

Anti-VEGF treatment shows therapeutic benefits in a mouse model for psoriasis

Madrid, 7th December 2009 - The journal *P.N.A.S. (Proceedings of the National Academy of Sciences U.S.A.)* publishes today a featured article by Helia Schonthaler et al. showing, for the first time, that blocking VEGF could be an effective treatment for the skin disease psoriasis. When injecting an anti-VEGF antibody in a mouse model for psoriasis, the authors saw a substantial amelioration in the psoriasis-like symptoms. This suggests that a treatment with anti-VEGF antibodies, which are already approved to treat cancer, could also be used to help psoriasis patients.

Psoriasis is a common inflammatory skin disease that affects 2% of the global population. It is characterized by recurring patches of inflamed, itchy and scaly skin, which cause mild to severe pain that disrupts daily life. There is currently no cure for psoriasis and its causes are still poorly understood, but are believed to involve a complex mix of environmental and genetic factors.

It was shown that the formation of blood vessel (angiogenesis) and their remodeling are important events in psoriasis. The protein *vascular endothelial growth factor (VEGF)* plays a critical role in blood vessel formation and is present at high levels in psoriatic patches in the skin of human patients. Moreover, systemic levels of VEGF, i.e. the amount of VEGF in the patients' blood, seem to be higher the more severe the disease is.

The *Genes, Development and Disease Group* from the *BBVA Foundation-CNIO Cancer Cell Biology Programme*, headed by Erwin Wagner, used for this study the mouse model for psoriasis previously established by the Wagner group (Zenz, R. *et al.*, *Nature* 2005). To test whether blocking VEGF with an antibody could reduce the severity of the disease, these mice were injection with anti-VEGF antibodies, when the disease was already visible (in collaboration

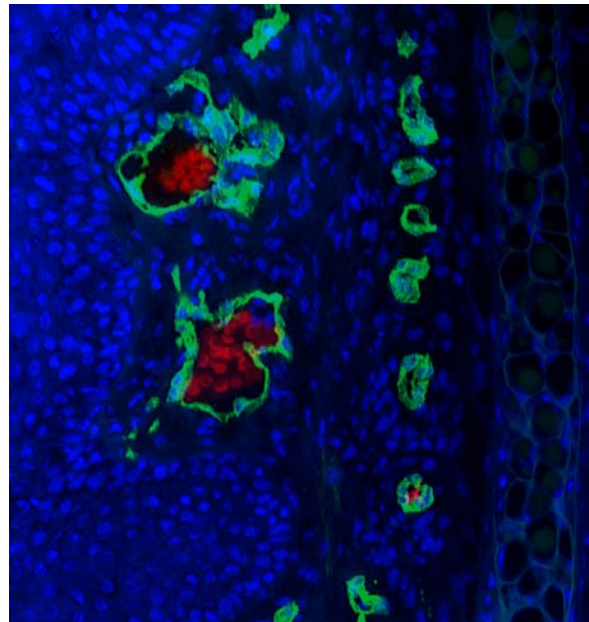


Fig. 1 Enlarged blood vessels in psoriasis-like inflamed mouse skin. Cells lining the blood vessels are stained in green, nuclei are stained in blue by DAPI and erythrocytes appear in red due to their autofluorescence.

with Michael Detmar, ETH Zurich). This treatment dramatically reduced the psoriasis-like symptoms and resulted in almost normal epidermal architecture as well as a reduced size and number of blood vessels. The authors speculate that the anti-VEGF antibody blocks VEGF's ability to induce angiogenesis and to attract immune cells, which is one of the underlying triggers for psoriasis.

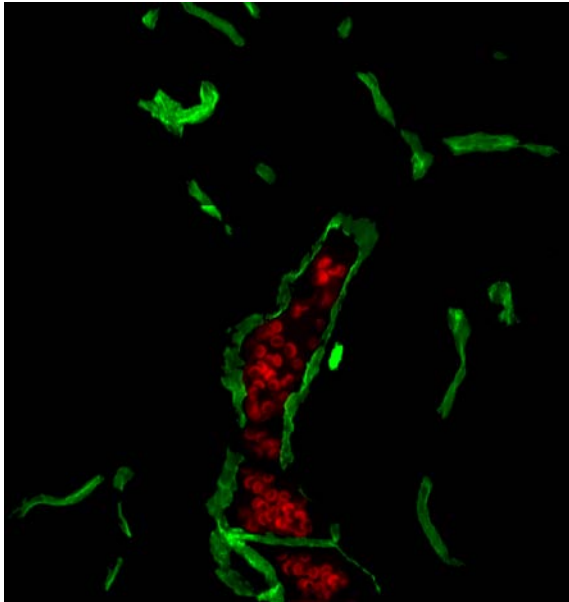


Fig. 2 **Increased number of blood vessels in inflamed skin in a mouse model for psoriasis.** Endothelial cells are stained in green, and erythrocytes appear in red due to their autofluorescence.

These results suggest that anti-angiogenic therapies may also be useful for treating other types of inflammatory diseases. In this context it is interesting to note that the Wagner group has recently identified a novel molecular pathway, which could be exploited for new targets to treat inflammatory skin diseases (see Guinea-Viniegra, J *et al.*, *Genes and Development*, 2009 and <http://www.cnio.es/es/news/docs/juan-guinea-viniegra-genes-development-16nov09-es.pdf>). Antibodies to block VEGF are already used to treat cancer patients, where they prevent blood vessel formation in growing tumours. These different approaches provide possible new avenues for therapeutic interventions in psoriasis, inflammatory skin diseases and cancer.

Systemic anti-VEGF treatment strongly reduces skin inflammation in a mouse model of psoriasis. Helia B. Schonhaler, Reto Huggenberger, Stefanie K. Wculek, Michael Detmar, and Erwin F. Wagner, *PNAS published online before print December 7, 2009*, doi:10.1073/pnas.0907550106

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