







Focus of research group (I)

Staff members: Coert Zuurbier (PI), Nina Hauck, Benedikt Preckel (PI),

Markus Hollmann (PI)

Location: LEICA, Anesthesiologie, AMC

Size of research group: 2-3 PhD, 2 technicians, 2 senior researcher and 4-8

MSc/BSc students/year

Mission:

<u>Understanding</u> + <u>therapeutic</u> treatment of **acute ischemic injury**

Vision:

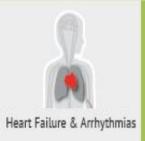
Mitochondrial damage (CM + EC) constitutes acute cardiac I/R injury

Aims:

Unraveling molecular mechanism of mito-damage (mito-HKII, metabolism)

Developing multimodal mito-I/R therapy in a clinical setting

Approach: studying drugs effects and mechanism at the level of:
a) cardiomyocyte, b) different endothelium cell, b) intact heart,
c) intact animal, d) human tissue



Focus of research group (II)

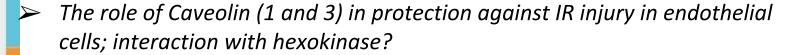
Current expertise



Keeping hexokinase II at the mitochondria (mitoHKII) is the crucial event \uparrow mitoHK $\rightarrow \downarrow$ cell death, metabolic remodelling (\uparrow glycolysis \downarrow OXPHOS) Smeele Circ Res 2011; Smeele Circ Res 2011; Nederlof Circ Res 2013



Therapy needs to be tested in presence of propofol, P2Y12 inhibitors, aged/diabetic status, opiates, duration of ischemia





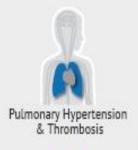
Current funding

- EU cardioprotection COST action (core member)
- Chinese Scholarship Council
- Alliance Vumc-AMC (OOTB)
- Chinese Scholar Council
- DAAD, German Academic Exchange Service

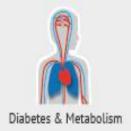














Future plans

Short term (1-2 year) plan

- Discover the most strongest protective agents/therapies
- Check effectiveness in clinical conditions (anesthetics, anti-coagulants, co-morbidities, co-medications)
- Combine into multimodal therapie with strongest protection

Necessary infrastructure:

Isolated heart platforms, metabolomics ¹³C heart, in vivo mouse/rat heart function/metabolism (small animal MRI/PET), animal facility

Long term (>2 year) plan

Plan: first clinical trials in CABG patients and AMI patients Necessary infrastructure:

Collaborations:

Clinical Anesthesiology, AMC (Preckel, Hollmann) Exp. Cardiology, AMC (Baartscheer, Coronel) Lab Gen Metab Dis, AMC (Houtkooper) University California, San Diego (HH Patel)

Cardioprotection in Clinic Ions in cardiomyocytes ¹³C metabolism intact heart GGO mice Caveolin