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The antioxidant properties of a new anti-oxidative peptide (VG5) in different oxidation system

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In order to enhance the physiological effectiveness of the peptide used as medicine and health food in the future, we modified the original skeleton of natural multifunctional algae peptides (VECYGPNRPQF, VF11) for various antioxidant capacity detections and utilized the bioinformatics knowledge to explore the relationship of amino acids diversity. The ABTS radical cation de-colorization assay was widely applied to evaluate the total anti-oxidative activity in both lipophilic and hydrophilic samples. The ABTS radicals scavenging activity of VECYG (VG5) is close to that of VF11 by hydrogen or electron donation and it was far superior to YGPNRP (YP6) and PNRPQF (PF6). On the other hand, the penta-peptide VG5 (IC₅₀ 10.17±0.12 μM) was also more close to those of VF11 (IC₅₀ 9.44±0.35 μM) and natural antioxidant trolox (IC₅₀ 5.63±0.25 μM) for quenching hydroxyl radicals capacity; and it was far superior to YP6 (IC₅₀ 56.41±0.23 μM) and PF6 (IC₅₀ 148.37±1.46 μM). We also further detected the oxidation-induced DNA damage to elucidate the prospective antioxidant role of peptide in human. The super coil (SC) form in DNA was completely converted to the open circular (OC) form due to the Fenton reaction (Fe²⁺+H₂O₂) in our study. The result showed these peptides had the protective capacity in oxidation-induced DNA damage, so it further strengthened the ability of the peptides to protect hydroxyl radical induced damage. These results suggested the shorter chain peptide VG5 might be able to substitute for hendeca-peptide (VF11) to serve as food additives with health claims in the future.

Biography

I-Chuan Sheih has ever been as a RD for four years in the Resource Microbiology Institute and a Researcher for six years in Food Industry Research Development Institute. She has completed her PhD in 2009 and completed Postdoctoral research for two and a half years in National Chung Hsing University. She is the Associate Professor of Department of Food and Beverage Management in Ta Hwa University of Science and Technology and a Project Director of Ministry of Science and Technology. She has published many SCI papers in reputed journals.

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