CLCA2 is Overexpressed in Psoriatic but Not In Atopic Dermatitis Mouse Skin Models

**Introduction**

CLCA2 (chloride channel regulator, calcium-activated)
- Highly expressed by keratinocytes
- Thought to be required for epithelial differentiation
- Known terminal epithelial differentiation proteins like filaggrin are differentially regulated in skin diseases including psoriasis and atopic dermatitis

**Aim:** Expression pattern analyses of CLCA2 in murine models of psoriasis and atopic dermatitis compared to filaggrin

**Materials & Methods**

- Induction of psoriasis-like dermatitis in BALB/c mice via imiquimod
- Induction of atopic dermatitis in SKH-1 mice via oxazolone
- Animal study approved by the State Office of Health and Social Affairs, Berlin, Germany (LaGeSo; G 0126/13)
- Pathohistological characterization of skin lesions in both mouse models
- Expression analyses of CLCA2 and filaggrin via RT-qPCR and immunohistochemistry in healthy and dermatitis models

**Results**

**Fig. 1:** Psoriasis-like dermatitis was characterized by a thickened epidermis and T-cell infiltration. Induction via topical application of the TLR7 agonist imiquimod in BALB/c mice (n=3). * p< 0.05.

**Fig. 2:** Atopic dermatitis was characterized by thickened epidermis and infiltration of eosinophils, mast cells, and T-cells. Induction via topically applied oxazolone in SKH-1 mice (n=3). * p< 0.05.

**Fig. 3:** mRNA expression of CLCA2 and filaggrin was approximately five-times higher in the psoriasis-like skin compared to healthy controls. Dotted lines: limits for valid statement of lowered / elevated parameters. * p < 0.05.

**Fig. 4:** In atopic dermatitis mRNA expression of CLCA2 and filaggrin was similarly unchanged compared to healthy controls. Dotted lines: limits for valid statement of lowered parameters.

**Fig. 5:** The CLCA2 protein was strongly expressed in more epidermal layers in psoriasis-like dermatitis (B) compared to healthy skin (A). Filaggrin was virtually identical expressed as CLCA2 in healthy (C) and psoriatic skin (D). DAB immunohistochemistry, hemalaun counterstain.

**Fig. 6:** The CLCA2 protein was found in more epidermal layers in atopic dermatitis (B) compared to healthy skin (A), however, with a less staining intensity. Filaggrin showed a virtually identical expression pattern as CLCA2 in healthy (C) and diseased skin (D). DAB immunohistochemistry, hemalaun counterstain.

**Conclusions**

- CLCA2 is overexpressed only in the psoriatic skin model, but not in atopic dermatitis.
- The well-known terminal epithelial differentiation protein filaggrin shows a virtually identical disease associated expression pattern.
- CLCA2 and filaggrin are expressed in the same cell type independent of the skin disease.
- The results support the notion that CLCA2 may act as a terminal differentiation protein.

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