Synopsis of Original Research Paper

Identification of sprouting factor for peripheral nerve fibers in the epidermis with chronic pruritic skin disease

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In addition to epidermal hyperplasia, chronic pruritic skin diseases (e.g., atopic dermatitis, dry skin) show the increased number of nerve fibers in epidermis. However, the characteristics and the mechanisms of sprout of nerve fibers are still unknown. In the present study, we investigated the characteristics of the nerve fibers in epidermis by using the immunohistochemical analysis and proteomics analysis of epidermal protein for identification of the factor for sprouting in the dry skin mouse model with itch. For preparing the mouse model, the rostral back was treated daily with cutaneous application of acetone/ether (1:1) mixture (AE), water following AE (AEW). The stratum corneum hydration decreased in AE- and AEW-treated mouse skin, but not non-treated skin. The treatment with AEW induced the spontaneous scratching as an itch-associated response, and increased the number of protein gene product 9.5-positive nerve fibers, which were calcitonin gene-related peptide-positive C-fiber neurons. However, these alterations were not shown in non- and AE-treated mice. The proteomics analysis showed a lot of epidermal proteins that the expression altered by treatment with AE and AEW, compared with non-treatment. We are doing the identification of these proteins by using MALDI-TOF/MS.