Skin Diseases

ATOPIC DERMATITIS

Background

Atopic dermatitis (AD) is one of the most common chronic inflammatory skin diseases and the most common form of eczema in childhood. It is characterized by dry erythematous lesions and intense pruritus.

AD is a relapsing disease that is complex, multifactorial, and still not completely understood. It can be triggered by both epidermal barrier alterations and immune response dysregulation, each of them being potentially responsible for the induction of the other alteration, thereby creating a vicious circle responsible for the lesions.

Pathology Model

2D: Cultured human keratinocytes are challenged by either by a cocktail of proinflammatory agents (TNF)-a (Th1cytokine) or IL-4 and IL-13 (Th2 cytokines) either alone or in microfluidic communication with immune cells (i.e. Tcells).

3D: Commercial models of reconstructed human epidermis from normal human primary keratinocytes cultured on an inert polycarbonate filter at the air-liquid interface are challenged with selected inflammatory stimuli (to be jointly defined).

Readouts

- **Gene expression**: quantitative evaluation of the expression of selected panels of genes of interest (i.e. TSLP, IL1a, IL18, IFNa2, IFNß1, IL4R, IL8, MIP1a, RANTES, MIP3a, MDC, CCL27, involucrin and filaggrin) in cells challenged with Inflammatory mediators (e.g.: IL-4, IL-13)
- **Quantitative evaluation of caspase** activation (i.e. 3 or 8 or 9)
- **Quantitative evaluation of** selected **cytokines** of interest via ELISA (i.e. TSLP, IL1a, IL18, IFNa2, IFNß1, IL4R, IL8, MIP1a, RANTES etc.)
- **Cytokine signaling**: STAT-6, MAPK analysis through biochemical characterization and quantitative analysis of phosphorylated proteins.