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Detection and scavenging of hydroxyl radical via D-phenylalanine hydroxylation in human fluids.

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ABSTRACT:

Hydroxyl radical (·OH) is highly reactive, and therefore very short-lived. Finding new means to accurately detect ·OH, and testing the ability of known ·OH scavengers to neutralize them in human biological fluids would leverage our ability to more effectively counter oxidative (·OH) stress-mediated damage in human diseases. To achieve this, we pursued the evaluation of secondary products resulting from ·OH attack, using a detection system based on Fenton reaction-mediated D-phenylalanine (D-Phe) hydroxylation. This reaction in turn generates o-tyrosine (o-tyr), m-tyrosine (m-tyr) and p-tyrosine (p-tyr). Here, these isomers were separated by HPLC, equipped with fluorescence detectors due to the natural fluorescence of these hydrotyrosines. By extension, we found that, adding radical scavengers competed with D-Phe on ·OH attack, thus allowing to determine the ·OH quenching capacity of a given compound

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