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**ABSTRACTS | Epidermal Structure and Barrier Function**

**LB723**

Face skin changes caused by face mask during the COVID-19 pandemic
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With the prolonged COVID-19 situation, wearing a face mask has become daily routine and we studied facial skin changes caused by wearing a mask for preparing possibilities on changes in skin characteristics for about three months from mid-June to mid-September, and compared to skin changes caused by wearing a mask during the day. Measured areas were divided into two groups. Cheeks, perioral area and chin were mask-wearing area and forehead was non-mask-wearing area. Skin temperature, redness, hydration, keratin, elasticity, pore, color and trans-epidermal water loss (TEWL) were measured. Skin changes caused by long-term wearing of mask were shown in TEWL, skin hydration and keratin. Compared to June, TEWL was increased significantly on the cheeks, perioral area and chin. There was significant difference in TEWL increase in the cheeks and perioral area compared to the forehead. Also, skin hydration was significantly decreased on the cheeks. Skin hydration of perioral area was also decreased. There was significant difference in skin hydration decrease in the cheeks compared to the forehead. Compared to June, skin keratin in both cheeks and perioral area increased. There was significant difference in skin keratin increase on the perioral area and chin. There was significant difference in skin keratin increase in the cheeks and chin compared to the forehead. In previous studies, skin characteristics that were quickly affected by wearing a mask were skin temperature and redness. On the other hand, TEWL, skin hydration and keratin were more affected by wearing a mask for a long time so there was difference short-term and long-term effect of mask in changed skin characteristics. In conclusion, the effect of long-term wearing a mask on the face skin. This result is meaningful in that we studied the effect of wearing a mask in daily life for ordinary people, not those who wear mask in the occupational environment.

**LB725**

Skin barrier formation by epigenetic regulation of EGR3
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Epigenetics is the field of biology that studies the influence of the environment and lifestyle on the expression of genes without changing their DNA sequence, and has recently attracted more and more interest from cosmetic brands. Here, we show that EGR3 plays a critical role on the formation of skin barrier by epigenetic regulation and its application on the cosmetic industry. Skin barrier, the outermost surface of the epidermis, protects our body from external threats of environments. Late epidermal differentiation is a key step of skin barrier formation. We recently found that EGR3 is the transcription factor which is highly expressed in the stratum granulosum by the integrative analysis of various data obtained from open-source database. However, its expression is lost under poorly differentiated conditions, such as parakeratosis-lesional skin. The loss of function study and the analysis of skin tissues data revealed that EGR3 functions as the important regulator of late epidermal differentiation. Further, RNA-seq and ChIP-seq analysis revealed that EGR3 mediated the regulation genes located in the epidermal differentiation complex in which over fifty genes encoding proteins involved in the terminal differentiation and comification of keratinocytes are located. Interestingly, EGR3 totally regulates the expression of the genes located in epidermal differentiation complex through activation of enhancers and induction of enhancer RNAs, meaning that epigenetic modulation is important for the function of EGR3. Finally, we discovered that Penta-O-galloyl-L-D-glucose from Paeonia lactiflora Pall. root extract enhances the expression of skin barrier genes via EGR3 upregulation, and thus it can be a useful cosmetic ingredient to enhance skin barrier function.

**LB724**

Human epidermal organoids: Establishing a reproducible stratified human epidermal organoid culture system
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Skin is the largest human organ and performs various functions such as protection, temperature regulation, water retention, sensation and immune defense. An organoid is a collection of organ-specific cells that develops from stem cells or organ progenitors and is capable of recapitulating specific functions of the organ. Epidermal organoids are organoids grown from keratinocytes isolated from the epidermis. Here, we describe a well-established and reproducible method for culturing human epidermal organoids (HEOs) in 7 days. We tested different media conditions to develop defined HEO growing and expansion conditions. HEOs were successfully generated from primary keratinocytes isolated from human skin as well as established keratinocyte cell lines (NKG21 and KER7 cells). We characterized these organoids to show that they resemble the human epidermis. We demonstrated that the HEOs express epidermal genes including collagen 17 (COL17), keratin 15 (K15), keratin 14 (K14), keratin 5 (K5), keratin 10 (K10), keratin 1 (K1), filaggrin (FLG), transglutaminase 1 (TGM1), and transglutaminase 3 (TGM3).

**LB726**

The combination of 0.5% retinol with a naturally derived TRPV 1 antagonist and anti-inflammatory botanical extract helps mitigate retinoid-induced irritation
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The use of topical retinol is recognized as the gold standard for the treatment of photo-damaged skin. However, topical application of retinol can potentially cause irritation manifested as burning sensation, erythema, peeling, or dryness. This can contribute to non-compliance or discontinuation of use for many individuals. Studies have shown that adjustments in timing and concentration levels can help mitigate the induced effects of retinol. There is very little understanding of the molecular mechanisms underlying retinoid irritation, however it has been shown that TRPV1 antagonists help mitigate irritation. Here, we designed a cosmetic formulation containing 0.5% retinol and a naturally derived plankton extract shown to antagonize TRPV1, and rosemary extract shown to suppress expression of multiple inflammatory cytokines. In consultation with a dermatologist we designed an 8-week gradual reitnination process and using this protocol, subjects who applied the formulation demonstrated high tolerability and reduction in dermatologist-assessed erythema, edema, and dryness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness. Panelist self-evaluations reported few moderate sensory discomfort scores and reduction in erythema. Separate clinical studies were conducted to evaluate skin pigmentation, global evenness.