

Topical application of St John's wort (*Hypericum perforatum* L.) and of its metabolite hyperforin inhibits the allostimulatory capacity of epidermal cells

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St John's wort (*Hypericum perforatum*) is a traditional herbal medicine that is used for the topical treatment of superficial wounds, burns and dermatitis. The characteristic metabolites of St John's wort are the photodynamic active plant pigment hypericin and the phloroglucin-derivative hyperforin. To date, no studies on immunomodulatory properties of topical preparations of St John's wort have been performed. Here, we investigated the alloantigen presenting function of human epidermal cells (EC) exposed to *Hypericum* ointment *in vivo* in a mixed EC lymphocyte reaction (MECLR). The effect of *Hypericum* ointment was compared with the immunosuppressive effect of solar-simulated radiation (SSR). Subsequently, we tested purified hyperforin *in vivo* and *in vitro* in a MECLR to evaluate its possible contribution to the effect of the *Hypericum* ointment. Furthermore, we assessed the effect of hyperforin on the proliferation of peripheral blood mononuclear cells (PBMC) *in vitro*. Compared with untreated skin, treatment with *Hypericum* ointment resulted in a significant suppression of the MECLR ($P \leq 0.001$) that was similar to the effect of SSR. The combination of *Hypericum* ointment plus SSR was not significantly different from either treatment alone. EC isolated from skin treated with the hyperforin containing ointment also showed a reduced capacity to stimulate the proliferation of allogeneic T cells ($P \leq 0.001$). Similarly, *in vitro* incubation of EC with hyperforin suppressed the proliferation of alloreactive T cells ($P \leq 0.001$). Furthermore, hyperforin inhibited the proliferation of PBMC in a dose-dependent manner, without displaying pronounced toxic effects as determined by Trypan blue staining. The results demonstrate an inhibitory effect of *Hypericum* extract and of its metabolite hyperforin on the MECLR and on the proliferation of T lymphocytes that may provide a rationale for the traditional treatment of inflammatory skin disorders with *Hypericum* extracts