

Promises and future of bio-printing technic in cosmetic evaluation

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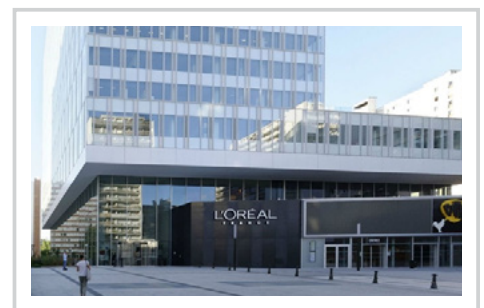


Abstract

Since last 80's, a long time before 2013 European Union ban on animal testing for cosmetic products, L'Oreal has placed itself as a pioneer for reconstructed human skin. It became one of the first cosmetic companies testing its raw materials/actives/formulations on in-house reconstructed human skin. Many different skin models are currently used in-house for efficacy and safety evaluation tests and knowledge of human skin physiology and pathology. However, one of the challenges with in vitro models is to develop more relevant and predictive ones according to cosmetic target (anti-aging, skin imbalance etc...). Bio-printing is a great alternative to create new models of skin with a complexity that cannot be achieved only by human hands. One of the biggest potential advantages of this technology is the ability to place cells or biological material where it needs to be placed, opening a few doors for tissue engineering. Taking advantages of our long expertise in skin tissue engineering and thanks to new technologies (bio-printing, gene editing), L'Oreal R&I aims to develop more predictive and pertinent skin models. Human normal keratinocytes and melanocytes can be printed with good viability and can differentiate to form a correct epidermis or full thickness model. Histology and immunofluorescence on the main markers show that each cell types are functional. Taking advantages of those results, we have developed a patterned epidermal model where two types of keratinocytes are printed with different designs. Interestingly they keep the design along the culture and form an epidermis with all differentiation layers and express correct epidermal main markers. We have developed a new epidermal patterned model with resolution that cannot be achieved only by human hands. This model could be used to study skin disease where the pathological and the healthy areas of the skin would be in the same sample leading to a more physiological in vitro model, improve the robustness and reduce the number of samples in evaluation tests.

Biography

Maite Rielland is currently leading the Biomaterial and Bio-printing team in L'Oreal Advanced Research. She completed Bachelor in Biology and specialized during her Master in development and stem cells. She obtained her PhD at the French National Institute of Agronomical Research where she studied the defects which arise after nuclear transfer in mouse cloned embryos, focusing in the establishment of culture protocols for in vitro cell models. Thereafter during her postdoctoral studies, she spent one year at Mount Sinai Medical Centre and then 3 years at the New-York University (NYU) Medical Centre investigating 2D and 3D in vitro models. In 2014, she joined Advanced Research L'Oreal Tissue Models Team to establish new skin tissue models and install the bio-printing platform.



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