

## Identification and Clarification of Mechanism for Elements that Regulate Disorders of Sensory Organs

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### Summary

Magnesium (Mg) is an essential element. Calcium (Ca), strontium (Sr) and barium (Ba) are known as homologous elements of magnesium. Recent studies revealed that magnesium and its homologous elements affect human health. On the other hand, it has been reported that melanin in the skin protects skin damage derived from ultraviolet light irradiation. It has been also reported that melanin possesses antioxidant activity. Recently, it is hypothesized that melanin in various sensory organs may widely protect damage from various environmental stimulations.

In this study, relative levels of melanin in the skin from various hairless mice (wild-type mice, genetically-modified mice of line 242 and genetically-modified mice of line 304) and forehead and toenails in humans were measured by using a reflectance spectrophotometer. Levels of magnesium and its homologous elements in skin samples from the hairless mice and hairs and toenail samples from humans were measured by inductively coupled plasma-mass spectrometry (ICP-MS: 7500cx, Agilent Technologies, Inc., CA, United States) after ashing the samples.

Our results showed that levels of pigmentation in the skin from the hairless mice and humans were more objectively evaluated by the reflectance spectrophotometer. Levels of magnesium and its homologous elements in skin samples from the hairless mice and hairs and toenail samples were detected by ICP-MS. Thus, the hairless mice with different levels of skin pigmentation, the reflectance spectrophotometer and ICP-MS could be a strong tool to clarify the correlation between melanin and element level.