Molecular Pharmacology (USA) Limited

A novel topical anti-cytokine cream effective in sun burn recovery

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INTRODUCTION

Thermalife Cream (AUSTR 27419), an anti-arthritic biological product, has been successfully used off-label for sun burn recovery. A novel product (MPL-104), derived from Thermalife, was assessed on its therapeutic potential in oxsoralen-UVB burns. As a possible mechanism for the sunburn efficacy, suppression of TNF-α and IL-1β production by human monocytes was assessed *in vitro*.

METHOD

Sunburn: Four sites were marked on the arm of the subject. Three sites were exposed to oxsoralen (1%) plus UVA/UVB light, one site was exposed to oxsoralen only. MPL-104 cream was applied at 5min, or at 4hrs after injury. A third injury site was not treated. Photographs were taken before, 24hrs, and 7weeks after injury.

In vitro cytokine suppression: Human monocyte cultures (10% FCS, 5% CO^2) were either stimulated with 500ng/ml LPS (E.coli 0111:B4) or not in the presence of 0% or 10% MPL-104. 24Hrs after incubation, culture media was collected, centrifuged, and assayed (cytokine ELISA).

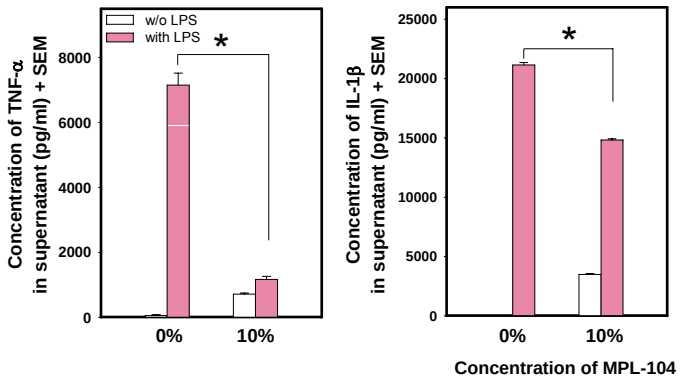

Fig.1: Suppression of TNF-α (left panel) and IL1β secretion (right panel) in LPS-challenged human monocytes, measured in triplicate, 24hrs after treatment with 0% (control) or 10% of MPL-104, a Thermalife follow-up product.

Fig.2: Photographs showing efficacy of MPL-104, a product derived from Thermalife, on the recovery after oxsoralen enhanced UVA/UVB burns. MPL-104 cream was applied at 5min, or 4hrs after the burn. The control site was exposed to oxsoralen and UV only, no cream was applied. Injury sites were inspected at 24hrs and 7 weeks post injury. As can be seen from the pictures, MPL-104 reduced erythema, edema, tissue damage, and scarring.

RESULTS

Sun burn assessment: At 24hrs after oxsoralen-UV, the 5min treatment site showed slight erythema, the 4hr treatment site had pronounced erythema and slight blister formation, whereas the untreated site had pronounced erythema and strong blister formation.

Seven weeks post-injury, the 5min site was normal, the 4hr site was a dark colour, whereas the untreated site had a significant scar. Oxsoralen alone had no effect on the skin.

In vitro cytokine suppression: MPL-104 (10%) suppressed LPS-induced TNF-α ($p<0.001$) and IL1β secretion ($p<0.05$) by 71.1% and 48.7%, respectively.

CONCLUSION

MPL-104, a novel product derived from the anti-arthritic cream Thermalife, reduced erythema, edema, tissue damage, and scarring after oxsoralen-enhanced UVA/UVB burns. This efficacy is likely to be related to suppression of cytokines, as MPL-104 reduced the secretion of TNF-α and IL1*β* in LPS-stimulated monocytes.