4-Cryptochlorogenic Acid Positively Regulates Pigmentation via Inducing Melanoblast Specification and Melanin Synthesis in Zebrafish Embryos and B16F10 Cell

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Background: The effective ingredients that are added to cosmetics on the market have concentration limits, which weakens the maximum effect on anti-melanogenic activity. Finding a safer and more effective ingredient for anti-melanogenic activity could be an important strategy for cosmetics. Methods: First of all, the DPPH test was used to determine the antioxidant activity of several monosomes of coffee. Secondly, based on the previously mentioned finding, zebrafish embryos were then used to confirm the anti-melanogenic activity of 4-cryptochlorogenic acid. Moreover, PCR technology was used to study the changes in transcriptional levels of tyrosinase (TYR) families and small eye-related transcription factors (MITF). In addition, the drug was tested for degradation of artificial melanin. Finally, the effect of 4-Cryptochlorogenic Acid on melanin synthesis was verified by using mouse melanoma cells (B16F10) as an auxiliary model. Results: 4-cryptochlorogenic acid induced dose-dependent reductions in melanin production in both the melanoma cells and zebrafish. Moreover, in vivo system (zebrafish embryos), 4-cryptochlorogenic acid induced dose-dependent reductions in tyrosinase activity, the transcriptional levels of TYR families and MITF without affecting viability. Besides, 4-cryptochlorogenic acid can degrade synthetic melanin. Conclusion: These results indicate that 4-cryptochlorogenic acid has potential as a tyrosinase inhibitor. Keywords: 4-cryptochlorogenic acid, anti-melanogenesis, tyrosinase, zebrafish, B16F10

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