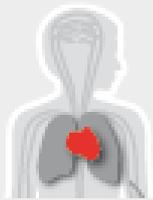


# Focus of research group (I)

Name PI: Kak Khee Yeung

Department, UMC: Vascular Surgery, location VUmc

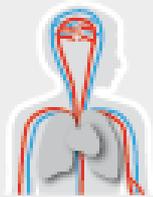
Size of research group: 3 PI's, 4 full time Ph.D.Students, 4 clinical/parttime Ph.D.-Students.



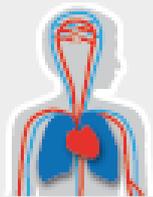
Heart Failure & Arrhythmias



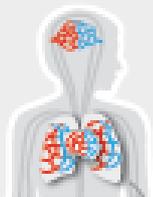
Pulmonary Hypertension  
& Thrombosis



Atherosclerosis  
& Ischemic Syndromes



Diabetes & Metabolism



Microcirculation

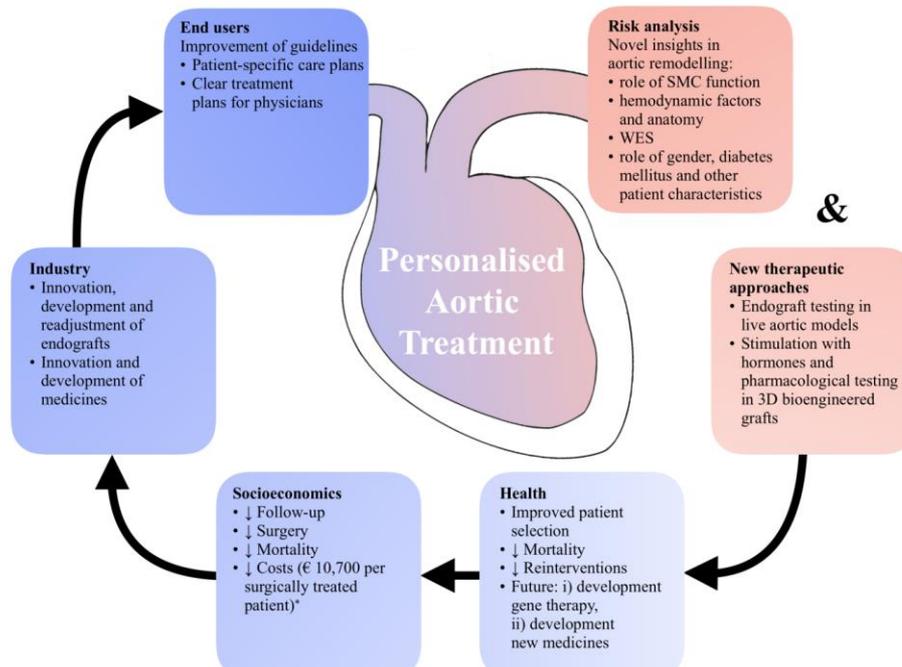
**Unravel the pathophysiology of aortic aneurysms and dissections.**

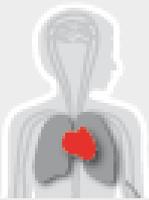
## VISION

that aortic diseases is caused by failure in aortic remodelling, caused by SMC dysfunction influenced by gender, environmental stress factors like smoking, aging, aneurysm causing genes, hormones, glucose/diabetes and aortic wall stress.

## AIMS

Prediction of aortic impairment and choice of treatment (open, endovascular or no surgical repair or medical treatment or combinational therapy) to achieve personalised aortic treatment. Besides the prediction, we will gain more knowledge about the pathophysiology and connection of the aortic diseases. We will identify risk groups for impairment of the disease and patients who will not benefit of endovascular treatment. The project will lead to new combinational therapy, possibility of developing medical options and future gene therapy

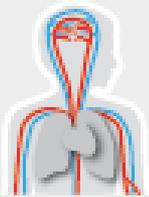




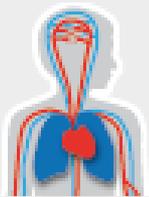
Heart Failure & Arrhythmias



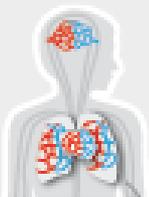
Pulmonary Hypertension  
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Atherosclerosis  
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Diabetes & Metabolism



Microcirculation

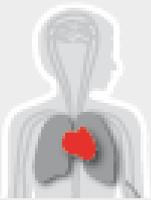
# Focus of research group (II)

## Current expertise

- PARELSNOER AAA, biobank
- Transdifferentiation of SMC of skin fibroblast
- Functional tests for genes
- Live aortic tissue handling for stimulation tests
- Contraction studies of SMC with ECIS and microscopy
- 3D-bio engineering of vessels
- Live aortic models
- qPCR for quantification of RNA or DNA
- Studies on periaortic fat tissue
- Anatomy studies, flow MRI
- WES
- Metformin, glucose studies (Stanford)

## Current funding

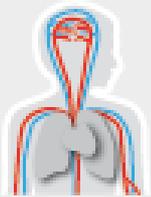
- ICAR AIO: 1 full time PhDstudent 4 years (250.000eu)
- ACS grant: 25.000eu
- Registries/Trials: 112.043 eu
- Gore research grant 360.238 eu
- Stichting Vumc: 239.000 eu



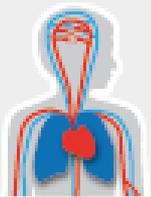
Heart Failure & Arrhythmias



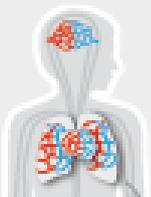
Pulmonary Hypertension  
& Thrombosis



Atherosclerosis  
& Ischemic Syndromes



Diabetes & Metabolism



Microcirculation

# Future plans

## Short term (1-2 year) plan

Plan: apply for Grants, expand international collaboration network. Focus on further exploring SMC function in aortic aneurysms.

- Influence of pressure on SMC function in 3D bio-engineered vessels
- Further validation of transdifferentiation of fibroblasts into SMC
- Influence of hormones, pvat, glucose and specific genes
- Implementation of flow MRI in aortic dissections
- Stimulation studies with metformin and glucose

Necessary infrastructure: 3D vessels, cell specific sequencing

## Long term (>2 year) plan

Plan: expand the field to aortic dissections and connection with bicuspid aortic valves. Further exploration in genetic disorders, mouse studies.

Participation in Metformin trials. Association with clinical outcome (endovascular or FU).

Necessary infrastructure: collaboration with cardiac surgeons. Mouse studies experience. WES.

## Collaboration in ACS

- PARELSNOER AAA: Vascular surgery departments Vumc, AMC, Lumc
- Stimulation studies doxycyclin, Mouse studies: Yeung (Vumc) & de Waard (AMC)
- Physiology: Hordijk, Koolwijk, Musters
- Clinical trials (AJAX)
- PVAT (Vumc: Yeung & Eringa)