

Trained innate immunity and atherosclerosis



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Innate immune cells can build a nonspecific immunological memory, which has been termed trained immunity. We propose that trained immunity, although beneficial in the context of recurrent infection, actually contributes to the tissue injury in chronic inflammatory conditions, such as atherosclerosis. Our research groups aims at investigating the role of trained immunity in the pathophysiology of atherosclerosis. By deciphering the intracellular mechanisms of trained immunity, the ultimate aim is to provide novel pharmacological targets that can be used to prevent atherosclerotic cardiovascular disease.

Curriculum Vitae

Prof. Niels Riksen

Niels Riksen studied medicine at the Radboud university in Nijmegen, the Netherlands. He specialized in internal medicine, with a focus on vascular medicine and was registered as specialist in vascular medicine in 2010. In 2007 he obtained his PhD at the department of Pharmacology and went to London (Hatter Cardiovascular Institute, UCL) as a postdoctoral research fellow in 2007/2008 to focus on myocardial ischemia reperfusion injury. In 2014 he was appointed full professor of vascular medicine and Head of the department of Vascular Medicine at the Radboud university medical center. His research is focussed on the role of the innate immune system in the development of atherosclerosis.

Selected publications:

1. Noz MP, ter Telgte A, Wiegertjes K, Joosten LAB, Netea MG, de Leeuw FE, Riksen NP. Trained immunity characteristics are associated with progressive cerebral small vessel disease. *Stroke* 2018 Dec;49(12):2910-2917
2. Leentjens J, Bekkering S, Joosten LAB, Netea MG, Burgner DP, Riksen NP. Trained innate immunity as a novel mechanism linking infection and the development of atherosclerosis. *Circ Res*. 2018;122:664-669
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4. Bekkering S*, Arts RJW*, Novakovic B, Kourtzelis I, Popa CD, ter Horst R, van Tuijl J, Simon A, van de Veerdonk FL, Chavakis T, Joosten LAB, Van der Meer JWM, Stunnenberg H, Riksen NP[†], Netea MG[†]. Metabolic induction of trained immunity involves mevalonate pathway. *Cell*. 2018 Jan 11;172(1-2):135-146 [†]Shared senior author
5. El Messaoudi S, Nederlof R, van Swieten HA, Pickkers P, Vos A, van den Broek PH, Bilos A, Noyez L, Kievit PC, Rasing-Hoogveld A, Bouw MP, Peters JGP, Coenen M, Donders R, Zuurbiers C, Rongen GA, Riksen NP. The effect of metformin on cardiac injury during coronary artery bypass grafting: a double-blinded randomized controlled trial. *Lancet Diab Endocrinol* 2015;3:615-623
6. Bekkering S, Quintin J, Joosten LA, van der Meer JWM, Netea MG, Riksen NP. Oxidized low-density lipoprotein induces long-term proinflammatory cytokine production and foam cell formation via epigenetic reprogramming of monocytes. *Arterioscler Thromb Vasc Biol* 2014;34:1731-8.