High levels of Psoriasin (S100A7) and alfa-defensins in whole saliva from Down's syndrome patients

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During a study performed on the human salivary proteome/peptidome in order to define its physiological and pathological variability, we analysed samples collected from a population of subjects affected by Down Syndrome (DS). We investigated the quali-quantitative composition of the protein families of secretory origin, typically present in human saliva, as well as alfa-defensins and some calcium binding proteins belonging to the S100 family. Whole human saliva was collected according to a standard protocol [1] from 37 DS and from an equal number of control subject. The two groups were sex and age matched. Separation and detection of proteins/peptides was performed using RP-HPLC-ESI mass spectrometry according to reported procedures [1]. Interestingly we found high concentrations of psoriasin (S100A7), and alfa-defensins 1 and 3 in saliva of the patients in comparison with normal subjects ($p < 0.0001$ for S100A7; $p < 0.05$ for alfa-defensins 1 and 3). Moreover, a correlation was found between psoriasin and alfa-defensin 3 concentration ($r^2 = 0.59$, $p < 0.0001$).

Psoriasin is present in the cytoplasm and in the nucleus of epithelial cells, but it was also found to be secreted [2]. Psoriasin expression is low or absent in normal epithelium and it increases in association with several hyperproliferative and inflammatory skin diseases, abnormal differentiation and neoplasia in several tissues [3]. S100A7 exhibits antimicrobial activity and it may act as a proinflammatory agent [4]. Several stress stimuli can promote the expression of S100A7, including UV stimulation, loss of attachment to extracellular matrix, growth factor deprivation [2]. Psoriasin is down-regulated by IFN-gamma and induced by reactive oxygen species (ROS) [5]. It is known that DS subjects show an imbalance of anti-oxidant enzyme activities and an increased generation of reactive oxygen species [6], which could be at the basis of the increased levels of S100A7 found in our subjects. Alfa-defensins are multifunctional peptides involved in cell chemotaxis and in wounds repair and they show a broad spectrum of antimicrobial activity against bacteria, fungi and even some enveloped viruses [7]. The high salivary levels of alfa-defensins may be connected to the increased concentrations of S100A7, which has been shown to induce the expression and the release of alfa-defensins 1-3 from neutrophils [4].

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