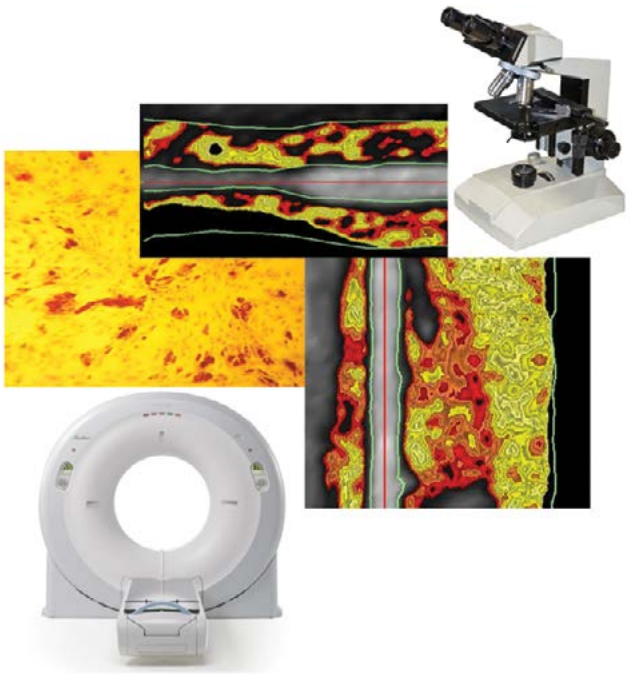
Inflammation Quantification for Cardiovascular Disease Risk Characterisation

An unconventional method uses common computerised tomography to detect vascular inflammation by tracking changes in the perivascular fat.

Coronary artery disease (CAD) is the most frequent cause of death in industrialised nations and it is responsible for billions of pounds of healthcare spending annually: in the EU alone, £169 billion is spent every year dealing with CAD.

The first sign of the disease in roughly 50% of men and 64% of women is a heart attack or death. There is therefore significant value in identifying apparently healthy individuals with 'at-risk' pathology.

Following our landmark discovery that inflammation in the coronary artery (the major driver of CAD development and subsequent heart attacks) drives changes in the surrounding fat, we have developed a non-invasive method for quantifying inflammation in the coronary artery.



The method uses coronary computerised tomography (CT) to estimate the changes in the size of fat cells around the arterial wall.

These changes are expressed as a single index, (the 'Fat Attenuation Index, (FAI), which provides an estimate of site-specific coronary inflammation. Non-invasive detection of vascular inflammation is the 'holy grail' of cardiovascular medicine, as it will significantly affect clinical practice by allowing early cardiovascular risk stratification of the population and deployment of therapeutic strategies to prevent CAD and heart attacks.

Currently protected by a patent application, our method offers major advantages over existing approaches for the diagnosis of vascular inflammation.

Following very positive commercial feedback, a multidisciplinary team funded by the UCSF scheme and led by Professor Antoniades, Professor Channon (both at the Division of Cardiovascular Medicine, Radcliffe Department of Medicine) and Professor Noble (Oxford Institute of Biomedical Engineering) is currently working on developing a stand-alone, automated and user-friendly software.

This will increase the commercial value and attractiveness of the method and allow further validation in large-scale clinical studies. Overall, we believe that the current method has the potential to deliver both health and wealth and revolutionise the ever-expanding market of non-invasive cardiovascular imaging.

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