Reactivity of the one-electron reduction product from nifedipine with relevant biological targets

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The reactivity of the electrochemically generated nitro radical anion from nifedipine, a nitro aryl 1,4-dihydropyridine derivative, with relevant endobiotics and thiol-containing xenobiotics, was quantitatively assessed by cyclic voltammetry. The method was based on the decrease in the return-to-forward peak current ratio after the addition of compounds. A quantitative procedure to calculate the respective interaction constants between the radicals and the xeno/endobiotics is also provided. In the optimal selected conditions, i.e. mixed media (0.015 M aqueous citrate/DMF: 40/60, 0.3 M KCl, 0.1 TBAI) at pH 9.0 the following order of reactivity was obtained: glutathione > uracil > adenine and cysteamine > N-acetylcysteine > captopril > penicillamine. In all cases, the interaction rate constants for these derivatives were greater than the natural decay constant of the radical. Studies on the reactivity at pH 7.4 were also conducted. Results from these experiments indicate a significant re