The protein concentrate APOSEC, obtained from white blood cells, when given intravenously 40 minutes after an acute myocardial infarction, largely prevents scarring of the cardiac muscle. These were the findings of Hendrik Jan Ankersmit, Head of the Christian Doppler Laboratory for Diagnosis and Regeneration in Cardiac and Thoracic Diseases at the MedUni Vienna, which were unveiled back in the autumn of 2011. A study by a team of researchers led by Ankersmit has now unravelled further mechanisms responsible for how APOSEC works.

A lack of oxygen, due to inflammation and "sticking" of the incoming blood supply caused by platelets in the blood can lead to microvascular obstruction (MVO) in the tissue of the affected organ. In ischaemic...
conditions (such as myocardial infarctions, strokes, etc.), an additional
drug treatment that combines the effects of vasodilation, platelet
aggregation inhibition and immunomodulation would be ideal.

"Through fundamental research, we have demonstrated that APOSEC
triggers several of these protective mechanisms at once. APOSEC
contains, among others, nitrogen monoxide (NO), which is responsible
for the vasodilating and platelet aggregation inhibiting effect after an
acute myocardial infarction. In collaboration with the working groups
led by Prof. Mariann Gyöngyösi (Cardiology, MedUni Vienna) and Prof.
Ivo Volf (Medical Physiology, MedUni Vienna), we have been able to
demonstrate in large animal experiments that ECG changes in animals
treated with APOSEC resolved and the signs of MVO were prevented."

APOSEC is a product containing soluble proteins that are excreted by
white blood cells after they are irradiated. The recovery of white blood
cells as 'bio-reactors' is simple and can be compared in terms of effort to
a regular blood donation. The product can be produced in advance and is
easily available if the worst happens. A GMP facility is currently being
set up in collaboration with the Red Cross's Blood Donation Centre in
Linz (Dr. Christian Gabriel) to manufacture this "biological" under good
manufacturing practice (GMP) conditions.

As part of his PhD thesis, Dr. Konrad Hoetzenecker from the
Department of Thoracic Surgery was also able to demonstrate that
APOSEC has an immunosuppressive effect in an experimental cardiac
muscle inflammation model. Working with Prof. Urs Eriksson from the
University of Zürich, it was possible to demonstrate that CD4-positive T
cells are forced under the influence of Caspase-8 to undergo
programmed cell death (apoptosis). This explains a further fundamental
scientific aspect of the effect of APOSEC.

More information: "Secretome of apoptotic peripheral blood cells

Provided by Medical University of Vienna

Citation: Treatment of heart attacks with APOSEC: further mechanism unravelled (2012, August 28) retrieved 22 January 2024 from https://medicalxpress.com/news/2012-08-treatment-heart-aposec-mechanism-unravelled.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.