Synopsis of Original Research Paper

The effects of dickkopf 1 (which is an inhibitor of Wnt signaling pathway and is highly expressed in palmoplantar areas) on anti-aging (including the regulation of pigmentation, hair follicles and skin regeneration)

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Palmoplantar skin, which stands for palms of the hands and soles of the feet, is generally hypo-pigmented compared with non-palmoplantar skin on the rest of the body. We have been hypothesizing that palmoplantar skin phenotype derives from the dermal fibroblasts, which influence overlying epithelium. We have proved that cultured fibroblasts derived from palmoplantar skin express higher levels of dickkopf1 (DKK1), which is an inhibitor of Wnt signalling, than those derived from non-palmoplantar skin at the RNA level measured by RT-PCR and at the protein level by Western blotting and immunocytochemistry. We also proved that DKK1 suppresses melanocyte growth and differentiation through the Wnt/β-catenin/MITF pathway. DKK1 also suppresses melanin uptake by epidermal keratinocytes via PAR2, which explains why DKK1 causes hypo-pigmentation in three dimensional skin equivalents. Additionally, DKK1 increases the growth of keratinocytes via the induction of αKLEIP and keratin 9. Male type baldness is associated with higher DKK1 expression levels. In this study, we evaluated the expression patterns of DKK1 between palmoplantar skin and non-palmoplantar skin *in vivo*. Western blotting and immunohistochemistry indicate that the expression of DKK1 is upregulated in palmoplantar skin compared with non-palmoplantar skin *in vivo*. We conclude that the expression of DKK1 is upregulated *in vivo*, thus maintaining the homeostasis of palmoplantar skin, which is non-hair bearing, thick and hypopigmented skin. Further studies will focus on the effect of DKK1 on anti-aging.