

Evaluation of spin traps for in vivo application

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Free radicals have been postulated to have important roles in the development of ischemia-reperfusion damage, cancer, aging, and other types of uncontrolled oxidation. Due to the reactive nature of these species, however, they are generally very short-lived in vivo and cannot be detected directly without some means to stabilize them. Most of the approaches to detect these species in biological systems require the use of in vitro systems, isolated organs, or in vitro analyses of free radicals generated in vivo. One of the major obstacles which prevents the direct detection of trapped free radicals in vivo with low frequency EPR spectrometer is the stability of the spin adducts of the reactive free radicals. We have systemically studied various spin traps, and compared their potential utility in trapping free radicals in vivo. Several aspects of in vivo spin trapping, including the pharmacokinetics and cytotoxicity of spin traps, and stability of various spin adducts, will be discussed.