Overview ongoing research Atherosclerosis & Ischemic Syndromes Research Program ACS – December 2018

PI	UMC	Dept	Mission	Expertise
Carlie de Vries	AMC	Medical Biochemistry	We aim to understand the underlying mechanism of vascular disease and diet-induced diabetes with the ultimate goal to apply our novel insight in clinical practice. Focus on Nur77 & FHL2.	Nuclear Receptor Nur77 and its cofactor FHL2 Primary smooth muscle cell (SMC) culture human / mouse Primary macrophages mouse bone marrow / metabolism Molecular biology / protein expression bacteria / lentivirus Mouse models on SMC pathology / obesity / atherosclerosis
Marco Götte/Cor Allaart	VUmc	Cardiology	To translate EP procedures from X-ray into a fully integrated MRI guided process.	• Precise, non-ionization, non-invasive, 3D diagnostics for electropathology • Personalized, specific, therapy-stratification • Accurate peri-procedural guidance and precise, real-time feedback on interventions • Predictable clinical outcomes and improved therapeutic success
Otto Kamp	VUmc	Cardiology	The development of theragnostics (imaging combined with therapy) in clinical cardiology, especially in acute coronary syndromes, but also exploring endocarditis.	8 publications on the topic of sonolysis resulting in 2 academic thesis/promovendi.
Paul Krijnen/Hans Niessen	VUmc	Pathology	Accelerated macro- and microvascular inflammation Pathophysiology.	• Extensive human tissue biobank (coronary arteries, hearts). • Tissue analysis (HC, IHC, multicolor IHC, RNAish). • Viable tissue processing / culture. • Animal models of myocardial infarction (MI) in rat and mouse atherosclerosis ± MI and ± viral myocarditis, diabetes. • Human/animal adipose tissue-derived mesenchymal stem cells.

Esther Lutgens	AMC	Medical Biochemistry	To better understand the role of the immune system in atherosclerosis and the metabolic syndrome.	• Mouse models of atherosclerosis, diet induced obesity, EAE • Immune system: FACS, sorting, cell culture, luminex • Histology and morphometry, pathology • Drug design: in collaboration with G. Nicolaes (UM)
Paul Nederkoorn	AMC	Neurology	New RCTs with as goal to treat more patients successfully.	3D DEC MRI
Bert-Jan van de Born	AMC	Vascular Medicine	To better understand the biological mechanisms that underlie ethic disparities in (risk factors for) cardiovascular disease.	• Hypertension and CV risk prediction • Non-invasive hemodyamics (pulse wave analysis/-velocity) • Sympathetic nervous system/renal hemodynamics/non-osmotic sodium binding
Jan van den Bosche	VUmc	Molecular Cell Biology and Immunology	Understanding and targeting macrophage immunometabolism	• Macrophage (& monocyte) biology • Metabolic characterization • Functional profiling • In-dept phenotyping • Reprogramming
Vivian de Waard	AMC	Medical Biochemistry	To unravel the different signalling pathways involved in Marfan Syndrome and other aortic aneurysm diseases.	• Mouse models of Marfan syndrome and abdominal aneurysms • Clinical trial in Marfan patients; RESVcue Marfan • Haploinsufficency/Dominant negative FBN1 mutations • Smooth muscle cells / Extracellular matrix • Vascular pathology / Immunohistochemistry / Imaging • Aortic explant cultures (smooth muscle cells)
Menno de Winther	AMC	Medical Biochemistry	To define and understand how innate immunity (e.g. monocytes and macrophages) are regulated in the context of (cardio-metabolic) disease, how it contributes to disease and to identify approaches to influence it.	• Human and mouse cell culture systems • Molecular Biology, Cell Biology, Immunommetabolism • Animal models for disease (Athero, MI) • Extensive cell phenotyping by FLOW • Genomics techniques: RNAseq, ChIPseq, ATACseq, Single cell RNAseq

Coert Zuurbier	AMC	Anesthesiology	Understanding and therapeutic treatment of acute ischemic injury	• Keeping hexokinase II at the mitochondria (mitoHKII) is the crucial event↑ mitoHK → ↓ cell death, metabolic remodelling (↑glycolysis ↓ OXPHOS) • Therapy needs to be tested in presence of propofol, P2Y12 inhibitors, aged/diabetic status, opiates, duration of ischemia The role of Caveolin (1 and 3) in protection against IR injury in endothelial cells; interaction with hexokinase?
Jeffrey Kroon	AMC	Vascular Medicine	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).	• 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