my co-promotor, for his help in shaping my thesis and propositions, and for sharing his knowledge of proteomics.

I would further like to thank Carolien, Agnes and Irina for their guidance in the lab and their supervision of the machinery which enabled me and everyone in the group to measure tens of thousands of samples. At the same time I would like to apologize for all of the mistakes which I've made, after which I came running to you for help; thank you for having my back!

My current colleagues I owe a great deal due to their contributions to both my development as a researcher and the friendly and encouraging environment in the group. Karli started just two weeks before me and was always game for fun discussions, glyco-related or not. I would like to thank him for all his technical and bioinformatic support. Noortje joined us later and was also frequently subjected to my questions, as well as many friendly conversations. In addition, I would like to thank her for the organisational skills she shared with me when we organised a small lab outing. Thank you both for being my paranymphs! Albert guided me during my first experiment as a PhD student; I would like to thank him for his guidance, as well as for the Christmas tree which now adorns my desk. Further thanks to David who has boosted my understanding of analytics and introduced me to new and exciting board games. Stephi, thank you for the organisational skills which helped support the literal backbone of

this thesis! Bas, thank you for all the technical support, and sorry for all of the bugs I encountered which should not have been possible! Further thanks to Viktoria, Guinevere, Gerda, Kathrin, Florent, Cees, and all of the others at the CPM!

I would also like to thank my former colleagues, Yoann, Gerhild and Maurice, for showing me the ropes of glycoanalysis. Yoann aided me in writing several publications and gave me a lot of useful advice. Gerhild taught me how to interpret mass spectrometric data and Maurice was always ready to impart (an often lengthy monologue of) his vast repository of knowledge.

In addition, I would like to thank Hae-Won, Marian, Jeanine and Eline for expanding my view on statistics and aiding in the processing of large datasets.

To my collaborators in Amsterdam and Maastricht: it was a pleasure to work with you! Michael, Gillian, Myrthe and Sanne: thank you for your contributions to my thesis and good luck with yours as well! Gestur, Theo and Jan Willem: thank you for your guidance.

I would also like to thank the students I had the pleasure of supervising: Lisette, Shivani and Jayshri. I learned a lot from supervising you, as I hope you did too!

I would further like to thank Manu for guiding me through the bureaucratic jungle known as 'Converis'.

Finally, I would like to address the support I got from home, from Jan and my family. Thank you for the afternoons and evenings when you looked after Leander so that I could work on my thesis, and for the second opinions on various pieces of writing. I would also like to thank Jan for all of his encouragement and for the confidence he has given me.

## Curriculum Vitae

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Henriëtte Rosina Plomp was born on Friday the 13th of November, 1987 in Leiderdorp, The Netherlands. After receiving the bulk of her primary education in international schools, she attended the Stedelijk Gymnasium Leiden and graduated in 2006. During the next three years, she was enrolled in the Bachelor program Life Science and Technology, a collaboration between Leiden University and the Technical University Delft. In her final year there, she followed an internship at the Department of Molecular Cell Biology at the Leiden University Medical Center, supervised by Dr. A. Zaldumbide and Prof. Dr. R. C. Hoeben, investigating the migration of human mesenchymal stem cells from different biological sources.

Following that, Rosina enrolled in the Master study Forensic Science at the University of Amsterdam, receiving a degree in 2011. In that year she also performed an internship at the Department of Forensic Molecular Biology at the Erasmus Medical Center, supervised by Dr. K. Ackermann and Prof. Dr. M. Kayser. During this time she conducted research into the expression of circadian biomarkers in human blood.

In 2012 Rosina joined the Center for Proteomics and Metabolomics at the Leiden University Medical Center as a PhD student under the supervision of Prof. Dr. M. Wührer, Prof. Dr. A.M. Deelder and Dr. P. Hensbergen. During her PhD, which was funded by the HighGlycan Project of the European Union's Seventh Framework Programme, Rosina investigated glycosylation of immunoglobulins using a mass spectrometry-based proteomics approach, which resulted in this thesis. Since completing her thesis, she has continued in the field of glycoproteomics as a post-doctoral researcher in the same group.

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