Signal deficiency of melanocortin-1 receptor augments extent of skin infection induced by *S. aureus*

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Introduction

The melanocortin-1 receptor (MC1R) is crucially involved in skin melanin pigmentation in a variety of vertebrate species. It is a G protein-coupled receptor with 7 transmembrane domains and binds melanocortins such as alpha-melanocyte-stimulating hormone with high affinity. Despite its physiological role in skin pigmentation there is ample evidence that α -MSH has additional biological effects including immunomodulation, the latter often mediated by MC1R. However, the role of MC1R in cutaneous infection has not been investigated to the best of our knowledge. Here, we examined the impact of MC1R deficiency in a mouse model for cutaneous infection.

Methods

Mice were intradermally injected on the right and left flanks with 10^7 colony forming units of *S. aureus* (strain SH100,

Results

Increased skin lesion size in **Mc1r^{e/e}** mice compared to WT mice

Fig.1: Skin lesion size of C57BL/6 WT ($n = 5$) and **Mc1r^{e/e}** ($n = 5$) mice after i.d. inoculation with *S. aureus*. * $p < 0.05$ versus WT

Higher bacterial loads in lesional skin of **Mc1r^{e/e}** mice compared to WT mice

Fig.2: Representative immunofluorescence staining of *S. aureus* infected-skin from C57BL/6 WT and **Mc1r^{e/e}** mice with anti-*S. aureus* antibody at day 6 post infection (A). Quantitative real-time PCR of nusA and sigA mRNA expression, two established markers for *S. aureus*, in lesional skin at days 6 post infection (B).

Conclusion

Our preliminary findings indicate that MC1R could be involved in controlling both the extent of infection and subsequent immune response of the skin to *S. aureus*.

Reduced release of cutaneous pro-inflammatory cytokines in **Mc1r^{e/e}** mice compared to WT mice

Fig.3: Quantitative real-time PCR of IL-6, IL-17a, IL-8 and IL- β mRNA expression in lesional skin at days 6 post infection. * $p < 0.05$ versus WT

Reduced number of neutrophils infiltrates, activated macrophages and regulatory T cells in lesional skin of **Mc1r^{e/e}** mice compared to WT mice

Fig.5: Quantitative real-time PCR of Ly6C and CD11b mRNA expression in lesional skin at days 6 post infection. * $p < 0.05$ versus WT(A). Flow cytometric analysis of the expression levels of cell markers (CD25,Foxp3,F4/80 and CD11b) at day 6 post infection (B).