BioMedical
EMPORIUM

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FACIAL CLEANSER

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COSMECEUTICAL SIGNIFICANCE

Salicylic acid softens the stratum corneum (SC), while also dissolving desmosomes at a rapid pace. This results in a reduction of the adhesion between corneocytes, leading to the exfoliation of corneocyte sheets. Hence, the topical application of salicylic acid presents comedolytic properties and promotes dermal cellular turnover. Additionally, salicylic acid is lipophilic which allows easy permeation into the sebaceous glands. This results in the antagonism of hyperseborrhea, which in turn can produce a curative effect. Furthermore, salicylic acid contains well-known recognized anti-inflammatory properties, suitable for soothing inflamed skin by reducing facial erythema. This is particularly important when aiming to improve acne, where four pathogenic factors contribute to acne formation: increased sebum production, hyperkeratinization of follicular keratinocytes, colonization of P acnes, and inflammatory skin events.

Menthol is added to the BioMedical Emporium Facial Cleanser to improve dermal penetration of salicylic acid by stimulating skin nociceptors and initiating an axon reflex with the subsequent release of vasodilator peptides.

Therefore, this counteracts the vasoconstrictive effects of salicylic acid to improve its dermal penetration. Moreover, the literature also attributes the dermal penetration-enhancing effects of menthol to mechanisms such as lipid packing disruption and generation of eutectic mixtures.

A cleanser should provide a balance between removing unwanted substances from the skin surface and minimizing damage to the skin barrier. Hence, a gel-based cleanser like the BioMedical Emporium Facial Cleanser is not considered ideal for dry skin since this can compromise the integrity of the dermal barrier with further dehydration and stripping of skin sebum. In contrast, oily skin and acne-prone skin types greatly benefit from including gel-based cleansers in their skincare routines. Moreover, the soothing, cooling sensation created by a menthol-containing gel cleanser is ideal for the hot summer months whereas a cream-based, hydrating cleanser can be reserved for the cold winter months.

THE EFFECTS OF SALICYLIC ACID AND MENTHOL ON THE SKIN

Impact on skin: Salicylic acid

Cosmeceutical features: ↓ redness, ↑ skin texture, ↑ healing, ↓ oily appearance, ↓ pore size, ↑ unclogging of pores, ↓ infection occurrence

Physiology: ↓ inflammation, ↓ NFκB, ↓ AMPK/ SREBP-1 pathway, ↑ dissolving of desmosomes, ↑ cell turnover, ↓ sebum production, ↑ antimicrobial activity, ↓ sebocyte lipogenesis, ↓ FAS, ↓ ACC, ↓ COX-2 expression, ↓ IL-1β, ↓ IL-6, ↓ TNF-α, ↓ OSM, ↓ STAT3, ↓ SREBP-1a, ↓ SREBP-1c

Impact on skin: Menthol

Cosmeceutical features: ↑ skin soothing, ↑ perceived cooling sensation

Physiology: ↑ nociceptors, ↑ axon reflex, ↑ vasodilator peptide release, ↑ dermal vasodilation, ↑ dermal salicylic acid penetration, ↑ selective activation of TRPM8

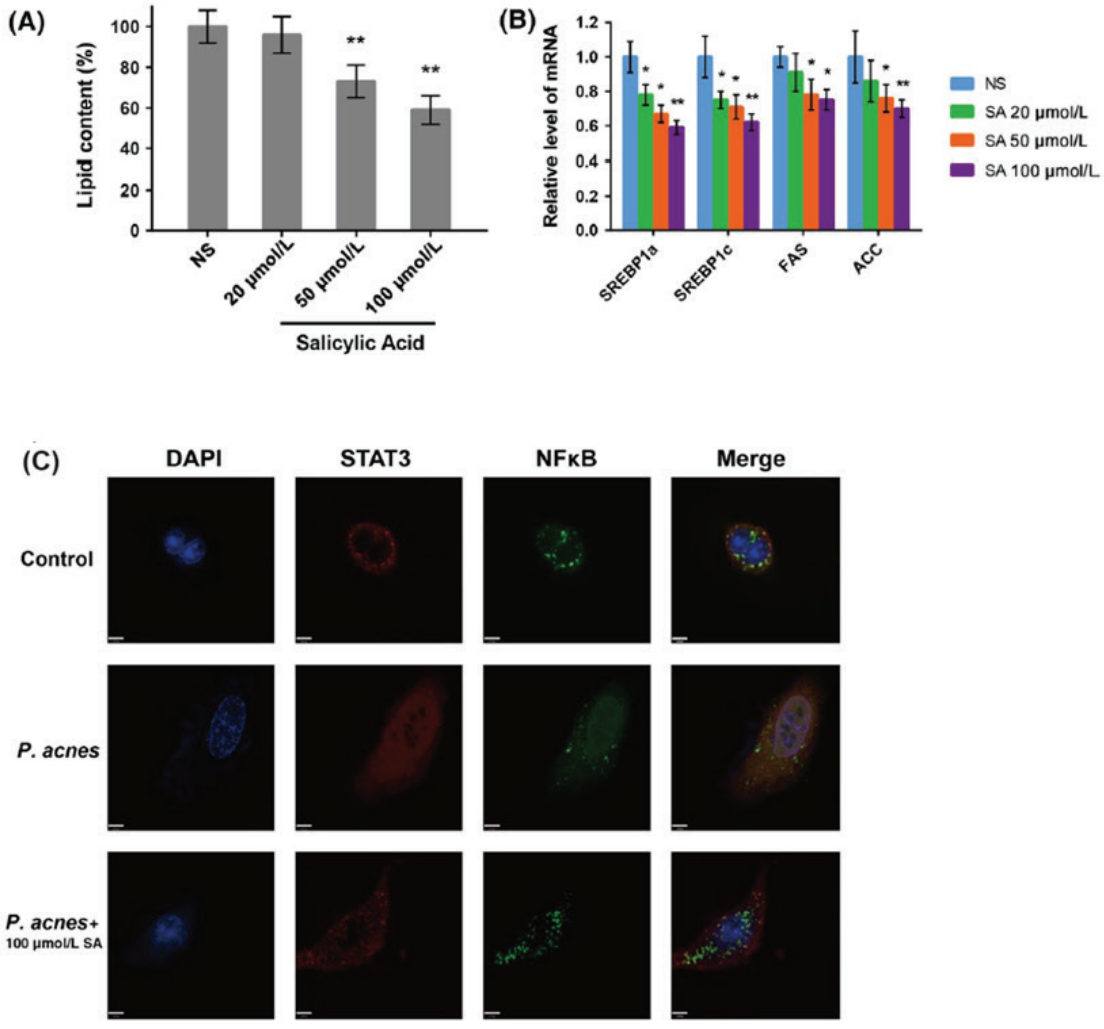

Figure (A) Lipid content in SEB-1 sebocytes decreased when treated with salicylic acid with different concentrations. **(B)** Salicylic acid decreased mRNA levels of SREBP-1a, SREBP-1c, FAS and ACC. **(C)** Immunocytofluorescence staining was performed for STAT3 and NFκB in SEB-1 sebocytes in the control group and stimulated with heat-inactivated P acnes before and after treatments with salicylic acid (Lu *et al.*, 2019).

Table 1: Classification and cosmeceutical significance of salicylic acid

INGREDIENT	CLASSIFICATION	REASON FOR INCLUSION
Salicylic acid	βHA, phenolic aromatic acid	Anti-inflammatory action, deep cleaning, sebum regulation, skin degreasing properties and reducing pore size
Menthol	Menthane monoterpenoid	Skin penetration enhancer, vasodilator and provides a soothing, cooling sensation

LIST OF ABBREVIATIONS

ACC:	acetyl-CoA carboxylase
AMPK:	5' adenosine monophosphate-activated protein kinase
βHA:	beta-hydroxy acid
COX-2:	Cyclooxygenase-2
DAPI:	4',6-diamidino-2-phenylindole
FAS: f	fatty acid synthase
IL-1β:	IInterleukin-1β
IL-6:	Interleukin-6
mRNA:	messenger Ribonucleic Acid
NFκB:	Nuclear Factor κB
OSM:	oncostatin-M
P acnes:	*Propionibacterium acnes*
SC:	stratum corneum
SEB-1:	sebaceous gland cell line
SREBP-1:	sterol response element-binding proteins-1
SREBP-1a:	sterol response element-binding proteins-1a
SREBP-1c:	sterol response element-binding proteins-1c
STAT3:	Signal transducer and activator of transcription 3
TNF-α:	Tumor Necrosis Factor-α
TRPM8:	Transient Receptor Potential Cation Channel Subfamily M Member 8

WARNINGS

Topical salicylic acid formulations are generally well-tolerated by all skin types. However, salicylic acid application should be avoided in individuals with salicylate allergy, active dermatitis, and skin infections. Moreover, avoid using salicylic acid in combination with an agent that causes dry skin (some individuals can be more sensitive to experiencing dermal dryness). Topical use of salicylic acid during pregnancy is not associated with an increased risk of congenital malformation as is the case with systemic salicylic acid administration due to its structural similarity to aspirin. However, it is recommended to limit the size of the area exposed to salicylic acid, avoid occlusion of the site where salicylic acid is applied, and limit the duration of topical salicylic acid use during pregnancy.

STORAGE INSTRUCTIONS

Store at or below 25°C.

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