



Original Article

Synthesis and Evaluation of New Coumarins as Antitumor and Antioxidant Applicants

ABSTRACT

This work involves the synthesis of eight novel fused coumarin compounds, which were confirmed by various spectrophotometers and then, assessed for their apoptotic-inducing and free radical-quenching activities. The pharmacokinetic parameters were evaluated *in silico* using pre-ADMET, a free online program. The apoptotic-inducing activity was tested against six tumorigenic cell lines. Also, their safety against normal cells was examined. The free radical-quenching activity was assessed by checking these compounds' ability to eliminate DDPT and hydroxyl moieties. Pharmacokinetic investigations showed that the synthesized fused coumarin compounds have excellent penetration across the GIT mucosa and most of them have poor penetration across the blood-brain barrier. These findings suggest good oral bioavailability along with low neurological toxicity profiles. The evaluation of the apoptotic-inducing activity revealed that all of the compounds have weaker activity as compared to the reference. Among these compounds, SA4 was the most potent one. Nevertheless, all of these new compounds had an excellent safety profile against normal cells. On the other hand, the assessment of the free radical-quenching activity of these synthesized compounds also indicated that all of them were less active than the reference. In this field, SA0 was the strongest free radical-quenching compound. From these realizations, along with the apparent safety and good pharmacokinetic characteristics in accordance with the *in silico* study, compounds SA4 and SA0 are considered the most promising agents. The authors hope that these new fused coumarin compounds can be utilized in the coming years for the production of new powerful drugs with apoptotic-inducing and free radical-quenching potentials which can help in the battle against many diseases.