

# ABSTRACT

**PRESENTER:** Robert Bird

**COMPANY:** LipoTrue

**JOB TITLE:** Managing Director

**Podium Title:** *Novel characterization of skin microbiome metabolites stimulated by a prebiotic to improve microbiome-epidermal communication*

## **Background information (Short introduction)**

Commensal microorganisms are able to release metabolites with different activities that have a direct effect on their counterparts, epidermal keratinocytes. Upon stimulation, keratinocytes get activated and increase levels of proteins involved in key epidermal functions such as cellular protection, growth and integrity.

We demonstrate how a novel prebiotic is able to induce the release of antioxidant metabolites by commensal microorganisms with a beneficial effect on human epidermal cells.

## **Objective**

To develop a novel prebiotic acting on skin microbiome to stimulate release of beneficial metabolites onto human skin and supporting microbial diversity.

An in vitro model of human colonized skin, metabolomics, proteomics and unique NGS evaluation of 16S rRNA gene will be used to demonstrate the ability of this new ingredient to modulate the release of antioxidant microbial metabolites for a direct benefit on the antiaging properties of skin, including moisturization.

## **Methodology**

The effect of a prebiotic on the abundance of skin microbial representatives, on in vitro model of healthy colonized epidermis, was analysed by RTqPCR. The ability of the ferment to raise the antioxidant potential of skin microbiota cocultured on HEK cells was studied by FRAP. The metabolomic analysis of released microbial molecules in the presence of the ferment was done by reversed LCMS. Visualization of colonized-HEK exposed to the prebiotic was done by microscopy. The effect of released metabolites on HEK cells was evaluated by proteomics. For clinicals, a single-blind and placebo-controlled study was performed with 40 healthy female subjects. Products were topically applied on whole face, 2x/day for 28 days. Skin improvement on forehead and crow's feet was evaluated by fringe projection and corneometry. Microbiota from forehead was evaluated by 16S rRNA gene sequencing.

## **Results**

We show that metabolization by skin microbial representatives of a new prebiotic (bacterial ferment) stimulates the release of key antioxidant metabolites (coumaric acid) promoting synthesis of antiaging proteins (SOD1, CoIVII) by HEK cells. The prebiotic promoted a balanced

growth of main commensal microorganisms on HEK, reinforcing its benefits on skin. NGS of 16S rRNA gene determined the specific OTUs on forehead skin samples from volunteers treated with the ferment. A modulation of *Corynebacterium* sp. and *Staphylococcus* sp., implicated on skin moisturization and protection, was observed.

## **Conclusion**

The new prebiotic sustained the balance of skin microbiota. It induced the release of antioxidants preserving epidermal integrity and promoting the synthesis of proteins related to oxidative stress, inflammaging and DEJ integrity. Clinical trials, less wrinkles and roughness on crow's feet and forehead and more skin hydration were seen.

It also preserved the abundance of *Staphylococcus epidermidis* and improved the levels of *S. hominis*, essential to protect skin against pathogens. Also, supported the presence of *Corynebacterium* sp., present in moist skin areas. Results show a unique mechanism in which the stimulation of the release of antioxidants by the skin microbiota is beneficial for skin.

## **Why is this important to the industry?**

The novel bacterial ferment from a natural & unique origin for manufacturers and end-users to explore; the microorganism was found in a cave preserved for more than 3 million of years. This ingredient can be used on face care for antiaging products associated with the modulation of healthy skin microbiota, due its potent antioxidant effect and skin barrier protection. Even, it provides the end-users an increase of moisturization and a decrease of facial wrinkles and rugosity in different areas.

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Robert is the Managing Director of LipoTrue Inc., in charge of the North American region. He has been with the company since 2017. Robert has previously worked at DSM where he held several positions including Business Development Manager and Global Key Account Manager. He has also worked in BASF where he held a position as a Key Account Manager as well as Croda Inc. where he was an R&D Chemist.

Robert received his bachelor's degree in chemistry from Rutgers University in New Brunswick, NJ.