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Subject: epo

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Erythropoietin promotes hair shaft growth in cultured human hair follicles and modulates hair growth in mice.

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Abstract

**BACKGROUND:** Recent studies have shown that erythropoietin (EPO)/erythropoietin receptor (EPOR) signaling exist in both human and mouse hair follicles (HFs). **OBJECTIVE:** To investigate whether dermal papilla cells (DPCs) express functional EPOR and, if so, to investigate effects of EPO on hair shaft growth in cultured human scalp hair follicles and hair growth in mice.

**METHODS:** EPOR expression in DPCs and follicular keratinocytes was examined by RT-PCR and immunoblot. Phosphorylation of EPOR signaling pathway mediators by EPO treatment was examined by immunoblot. MTT assay was employed to check cell viability after EPO treatment. Hair shaft growth was measured in the absence or presence of EPO and matrix keratinocyte proliferation was examined by Ki-67 immunostaining in cultured hair follicles. Agarose beads containing EPO were implanted into dorsal skin of C57BL/6 mice to examine effects of EPO on hair growth in vivo. **RESULTS:** EPOR mRNA and protein are expressed in cultured human DPCs. EPOR signaling pathway mediators such as EPOR and Akt are phosphorylated by EPO in DPCs. EPO significantly promoted the growth of DPCs and elongated hair shafts with increased proliferation of matrix keratinocytes in cultured human hair follicles. In addition, EPO not only promoted anagen induction from telogen but also prolonged anagen phase. **CONCLUSIONS:** EPO may modulate hair growth by stimulating DPCs that express functional EPOR. Copyright © 2010 Japanese Society for Investigative Dermatology. Published by Elsevier Ireland Ltd. All rights reserved.

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