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## Gene and cell therapy based treatment strategies for inflammatory bowel diseases

Marel, S. van der

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**Author:** Marel, Sander van der

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## Appendices

### List of publications

1. Majowicz A, Maczuga P, Kwikkers KL, **van der Marel S**, van LR, Petry H, van Deventer SJ, Konstantinova P, Ferreira V. Mir-142-3p target sequences reduce transgene directed immunogenicity following intramuscular AAV1 vector-mediated gene delivery. *J Gene Med* 2013.
2. Majowicz A, **van der Marel S**, te Velde AA, Meijer SL, Petry H, van Deventer SJ, Ferreira V. Murine CD4(+)CD25(-) cells activated in vitro with PMA/ionomycin and anti-CD3 acquire regulatory function and ameliorate experimental colitis in vivo. *BMC Gastroenterol* 2012;12:172.
3. Cousens LP, Mingozi F, **van der Marel S**, Su Y, Garman R, Ferreira V, Martin W, Scott DW, De Groot AS. Teaching tolerance: New approaches to enzyme replacement therapy for Pompe disease. *Hum Vaccin Immunother* 2012;8:1459-1464.
4. **van der Marel S**, Majowicz A, Kwikkers K, van LR, te Velde AA, De Groot AS, Meijer SL, van Deventer SJ, Petry H, Hommes DW, Ferreira V. Adeno-associated virus mediated delivery of Tregitope 167 ameliorates experimental colitis. *World J Gastroenterol* 2012;18:4288-4299.
5. **van der Marel S**, Majowicz A, van DS, Petry H, Hommes DW, Ferreira V. Gene and cell therapy based treatment strategies for inflammatory bowel diseases. *World J Gastrointest Pathophysiol* 2011;2:114-122.
6. **van der Marel S**, Comijn EM, Verspaget HW, van DS, van den Brink GR, Petry H, Hommes DW, Ferreira V. Neutralizing antibodies against adeno-associated viruses in inflammatory bowel disease patients: implications for gene therapy. *Inflamm Bowel Dis* 2011;17:2436-2442.
7. **van der Marel S**, Duijvestein M, Hardwick JC, van den Brink GR, Veenendaal R, Hommes DW, Fidder HH. Quality of web-based information on inflammatory bowel diseases. *Inflamm Bowel Dis* 2009;15:1891-1896.

## **Curriculum Vitae**

Sander van der Marel, werd geboren op 17 mei 1983 te Leiderdorp. In 2001 haalde hij zijn VWO diploma aan het Stedelijk Gymnasium Leiden. Hij stuurde biomedische wetenschappen aan de universiteit van Amsterdam en geneeskunde aan de universiteit van Leiden. Na het behalen van het artsexamen (Cum Laude) in september 2008 ging hij als artsonderzoeker werken bij de afdeling Maag- Darm- en Leverziekte van het Leidse Universitair Medisch Centrum (LUMC) in samenwerking met Amsterdam Molecular Therapeutics (uniQure). In september 2012 is hij begonnen met de vooropleiding Interne geneeskunde in het MC Haaglanden in den Haag, als onderdeel van de opleiding tot Maag- Darm- en Leverarts.

Sander van der Marel, born 17-05-1983 in Leiderdorp finished secondary education in 2001 at the Stedelijk Gymnasium Leiden. Thereafter he studied biomedical sciences at the University of Amsterdam and medicine at the University of Leiden. After obtaining the medical degree (Cum Laude) September 2008, he started his PhD at the research laboratory of the department of Gastroenterology and Hepatology of the Leiden University Medical Center, in cooperation with Amsterdam Medical Therapeutics (uniQure). September 2012 he started his residency internal medicine at the MC Haaglanden, as part of his training to become a gastroenterologist.

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Tevens wil ik alle huidige en voormalige medewerkers van de R&D- afdeling van uniQure bedanken voor hun steun, hulp, enthousiasme en voor de gezelligheid. Het was geweldig om op zo’n schitterende afdeling, met zulke fantastische collega’s te mogen werken. Bijzondere dank gaat daarbij uit naar mij directe collega’s in de immunologiegroep. My co-Promotor dr. Valerie Ferreira; dear Valerie, when I arrived at uniQure I did not have any experience in the lab. In fact, I had never held a pipette in my hands, ever. Nonetheless, you were willing to let me give it a shot. You were always there for me and I’m very grateful for all your ideas, input, help and support over the past four years and for the opportunity to learn from such a gifted immunologist as yourself. My fellow PhD-student, Anna Majowicz, dear Anna, your enthusiasm, knowledge and kindness are inspirational. I’m happy to have worked with such a talented young scientist as yourself and to be able to call you a friend. Karin Kwikkers, beste Karin, jou zal ik me altijd herinneren als opgewekt en zingend aanwezig, iets waar een mens, zelfs na hele dagen buffelen in een te warm FACS lab, vrolijk van kan worden. Dankbaar ben ik ook dat ik het laatste jaar van het project direct met je heb mogen samenwerken en heb mogen profiteren van jouw brede kennis, ervaring en enthousiasme voor de immunologie. Richard van Logtenstein, beste Richard, dank voor alle hulp, kunde, enthousiasme en flexibiliteit als het aankwam op vivo-experimenten.

Daarnaast wil ik alle medewerkers van de afdeling Maag- Darm- en Leverziekte van het Leids Universitair Medisch Centrum (LUMC) bedanken. Mijn dank gaat hierbij in het bijzonder uit naar Dr. H. Verspaget. Beste Hein, dank voor je hulp, steun en prettige wijze van communiceren. Ook Lokke Stevens, Marjolein Duijvestein, Christine Vos, Rutger Jacobs en Philippe Voorveld wil ik van harte bedanken voor hun steun, hulp en gezelligheid bij de diverse congressen.

Bovendien wil ik alle medewerkers van het Tytgat Instituut van het Academisch Medisch Centrum (AMC) bedanken. Mijn dank gaat hier in het bijzonder uit naar Prof. dr. G.R. van den Brink. Beste Gijs, ondanks dat je slechts gedurende een korte periode aan het project verbonden was, heeft jouw kennis en enthousiasme voor de wetenschap grote indruk op me gemaakt.

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Sander van der Marel,  
Leiden.

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## List of abbreviations

AAV	Adeno-associated viruses
Ab	Antibody
ACCA	Anti-chitobioside carbohydrate antibody
ADA	Anti-drug-antibodies
GAA	Acid alpha-glucosidase
ALCA	Anti-laminaribioside carbohydrate antibody
AMCA	Anti-mannobioside carbohydrate antibody
ANCA	Antineutrophil cytoplasmic antibody
anti-C	Anti-chitin
anti-L	Anti-laminarin
APC	Antigen presenting cell
ASCA,	Anti-Saccharomyces cerevisiae antibodies
ATP	Adenosine-5'-triphosphate
QA/QC	Quality assurance/ Quality control
CCMO	Centrale Commissie Mensgebonden Onderzoek
CD	Crohn's disease
CIDP	Chronic inflammatory demyelinating polyneuropathy
CMV	Cytomegalovirus
CRIM	Cross-reactive immunologic material
CRP	C reactive protein
CTLA-4	Cytotoxic T-Lymphocyte Antigen 4
DAI	Disease activity index
DC	Dendritic cell
DMEM	Dulbecco's modified Eagle's medium
DNA	Deoxyribonucleic acid
EAE	Experimental autoimmune encephalomyelitis
ERT	Enzyme replacement therapy
Et al.	(Latin, et alii) and others
Fab	Fragment, antigen binding region
Fc	Fragment, crystallisable region
FBS	Fetal bovine serum
Foxp3	Forkhead Box-P3
GAA	Alpha-glucosidase
Gc	Genome copy
GI	Gastro-intestinal
GFP	Green fluorescent protein
GITR	Glucocorticoid-induced TNFR-related protein
GMP	Good Manufacturing Practices
HE	Hematoxylin and eosin
HEK293	Human Embryonic Kidney 293
HIV	Human immunodeficiency virus
IBD	Inflammatory bowel diseases
ICOS	Inducible co-stimulator
Ig	Immunoglobulin
IL	Interleukin
IS	Immuno-suppression
ITP	Idiopathic thrombocytopenic purpura
iTreg cell	Induced regulatory T cell
IVIG	Intravenous immunoglobulin
Max	Maximum

MHC	Major Histocompatibility complex
Min	Minimum
miRNA	Micro RNA
MLR	Mixed lymphocyte reaction
MSC	Mesenchymal stromal cells
MS	Multiple sclerosis
MTX	Methotrexate
nAb	Neutralizing antibody
NOD/SCID	Non-obese diabetic/severe combined immunodeficiency
nTreg cells	Naturally occurring regulatory T cell
OmpC	Outer membrane porin C
OPG	Osteoprotegerin
OVA	Ovalbumin
PAB	Pancreatic auto-antibodies
PBMC	Peripheral blood mononuclear cell
PCR	Polymerase Chain Reaction
PMA	Phorbol-12-myristate-13-acetate
qPCR	Quantitative Polymerase Chain Reaction
rAAV	Recombinant adeno-associated viruses
R&D	Research and Development
Rh	Recombinant human
RNA	Ribonucleic acid
SD	Standard deviation
SEM	Standard error of the mean
SLE	Systemic lupus erythematosus
TCR	T cell receptors
T1D	Type 1 diabetes
TNBS	Trinitrobenzene sulfonate
TNF	Tumor Necrosis Factor
Teff cell	Effector T cell
Treg cells	Regulatory T cells
Tregitope	Regulatory T cell epitope
TregPMA cells	iTreg cells induced by PMA/ionomycin/antiCD3/IL-2
UC	Ulcerative colitis
WPRE	Woodchuck hepatitis virus post-transcriptional enhancer
Yr	Years