

3rd World Conference on
Ageing and Gerontology
July 09-10, 2026 | Frankfurt, Germany



Aisada Koenig

JenLab GmbH, Berlin

Multiphoton Tomography: A New Technology for Testing Anti-Ageing Products

Skin ageing is a complex process involving structural changes of the extracellular matrix proteins such as collagen and elastin, along with alterations in the activity of epidermal cells. Traditional approaches rely on surface imaging or invasive biopsies. These techniques are limited in their ability to directly and dynamically monitor aging processes in deep living skin in its native 3D microenvironment, as well as to perform measurements at multiple time points. Multiphoton Tomography (MPT) overcomes these limitations by providing a kind of multidimensional “virtual biopsy” that shows cellular and structural details with high submicron resolution, including cellular metabolism with high temporal resolution. It combines several advanced optical techniques, including two-photon fluorescence, second harmonic generation, reflectance confocal microscopy, and fluorescence lifetime imaging.

MPT enables visualization of key structural proteins such as collagen, elastin, and keratin, alongside pigment molecules such as melanin, and the important metabolic cofactors NADH and FAD, thereby providing optical metabolic imaging (OMI)¹. This information helps identify age-related skin changes, as well as allows researchers to assess how cosmetics or pharmaceuticals affect skin health, structure, and metabolic activity in vivo.

This presentation highlights the key applications of MPT in gerontology and cosmetic research, with a focus on ageing biomarkers and analysis of cellular metabolism.

Biography

Dr. Aisada König is a researcher at JenLab GmbH in Germany, where she specializes in biophotonics, multiphoton tomography, and femtosecond laser imaging. Her research focuses on the development and application of advanced, non-invasive optical imaging technologies for biomedical and clinical diagnostics. As a key member of the JenLab research team, she contributes to innovations that enhance the visualization of biological tissues with high spatial resolution, supporting both scientific research and medical practice.

Dr. König collaborates on the development and application of multiphoton imaging techniques that enable "virtual biopsies" of human tissues, including skin and corneas, allowing clinicians to evaluate tissue structure and detect conditions such as skin cancer without the need for invasive tissue removal. Her work bridges biomedical laser technology and clinical research, advancing the use of optical imaging for early disease detection, personalized medicine, and translational healthcare applications.