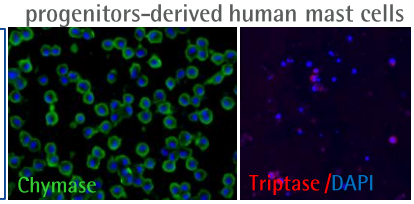
Investigating the effect of mast cell stabilizers *in vitro* and *ex vivo*

Mast cells are important regulators of epidermal barrier function and skin homeostasis as well as known key players in type I allergic reactions. Here, their activation results in histamine release causing dermatological symptoms including hives, itching or atopic eczema (Voss et al., Int J Mol Sci. 2021). Notably, the vast majority of topical skin care products still contains ingredients causing irritations in sensitive skin due to enhanced mast cell activity. Therefore, the major challenge for the development of topical cosmeceuticals is to balance physiologically relevant mast cell function and their pathological over activation.

Claim substantiation:
anti-irritant
anti-inflammatory
anti-redness
anti-aging

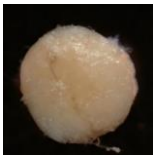
Our methods

In vitro culture of hematopoietic blood progenitors-derived human mast cells



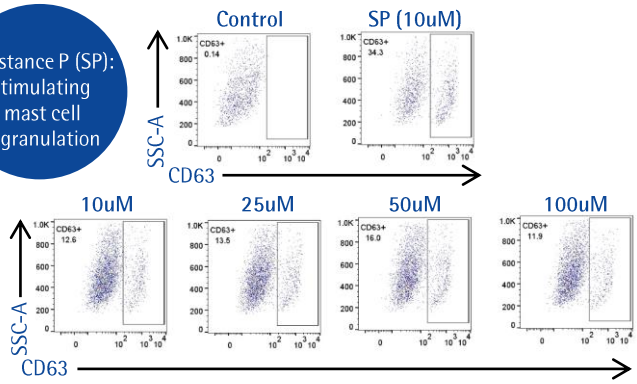
Amputated hair follicle organ culture

Skin organ culture

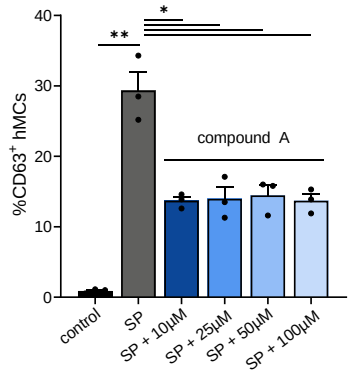


Compound A inhibits substance P-induced mast cell degranulation *in vitro*

Substance P (SP): Stimulating mast cell degranulation



Representative plots of FACS analysis; CD63: marker of mast cell activation; SP = Substance P.

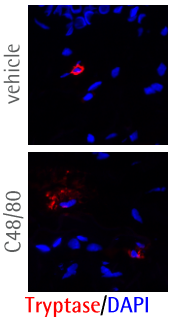


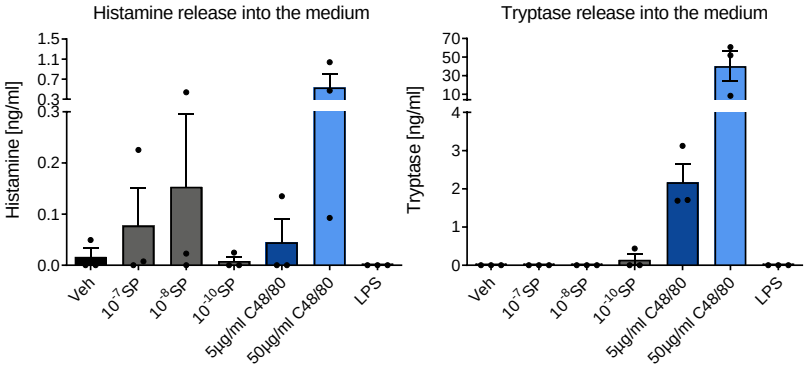
Mean±SEM. *P<0.05, **P<0.01; CD63: marker of mast cell activation; SP = Substance P.

Read-outs:
degranulation, cytokine secretion, proteases release, leukotrienes and prostaglandins secretion, mast cell viability, mast cell chemotaxis, co-culture systems, modulation of membrane receptor expression; compound interference with mast cell degranulation & activation (induced by SP, C48/80, LPS, IFNγ,...

Selected publications:
Lu et al., Exp Dermatol 2007; Gherardini et al., Int J Cosm Sci 2019; Langan et al., Exp Dermatol 2015

NEW: Release of mast cell mediators into the medium during organ culture (fast screening of compounds)

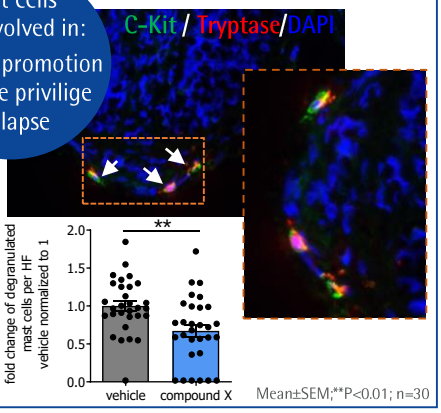




Mast cell activation/ degranulation: Substance P (SP), complement Compound 48/80 (C48/80), lipopolysaccharide (LPS; cytokine release only)

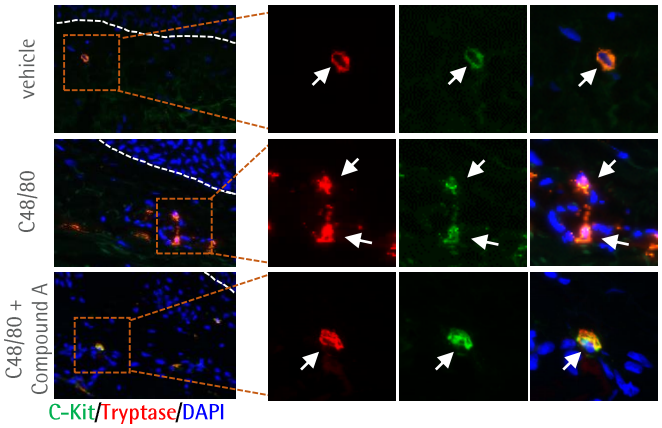
Similar read-out parameters available for *ex vivo* human hair follicle organ cultures

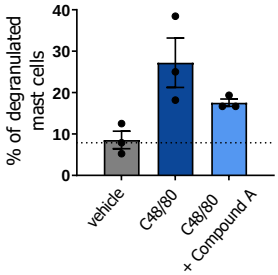
mast cells are involved in:
-catagen promotion
- immune privilige collapse



Mean±SEM;**P<0.01; n=30

Compound A prevents mast cells from C48/80 induced degranulation in human skin organ cultures *ex vivo*





Mean±SEM. n=3 technical replicates from one healthy donor with 4 sections from each,

In vehicle treated, *ex vivo* skin organ cultures, granules are restricted to the cytoplasm of mast cells (upper part); C48/80 treatment causes degranulation into the tissue (middel part); this is rescued by application of Compound A (lower part).

Contact us for a customized study:

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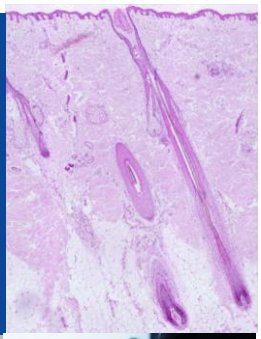

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