**001**

Ginsenoside compound K ameliorates the severity of imiquimod-induced psoriatic pathology by inhibiting REG3A/Reg3a in mice

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Psoriasis is an immune-mediated inflammatory skin disease. Ginsenoside compound K (CK) is an active ingredient of ginseng which is reported to exert beneficial effects on inflammation. However, the biological role of ginsenoside CK in psoriasis is still unclear. Our aim was to investigate the effect of ginsenoside CK on the proliferation of keratinocytes and the expression of human regenerating islet-derived protein 3A (REG3A) and its mouse homolog Reg3a as well as the inhibitory effect of ginsenoside CK on imiquimod-induced psoriasis-like mice. The effect of ginsenoside CK on the proliferation of HaCaT cells and NHEK cells was measured by MTT. The apoptosis of HaCaT cells induced by ginsenoside CK in HaCaT cells was analyzed by flow cytometry. The inhibitory effect of ginsenoside CK on RAG3A induced by IL-36 in HaCaT cells was identified by WB and qRT-PCR. Psoriatic models in mice were induced by imiquimod cream. The thickness of mouse ear and skin epidermis was measured based on hematoxylin and eosin stain (H&E) of tissues. The expression of Reg3a protein in lesional skin of psoriatic mice was identified by WB and immunofluorescence. Ginsenoside CK could inhibit the proliferation of HaCaT cells and NHEK cells, but it could not induce the apoptosis of HaCaT cells. The expression of RAG3A protein stimulated by IL-36 was inhibited by ginsenoside CK in HaCaT cells. In the mouse model of psoriasis, the topical application of ginsenoside CK significantly decreased the epidermis thickness of lesional skin of psoriatic mice and the expression of Reg3a protein. Ginsenoside CK inhibited the proliferation of HaCaT cells and NHEK cells as well as attenuated imiquimod-induced psoriasis-like pathology in mice by reducing the expression of RAG3A/Reg3a protein. These results indicated that ginsenoside CK exhibited therapeutic effects in psoriasis.

**002**

RNA-seq analysis reveals unique transcriptome signatures in dermatomyositis with distinct autoantibodies specificities

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Dermatomyositis (DM) is a systemic inflammatory myopathy associated with a hallmark rash and muscle weakness. While DM is primarily a disease of adults, children can also develop the condition. The pathophysiology of DM is still not fully understood, but there is growing evidence that the disease is driven by the interaction of innate and adaptive immune system. While current DM research is focused on the understanding of the role of autoantibodies, inadequately described are the specific transcriptome differences associated with these autoantibodies. The findings of this study could be instrumental in the understanding of disease pathogenesis and in the creation of targeted therapies. To investigate the transcriptional profiles of children and adults with different autoantibodies, we performed high throughput sequencing technologies in 27 dermatomyositis and 7 healthy volunteers. These dermatomyositis patients were segregated into three subsets based on distinct autoantibodies present in their sera. Including 10 patients that anti-melanoma differentiation associated gene 5 antibody (MDA5) positive with interstitial lung disease (ILD), and 8 patients that anti-transcriptional intermediary factor 1-γ (TIF1-γ) antibody positive with tumor, and 9 patients that both two antibodies are negative with neither interstitial lung disease nor tumor. We extract RNA from the peripheral blood mononuclear cells of these patients and healthy controls. BGI seq 500 RS was used for sequencing. Gene ontology analysis and pathway enrichment analysis revealed cytokine activity, receptor binding and protein binding molecular function were specifically dysregulated in MDA5 positive patients. Glycosphingolipid binding and antioxidant response were specifically dysregulated in TIF1-γ positive patients. Both patient subsets were compared with antibodies negative patients. We also found different immune pathway between three subsets. Such as innate and adaptive immune system play an important role in the pathogenesis of dermatomyositis. This study has identified unique expression pattern of transcripts in DM patients. This ‘sub-grouping’ approach could further be useful for clinical evaluation of DM patients and designing targeted therapies.

**003**

A case of wong-type dermatomyositis with Anti-TIF1-γ antibody

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Anti-transcription intermediary factor 1 (TIF1)-γ antibody have been identified in cases with cancer-associated DM. We report the first case of positive anti-TIF1-γ antibody in Wong-type DM associated with painful gland tumor and demonstrated the importance of detection of serum anti-TIF1-γ antibody and screening tumor in Wong-type DM. The titers of the antibody was also closely correlated with the severity of cutaneous and the prognosis of the disease. Dynamic observation of serum anti-TIF1-γ antibody levels would be helpful in predicting the course and facilitating better therapeutic targeting.

**004**

HRCT in accessing of interstitial lung disease in dermatomyositis with positive expression of anti-MDAS autoantibody

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Objectives. A newly described autoantibody to a 143-145 kDa nuclear protein, identified as melanoma-differentiation associated gene 5 (MDA5), were closely associated with life-threatening ILD in DM. Occult lung disease by HRCT (high-resolution computerized tomography) seems to be a good alternative to conventional screening of ILD. This study examined the antibody in the sera of patients with DCMAD and described HRCT scores and findings in patients with positive anti-MDAS antibody. Methods. We screened 79 patients with various CTIDs, including 18 with DCMAD (22 of DM, 16 of CADM). Anti-MDAS antibody was detected by enzyme-linked immunosorbent assay (ELISA) and confirmed by neutralization and ELISA. Results. The level of anti-MDAS antibody shown by the ELISA was significantly greater in the samples from patients with CADM than in those from patients with classic DM (194.9±377.5 vs 37.2±8161.1, P=0.002). The HRCT scores of the MDAS positive subset were increased compared with those MDAS-negative group (122.9±54.8 vs 70.0±59.8, P=0.041) and correlated with anti-MDAS antibody level (r=0.514, P=0.012). Conclusion. Anti-MDAS antibody was found at an unusually high frequency in this group of Chinese patients. HRCT diagnosis should combine with the detection of anti-MDAS antibody, which will help us to determine the pathologic type and prognosis of patients with DCMAD.

**005**

Elucidating the mechanism(s) of silica nanoparticle induced immunomodulation in contact hypersensitvity

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Silica Nanoparticle (NP) enabled consumer products and biomedical devices have become ubiquitous. Many examples exist of NP based products in the cosmetic, sunscreen, and textile industries. While currently used as an anti-caking agent in cosmetics and foods, silica NPs have been the focus of numerous transdermal drug delivery studies, which can lead to increased dermal exposure. Research on the lungs and gastrointestinal tract have highlighted a potential immunomodulatory capacity of NPs, however, additional research into the health effects of NPs on contact hypersensitivity is warranted. To elucidate the effect of silica NPs on both healthy and inflamed skin, our lab topically exposed hairless C57BL/6 mice to a dinitrochlorobenzene (DNB) allergen, with or without NP pretreatment, in the challenge phase of a contact hypersensitivity response. Previous work has shown that topically applied 20 nm silica NPs decreased the DNB induced ear swelling response, and this effect was characterized by decreased cytokine expression (IL-1β and MIP-2) and reduced cytotoxic T cell localization in skin 24 hours after DNB challenge. To elucidate the mechanism of action of these NPs, we conducted a RNA sequencing study on whole skin samples. The transcriptome analysis revealed over 3400 differentially expressed genes in DNB treated skin, compared to control skin. Pathway analysis reveals that many of the genes are involved in skin barrier repair, antioxidant response, and immune signaling. Interestingly, the top pathways were enriched with both DNB and NPs, compared to skin treated with only DNB. Genes associated with fatty acid oxidation, activator protein-1 signaling, and antioxidant activity were all upregulated, compared to DNB only samples. While more work is needed to identify whether changes in the transcriptome lead to functional changes in the skin, this data provides insight into potential mechanisms of silica NP induced skin immunomodulation.

**006**

Topical application of caffeoyl prolyl histidine amide suppresses 2,4-dinitrochlorobenzene-induced atopic dermatitis-like symptoms in BALb/c mice

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Atopic dermatitis (AD) is a chronic inflammatory skin disease that affects 10% to 15% of the population worldwide. While AD is currently treated with topical corticosteroids, antihistamines, and moisturizers, these treatments are often inadequate and can cause significant side effects. As such, there is a need for new, effective treatments for AD. Caffeoyl prolyl histidine amide (CA-PH) is a compound that has been shown to have anti-inflammatory effects in several in vitro and in vivo models of AD. However, the mechanisms of action of CA-PH remain unclear. To investigate the potential of CA-PH as a treatment for AD, we conducted a study to determine its effects in a mouse model of AD. Mice were sensitized with 2,4-dinitrochlorobenzene (DNCB) and challenged weekly for 8 weeks to assess the relieving effects of DNCB-induced AD-like symptoms. CA-PH alleviated DNCB-induced AD-like symptoms, including skin irritation, redness, and itchy skin. CA-PH also reduced serum IgE levels, and mRNA levels of TSLP, interleukin (IL)-4, IL-25, IL-31, and IL-33 in the skin. These results indicate that CA-PH may be a potential therapeutic option for AD.