

9. Skin microbiome research set to transform cosmetics industry

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For 10 years, genetic sequencing technologies have made remarkable progress in understanding the human microbiome by mapping its bacterial components. Alcimed, a consulting company based in France which specialises in innovation and the development of new markets, highlights in this article the latest developments in cosmetics and personal care that target the skin microbiome.

The number of research publications has grown exponentially. The US holds more than half of the total number of publications, and is the source of the largest research project on the microbiome: the Human Microbiome Project. The study, funded through €153 million contributed by the National Institute of Health of the United States, enabled the characterisation and analysis of different microbiomes in order to determine their role for in maintaining one's health.

The company, Markets & Markets, predicts the value of the global microbiome market to reach €265 million euro by 2019, and to excel to a whopping €574 million by 2023. Subsequent to focusing on the gut microbiome, researchers and industry experts are now turning their attention to the skin microbiome.

A crucial protective role for health

The bacteria of the skin microbiome have a crucial protective effect. They help maintain the immune system, repair damage, and protect against allergens and UV exposure. Bacteria also limit damage caused by oxidation and improve the hydration and elasticity of the skin. However, an unbalanced microbiome is linked to many skin conditions such as eczema, allergies, dandruff, acne or dermatitis.

Conventional care products, which are responsible for 90 percent of chemicals on the

skin according to the Human Microbiome Project analysis, are implicated in the increasing number of skin problems in the Western world. Common moisturisers, soaps and shampoos can undermine the skin microbiome, due to the antimicrobial preservatives they contain or their alkaline pH. An increasing number of industry experts have seized this market opportunity by developing skin care products adapted to the skin microbiome.

Products targeting skin microbiome

Largely present in the market for the intestinal microbiome, there are also some products available that impact the skin microbiome. These products are in the form of either probiotic tablets used to increase the number of beneficial bacteria in the microbiomes or prebiotics, which are short chain oligosaccharides or polysaccharides that promote the growth of targeted bacteria. These include:

Lactofiltrum RUS AVVA, which treats atopic dermatitis the antibacterial and antimicrobial probiotic,

Lacidofil, developed by the Institut Rosell Lallemand Perocur Forte from Hexal, which is a probiotic that reduces acne.

Probiotic skin care launches

The global cosmetics industry has also seen a number of new launches targeting the skin microbiome. A dozen specialist moisturisers containing probiotics are already on sale, developed by leading cosmetics houses. These include:

L'Oréal's Lipikar Baume, sold within its Laroche Posay brand name, which integrates the bacterium *Vitreoscilla filiformis* to support microbial diversity

Avene's XeraCalm range, which claims to stimulate the production of antimicrobial peptides.

Smaller players are also engaged in the development of products targeting the skin microbiome. Some examples are Melatogenine AOX Probiotics by Gatineau Paris, the

Super Facialist's cream Probiotic and Epicuren's Acidophilus Probiotic face cream.

What about formulations with prebiotics?

Today, formulas containing prebiotic ingredients are less developed. However, British company, REN, launched the Citrus Limonum Prebiotic Hand Cream. This product contains alpha-glucan oligosaccharide, a prebiotic that prevents disease caused by pathogenic bacteria. Belgian company, Gova Ingredients, sells Biolin, which is a prebiotic based on gluco-oligosaccharide.

AOBiome, an American start-up leading in the skin microbiome market, is a pioneer in the development of products that modulate the skin microbiome by chemical reactions. The company won the Shark Tank entrepreneurship contest on dermatology and recently launched the Mother Dirt range. Products in the range contain bacteria that oxidise ammonia found in perspiration. This releases nitrite and nitric oxide, which are two beneficial molecules for skin health. In 2015, the phase 2 clinical tests on adult acne products were commenced.

Skin health technologies of the future

Global industry leaders such as Procter & Gamble, L'Oréal and Johnson & Johnson continue to push boundaries in R&D to increase knowledge on the skin microbiome and to develop new products.

Procter & Gamble published a patent on 31 December 2015 on a cosmetics formula containing *galacooligosaccharide*, a prebiotic agent to improve the condition and appearance of skin. Subsequent to that in November, the company published a study that characterises bacteria responsible for dandruff. The study also identifies the conditions that allow these bacteria to thrive in order to control them.

Richard Martin, director of L'Oréal biotechnology division, announced in March that the global cosmetics house is conducting research on the skin microbiome. This is to develop new products that will regulate the balance of the microbiome. Research will also be conducted on new products to reduce acne by increasing the proportion of beneficial strains of microorganisms.

Johnson & Johnson company Janssen opened the Janssen Human Microbiome Institute in 2015 with a focus on impacting human health through technologies targeting microbiomes. Earlier this year, Johnson & Johnson Consumer announced a partnership with start-up company, ProdermIQ, which developed the analytical tool, Skindex. This equipment measures skin health through the study of the microbiome.

‘These developments are a promising step towards developing customised cosmetics specific to individual consumers’ microbiome,’ says Vincent Pessey, project manager at Alcimed.

<http://www.pharmacos.co.za/skin-care/1789-skin-microbiome-research-set-to-transform-cosmetics-industry>