

Editorial

At the Crossroad Between Inflammation and Skin Aging

Inflammation is a double-edged sword. On one hand, it triggers body's defense mechanisms against invading pathogens and contributes to the natural course of healing after damage. On the other hand, it can fire up unwanted or uncontrolled responses that lead to tissue damage and functional disorders. Skin, as the body's largest defense organ with great capability of immune modulation, is highly prone to inflammatory disorders due to its wide range of contacts with external pathogens and environmental insults. Inflammatory diseases and conditions in human skin can cause significant health complications and gradually erode skin's structure and function from both surface and within. Such conditions usually cover a broad range of clinical symptoms that vary in severity, and affect people of all ages and races. There is often high prevalence of common chronic inflammatory dermatoses, such as acne vulgaris and contact dermatitis-related skin sensitivity, although not life-threatening, can be very bothersome and discomforting, posing significant negative impact on individuals' quality of life [1, 2]. Therefore, it is critical for both clinicians and researchers to have continuous discussion and update on how to prevent, treat, and manage patients with such conditions.

Aging, hallmarked as a progressive decline of interrelated physiological systems and metabolic pathways, can further compromise body's immune system and make it more vulnerable to inflammatory conditions. Inflammaging, a newer concept highlighting an age-related low-level of uncontrolled chronic inflammatory condition of the body, has become an emerging field of research due to its involvement in many degenerative disorders [3]. Examples include cardiovascular diseases, diabetes, obesity, age-related neurodegenerations, skin aging, and more.

Common modulating factors involved in inflammaging are summarized in Fig. (1). In general, healthy aging relies on the fine balance between pro-inflammatory and anti-inflammatory mechanisms. When inflammatory signals overtake the stage, they can induce a cascade of reactions of oxidative damage and increased tissue degradation that eventually lead to signs of aging [4]. In skin, this process can be accelerated by environmental insults such as solar exposure and pollutions, as well as internal factors such as psychological stress and metabolic stress. Anti-inflammatory and anti-oxidant treatments might help alleviate these conditions thus facilitating the rejuvenation process. However, a thorough understanding on the mechanisms of skin inflammaging is still lacking to date which makes it difficult to develop targeted and effective treatments. Further investigations focusing on inflammatory biopathways will help develop better drug targets and potential interventions treating age-related skin disorders and improve patients' quality of life.

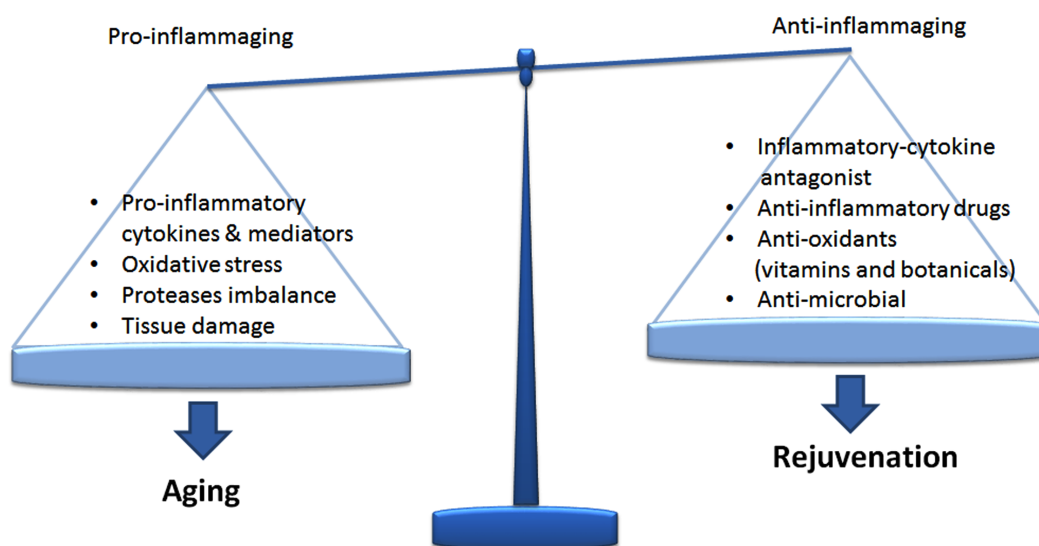


Fig. (1). The pro- and anti-inflammatory mechanisms modulate the balance between aging and rejuvenation.

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