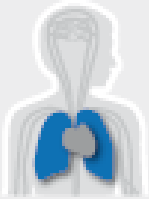
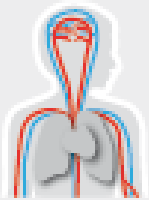


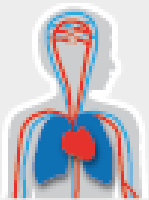
Heart Failure & Arrhythmias



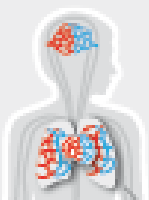
Pulmonary Hypertension
& Thrombosis



Atherosclerosis
& Ischemic Syndromes



Diabetes & Metabolism



Microcirculation

Focus of research group (I)

Name PI: Deli Zhang

Department, UMC: Physiology (VUmc location)

Size of research group: 2 (Jin Li and me), under supervision of Prof. B. Brundel.

(Inter)national collaboration :

Prof. **N de Groot** from Erasmus MC, Rotterdam (AF Biobank)

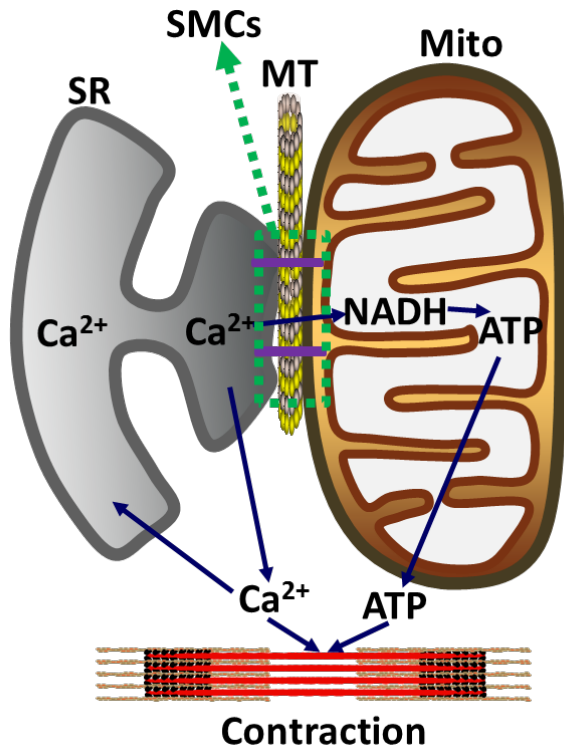
Prof. **MA Esteban** from GIBH, Chinese Academy of Science

Current mission, vision and aims

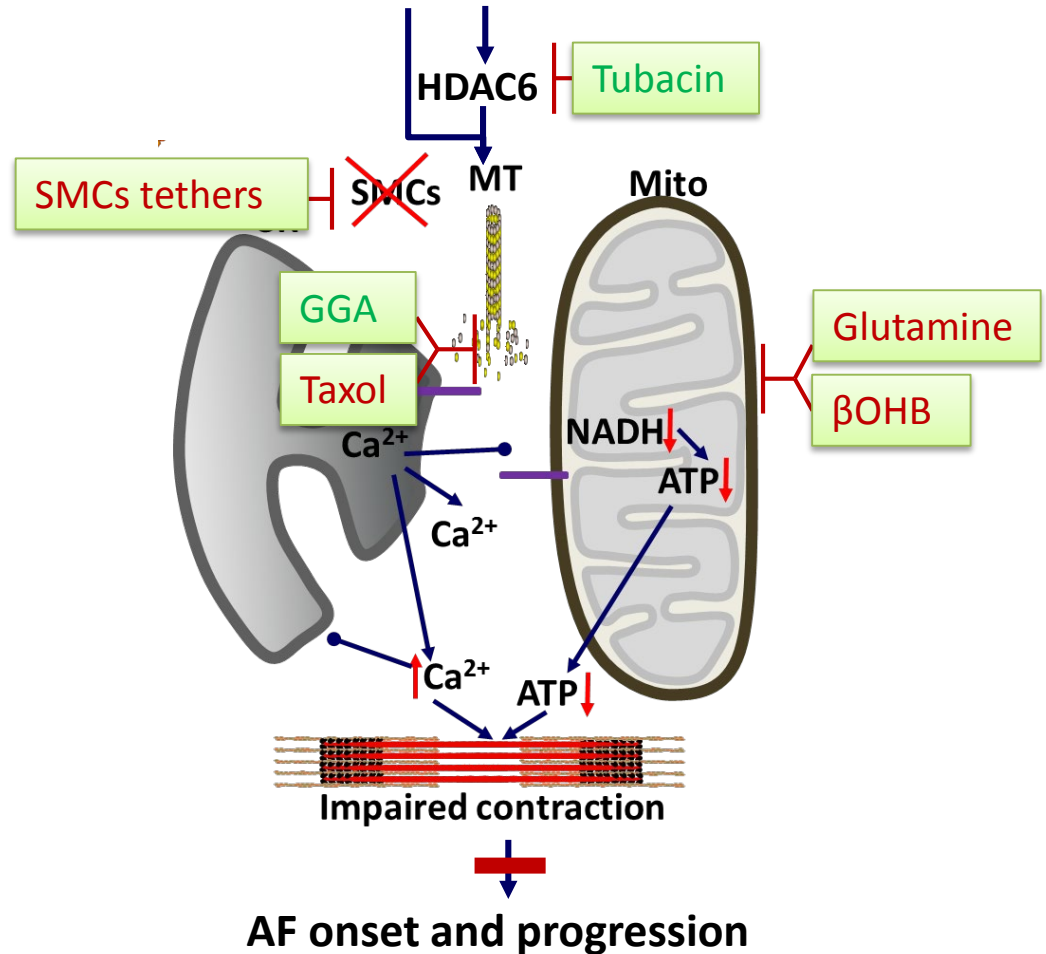
1. To uncover the molecular mechanism underlying progression of atrial fibrillation (AF): focus on **Microtubule mediated SR-Mitochondria contacts** (Microtubule -SMCs pathway)
2. To develop curable drug treatment for AF
3. To discover novel biomarkers for AF for safer personalized treatment

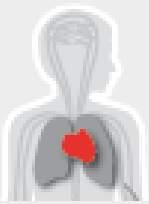
Key role of Microtubule -SMCs pathway in AF

Normal

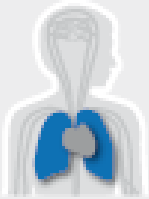


Risk factors & AF

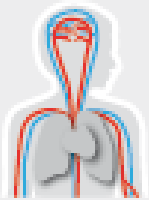




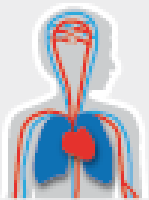
Heart Failure & Arrhythmias



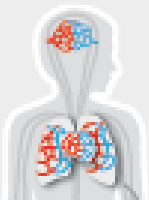
Pulmonary Hypertension
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Diabetes & Metabolism



Microcirculation

Focus of research group (II)

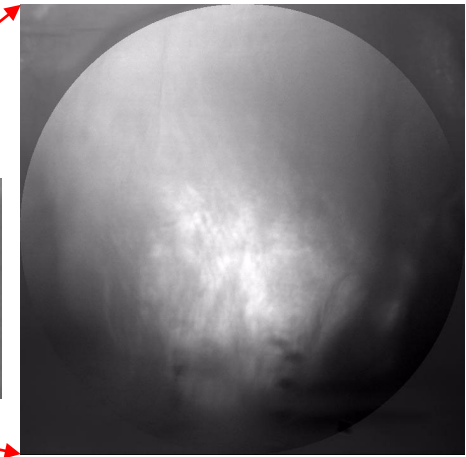
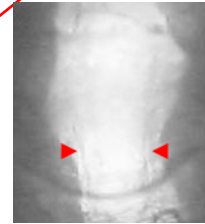
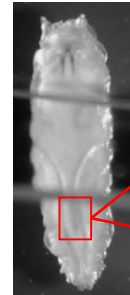
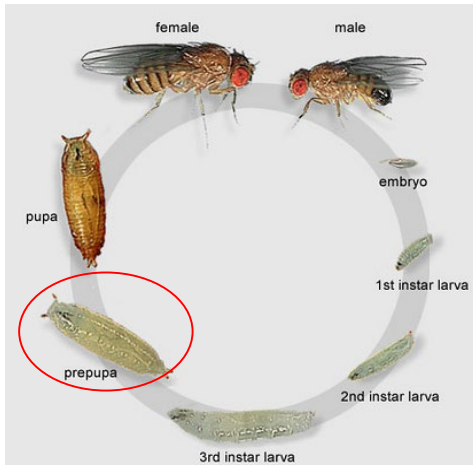
Current expertise:

- *In vitro* cellular model for AF
 - HL-1 cardiomyocytes
 - Adult rat atrial cells
- *In vivo Drosophila* model for AF

Molecular biology techniques: Biochemical and Imaging

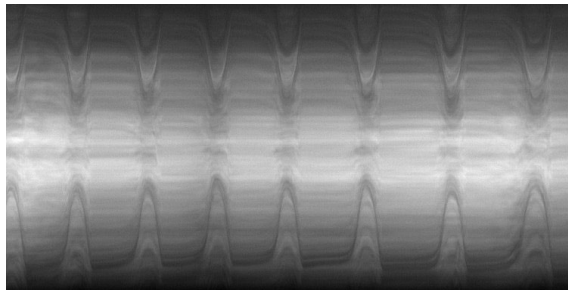
Current funding: Dr. Dekker Junior postdoc Grant from DHF

In vivo: Tachypaced *Drosophila* prepupa

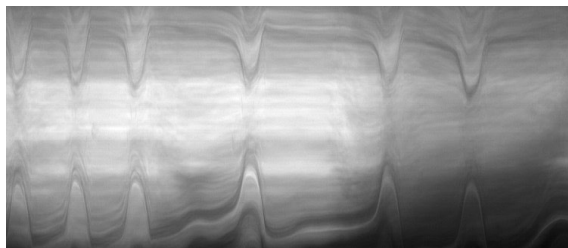


M-mode cardiography

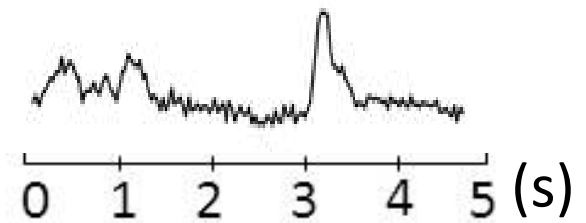
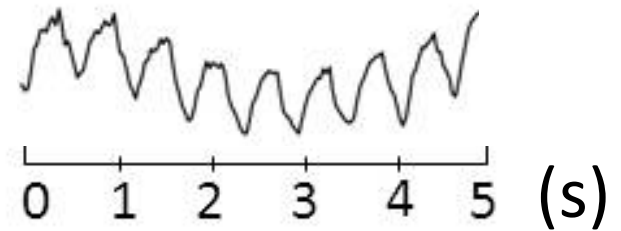
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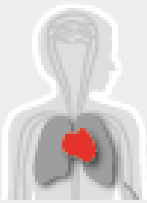


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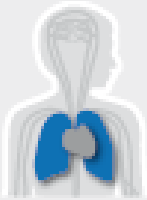


Heart wall traces

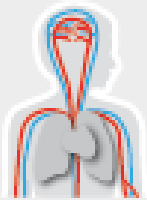




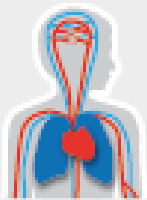
Heart Failure & Arrhythmias



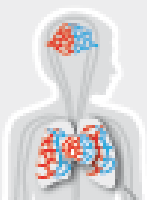
Pulmonary Hypertension & Thrombosis



Atherosclerosis & Ischemic Syndromes



Diabetes & Metabolism



Microcirculation

Future plans

Year 1	Year 2	Year 3
<p>Aim1: Microtubule-SMCs pathway in HL-1 cardiomyocyte and in <i>Drosophila</i> models for AF</p> <ul style="list-style-type: none"> Molecular changes: Western blot, STED microscopy, EM, Functional changes: high speed confocal microscopy, Seahorse 		
<p>Aim2: Microtubule-SMCs pathway in AF patients</p> <ul style="list-style-type: none"> Molecular changes: Western blot, STED microscopy, EM, ELISA 		
<p>Aim3: Microtubule-SMCs pathway in ZSF1 rats</p> <ul style="list-style-type: none"> Molecular changes: Western blot, STED microscopy, EM Functional changes: echocardiography, burst pacing and ECG, Seahorse, cardiomyocytes force and calcium sensitivity measurements 		

Short term (1-2 year) plan

Plan: Finish the project

Necessary infrastructure: listed in the table above

Long term (>2 year) plan

Plan: attract new funding for follow-up studies

Necessary infrastructure: listed in the table above

Collaboration in ACS

- Prof. **J. van der Velden** on the setup to measure sarcomeric contraction force (atria from patients and rats)
 - Prof. **W. Paulus** on the ZSF1 rat model
 - **R.J.P. Musters/Imaging center** on the super resolution microscopy
- Looking for future collaboration on Mitochondrial function measurement. (Dr. Riekelt Houtkooper ...)