P37

Cudraflavanone A purified from *Cudrania tricuspidata* inhibits mammalian DNA topoisomerase I activity

Youn-Hwa Rho, Byong-Won Lee[1], Ki-Hun Park[1] and Young-Seuk Bae

Department of Biochemistry, College of Natural Sciences, Kyungpook National University, Daegu 702-701, Korea;
[1]Division of Applied Life Science, Department of Agricultural Chemistry, Gyeongsang National University, Jinju 660-701, Korea

In recent years topoisomerase I has been considered as an attractive target for antitumor agents. A chloroform extract of the root barks of *Cudrania tricuspidata* showed an inhibitory effect on mammalian DNA topoisomerase I. The topoisomerase I inhibitory compound was purified and identified as 2S-2′,5,7-trihydroxy-4′,5′-(2,2-dimethylchromeno)-6-prenyl flavanone (cudraflavanone A). Cudraflavanone A was shown to inhibit the activity of topoisomerase I with approximately 0.4 mM of IC_{50}. Concentration of 6 μM cudraflavanone A caused 50% growth inhibition of human cancer cell U937. Cudraflavanone A-induced cell death was characterized with the cleavage of poly (ADP-ribose) polymerase (PARP) and pro-caspase 3. Furthermore, cudraflavanone A induced the fragmentation of DNA into multiples of 180 bp, indicating that the inhibitor triggered apoptosis. This induction of apoptosis by cudraflavanone A was also confirmed using flow cytometry analysis. Taken together, these results suggest that cudraflavanone A may function by inhibiting oncogenic disease, at least in part, through the inhibition of topoisomerase I activity.

P38

3,4-dihydroxybenzaldehyde purified from *Xanthium strumarium* inhibits protein kinase CKII activity

Bang Hyo Lee, Jong Soo Uhm, Sang Kook Kim, Beom Sik Kang, Byung Jo Moon, and Young-Seuk Bae

Department of Biochemistry, College of Natural Sciences, Kyungpook National University, Daegu 702-701, Korea

Protein kinase CKII (CKII) is a protein Ser/Thr kinase, which catalyzes the phosphorylation of a large number of both cytoplasmic and nuclear proteins including DNA binding proteins, nuclear oncoproteins, and transcription factors. Genetic analysis has demonstrated that CKII is required for cell viability and progression of the cell cycle. The expression level of CKII is greatly enhanced in a variety of tumor or leukemic cells. The overexpression of CKIIα leads to tumorigenesis in mice overexpressing myc. These observations suggest that CKII plays a critical role in cell proliferation and oncogenesis. *Xanthium strumarium* has been used clinically for the treatment of various tumors in the Orient. However, the mechanisms by which extract of *X. strumarium* exerts its anticarcinogenic effects remain largely unknown. In this study, we first demonstrate that 3,4-dihydroxybenzaldehyde purified from *X. strumarium* is an inhibitor of CKII activity. 3,4-dihydroxybenzaldehyde killed human cancer cells. Thus, the present results suggest that 3,4-dihydroxybenzaldehyde is likely to function by inhibiting oncogenic disease, at least in part, through the inhibition of CKII activity.