



Joint Press Release

BASF and CTIBiotech to develop first 3D bioprinted human reconstructed skin including immune macrophages

The new 3D model will allow research and development of anti-inflammatory properties of active ingredients.

September 5, 2019 – The joint research of BASF Care Creations® and CTIBiotech is about to reach a new milestone. The cooperation partners announce the development of the first 3D bioprinted skin models including immune macrophages. The reconstructed tissue models will be the basis for development and testing of bio-actives for skin care applications.

Using CTIBiotech's 3D bioprinting technology will enable BASF's scientists to increase their 3D bioprinted skin model portfolio. The technology will provide a powerful platform for skin care researchers wishing to study the function of macrophages in a fully reconstructed skin.

Macrophages constantly monitor the skin's microenvironment for indications of cell stress, tissue injury or infection. They are essential to close wounds and to fully regenerate tissue. To maintain skin homeostasis, macrophages have a high degree of plasticity that promote or suppress inflammation.

“Compared to current *in vitro* methods, the 3D immune bioprinted skin developed with CTIBiotech will allow analysis more in line with human physiology and the immune role of macrophages,” said Dr Sébastien Cadau, 3D tissue engineering specialist at the BASF site in Lyon, France. “That’s how the technology is going to help us accelerate the development of innovative and highly reliable ingredients for the skin care market. Our understanding of an immunocompetent 3D skin provides the basis for developing and testing advanced cosmetic bio-actives for skincare applications.”

BASF and CTIBiotech started their cooperation as early as 2011. In 2015, the research partners started working on 3D tissue models for the development and testing of bioactives for skin care applications. In 2018, they announced first results: The experts demonstrated both the *ex vivo* production of physiological sebum in a long-term culture of a 3D human sebaceous gland model and the regulation of this sebum production by means of active ingredients.

“CTIBiotech and BASF have a long history of collaborations on innovative human skin models to advance human skin care,” said Prof Colin McGUCKIN, Chief Scientific Officer at CTIBiotech. “CTIBiotech hosts a team of world experts for human tissue engineering with 3D Bioprinting technology that will strengthen the success of this partnership also in the future.”

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About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 122,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of around €63 billion in 2018. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information at www.basf.com.

About CTIBIOTECH – Cell Therapy Research Institute

CTIBiotech develops and produces predictive models of human tissues and cells for biomedical, pharmaceutical and dermatocosmetic research and development. CTIBiotech hosts a team of world-class experts who have pioneered innovation in bioengineering and regenerative medicine over the past 30 years. CTIBiotech partners with public and private organizations to develop innovative solutions for the efficacy and safety testing of active ingredients, dermatocosmetics, drug candidates, cell therapies and medical devices. CTIBiotech is organized around three Business Units: 1. CTISkin: advanced human skin models to test new product ideas with scientific innovation and credibility for dermatology and cosmetics; 2. CTIPharma: robust and predictive biological bioassays on human cells to accelerate the development of drugs, medical devices and cellular therapies; 3. CTIBiosourcing: manufacturing of

biological models, tissues and human cells. More than 50,000 tissue samples in stock or on demand for biosourcing through a network of 200 healthcare partners worldwide.

Further information at www.ctibiotech.com.

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