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PEROXYNITRITE SCAVENGING BY NO MODULATORY ACTIVITIES OF HYDROQUINONE FROM COFFEE

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Peroxynitrite (ONOO⁻), a potent cytotoxic oxidant formed by the reaction of nitric oxide (\cdot NO) and superoxide radical (\cdot O₂⁻), reacts rapidly to cause of oxidization and nitration process. The importance of the regulation of ONOO⁻ has been recently recognized because of the lack of specific endogenous enzymes against ONOO⁻. Coffee that is a complex mixture containing a variety of components has been reported to have both beneficial and hazardous effects. In the present study, we investigated the ONOO⁻ scavenging effect of coffee ingredient, hydroquinone and its biological effect on NO metabolism in the murine macrophage cell line RAW 264.7. Hydroquinone showed the significant inhibition on ONOO⁻-induced nitration of GSH reductase in a dose-dependent manner. Furthermore, hydroquinone led to scavenge ONOO⁻ through nitration. Moreover, stimulation with bacterial wall component lipopolysaccharide (LPS) significantly increased level of NOx in RAW 264.7 cells, while hydroquinone blocked the increase of NOx and suppressed the activation of iNOS. This indicated that hydroquinone also reduced endogeneous NO generation. These data begin to provide the understanding of the ONOO⁻ scavenging activity of hydroquinone and possibly the use of leader compounds as therapeutic agents in various disorders.