Synthesis of Symmetrical 1,5-bis-thio-Substituted Anthraquinones for Cytotoxicity in Cultured Tumor Cells and Lipid Peroxidation

林本元

Huang HS;Chou JF;Chiu HF;Hwang JM;Lin PY;Tao CW;Yeh PF;Jeng WR

Abstract

The synthesis of a series of anthraquinone moieties bearing symmetrical sulfur-linked substituents in the 1 and 5 positions is described. These compounds were evaluated for their ability to inhibit the growth of suspended rat glioma C6 cells and human hepatoma G2 cells, respectively. In addition, the redox property of the compounds was determined based on the inhibition of lipid peroxidation in model membranes. Compounds 2a and 2h in this series compared favorably and exhibited the most potent cytotoxicity (0.02, 0.05 microM) against C6 cells in the XTT colorimetric assay. As far as redox properties are concerned, all bis-thio-anthraquinones show potential lipid peroxidation in model membranes very close to that of mitoxantrone (MX), and 2a, 2d, 2e, 2i, 2j, and 2k have more potential than that of MX. The lack of cytotoxicity of compound 2i cannot be related to lipid peroxidation, but the steric and electronic properties of the side-chain substituent maybe impair effective recognition of the cleavable complex. In contrast to MX, 2a and 2h are cytotoxic in rat glioma C6 cells and do not enhance lipid peroxidation in model membranes.