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Cytotoxic Activity of 2-Aminomethylene-3(2*H*)-benzofuranones against Human Oral Tumor Cell Lines

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A total of 23 newly-synthesized 2-aminomethylene-3(2*H*)-benzofuranone and structurally-related compounds were compared for their cytotoxic activity against both normal (human gingival fibroblast HGF) and tumor cells (human oral squamous cell lines HSC-2, HSC-3 and human salivary gland tumor cells HSG). There was a significant variability of drug sensitivity among the oral tumor cell lines. In general, HSC-2 cells were the most sensitive, followed by HSG cells, while HSC-3 cells were the most resistant. HGF normal cells were highly resistant to all compounds, suggesting their tumor-specific cytotoxic action. The cytotoxic activity of the compounds with morpholine, 1-methylpiperazine or piperidine structure was generally elevated by the introduction of fluorine, but not chlorine and methoxy functional groups, to the benzofuranone structure, whereas that of compounds attached by 1-phenylpiperazine or 1-(2-pyridyl)piperazine was rather reduced. The most active compounds induced internucleosomal DNA fragmentation in human promyelocytic leukemia HL-60 cells, but not in HSG, further confirming that oral tumor cell lines are resistant to DNase digestion.