

〈原 著〉

## プロアントシアニジン高含有ブドウ種子抽出物の メラニン生成抑制効果

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### **Inhibitory Effects of Proanthocyanidin-rich Extract from Grape Seeds on Melanogenesis**

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#### **Abstract**

We investigated the inhibitory effect of proanthocyanidin-rich extract from grape seeds (PA) on melanogenesis. PA inactivated tyrosinase isolated from mushroom and dose-dependently reduced melanin production and tyrosinase activity in B16 mouse melanoma cells with no change in cell viability. PA did not have effect on the protein amounts and the level of mRNA of tyrosinase in normal human melanocyte, indicating that PA prevented melanin synthesis by inhibiting the tyrosinase activity selectively. Analysis of PA's proanthocyanidin by MALDI-TOF MS revealed that PA was constituted by 1-13 units of catechin which was partly esterified with gallic acid. A comparison of the inhibitory effect of separated proanthocyanidin polymer on tyrosinase isolated from mushroom indicated that the higher the unit of proanthocyanidin monomer (catechin), the stronger the proanthocyanidin inhibits tyrosinase activity. In the experiment of B16 mouse melanoma cells, lower degrees of polymerization of proanthocyanidins did not reduce melanin production and tyrosinase activity, and the more than 3 degrees of polymerization reduced melanin production and tyrosinase activity in proportion to the degree of polymerization. Topical application of 1% PA cream prior or posterior to UV-irradiation effectively suppressed UV-induced hyperpigmentation in human. We concluded that the mechanism of melanogenesis-inhibitory effect of PA was due to selective inhibition of tyrosinase activity, and the higher degrees of polymerization of proanthocyanidins were more effective to reduce melanogenesis.

**Key words:** melanin, tyrosinase, melanogenesis, proanthocyanidin, MALDI-TOF MS.