**IMMUNOCOMPETENT 3D SKIN MODELS**

Whether acquired or inherited, skin diseases significantly affect the patient’s quality of life. Most acquired skin diseases are curable and are generally treated with over-the-counter medicine. Some skin conditions such as; Psoriasis, Vitiligo, and albinism are lifelong and are considered non-curable. Apart from these diseases, other autoimmune disorders and melanomas also pose a significant challenge. To better understand the changes and mechanisms occurring in the skin due to a particular disease, researchers started developing disease-specific skin models that mimic their in- vivo conditions. These models, also known as Human Skin Equivalents or HSEs, could help researchers test drugs’ efficacy, predict the disease progression, and devise strategies to cure and treat the disease. Skin being a complex, multilayered tissue of different kinds of cells and the presence of various skin adnexa pose a significant challenge in developing a model that recapitulates all the changes that occur in the diseased skin tissue. Over the past decade, skin disease modeling has improved leaps and bounds. With the advent of 3D bioprinters, it has become possible to produce reproducible tissue models with proper tissue microvasculature and different skin adnexa. Although these models are suitable for checking the efficacy of drugs, they are still limited in their usage of autoimmune diseases and diseases that affect a particular adnexa. Keeping this in view, researchers started to induct different immune cells, such as the T cells, macrophages, etc., into these models to check their interaction mechanism in these autoimmune diseases. Apart from these methods, the inclusion of IPSCs and gene knockout cells to mimic the diseased tissues have also been used. Even though extraordinary progress has been made in the field of skin tissue modeling, there are still some challenges that need to be addressed; the inclusion of various adnexa together in a 3D model, the Limited printing resolution of 3D Bioprinters currently available, and the lack of focus on the genetic aspect of the diseases. Given the challenges above, in designing an immunocompetent 3D skin model, we generally start by researching thoroughly the pathogenesis of the disease, various adnexal involved, and the immune cells that participate in the process. Afterward, the methods and strategies that have already been implemented are laid out, e.g., in the case of Psoriasis, a commercially available immunocompetent model is available. Still, it lacks the inclusion of all the adnexa affected by the disease, and also there is the use of only lymphocytes. In contrast, the role of leukocytes and dendritic is not shown; apart from this, IPSCs have not reportedly been used for 3D psoriatic immunocompetent models. The inclusion of all the affected adnexa and involved immune cells may provide a deeper insight into the in-vivo pathogenesis of the disease. In addition to this, a gene knockout model of the gene BCL11A, which is considered an epidermal barrier impairment gene, can also be investigated in a complete psoriatic model. Cheminformatic analysis yielding immunomodulatory drugs can also be performed. Lastly, drug efficacy and disease progression is evaluated to confirm the usability of the model.