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Superoxide radicals react with peptide-derived tryptophan radicals with very high rate constants to give hydroperoxides as major products

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ABSTRACT

Oxidative damage is a common process in many biological systems and proteins are major targets for damage due to their high abundance and very high rate constants for reaction with many oxidants (both radicals and two-electron species). Tryptophan (Trp) residues on peptides and proteins are a major sink for a large range of biological oxidants as these side-chains have low radical reduction potentials. The resulting Trp-derived indolyl radicals (Trp[•]) have long lifetimes in some circumstances due to their delocalized structures, and undergo only slow reaction with molecular oxygen, unlike most other biological radicals. In contrast, we have shown previously that Trp[•] undergo rapid dimerization. In the current study, we

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