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Relationship between Cytotoxic Activity and Radical Intensity of Isoflavones from *Sophora Species*

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Among 11 isoflavones tested, genistein [YS13] produced higher cytotoxic activity against human oral tumor cell lines (HSC-2, HSG) than against normal cells (human gingival fibroblast, HGF), suggesting its tumor-specific action. Electron spin resonance (ESR) spectroscopy showed that YS13 did not produce radical, nor scavenged $O_2 \cdot$, generated by hypoxanthine-xanthine oxidase reaction system, suggesting that radical-mediated oxidation mechanism is not be involved in the YS13-induced cytotoxicity. Addition of one prenyl group produced YS18 and YS19 with higher anti-*Helicobacter pylori* activity. Addition of two prenyl groups produced YS21 with the highest cytotoxic activity but lower tumor-specificity. Since YS21 produced the highest amount of radical and most efficiently scavenged $O_2 \cdot$, this compound may induce cytotoxicity by radical-mediated oxidation mechanism. All isoflavones failed to induce anti-human immunodeficiency virus (HIV) activity. These data suggest the medicinal efficacy of isoflavones.