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

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ABSTRACT:

Hydroxyl radical ($\cdot\text{OH}$) is highly reactive, and therefore very short-lived. Finding new means to accurately detect $\cdot\text{OH}$, and testing the ability of known $\cdot\text{OH}$ scavengers to neutralize them in human biological fluids would leverage our ability to more effectively counter oxidative ($\cdot\text{OH}$) stress-mediated damage in human diseases. To achieve this, we pursued the evaluation of secondary products resulting from $\cdot\text{OH}$ 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 $\cdot\text{OH}$ attack, thus allowing to determine the $\cdot\text{OH}$ quenching capacity of a given compound

¹ Authors contributed equally to the work

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