Genetic markers to identify potential heart attack victims discovered

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An international team of researchers led by the Universities of Leicester and Cambridge in the UK has discovered genetic markers that identify people at risk of clot formation and heart attacks.

The study was funded in part by the BLOODOMICS ('Identification of risk genes for atherothrombosis in coronary artery disease by transcriptome and proteome analysis and high-throughput exon resequencing') project. The results, published in the journal *Blood*, could provide potential therapeutic targets for the treatment of cardiovascular disease.

Coronary heart disease is the most common form of disease affecting

the heart and is an important cause of premature death. Professors Alison Goodall from the University of Leicester and Willem Ouwehand from the University of Cambridge and the National Health Service Blood and Transplant (NHSBT), along with their colleagues, studied the novel genes that regulate platelets, the tiny cells in the blood that stick together to form a blood clot. They aimed to discover what makes these cells stickier in some people than in others.

"We have long known that platelet activity and clot formation varied between different people - but we now have identified some of the genetic reasons for this," said Professor Goodall, the lead author of the paper.

Professor Ouwehand pointed out that the research had uncovered a new molecule that plays an important role in platelets. "Studies in large number of NHS patients who experienced a heart attack and healthy controls suggests that genetic differences in the gene for this protein slightly modifies the risk for blood clots," Professor Ouwehand said. "This type of study will help us to unravel the complex question why some people have a higher risk of a heart attack than others." He noted that "one day this type of research may lead to a new generation of drugs that can be used to reduce the risk of this devastating disease."

Coronary artery disease and atherothrombosis kills more people in Europe than any other disease. In total, 600,000 people are diagnosed with myocardial infarction (Ml) every year, and 50% of these cases are fatal. Many survivors experience a reduction in quality of life. The project team found that long-term aspirin provides a cheap approach to the prevention of Ml, but its use is associated with unacceptable side effects, hence the need for the identification of markers to detect individuals at risk of these diseases.

However, such markers are not currently available. 'The completion of

the human genome sequence and high-throughput sequencing and typing of single nucleotide polymorphisms, together with new technologies provide a unique opportunity for their identification,' according to the research team. The development of better drugs for the prevention and treatment of these diseases will also be facilitated by "a greater understanding of the mechanisms of platelet interaction with the damaged vessel wall and with other blood cells."

More information: Goodall, A.H., et al. (2010) Transcription profiling in human platelets reveals LRRFIP1 as a novel protein regulating platelet function. *Blood*, 116: 4646-4656. DOI: 10.1182/blood-2010-04-280925

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