

t-butyl-4-hydroxyanisole as an inhibitor of tumor cell respiration

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The effect of t-butyl-4-hydroxyanisole (BHA), a widely used food antioxidant additive, on the culture growth, oxygen consumption, and redox state of some electron carriers of intact TA3 and 786A ascites tumor cells has been studied. BHA inhibited culture growth and respiration of these two tumor cell lines, by inhibiting the electron flow through the respiratory chain. Experiments to determine its site of action showed that BHA did not inhibit noticeably the electron flow through cytochrome oxidase, due to the ability of N,N,N',N'-tetramethyl-p-phenylenediamine to bypass the BHA inhibition of the respiration. Electron flow through the ubiquinone-cytochrome b-c1 complex also was unaffected by BHA; in fact, BHA failed to inhibit the oxidation of duroquinol.

Spectrophotometric experiments are in accordance with studies carried out using synthetic electron donors. The redox state of NAD(P)⁺, determined in steady-state conditions, changed to a more reduced level, and the redox states of ubi