

Title Screening for cancer chemopreventive agents from soybean
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Abstract

Diets rich in fruits, vegetables and grains are known to reduce cancer risk in humans. Identification of specific phytochemicals that provide chemopreventive benefits and understanding their mechanism of action will provide opportunities to use diet to promote health. The objectives: 1. Screen soybean isolates for potential cancer chemopreventive activity using an in vitro bioassay. 2. Use this bioassay to direct the isolation of the active agent(s). Sequential refluxing of soy flour with ethyl acetate, ethanol and water yielded crude solvent extracts. A bioassay based on Murine hepatoma cells (Hepa 1c1c7 cells) was employed to test isolates for their ability to induce quinone reductase (QR). QR is a prototypical phase II detoxification enzyme capable of transforming (pro)carcinogens into inactive adducts, representing one tissue defense system to genotoxic effect of carcinogens. This bioassay was used to direct the isolation of QR-inducing active agents during selected purification steps. QR-inducing activity was 5-times more potent in crude ethanol extracts than ethyl acetate extracts, and 100-times more potent than in aqueous extracts, based on the levels of dry matter from these extracts required to double QR specific activity in the bioassay. Removal of phospholipids by precipitation with magnesium chloride in cold acetone led to an enrichment of bioactivity in the material remaining soluble in ethanol. Flash chromatography on C18-silica gel using a step gradient of 0-100% methanol yielded 5 fractions, the three most potent of which constituted 15% of the recovered material and could double QR specific activity at levels ranging from 20-180 ppm. The level of isoflavones in these active isolates was insufficient to account for the observed bioactivity. Efforts to isolate and identify the active agent(s) are continuing. Identification of components in soybean capable of conferring protection from cancer will lead to both health promoting and value-addition opportunities derived from soybeans.