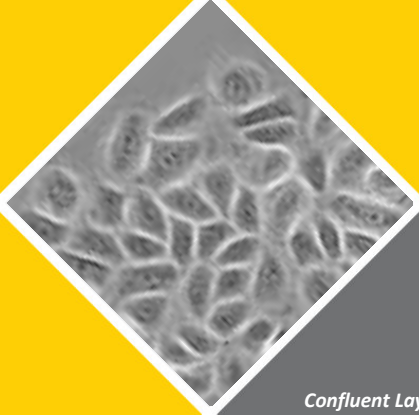
Skin Diseases

PSORIASIS



Confluent Layer of Human Keratonocytes in culture

Background

Psoriasis is a common, chronic relapsing/remitting immune-mediated skin disease characterized by red, scaly patches, papules, and plaques, There are five main types of psoriasis: plaque, guttate, inverse, pustular, and erythrodermic, Plaque psoriasis is the most common form and typically manifests as red and white scaly patches on the top layer of the skin. The causes of psoriasis are not fully understood. Psoriasis develops when the immune system mistakes a normal skin cell for a pathogen, and sends out faulty signals that cause overproduction of new skin cells. Though many treatments are available, psoriasis can be difficult to treat due to its chronic recurrent nature. A new generation of targeted immune therapies is being subjected to rigorous investigation in order to advance treatment options for psoriasis.

Pathology Model

Primary Normal Human Epidermal Keratinocytes (NHEK) will be cultivated in a hydrogel matrix containing a mixed 3D culture of fibroblasts and macrophages (i.e. collagen based matrices or more complex commercial systems, such as Qgel).After 3 days of immersed culture conditions, the epidermis will be airlifted for 10 days, allowing differentiation and formation of a horny layer. In order to induce psoriasis, macrophages will be activated by adding IFNγ to the medium (i.e. 200U/ml overnight).

Readouts

The following parameters will be taken into consideration:

- **Immunofluorescence:** qualitative and/or quantitative evaluation of the expression of selected markers (ie. E-Cadherin, ICAM-1, Neurotrophin 4 etc.) by acquisition of confocal images or Odissey scanner.
- **Inflammatory cytokines:** quantitative evaluation of the production of selected panels of pro inflammatory cytokines by multiplex analysis (ie. IL-6, IL-1a, IL-8, IP-10, TARC, MCP-1, RANTES etc.)
- **Gene expression:** quantitative evaluation of the expression of selected panels of genes of interest (i.e. E-Cadherin, ICAM-1, Neurotrophin 4 etc.) in challenged cells. A transcriptomics analysis of challenged cells can also be taken into consideration.

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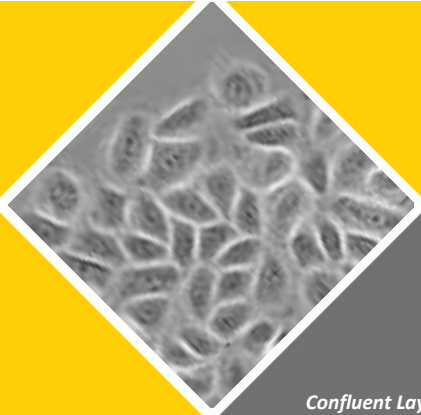

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Morphological analysis: qualitative analysis of alterations in cell morphology in challenged cells.

- **Vitality assay:** quantitative evaluation of cell viability with MTT assay
- **Oxidative stress:** quantitative evaluation of total ROS production in challenged cells.