Focus of research line

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Supervising: 4 PhDs, 2 Technicians, 1 Msc.

Current mission, vision and aims

Mission
To identify new potential therapeutic leads in order to treat- in particular- Lp(a)-induced atherosclerosis. We focus on the endothelium and the heart valve (valve interstitial cells).

Vision
By steering metabolic reprogramming of the vessel wall and the aortic valve, inflammation and eventually atherogenesis can be reduced.

Aim
Elucidate the molecular mechanisms and cross-talk between inflammation, metabolic alterations and leukocyte migration.
Current research focus

“Elucidate and target cell metabolism to decrease the pro-inflammatory state in high CV-risk patients”

Current expertise
- Experimental models to study inflammatory pathways *in-vitro*:
  - Confocal and live cell imaging
  - Leukocyte transendothelial migration under flow assays
  - Standard cell biology techniques, endothelial barrier function
- Atherogenic pathway detection using ‘omics’ and machine learning
- Metabolic flux assays

Topics of interest:
- Lipid-induced metabolic (re)programming
- Atherogenic pathways of Lp(a) leading to increased monocyte influx
Collaborations in ACS
Prof. M. de Winther, Dr. K. Prange
Prof. R. Houtkooper, Dr. M. van Weeghel
Prof. E. Lutgens, Dr. T. Seijkens
Profs. M. Nieuwdorp, K. Hovingh, E. Stroes
Prof. P. Hordijk
Dr. L. Vogt

**Lp(a) research**
Steer blood vessel metabolism against atherosclerosis

- **In-vivo validation:**
  - Mouse models
  - AtheroExpress (UMCU)

- **Functional models:**
  - in-vitro
  - ex-vivo

- **Pathway analysis:**
  - RNAseq
  - $^{13}$C-flux
  - Inhibitory/reversibility exps

Strong independent risk factor
Highly prevalent
2-4 fold increased CVD-risk

**Lp(a) subject**
**Control subject**
**Lp(a) research**

Steer blood vessel metabolism against atherosclerosis

**Collaborations in ACS**

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**Lp(a) research**

Steer blood vessel metabolism against atherosclerosis

**Inflammation/leukocyte migration**

![Diagram showing Lp(a) patient, in-vivo validation, functional models, pathway analysis, and collaborations in ACS.](image)

**Collaborations in ACS**

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Future plans

Current funding
VENI (NWO/ZonMW), ACS-postdoc 2017, Industrial grant

Short term (1-2 year) plan
Validation of our *in-vitro* pathways in *ex-vivo* setting
Implement inflammatory lab-models in clinical trials

Long term (>2 year) plan
Expand translational research in Amsterdam UMC
Acquire VIDI
Further identify attractive targets to improve endothelial and valve function in atherosclerosis