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Identification of the skin psoriatic inflammation profile by cytokine analysis from tape stripping

A Keszegpál, A Latzko, T Macleod, P Laws, M Goodfield, M Stacey, M Wittmann

A Keszegpál, M Wittmann - Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds, Leeds, United Kingdom,
A Latzko, T Macleod, M Stacey - Faculty of Biological Sciences, University of Leeds, Leeds, United Kingdom and
P Laws, M Goodfield - Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom

Psoriasis presents with different subtypes and some of those subtypes may not differ in clinical phenotype presentation but with regard to the underlying inflammation (molecular subtype). Correct subtype diagnosis may be important to direct the therapeutic decisions. We have developed a modified tape-stripping method to identify molecular disease subtypes. Epidermal material was removed with CuDerm adhesive tapes which were subsequently placed on dry ice. Protein extraction was performed using lysis buffer and sonification steps. A flow cytometry based multiplex analysis was performed to quantify epidermally expressed cytokines. Results were normalised to total protein content in the sample. We present the potential of this approach with the example of a severely ill, 38 year old female patient hospitalised for generalised pustular psoriasis. Ten tapes were obtained from lesional skin before and 5 days after the initiation of systemic therapy with Infliximab in combination with oral prednisolone and Acitretin. Initially extremely high levels of IL-1β (3.34 pg/µg protein compared to average of 0.58 pg/µg in plaque psoriasis), and IL-8 (104.67 pg/µg protein compared to average of 17.44 pg/µg in plaque psoriasis) were significantly reduced while other inflammatory markers including S100A8/A9, CCL20 and GROα remained at the same elevated levels and IL-18 expression increased. Although the patient's condition has overall improved, she still showed active psoriatic lesions at the occasion of the second sampling but presented with a changed underlying inflammatory response. Our findings provide evidence that tape stripping is a promising diagnostic method for epidermal inflammation with the potential to identify molecular disease subgroups and to support precision medicine approaches.