

Genes that protect against atherosclerosis identified

March 14 2008

One way of combating atherosclerosis is to reduce levels of “bad cholesterol” in the blood. Scientists at the Swedish medical university Karolinska Institutet have now identified the genes that bring about this beneficial effect.

In a new study on mice, which is presented in the open-access journal PLoS Genetics, the research group has shown that the accumulation of the plaque that causes myocardial infarction and stroke can be prevented if levels of the “bad” LDL cholesterol are reduced before atherosclerotic plaque has progressed beyond a particular point. The group has also identified a network of 37 genes that lowers levels of blood cholesterol and brings about the beneficial effect.

“Previously, much atherosclerosis research was focused on identifying ways to stabilise the most dangerous plaques in order to prevent them rupturing and causing myocardial infarction or stroke,” says Associate Professor Johan Björkegren, who has led the study. “Our discovery means that we can now target the actual development of dangerous plaques.”

Rather than covering individual vessel wall genes, their discovery encompasses a network of genes, and one that explains their mutual interaction. It is on account of years of network algorithm development under Jesper Tegnér, professor of computational biology, that the discovery of gene networks has been made possible.

“The time when individual genes or gene pathways were thought to explain the development of complex common diseases, such as atherosclerosis, is past,” says Dr Björkegren. “We now have enough tools and knowledge of system biology to take on the total complexity of these diseases.”

Atherosclerosis is the main cause of myocardial infarction and stroke, which cause almost half of all deaths in Sweden and other countries in the West.

Publication: ‘Transcriptional Profiling Uncovers a Network of Cholesterol-Responsive Atherosclerosis Target Genes’, Josefin Skogsberg, Jesper Lundström, Alexander Kovacs, Roland Nilsson, Peri Noori, Shohreh Maleki, Marina Köhler, Anders Hamsten, Jesper Tegnér, Johan Björkegren, *PLoS Genetics*, 14 March 2008.

www.plosgenetics.org/doi/pgen.1000036

Source: Karolinska Institutet

Citation: Genes that protect against atherosclerosis identified (2008, March 14) retrieved 19 April 2024 from <https://medicalxpress.com/news/2008-03-genes-atherosclerosis.html>

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