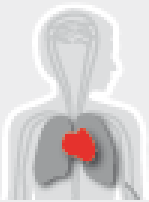


Focus of research group (I)

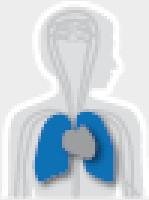
Name PI: Dr. Kak Khee Yeung, MD, PhD, FEBVS

Department, UMC: Vascular Surgery, Amsterdam UMC, location VUmc & AMC

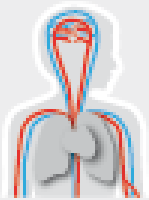
Size of research group: 3 PI's, 4 full time Ph.D.Students, 4 clinical/parttime Ph.D.-Students, 2 postdocs, 2 data managers and 1 laboratory analyst



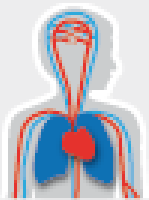
Heart Failure & Arrhythmias



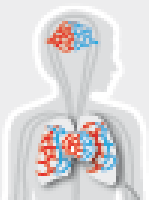
Pulmonary Hypertension & Thrombosis



Atherosclerosis & Ischemic Syndromes



Diabetes & Metabolism



Microcirculation

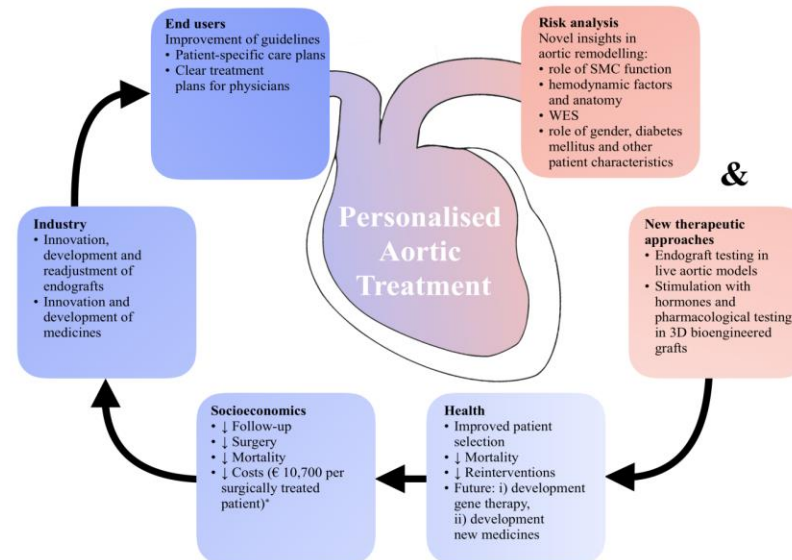
PERSONALISED TREATMENT OF AORTIC DISEASES

VISION

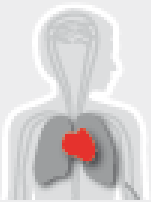
Aortic diseases involve aortic aneurysms and dissections. Both diseases are unpredictable and have no medical therapy that effectively stops the progression. Both disease have a multifactorial cause. We are in need for patient-specific or personalized models that predict treatment outcomes, which can be achieved by studying the pathophysiology, imaging and patients' characteristics. In order to perform these studies, we have build a large biobank containing patients' data, images and live cells.

AIMS

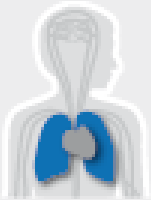
We want to prediction aortic disease progression and advice in choice of treatment (open, endovascular or no surgical repair or medical treatment or combinational therapy) with a personalised approach. We will identify risk groups for impairment of the disease and patients who will not benefit of endovascular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



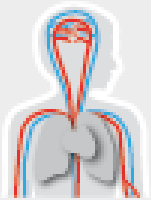
Focus of research group (II)



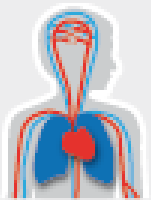
Heart Failure & Arrhythmias



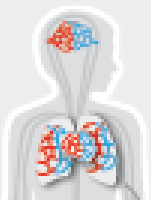
Pulmonary Hypertension
& Thrombosis



Atherosclerosis
& Ischemic Syndromes



Diabetes & Metabolism



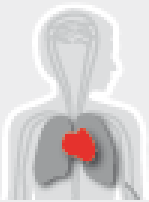
Microcirculation

Current expertise

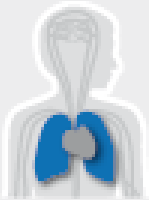
- PARELSNOER AAA, biobank with cell cultures
- Transdifferentiation of SMC of skin fibroblast
- Functional tests for genes
- Live aortic tissue handling for stimulation tests
- Contraction studies of SMC with ECIS and microscopy
- 3D-bio engineering of vessels
- Live aortic models
- qPCR for quantification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

Current funding

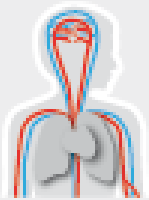
- Dekkerbeurs Senior Clinical Scientist (Yeung): 408.928
- Out of the box grants: 2x 10.000 eu
- Registries/Trials: 112.043 eu
- Industry grants: total of 660.000 eu
- TKI-PPPgrant: 1 000 000 eu
- Stichting Vumc: 239.000 eu
- AMC Foundation: 1 000 000 eu



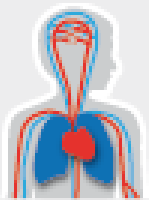
Heart Failure & Arrhythmias



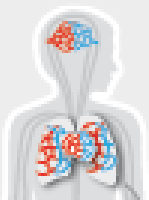
Pulmonary Hypertension
& Thrombosis



Atherosclerosis
& Ischemic Syndromes



Diabetes & Metabolism



Microcirculation

Future plans

Short term (1-2 year) plan

Plan: expand international collaboration network and start international consortium. Focus on further exploring SMC function in aortic aneurysms and use of artificial intelligence for prediction models and development of clinical decision support tools.

Studies highlighted:

- Influence of different phenotypes and hemodynamic changes on SMC function in aneurysms
- Further development of 3D bio-engineered vessels
- Further validation of transdifferentiation and ISPC's of skin fibroblasts into SMC
- Influence of hormones, pvat , glucose and specific genes on aneurysm progression
- Stimulation studies with metformin and glucose
- Development and implementation of MRI in aortic aneurysm workflow
- Automatic segmentation of aortic structures

Necessary infrastructure: local: PhD-students, postdoc, analysts, data managers

Long term (>2 year) plan

Plan: expand the platform to aortic dissections and other cardiovascular diseases. Further exploration in genetic disorders and different phenotypes. Development of clinical decision support tools and incorporating personalised treatment in clinical decision making. Provide personalised solution in surgery, follow-up and advice in medical therapy for aneurysms.

Participation in clinical trials and large consortia. Broaden the biobank to a national level.

Necessary infrastructure: (inter) national collaboration network and multidisciplinary approach.

Collaboration in ACS of Dr. Yeung:

- PARELSNOER AAA: Vascular surgery departments Vumc, AMC, Lumc
- Pathophysiology studies: Ed Eringa, Peter Hordijk and Jolanda van der Velden
- Genetic studies: Dimitra Micha, Arjan Houweling
- Imaging studies: Aart Nederveen, Jan Blankensteijn, Ron Balm
- Stimulation studies doxycyclin, Mouse studies: Vivian de Waard
- Proteomics studies: oncoproteomics lab of Connie Jimenez
- Clinical trials: AJAX (Wisselink; Balm), DREAM-trial (Blankensteijn) , ACT-trial (Jongkind), ANEUFIX (Hoksbergen)