

General information

Personal details

Name	Kim van der Heiden
Male/female	Female
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Academic education and degrees

Doctorate

University	University of Leiden
Date	11/09/2008
Supervisor(s)	Prof. Dr. R.E. Poelmann, Prof. Dr. A.C. Gittenberger-de Groot, Dr. B.P. Hierck
Title of thesis	Primary cilia on endothelial cells <i>Component of the shear stress sensor localized to athero-prone flow areas</i>

Master's

University	VU University of Amsterdam (Vrije Universiteit)
Completion date	21/08/2003
Main subject	Biomedical Sciences

Work experience since graduation

Assistant Professor 01/2013 – present, 1 fte, permanent

Department of Biomedical Engineering, Cardiology, Erasmus MC Rotterdam, The Netherlands

PostDoc 07/2010 – 12/2012, 1 fte, fixed-term

Department of Biomedical Engineering, Cardiology, Erasmus MC Rotterdam, The Netherlands

PostDoc 06/2008 – 05/2010, 1 fte, fixed-term

Cardiovascular Sciences Unit, National Heart and Lung Institute, British Heart Foundation, Imperial College London, UK

PhD student 11/2003 – 02/2008, 1 fte, fixed-term

Dept. of Anatomy and Embryology, LUMC, Leiden, The Netherlands

Research

My research focusses on improving the diagnosis and treatment of atherosclerosis. During my PhD I studied the effect of a biomechanical force, i.e. shear stress, on endothelial cell biology and found that endothelial cells at athero-susceptible sites carry a primary cilium, which is involved in shear stress sensing. My interest in the shear stress-induced activation of pro/anti-inflammatory signalling pathways in the endothelium subsequently led me to the Department of Cardiovascular Science at Imperial College London. My research there involved investigation of shear stress-induced transcription factor activity and inflammation between athero-protected and athero-susceptible sites, including PET/CT imaging in mice. Subsequently, I wanted to study the more advanced stages of the disease. Moreover, I wanted to study this with a multidisciplinary approach, bringing together biologists, engineers, imagers and clinicians. This led me to the department of Biomedical Engineering, Cardiology at Erasmus MC, Rotterdam. For the past six years I have been setting up national and international projects/ collaborations. These projects include my Veni (NWO-ZonMW) project in which I study the role of shear stress-induced biological pathways in plaque initiation and destabilization, and my Erasmus MC Fellowship, in which I link image-based shear stress calculations to non-invasive in vivo imaging of plaque activity during atherosclerotic plaque progression. Currently, I am extending my work on in vivo plaque imaging techniques, to make a start with the translation of my research to the clinic, in a project funded by the Erasmus MC and a Dutch Heart Foundation project.

Thesis supervision as Co-promotor (name, date)

- MSc. A.M. Moerman, expected 2019
- MSc. E. Meester, expected 2019
- MSc. R. Xing, expected 2017
- Dr. S. Cuhlmann, 03/2011

Grant allocation as Principal investigator (year, size(€), budget source, title)

- 2014, €392.238 Dutch Heart Foundation Shear stress and atherosclerotic plaque lipidomics
Dekker Senior Postdoc
- 2014, €150.000 Erasmus MC grant Non-invasive molecular imaging of inflammation to detect atherosclerosis
- 2012, €400.000 Erasmus MC Linking biomechanics to the biology of
Fellowship plaque progression; a non-invasive imaging study
- 2010, €250.000 NWO-ZonMW Reactive Oxygen Species as Mediators
Veni 916.11.015 of Biomechanics in Vascular Disease

Teaching

Supervisor

- | | | |
|--------------------------|----------------------|-----------------|
| • MSc-student | Ayla Hoogendoorn | 09/2013-12/2013 |
| • Lab technician-student | Dylan Mariën | 01/2013-06/2013 |
| • Lab technician-student | Thessa Damen | 02/2012-06/2012 |
| • BSc-student | Marco van der Wouden | 03/2012-04/2012 |
| • MSc-student | Bibi van Thiel | 04/2011-09/2011 |
| • MSc-student | Bahareh Meskhat | 03/2011-09/2011 |
| • BSc-student | Fabian Breijer | 11/2010-06/2011 |
| • BSc-student | Mengshi Yuan | 02/2010-05/2010 |
| • BSc-student | Sneha Varkey | 02/2009-05/2009 |

Managing course

- 2012, 2013, 2014, 2015 Cardiology section of the Minor Medical Delta "Geneeskunde voor technische studenten" for MSc students

Lectures

- Lecture Biomechanics at Dutch Heart Foundation Papendal course, 11-10-2012 for PhD-students
- Lectures in the departmental cardiovascular science course, 2009 for MSc students

Basic Teaching Qualification

- Course didactical skills 04-10-2012

Training

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|-----------|---|
| 2012/2013 | Female Career Development program for female top talent within Erasmus MC |
| 2012 | Course <i>Starting with supervision in science</i> |
| 2010 | Laboratory Animal Course (Art. 9) |
| 2001 | Radiation protection proficiency level 5B; Technical University Delft |

Management

- Co-organizer 6th, 7th, 8th, 9th, 10th, 11th International Conference on Biomechanics in Vascular Biology and Cardiovascular Disease (2011, Rotterdam, NL; 2012, Atlanta, USA; 2013, Rotterdam, NL; 2014, Montreal, Canada; 2015 Rotterdam, NL; 2016, Atlanta, USA)

Membership Scientific committee (national)

- Board membership: 2013-present, invited member of the Young ICIN-Netherlands Heart Institute scientific council (www.ICIN.nl/young)
- Board membership 2014-2015 Vena
- Associate editor Netherlands Heart Journal
- Guest editor Special issue Thrombosis and Hemostasis

Scholarships and prizes

- Poster Award CardioVasculaire Conferentie Noordwijkerhout, The Netherlands 2013, €75
- Young Investigator Award best presentation The 5th International symposium on biomechanics in vascular biology and cardiovascular disease, Rotterdam, The Netherlands 2010, €500
- Postdoctoral Travel Award NHLI Foundation 2010, €500
- Young life scientist award Promega UK 2009, £4000
- Travel grant British Heart Foundation 2009, £300
- Travel grant 5th European Meeting on Vascular Biology and Medicine 2009, €480
- Young Investigator Award best presentation The 3rd International symposium on biomechanics in vascular biology and cardiovascular disease, 2008, Rotterdam, The Netherlands (€500) 2008, €500
- Young Investigator Award for best presentation The Dutch Society for microcirculation and vascular biology 2006, €100
- Travel grant Leiden University Fund 2006, €1000
- Travel grant Leiden University Fund 2005, €750
- Poster award 12th Leiden Vascular Medicine Scientific Meeting 2005, €75
- "Zilveren Vlam" Annual award for the best student in Biology and Medical Laboratory Research from the Dutch Society of BioMedical Laboratory Employees 2001, €150

Invited (plenary) lectures

- Invited oral presentation, Crossing borders festival, NL, 12 November 2014
- Invited external examiner PhD Defence, University of Sheffield, UK 24 Oktober 2014
- Invited oral presentation, University of Cambridge, UK 7 February 2014
- Invited external examiner PhD Defence, University of Sheffield, UK 25 November 2013
- Invited oral presentation, 8th International Conference on Biomechanics in Vascular Biology and Cardiovascular Disease, Rotterdam, The Netherlands
- Invited seminar, University of Sheffield, UK, 9 May 2012
- Invited oral presentation, Vulnerable plaque meeting, Greece, 24 June 2012
- Chair NAVBO Vascular Matrix Biology and Bioengineering Workshop in Hyannis, MA, USA 19 Oktober 2015
- Chair 5th, 6th, 7th, 8th, and 9th International Conference on Biomechanics in Vascular Biology and Cardiovascular Disease (2010, 2011, 2012, 2013)

Publication list

H-index: 16

Peer reviewed international publications

1. Evans PC, Gijsen FJ, Wentzel JJ, van der Heiden K. Biomechanics in vascular biology and cardiovascular disease. *Thromb Haemost.* 2016 Feb 11;115(3):465-466. IF 4.984
2. van der Heiden K, Hoogendoorn A, Daemen MJ, Gijsen FJ. Animal models for plaque rupture: a biomechanical assessment. *Thromb Haemost.* 2015 Nov 26;115(3). IF 4.984
3. Hartwig H, Silvestre-Roig C, Hendrikse J, Beckers L, Paulin N, Van der Heiden K, Braster Q, Drechsler M, Daemen MJ, Lutgens E, Soehnlein O. Atherosclerotic Plaque Destabilization in Mice: A Comparative Study. *PLoS One.* 2015 Oct 22;10(10):e0141019. IF 3.234
4. Winkel LC, Hoogendoorn A, Xing R, Wentzel JJ, Van der Heiden K. Animal models of surgically manipulated flow velocities to study shear stress-induced atherosclerosis. *Atherosclerosis.* 2015 Jul;241(1):100-10. IF 3.994
5. Krenning BJ, Van der Heiden K. Should ethnicity be included in cardiovascular risk stratification? *Neth Heart J.* 2015 Jan;23(1):42-3. IF 1.837
6. Cuhlmann, S., Gsell, W., Van der Heiden, K., Habib, J., Tremoleda, J.L., Khalil, M., Turkheimer, F., Bird, J., Clark, J., Haskard, D., Krams R., Jones, H., Evans, P.C. In vivo mapping of vascular inflammation using the translocator protein tracer 18F-FEDAA. *Mol Imaging* in press IF 3.408
7. Winkel, L.C.J., Groen, H.C., van Thiel, B.S., Müller, C., van der Steen, A.F.W., Wentzel, J.J., de Jong, M., Van der Heiden, K. Folate receptor-targeted SPECT/CT to detect activated macrophages in atherosclerosis; can it distinguish vulnerable from stable atherosclerotic plaques? *Mol Imaging* 2013;12:1-5 IF 3.408
8. Van der Heiden, K., Gijsen, F.J., Narracott, A., Hsiao, S., Halliday, I., Gunn, J., Wentzel, J.J., Evans, P.C. The effects of stenting on shear stress: relevance to endothelial injury and repair. *Cardiovasc Res.* 2013;99(2):269-75 IF 5.940
9. Van der Heiden, K., Egorova, A.D., Poelmann, R.E., Hierck, B.P. Primary cilia as biomechanical sensors in regulating endothelial function; invited review; *Differentiation.* 2012;83(2):S56-61. IF 2.855
10. Van der Heiden, K., Egorova, A.D., Poelmann, R.E., Wentzel, J.J., Hierck, B.P. Role for primary cilia as flow detectors in the cardiovascular system. *International review of cell and molecular biology; invited review; Int Rev Cell Mol Biol.* 2011;290:87-119. IF 4.481
11. Egorova, A.D., Van der Heiden, K., Van de Pas, S., Vennemann, P., Poelma, C., Deruiter, M.C., Goumans, M.J., Gittenberger-de Groot, A.C., Ten Dijke, P., Poelmann, R.E., Hierck, B.P. Tgf β /Alk5 signaling is required for shear stress induced klf2 expression in embryonic endothelial cells. *Dev Dynam.* 2011 Jul;240(7):1670-80. IF 2.536
12. Van der Heiden, K., Cuhlmann, S., Saliba, D., Tremoleda, J.L., Khalil, M., Zakkar, M., Chaudhury, H., Luong, L.A., Mason, J.C., Udalova, I., Gsell, W., Jones, H., Haskard, D.O., Krams, R., Evans, P.C. Disturbed blood flow induces RelA via c-Jun N-terminal kinase 1: a novel mode of NF- κ B regulation that promotes arterial inflammation. *Circ Res.* 2011 Apr 15;108(8):950-9. IF 9.489
13. Chaudhury, H., Zakkar, M., Boyle J.J., Cuhlmann, S., Van der Heiden, K., Luong, L.A., Davis, J., Platt, A., Mason, J.C., Krams, R., Haskard, D.O., Clark, A., Evans, P.C. c-Jun N-terminal kinase primes endothelial cells at atheroprone sites for apoptosis. *Arteriosclerosis Thrombosis and Vascular Biology*, 2010;30:546-53. IF 7.215
14. Van der Heiden, K., Cuhlmann, S., Zakkar, M., Luong, L.A., Evans, P.C. Role of nuclear factor kappaB in cardiovascular health and disease. *Clinical Science*, 2010;118:593-605. IF 3.890
15. Poelma, C., Van der Heiden, K., Hierck, B.P., Poelmann, R.E., Westerweel, J. Measurements of the wall

shear stress distribution in the outflow tract of an embryonic chicken heart. *Journal of the Royal Society Interface*, 2010;7:91-103.

IF 4.259

16. Van der Heiden, K., Zakkar, M., Luong, L.A., Chaudhury, H., Cuhlmann, S., Hamdulay, S.S., Krams, R., Edirisinghe, I., Rahman, I., Carlsen, H., Haskard, D.O., Mason, J.C., Evans, P.C. Activation of Nrf2 in endothelial cells protects arteries from exhibiting a pro-inflammatory state. *Arteriosclerosis Thrombosis and Vascular Biology*, 2009;29:1851-7.

IF 7.235

17. Poelmann, R.E., Van der Heiden, K., Gittenberger-de Groot, A.C., Hierck, B.P. Deciphering the shear stress sensor. *Circulation* 2008;117:1124-1126

IF 14.595

18. Hierck, B.P., Van der Heiden, K., Alkemade, F.E., van de Pas, S., Van Thienen, J.V., Groenendijk, B.C.W., DeRuiter, M.C., Horrevoets A.J.G., Poelmann R.E. Primary Cilia Sensitize Endothelial Cells for Fluid Shear Stress. *Dev Dynam* 2008;237:725-735

IF 3.018

19. Van der Heiden, K., Hierck B.P., Krams R., de Crom R., Cheng C., Baiker M., Pourquie M.J.B.M., Alkemade F.E., DeRuiter M.C., Gittenberger-de Groot A.C., Poelmann R.E. Endothelial primary cilia in areas of disturbed flow are at the base of atherosclerosis. *Atherosclerosis* 2008;196:542-550.

IF 4.601

20. Hierck B.P., Van der Heiden, K., Poelmann, R.E. Fluid shear stress and inner curve remodeling of the embryonic heart. Choosing the right lane! *The Scientific World Journal* 2008;8:212-222.

IF 2.52

21. Groenendijk, B.C.W., Van der Heiden, K., Hierck, B.P., Poelmann, R.E. The role of shear stress on ET-1, KLF2 and NOS-3 expression in the developing cardiovascular system of chicken embryos in a venous ligation model. *Physiology* 22; 2007:380-389.

IF 6.954

16. Hierck, B.P., van der Heiden, K., DeRuiter, M.C., Gittenberger-de Groot, A.C., Poelmann, R.E. Fluid shear stress controls cardiovascular development. A functional approach. *Wien Klin Wochenschr.* 2007;119:10-3

IF 0.885

17. Van der Heiden, K., Groenendijk, B.C.W., Hierck, B.P., Koerten, H.K., Mommaas, A.M., Gittenberger de Groot, A.C., Poelmann, R.E. Monocilia on chicken embryonic endocardium in low shear stress areas. *Developmental Dynamics* 2006;235:19-28.

IF 3.169

18. Molin, D.G., Bartram, U., Van der Heiden, K., Van Iperen, L., Speer, C.P., Hierck, B.P., Poelmann, R.E., Gittenberger-de Groot, A.C. Expression patterns of Tgfbeta1-3 associate with myocardialisation of the outflow tract and the development of the epicardium and the fibrous heart skeleton. *Developmental Dynamics* 2003;227:431-44.

IF 3.160