

## **C5 Mechanisms of antioxidant and antimelanogenesis induced by vanillin and vanillic acid**

Pin-Ru Chen<sup>1</sup>, Tzung-Han Chou<sup>2</sup>, Hsiou-Yu Ding<sup>3</sup>, Wei Jing Hung<sup>2</sup>, Rong-Jyh Lin<sup>4</sup>,  
Pei-Ju Hung<sup>2</sup> and Chia-Hua Liang<sup>2,\*</sup>

<sup>1</sup> Department of Medicinal Chemistry, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

<sup>2</sup> Department of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

<sup>3</sup> Institute of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

<sup>4</sup> Department of Parasitology, School of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

### **ABSTRACT**

Vanillin and vanillic acid, isolated from *Origanum vulgare*, was used to investigate the antioxidant activities and may serve as a quencher of oxidative attackers involving in the antimelanogenesis. The antioxidant activities have demonstrated that vanillic acid was more effective than that vanillin by free radical scavenging activities, reducing power and inhibition of lipid peroxidation. The inhibition of cellular reactive oxygen species (ROS) in H<sub>2</sub>O<sub>2</sub>-treated BNLCL2 cells for vanillic acid was greater than ascorbic acid (AA) and trolox. In B16F0 cells stimulate  $\alpha$ -melanocyte-stimulating hormone, vanillic acid inhibited cellular tyrosinase activity, DOPA oxidase, melanin contents and expressions of melanocortin-1 receptor (MC1R), microphthalmia-associated transcription factor (MITF), tyrosinase, tyrosinase-related proteins 2 (TRP-2) and TRP-1. Nevertheless, vanillin exhibited no tyrosinase inhibition activity in B16F0 cells. These results suggest that exhibited significantly stronger antioxidant activities than vanillin, might be its carboxyl group constituents, and suppose vanillic acid contributed to antimelanogenesis performances.

**Keywords:** antioxidant, antimelanogenic, vanillin, vanillic acid