

Principal Investigator

Dr Steffen Petersen

Address

Queen Mary University of London, William Harvey Research Institute
London Chest Hospital, Bonner Road, London E2 9JX

Lead Collaborators:

- 1 University of Auckland, Professor Alistair Young
University of Auckland, Anatomy with Radiology, 85 Park Road, Grafton
Auckland 1023, New Zealand

- 2 University of Oxford, Professor Stefan Neubauer
University of Oxford, Cardiovascular Medicine Division, Radcliffe Department of
Medicine, John Radcliffe Hospital, Headington, Oxford OX3 9DU

- 3 Barts Health NHS Trust, Dr Kenneth Fung
Barts Health NHS Trust, Barts Heart Centre, Cardiology, St Bartholomew's
Hospital, West Smithfield EC1A 7BE

- 4 Circle Cardiovascular Imaging Inc., Mr Kelly Cherniwchan
Circle Cardiovascular Imaging Inc. Research Suite 250, 815, 8th Ave SW
Calgary T2P 3P2, Canada

- 5 Erasmus MC, Professor Wiro Niessen
Erasmus MC, Radiology & Medical Informatics, 's-Gravendijkwal 230
Rotterdam 3015 CE, Netherlands

- 6 Geneva University Hospitals, Dr Georg Ehret
Geneva University Hospitals, Cardiology, Rue Gabrielle-Perret-Gentil 4
Geneva GE 1205, Switzerland

- 7 University Hospital Heidelberg, Dr Christopher Schlett
University Hospital Heidelberg, Diagnostic and Interventional Radiology
Im Neuenheimer Feld 110, Heidelberg BW 69120, Germany

- 8 Imperial College London, Professor Daniel Rueckert
Imperial College London, Department of Computing, 180 Queen's Gate
South Kensington Campus, London SW7 SAZ
- 9 Inria, Professor Nicholas Ayache
Asclepios, 2004 Route des Lucioles, Sophia Antipolis 06902, France
- 10 Klinikum der Universität München (Ludwig Maximilian University of Munich), Dr Moritz Sinner
Ludwig Maximilian University of Munich, University Hospital Munich
Department of Medicine I Marchioninstr. 15 Munich 81377, Germany
- 11 Universitat Pompeu Fabra, Dr Karim Lekadir
Universitat Pompeu Fabra, Department of I.C.T. Tàrradellas 138, Roc Boronat
Barcelona 08018, Spain
- 12 Semmelweis University, Dr Pal Maurovich-Horvat
Semmelweis University, Heart and Vascular Center, 68 Varosmajor st.
Budapest 1122, Hungary
- 13 University of Sheffield, Professor Alejandro Frangi
University of Sheffield, Faculty of Engineering, Pam Liversidge Building - Mappin
Street, CISTIB - Prof Frangi (Room C04), Sheffield S1 3JD
- 14 Sunnybrook Research Institute, Dr Graham Wright
Sunnybrook Research Institute, Schulich Heart Program, Rm M7-611 2075
Bayview Ave, Toronto M4N3M5, Canada
- 15 University Hospital Basel, Dr Claudia Cavelti-Weder
University Hospital Basel, Endocrinology / Diabetes, Petersgraben 4
Basel bs 4031, Switzerland
- 16 University of Sao Paulo, Dr Marcio Bittencourt
University of Sao Paulo, University Hospital Internal Medicine
Av. Lineu Prestes 2565, Sao Paulo SP 05508-000, Brazil
- 17 Yale University, Professor James Duncan
Yale University, Biomedical Engineering & Radiology, 300 Cedar Street
TAC - N309D, New Haven CT 06520, United States of America

Summary of research

Magnetic resonance imaging, ultrasound, cardiac function, cardiac structure, reference, cardiovascular risk

Application Lay Summary:

1a: Imaging of the heart and blood vessels is performed in a large subset of the UK Biobank cohort. Many measures defining the state of the heart and blood vessels can be derived from the images acquired. These measures are influenced by various health conditions and modifiable and non-modifiable factors, such as age, gender and ethnicity. The aim of this proposal is to describe the measures of the heart and blood vessel in the UK Biobank population and investigate how much modifiable and non-modifiable factors influence them. All new data will be made available for future research.

1b: Knowing the reference ranges for common imaging measures of the heart and circulation and how they are influenced by factors, such as age, gender, ethnicity, risk factors for heart attacks and strokes, is key for improving making diagnoses and predicting health outcomes.

1c: Descriptive statistics will be performed for all image derived phenotypes (IDPs) from the cardiovascular magnetic resonance (CMR) and carotid ultrasound images. We will perform subgroup analysis for important clinical factors, such as age, gender, cardiovascular risk, chronic conditions (e.g. Diabetes). We will apply descriptive statistics to a subpopulation considered "healthy without cardiovascular disease or presence of modifiable risk factors". Univariate and multivariate regression analysis will be used to assess relationships between IDPs and relevant co-variables. We will also assess intra- and inter-observer variability for IDP measurement when repeat analysis is available.

1d: Initial 5000 subjects from the imaging enhancement study.