Modulation of leukocyte homeostasis in atherosclerosis

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Author's Biography

The author of this thesis dissertation was born in Bogota, Colombia, on July 11th 1976. Following a Bachelor program in Chemical Engineering (Meritorious), she conducted an M.Sc. (Cum Laude) in biology in the University of Leiden with Professor Dr. Herman Spaink and Dr. Annemarie Meijer. During her M.Sc. she used zebrafish as model of infectious disease to investigate its innate immune responses to fish tuberculosis infection.

Thereafter, the author started her research as part of a project supported by the Netherlands Heart Foundation under supervision of Professor Dr. Theo van Berkel and Professor Dr. Erik Biessen. During her Ph.D. her studies centered on modulating immune responses to change the fate of atherosclerotic lesions in mice. This was achieved by using bone marrow transplantation of hematopoietic stem cells with genetic deficiencies or over-expressing human or mouse engineered genes. This methodology allowed her to activate or repress multiple immune responses, which in turn either promoted the resolution of inflammation, leading to atherosclerotic lesion stabilization; or caused induction of tissue injury and lesion vulnerability to rupture, which in humans leads to myocardial infarction or stroke and sudden death.

Complementing her experimental studies, she used her background in engineering to develop algorithms for transcriptome-scale analysis of gene expression in macrophages stimulated in-vitro with different cytokines. This has allowed her the identification of gene networks responsible for some of the phenotypes observed in-vivo. Additionally, she has used machine learning computational tools, to find gene signatures indicative of human atherosclerotic lesion stability or vulnerability to rupture.

Indira's focus lies on finding immune signatures and networks that can be used for personalized diagnosis and prognosis of disease as well as for modulation of immune responses.

Author's Publications

Poster Presentations:

- **Medina, IA**; Beckers, C; Westra, MM; Bot, I; Van Berkel, TJ; Tanaka, M and Biessen, EAL. Metallophilic Macrophage Ablation Stabilizes Atherosclerotic Plaques in Mice. Circulation. 2010; 122: A20705.
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- Herias, MV; Bai, L; **Medina, IA**; Wijnands, E; Delsing, D; Pham, C; Biessen, EAL and Heeneman, S. Leukocyte Cathepsin C Deficiency Attenuates Atherosclerosis in LDL Receptor Deficient Mice. Circulation. 2009; 120: S1166.
- **Medina, IA**; Bot, I; de Jager, S; van Berkel, TJC and Biessen, EAL. Deficiency Of Hck And Fgr Src Kinases Leads To Delayed Atherosclerosis In LDL Receptor Deficient Mice. Circulation. 2008; 118: S474.

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- **Medina, IA**; Soehnlein, O; Cougoule, C; Koenen, RR; Doering, Y; Drechsler, M; Bermudez, B; Wolfs, I; Herias, MV; Bot, I; de Jager, S; Weber, C; Cleutjens, J; van Berkel, TJC; Maridonneau-Parini, I; and Biessen, EAL. Janus Role of Hck and Fgr in Atherosclerosis Progression and Stability. Circulation. Submitted.
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- Vérollet, C; Zhang, YM; Le Cabec, V; Mazzolini, J; Charrière, G; Labrousse, A; Bouchet, J; **Medina, IA**; Biessen, EAL, Niedergang, F; B´nichou, S and Maridonneau-Parini, I. HIV-1 Nef triggers macrophage fusion in a p61Hck- and protease-dependent manner. J Immunol. 2010 Jun 15;184(12):7030-9.
- Meijer, AH; Gabby Krens, SF; **Medina, IA**; He, S; Bitter, W; Ewa Snaar Jagalska, B; Spaink, HP. Expression analysis of the Toll-like receptor and TIR domain adaptor families of Zebrafish. Mol Immunol. 2004 Jan; 40 (11): 773-83.

Acknowledgments

Looking backwards in time, it seems now incredible to have finished a PhD in cardiovascular immunology having started the path as a chemical engineer, fascinated about the idea of using engineering principles in the biomedical context. My path to become an independent researcher in immunology, had not been possible without the help, support and motivation that I received from many people around me.

I want to express my thanks to Annemarie Meijer, whose intellect, energy, professionalism and never ending curiosity continues to inspire me. Erik Biessen, who believed in my potential and gave me the opportunity to advance in my career, and who frequently used his "distortion optimistic field" to transform problems into (impossible) challenges and (impossible?) challenges into positive results. I am thankful to Theo van Berkel, for all his support not only when I was there in Leiden, but also being in Maastricht and now in Seattle.

I also thank Oliver Sohnlein and Rory Koenen, principal investigators at the Institute for Cardiovascular Prevention, IPEK, Munich; who welcomed me for some weeks in their lab in the Universitätsklinikum Aachen; and Jacob Bentzon, who shared with me his knowledge of mouse micro–surgery and anastomosis in the department of Cardiology of the University Hospital of Aarhus, Denmark.

My deepest gratitude and appreciation for Bea, Esmeralda and Marco, who at the end of the tunnel have not only shared with me great intellectual discussions but also strong friendships that get better as the years go by. Rianne, who has offered me the best friendship I could have imagined; Johanniek, whose memory stays in my hearth as a light that inspires my life; and Clara, whose advice I deeply appreciate.

My thanks to all people working at the divisions of Bio-pharmaceutics and Therapeutic Gene Modulation at the Leiden Amsterdam Center for Drug Research and the Experimental Vascular Pathology group, at the University of Maastricht, Academic Hospital, where I have had the privilege to work in Cardiovascular Immunology. In particular: Marcus Lucerna, Ramon de Nooijer, Perry Prince, Peter van Santbrink, Christian van der Lans, Marieke Pennings, Vivian de Waard, Thomas van Es, Sylvia Heeneman, Wouter Eigelaar, Maryam Sanati, Timo Rademakers, Carine Peutz, Marion Gijbels, Danielle Vanderschuren, Cora Beckers, Dirk Lievens, Kamille Kartal, Karen Gabriels, Floor Steegh, Judith Sluimer, Richard Frijnts, Erik van der Meer and Ester Lutgens for their warm support and friendship.

Similarly, I want express my gratitude to Rik Tinneman, Marijke Westra, Ilze Bot, Saskia de Jager, Jeroen Otten, Erwing Wijnands, Anette Christ, Veronica Herias, Mathijs Groeneweg, Jeffrey Pol, Mat Rousch, Anique Janssen-Vrehen, Celine Cougoule, Isabelle Maridonneau-Parini, Johan Kuiper and Jack Cleutjens not

only for their kind amity but also for their contributions to this research.

A personal word of gratitude to Anneke Poels, for her valuable help with the distribution of this dissertation to the instances concerned, in the University of Leiden.

My gratitude is extended to the evaluation committee of this dissertation for asking insightful questions and providing useful comments on the presentation of this scientific report.

Finally, my best appreciation goes to my family, who put up with me, or better said, with my absence. Not only the many hours I spent connected to the computer but also those moments where I was physically present, but gone in thought. For this, I reserve most of my gratitude to my husband, Giovanni and my daughter Sofia.