

Portuguese scientists discover new mechanism that regulates formation of blood vessels

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Researchers in one of the external groups of the Instituto Gulbenkian de Ciência (IGC), in Portugal, have discovered a novel mechanism which regulates the process whereby new blood vessels are formed and wounds heal, including chronic wounds, such as those found in diabetic patients and those suffering from morbid obesity. These findings, by Sérgio Dias and his team, are to appear in the new issue of the journal *PLoS ONE*, and have implications for the development of new therapeutic approaches to healing damaged blood vessels and building new ones.

Working at the Centro de Investigação e Patobiologia Molecular of the Portuguese Institute of Oncology Francisco Gentil, in Lisbon, the team showed that the cells that make new blood vessels (called endothelial cells) are stimulated by an intracellular signalling pathway, mediated by the protein Notch.

The formation of new blood vessels is a crucial step in wound healing: the newly-formed vessels allow anti-inflammatory proteins to reach the wound site, improve oxygenation of the damaged tissue and carry essential nutrients for the re-structuring of the tissue, that is, the skin.

According to Francisco Caiado, a PhD student at the IGC, and first author of this study, "We knew that the endothelial cells are stimulated by cells originating in the bone-marrow, the so-called bone-marrow derived precursor cells. We have now shown that the actual stimulus

happens through the Notch protein, found on the bone-marrow derived cells. Upon activation, Notch promotes the adhesion of the precursor cells to the site of the lesion, where they stimulate the endothelial cells to make new blood vessels".

Chronic skin wounds are an increasing medical problem, since they are commonly found in diabetic patients and in those suffering from morbid obesity. Diabetic patients may develop "diabetic foot", a condition whereby wounds do not heal leading, in the most severe cases, to amputation.

Source: Instituto Gulbenkian de Ciencia

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