Synopsis of Original Research Paper

Unraveling the relationship between age-related microvascular abnormalities and skin aging

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This study aimed to clarify the relationship between age-related abnormalities in the microvascular network and skin aging. For this, we first developed a new method for quantitatively analyzing the three-dimensional microvascular network in mouse ear skin. Using this methodology, we found that induction of impairment of endothelial cell function reduced the microvascular network density and pericyte coverage. It was also suggested that the skin may begin to show some of the characteristics of aged skin tissue. We also established a mouse line (Col4a1/a2-flox mouse) that can simultaneously knock-out *Col4a1* and *Col4a2* genes in time- and cell-specific manner by crossing mouse carrying specific Cre driver and that is expected to intentionally reduce the density of the microvascular network due to impaired angiogenesis. Furthermore, by combining various *in vitro* and *in vivo* assays, we identified the Notch-TGFb2 signaling axis as a candidate molecular mechanism by which the impairment of vascular basement membrane formation via the action of vascular endothelium and pericytes leads to abnormalities in the microvascular network. It is hoped by developing this research further that we will be able to pioneer future academic trends in cosmetology and contribute to the development of this field. Furthermore, I believe that this will provide a scientific foundation that will contribute to the prevention and improvement of skin aging and the development of new treatments for age-related skin diseases, and that will greatly contribute to improving people's health and beauty.