

### Assessment of chalcones as cancer chemopreventive agents

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Chemoprevention is based upon the use of natural or synthetic products to eliminate or minimize the development of cancer<sup>1</sup>. Many cancers are thought to occur due to processes such as oxidative stress and lipid peroxidation causing DNA damage. Chemopreventive compounds may prevent such damage from occurring. Chalcones belong to the flavonoid based group of compounds and have been reported to possess cancer chemopreventive properties<sup>2,3</sup>. In this study, we investigated the ability of novel synthetic chalcones to act as chemopreventive agents. The aim was to assess the ability of the chalcones to switch on the transcription factor Nrf2 thus inducing many cell defence genes. This was achieved using the AREc32 reporter cell line that contains the luciferase gene linked to the antioxidant response element (ARE), which is a sequence found within the promoters of cell defence genes to which the Nrf2 transcription factor binds<sup>4</sup>.

The luciferase reporter AREc32 cell line was exposed to varying concentrations of synthetic chalcones to determine a suitable non-toxic concentration to use (MTT assay). The AREc32 cells were then exposed to this non-toxic concentration of chalcones for 24 h after which the amount of luciferase activity (Nrf2 activity) was quantified. Of the 30 chalcones tested, 12 chalcones were found to activate the luciferase reporter gene by 2-fold or more (relative to untreated control) with the greatest induction being 16-fold. Further investigations are now in progress to delineate the common structural features of the chalcones that give the greatest induction in addition to the ability of these chalcones to prevent cellular cytotoxicity.

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