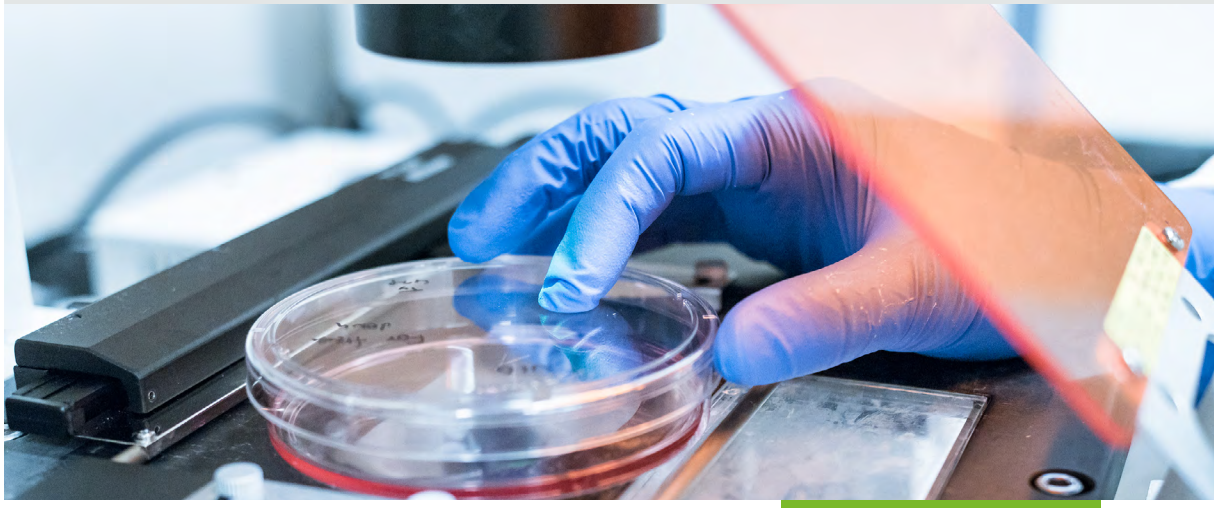
Gattefossé and BioMeca jointly developed a model of 3D dermal microtissue to study elastic properties *in vitro*



Joint Press Release

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During aging, human skin undergoes profound alterations of its biomechanical properties, and more particularly a loss of elasticity that results in skin sagging. Dermal elastic fibers represent the primary components that support tissue compliance and resilience. But as time goes by, their organization and functionality decline, which makes them a preferred target for cosmetic anti-aging strategies.

The current 3D bioengineered skin substitutes, which are easily available on the market, are still defective models to study skin elasticity. Indeed, they contain exogenous and artificial matrices that bias the measurement of biomechanical properties in the reconstructed tissue. So, there is a need to develop advanced models to investigate the mechanical structure of a tissue such as human skin.

3D scaffold-free microtissues were developed by Gattefossé laboratories to mimic *in vitro* an elastic tissue, which is responsible for intrinsic elastic properties of the dermis. **To accurately evaluate the elasticity of such skin microtissues, Gattefossé chose BioMeca's expertise for developing innovative analytical assessment with state-of-the-art technologies.**

"Characterizing biological models is becoming a challenge to evaluate new formulas or active ingredients aiming to restore or maintain skin integrity. BioMeca offers state-of-the-art technologies to bring new insights biology. Second Generation Harmonic microscopy highlights fibers network while Atomic Force Microscopy reveals tissue stiffness in both imaging and mechanically manipulating biological structures near physiological conditions overtime. With topographical mechanical measurement, quantitative nanomechanical quantification and tissue characterization, BioMeca's expertise represents a key for exploring elastic properties of skin models and opens a new door for skin care." underlined the co-Founder of BioMeca, Julien Chlasta.

3D scaffold-free spheroids take advantage of the ability of cells to secrete their own extracellular matrix to ultimately recreate their own microenvironment. This technology enabled Gattefossé to produce *in vitro* hundreds of 3D microtissues within a few days only using dermal fibroblasts aggregated in ultra-low affinity plates.

The elastic modulus (or Young modulus) was then measured using Atomic Force Microscopy (AFM) and the elastic fibers were visualized by Second Harmonic Generation (SHG) imaging microscopy. Gattefossé and BioMeca thus demonstrated that the 3D spheroid microtissue is a relevant and reliable model with a complex organization, comprising a dense, mature elastic fiber network sufficiently extensive to mimic *in vitro* dermal elastic mechanics.

This investigative approach has been featured at the 31st IFSCC Congress, in Yokohama late in 2020.

"By combining two cutting-edge analytical techniques, i.e., second harmonic generation (SHG) microscopy and atomic force microscopy (AFM), we have been able to accurately correlate both the presence and amounts of elastic fibers with elastic properties of microtissues, thus evidencing that newly formed elastic fibers were functional" said the Skin Biology Research Manager at Gattefossé, Dr HDR Nicolas Bechetoille.

This advanced 3D model has been successfully used to **measure the efficacy of EleVastin™ a novel active ingredient developed by Gattefossé,** fighting against age-related loss of skin elasticity. More to come in April 2021.

About GATTEFOSSÉ

Gattefossé is a French company who develops, manufactures and sells specialty ingredients for the personal care and pharmaceutical industries. Specialist in lipid chemistry and plant extraction, the group offers recognized expertise in formulation using its 4 application laboratories.

Gattefossé markets its products in more than 60 countries through 12 affiliated companies and a network of agents and distributors which provide solid technical support to its customers: 75% of its turnover is achieved outside France.

The company remains a family-run, independent business since its creation in 1880 and now employs 320 people worldwide.

About Biomeca

BioMeca, located in Lyon, France, helps biotech, cosmetic and pharma industries to understand effects and mechanisms of action of active ingredients, formulas, and drugs.

The company experts in biophysics and biology and is specialized in structural and mechanical characterization of biological samples at different scales, from large structures, such as tissues and cells, down to individual molecules of DNA and proteins.

BioMeca offers a cutting-edge technological platform suitable for *in vitro, in situ and in vivo* studies to support scientists in accomplishment of their projects and tailor-made solutions to meet issues and challenges of health and well-being.

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