

# **Anemonin is a natural bioactive compound that can regulate tyrosinase-related proteins and mRNA in human melanocytes**

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## **Abstract**

Melanin is the pigment responsible for skin color. Melanin synthesis occurs with the participation of the tyrosinase (TYR) family of proteins including TYR, tyrosinase-related protein 1 (TRP1), and tyrosinase-related protein 2 (TRP2/DCT). OBJECTIVE: The effect of a newly isolated natural compound that inhibits hyperpigmentation on the regulation of the TYR family of proteins was examined. METHODS: The natural compound, anemonin, was isolated from *Clematis crassifolia* Benth and was used to inhibit cellular TYR activity; it was found to have a low cytotoxicity (cell viability > 80%) in human melanocytes. RESULTS: In human melanocytes, anemonin showed both time- and dose-dependent inhibition (IC<sub>50</sub> 43.5 μM) of TYR. Western blot analysis and immunocytochemical staining revealed that expression of TYR, TRP1, and TRP2 was decreased in anemonin-treated melanocytes. Additionally, reverse transcription and quantitative real-time polymerase chain reaction analyses revealed that expression of mRNAs for MITF, TYR, TYRP1, and TYRP2 was also suppressed by anemonin. CONCLUSION: The natural compound, anemonin, an active compound of *C. crassifolia*, inhibits pigmentation synthesis in human melanocytes. Anemonin inhibits melanin synthesis by inhibiting the transcription of the genes encoding MITF, TYR, TRP1, and TRP2. This natural compound may be a candidate for cosmetic use.