Summary

Psoriasis is a common skin disease involving keratinocyte hyperproliferation and altered differentiation, as well as T-cell activation. A large group of genes dysregulated on transcriptional level in psoriasis is related to fatty acid signalling and adipocyte differentiation, exhibiting a pattern consistent with the activation of peroxisome proliferator activated receptor delta (PPARδ). PPARδ itself is strongly induced in psoriasis *in vivo*. A detailed study of PPARδ expression *in vitro* as well as its subcellular distribution in cultured primary human keratinocytes showed that PPARδ was not uniformly overexpressed in psoriasis-derived keratinocytes and that neither its expression nor its subcellular distribution is dependent on ligand binding. In primary keratinocytes, PPARδ was induced by the transcription factor AP1, in particular by junB, but not by canonical WNT signalling, in contrast to its regulation in colon carcinoma cells. Activation of PPARδ enhanced proliferation of keratinocytes, while this was inhibited by knock-down of PPARδ. Lentiviral-based knock-down of PPARδ or its activation with specific synthetic ligand, as a complementary approach, allowed the identification of heparin-binding EGF-like growth factor (HB-EGF) as a direct target gene of PPARδ. In order to examine PPARδ function *in vivo,* a lentiviral vector containing constitutive active mouse PPARδ under the control of inducible promoter was engineered.