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Anti-tumour activity of four soy isoflavone components against Src-activated human adenocarcinoma cells

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Src oncogene has been strongly implicated in the development, growth, progression, and metastasis of a variety of human cancers [1]. Genistein (GEN), a natural isoflavonoid phytoestrogen, is a strong inhibitor of Src [2]. Although daidzein, glycitein and equol, a metabolite of daidzein, are also major soy Isoflavone components, their functional role in Src activity remains unknown. Using HAG-1 human adenocarcinoma cells transfected with v-src (HAG/src), we investigated the anti-tumour activity of four isoflavone components by measuring proliferation, apoptosis, cell cycle perturbation, and signal proteins with WST-1 assay, FACS analyses, and Western blot, respectively. Activation of Src conferred resistance to either daidzein, glycitein or equol, but rendered the cells more sensitive to GEN. GEN arrested HAG/src cells at G2/M phase, while other isoflavones could not arrest HAG/src cells at any phase of the cell cycle. The sub-G0/G1 apoptotic cell populations were not increased over 72h exposure with either isoflavone components. GEN increased the expression levels of p53 and p21 with decreased phosphorylated p21. The levels of other main cell cycle-related proteins were not affected. These data suggest that GEN would be the only isoflavone component that may potentially suppress oncogenic activity driven by Src through increasing p53 and p21 levels.

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