

New cell therapy a promising atherosclerosis treatment

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Researchers at Karolinska Institutet have shown in a new study on mice, that cell therapy can be used to reverse the effect of 'bad' LDL cholesterol and reduce the inflammation that leads to atherosclerosis. The new cell therapy, which is presented in the prestigious scientific journal *Circulation*, can open the way for new therapies for stroke and myocardial infarction if the results prove translatable to humans.

Atherosclerosis is a chronic inflammation of the blood vessels. [Cholesterol](#) is transported in the blood in particles called LDL ('bad' cholesterol) that can accumulate in the vessel walls. This triggers the body's [immune system](#) to react against LDL, which then cause inflammation in the vessels, and eventually thrombus formation. If such a thrombus forms in the [coronary artery](#), the patient suffers a [myocardial infarction](#); if it forms in the [brain](#), a [stroke](#) can result.

The research group, under the direction of Professor Göran K Hansson at the Centre for Molecular Medicine, have developed a cell therapy that selectively dampens vascular inflammation induced by LDL. The therapy makes use of dendritic cells, which are characterized by a high degree of plasticity that renders them amenable to manipulation.

"With the appropriate treatment, dendritic cells can be made to inhibit rather than aggravate the inflammation around the LDL particles in the blood vessels," says Dr Andreas Hermansson, one of the researchers conducting the study. "A major advantage of this is that we can devise a treatment for vascular diseases that is highly specific."

The mouse studies now presented in *Circulation* have demonstrated substantial protective effects of the treatment, with a reduction of the atherosclerosis process of up around 70 percent. Last year, the researchers published results showing that antibodies recognizing the receptors that drive the immune reaction have protective effects, and now the same group is presenting a cell therapy that is at least as efficacious. It is hoped that this will pave the way for a completely new generation of selective anti-inflammatory therapies for cardiovascular disease.

"Treatments of atherosclerosis have traditionally targeted blood lipids, but a large proportion of treated patients still suffer life-threatening infarctions and stroke," says Professor Hansson. "We're now looking at the possibility of getting to the root of the problem and re-set, so to speak, the immune system's reaction to LDL, since it often has devastating consequences."

More information: "Immunotherapy with tolerogenic apolipoprotein B-100 loaded dendritic cells attenuates atherosclerosis in hypercholesterolemic mice", Andreas Hermansson, Daniel Johansson, Daniel F.J. Ketelhuth, John Andersson, Xinghua Zhou & Göran K. Hansson, *Circulation*, 28 February 2011; 123; 1083-1091. circ.ahajournals.org/

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