

# **Enhancement of skin barrier function by activation of granular layer cells and restoration of tight junction, and prevention of atopic and allergic dermatitis**

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Enhancement of skin barrier function by activation of granular layer cells and restoration of tight junction are important for the prevention of atopic and allergic dermatitis. We recently established a highly sensitive method for detection of allergen specific immunoglobulin class switching by the densely carboxylated protein (DCP) chip microarray. DCP chip provides sensitive quantitative measurement of allergen-specific IgGs, IgA and IgE by using limited amount of serum and also provides allergen-affinity of each immunoglobulins. By using the DCP chip, we measured the enhancement of skin barrier function after sensitization of allergen from skin. We analyzed the effects of pyruvate dehydrogenase kinase 4 (PDK4) inhibitor on activation of mitochondria in the granular layer cells of skin. Treatment of PDK4 inhibitor from the skin effectively inhibited dinitrochlorobenzene-induced skin inflammation and proliferated granular layer cells. Treatment of PDK4 inhibitor also block skin sensitization of ovomucoid. These results suggest that PDK4 inhibitor plays a role for prevention and/or treatment of allergy induced by skin-sensitization.