Commentary on “The Effects of Probiotics on Immune Regulation, Acne and Photoaging”

Mary-Margaret Kober

1Department of Dermatology Riverchase Dermatology, Naples, Florida.

Corresponding Author: Mary-Margaret Kober, Riverchase Dermatology, Naples, Florida, E-mail: mmkober@gmail.com

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With more than 500 bacterial species living on the skin expressing more than 2 million genes, the skin micro biota presents a delicate balance between pathogenic and commensal bacteria. Given that dysbiosis of the microflora can lead to pro-inflammatory states (1), precipitating conditions such as acne and rapid photaging, treatment modalities to shift the spectrum toward commensal flora continue.

Enter probiotics. At the most basic level, probiotics are live microorganisms that provide a health benefit to the host. Through their interaction with the immune system, probiotics have been shown to modulate gene expression and cellular differentiation, boosting the host’s immune response to true threats while inhibiting pro-inflammatory pathways linked to chronic inflammatory diseases.

The probiotic industry continues to grow annually, and in 2016, the probiotic industry was valued at 35.9 billion US dollars (2). Probiotics come in both oral and topical formulations. Oral intake of probiotics likely exerts their influence on the skin via the gut-skin-brain axis. According to this theory, alterations in the gut microflora may lead to increases in local and systemic inflammation, which at times manifest or contribute to the formation of dermatoses (3). When oral probiotics are consumed, they interact with the gut-associated lymphoid tissue (GALT) and have been shown to reduce systemic inflammation and influence systemic absorption. Indeed, oral administration of the probiotic L. reuteri reduced by 65% compared to a 38% reduction in those treated with tea

Although more research is needed to fully determine the role of fermented extracts, these early studies demonstrate that they provide an efficacious alternative delivery method for probiotic strains.

As our understanding of the skin microbiome continues to grow, we deepen our appreciation for its complexity and begin to understand the factors that may allow us to shape it. Tailoring an oral and skin care regimen to each patient’s specific microbial make-up may provide an opportunity for individualized treatment plans. Although further research is needed, we can see that oral and topical probiotics as well as fermented extracts hold promise for the treatment of acne, photaging and immune regulation, and their benefit will likely extend to a myriad of other conditions. However, further randomized controlled trials, including at the histopathologic level, are needed to best define the role of probiotics and their derivatives, such as prebiotics.

References