

Presdisposition to common heart disease 'passed on from father to son'

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A common heart disease which kills thousands each year may be passed genetically from father to son, according to a study led by the University of Leicester.

A paper published in medical journal *The Lancet* today shows that the [Y chromosome](#), a part of DNA present only in men, plays a role in the inheritance of [coronary artery disease](#) (CAD).

The study, called Inheritance of coronary artery disease in men: an analysis of the role of the Y chromosome, was led by researchers at the University's Department of Cardiovascular Sciences and Department of Genetics. The research took four years to complete and was primarily funded by the British [Heart](#) Foundation.

It was also supported by the National Institute for Health Research, LEW Cart Charitable Fund, National Health and Medical Research Council of Australia, the European Union, and the Wellcome Trust.

Coronary artery disease is the name given to the narrowing of blood vessels delivering blood to the heart, meaning that not enough oxygen can reach it. This can lead to angina symptoms, such as constriction of the chest, and heart attacks.

The British Heart Foundation found that coronary artery disease, also known as [coronary heart disease](#), caused 88,236 deaths in 2008 in the United Kingdom, with 49,665 deaths among men and 38,571 among

women.

The team at the University of Leicester analysed DNA from over 3,000 men from British Heart Foundation Family Heart Study (BHF-FHS) and the West of Scotland Coronary Prevention Study (WOSCOPS).

They found that 90 per cent of British Y chromosomes belong to one of two major groups – named haplogroup I and haplogroup R1b1b2.

The risk of coronary artery disease among men who carry a Y chromosome from haplogroup I is 50 per cent higher than other men, and the risk is independent of traditional risk factors such as high cholesterol, high blood pressure and smoking.

The researchers believe the increased risk is down to the haplogroup I's influence on the immune system and inflammation – how our bodies respond to infections.

Principal investigator Dr Maciej Tomaszewski, a clinical senior lecturer at the University's Department of Cardiovascular Sciences, said: "We are very excited about these findings as they put the Y chromosome on the map of genetic susceptibility to [coronary artery](#) disease. We wish to further analyse the human Y chromosome to find specific genes and variants that drive this association.

"The major novelty of these findings is that the human Y chromosome appears to play a role in the cardiovascular system beyond its traditionally perceived determination of male sex.

"The University of Leicester has been at the forefront of genetic research for many years. The success of this study builds up on excellence of support for genetic studies in the Department of Cardiovascular Sciences and the Leicester Cardiovascular Biomedical

Research Unit."

The project also included researchers from King's College, London, the University of Glasgow, the University of Leeds, the Wellcome Trust Sanger Institute, Cambridge, the University of Cambridge, the University of Ballarat and the Garvan Institute for Medical Research in Australia, the University of Lübeck and the University of Regensburg in Germany and the Marie Curie University and Medical School in Paris, France.

Provided by University of Leicester

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