PSORIASIS

HOW IS POLLUTION INVOLVED IN THE DEVELOPMENT AND/OR EXACERBATION OF PSORIASIS AND ATOPIC DERMATITIS?

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Pollution is associated with pulmonary1 and cardio vascular diseases2 but also contributes to numerous skin diseases and conditions. In addition to oxidative stress, environmental pollutants can induce an inflammatory response upon interaction with skin, thus leading to inflammatory skin conditions. This dysregulation of the immune system is expressed by an increased production of inflammatory mediators and involved in skin pathologies. Psoriasis skin pathology is associated with excessive secretion of inflammatory cytokines by T-cell populations, such as interleukin IL-23, IL-17, and IL-22, as well as with infiltration of neutrophils and T cells whereas Atopic Dermatitis key players are T helper type 2 (Th2)-type cytokines such as IL-4 and IL-133, which downregulates the expression of epidermal proteins, including filaggrin, loricrin, and involucrin. Both results in hyperproliferative, incompletely differentiated epidermal keratinocytes.4

At the University of Ferrara, we aim at understanding how is pollution involved in the development and/or exacerbation of psoriasis and atopic dermatitis skin diseases. We are building a Reconstructed Human Epidermis (RHE) and a Full Thickness (FT) pathological skin models that have been cultured with a medium supplemented with a pro-inflammatory cytokine cocktail to closely mimic inflammatory features. These developed models have been exposed to three main environmental pollutants Cigarette smoke, Ozone and diesel exhaust to assess pollution induced skin disorders and develop anti-pollution protective and curative treatments.