

## **New insights into Skin Microbiota in Acne Pathophysiology**

Gheorghe GIURGIU<sup>1</sup>, Manole COJOCARU

<sup>1</sup> Deniplant-Aide Sante Medical Center, Biomedicine, Bucharest, 012371, Romania

<sup>2</sup> Titu Maiorescu University, Faculty of Medicine, Bucharest, 031593, Romania

Corresponding author e-mail: deniplant@gmail.com

### **Abstract**

The role of skin microbiota in acne remains to be fully elucidated. The emotions of stress (e.g., depression and anxiety), for instance, have been hypothesized to aggravate acne by altering the gut microbiota and increasing intestinal permeability, potentially contributing to skin inflammation. It is increasingly believed that the interaction between skin microbes and host immunity plays an important role in this disease, with perturbed microbial composition and activity found in acne patients. Acne also has close connections with the gastrointestinal tract, and many argue that the gut microbiota could be involved in the pathogenic process of acne. Diet also shapes the gut microbiota. Emerging data suggest that dietary factors (i.e., the Western diet) may influence acne development. Growing evidence indicates that probiotics modify the pathophysiologic factors that contribute to acne, potentially improving patient compliance. Probiotics also have immunomodulatory properties on keratinocytes and epithelial cells. Taken together, the findings suggest that the microbiota plays an important role in acne pathogenesis and can be modulated for clinical improvement, but efforts should be made to identify the exact mechanisms and therapeutic effects of oral/topical probiotics in acne. This presentation concentrates on the skin and gut microbes in acne, the role that the gut–brain–skin axis plays in the immunobiology of acne, and newly emerging microbiome-based therapies that can be applied to treat acne. With the help of Deniplant brand natural remedies, the authors have developed several products for acne that act as immunomodulators of the human microbiome.

**Keywords:** acne, microbiota, skin, gut, brain, therapeutic implications