ImmunoTools IT-Box-Cy55M-Award 2013

Christian Hiepen

PhD Supervisor: Prof. Dr. Petra Knaus

Institut für Chemie und Biochemie
Freie Universität Berlin, Thielalle 63, 14195 Berlin

Fine tuning of BMP signal transduction "in Atherosclerosis"

Bone Morphogenetic Proteins (BMPs) are major extracellular cytokines involved in the development of bone and other tissues. Current research identified deregulated BMP signalling to occur in diseases of large human vessels, such as atherosclerosis of the human coronary artery. Here, a plug called atheroma forms within the vessel lumen causing a stenosis which eventually leads to heart attack because blood flow and oxygen supply becomes interrupted. It has been suggested that BMPs and their signalling pathways play a leading role in formation of theses large vessel defects through induction of endothelial and smooth muscle cell proliferation, migration and calcification. However, the precise molecular mechanisms behind these cellular responses are unknown. We aim to identify the underlying signalling mechanisms by use of primary human endothelial cell cultures. To create a pro-atherosclerotic environment that may change endothelial responsiveness to BMPs, the cytokines and growth factors provided in IT-BoxCy55M are a very useful tool. As such, recombinant CSF but also IL1,2,3,6,7 have already be found up-regulated in early phases of large vessel diseases. In case of award winning, we would apply a combination of different pro-inflammatory cytokines from IT-Box Cy55M to trigger endothelial responsiveness to BMPs. Additional stimulation with BMPs will then be analysed by Western Blotting, qRTPCR and reporter gene assays. By this, we aim to proof that atherosclerosis is triggered trough a pro-inflammaotry response of endothelial cells, in combination with deregulation of BMP signal transduction. The overall knowledge could be used in the clinic or pharma industry to design novel atherosclerosis therapies.

ImmunoTools IT-Box-Cy55M for Christian Hiepen includes 55 recombinant cytokines

rm EGF, rm Eotaxin / CCL11, rm FGF-a / FGF-1, rm FGF-b / FGF-2, rm FGF-8, rm Flt3L / CD135, rm G-CSF, rm GM-CSF, rm GRO-a / CXCL1, rm GRO-b / CXCL2, rm IFNgamma, rm IL-1alpha, rm IL-1beta, rm IL-2, rmIL-3, rm IL-4, rm IL-5, rm IL-6, rm IL-7, rm IL-9, rm IL-10, rm IL-11, rm IL-13, rm IL-15, rm IL-16, rm IL-17A, rm IL-17C, rm IL-17F, rm IL-19, rm IL-20, rm IL-21, rm IL-22, rm IL-25 / IL-17E, rm IL-27, rm IL-31, rm IL-33, rm IP-10 / CXCL10, rm LIF, rm MCP1 / CCL2, rm M-CSF, rm MIP-1α/ CCL3, rm MIP-1β / CCL4, rm MIP3α / CCL20, rm MIP3β / CCL19, rm NGF-beta, rm PDGF-AA, rm PDGF-BB, rm RANTES / CCL5, rm sCD40L / CD154, rm SCF, rm SDF-1α / CXCL12a, rm SDF-1β / CXCL12b, rm TNFα, rm TPO, rm VEGF DETAILS