

All-Optical Analysis of Mechanical Properties in Aged Skin

Eiji Hase

Institute of Post-LED Photonics, Tokushima University

Extracellular matrices such as collagen and elastin are important factors that determine the mechanical properties of the skin. Therefore, to analyze the mechanical properties of the skin, it is desirable to visualize their distribution and measure the mechanical properties at those locations. In response to this need, we developed a new all-optical multimodal imaging technique that combines nonlinear optical microscopy with Brillouin scattering microscopy. This novel imaging technique allows for the simultaneous visualization of three key microscale information, such as collagen, elastin, and elastic modulus, within the same field of view. This approach not only facilitates a detailed understanding of the structural and mechanical aspects of skin but also enhances our ability to assess how these properties change in various conditions, including aging. Such insights are vital for advancing our knowledge of skin biology and could lead to improved strategies for diagnosing and treating skin disorders.