

[PC1-44] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

The activity - binding affinity relationship of topoisomerase I inhibitors by flexible docking with FlexiDock

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Human Topoisomerase I (topo I) helps the control of DNA supercoiling in cells by assisting breaking and religation of DNA strand. It is essential for cellular metabolism and survival, hence, a good target for a novel class of anticancer drugs. As topo I inhibitor binds to the DNA-topo I complex, the religation of DNA strand is suppressed which results in the death of the target cell. Seven compounds of 1H-Imidazo[4,5-g]phthalazine-4,9-dione derivatives with IC₅₀ in the range of 0.001 and 6.27 μM in 5 different cancer cells and four compounds of 7-chloro-6-quinazoline-5,8-dione derivatives with positive and negative topo I inhibition activities were studied. Computer docking with FlexiDock was carried out to illustrate the binding modes between these compound and DNA-topo I binary complex of the DNA-topo I-topotecan ternary complex structure determined by crystallography. The results show that, in phthalazine derivatives, 3 compounds form one or two H-bonds each with Arg364, an important active site residue and 2 compounds form a H-bond each with P-Tyr723 with a water molecule as a bridge. One compound forms H-bond with Thr718. In quinazoline derivatives, 2 compounds with highly positive activity intercalated properly between DNA helices while the two negative compounds did not. The binding modes obtained demonstrated the overall correlation between the activity and the binding affinity, presenting the possible use of the modeling system for the prediction of the activity and design of novel drugs.

[PC1-45] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

Codonopside 1c is a potent inducer of apoptosis in Human Leukemia cell line, HL-60.

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Codonopside 1c is an active natural compound isolated from the roots of *Codonopsis lanceolata* (Campanulaceae), a Korean medicinal herb. In the present study, we investigated the in vitro effect of Codonopside 1c on the proliferation and induction of apoptosis in HL-60 human promyelocytic cells. When HL-60 cells were treated with Codonopside 1c, evidence of apoptotic features, including DNA fragmentation, formation of DNA ladder in agarose gel electrophoresis and increase of annexin V binding, were obtained. Our investigation of apoptosis in HL-60 cells showed an intracellular events that included (1) activation of caspase-3, caspase-8 and caspase-9; (2) decrease of bcl-2 and bax protein in cytosol; (3) decrease of XIAP, inhibitor of apoptotic protein; and (4) induction the release of Smac into cytosol. Broad caspase inhibitor (z-VAD-fmk), caspase 9 inhibitor (Ac-LEHD-fmk), caspase 8 inhibitor (Ac-IETD-fmk) and caspase-3 inhibitor (Z-DEVD-fmk) almost completely suppressed the DNA fragmentation. The induction of apoptosis by Codonopside 1c may provide a pivotal mechanism for its chemotherapeutic action.

[PC1-46] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

Antioxidant enzyme activity of flavonol quercetin in the presence of different antioxidants.

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It has been known that quercetin is one of bioflavonoid compounds and has anti-tumor effect by suppressing tumor growth in vitro and in vivo, including multiple biological effects by antioxidant and effective anti-inflammatory agent. The present study investigated whether quercetin can enhance antioxidant enzyme activity (glutathione peroxidase: GPX, superoxide dismutase: SOD, catalase: CAT) and regulate the intracellular reactive oxygen intermediate levels on the B16F10 murine melanoma cells in the presence of vitamin E, L-ascorbic acid

(vitamin C) and reduced glutathione (GSH). Quercetin were used 12,5, 25, 50, 100mM concentration. From this result The antioxidant enzyme activity of quercetin in the presence of vitamin E was stronger than GSH or vitamin C, in addition, the same treatments decreased intracellular reactive oxygen intermediate levels in B16F10 melanoma cells. Taken together, these result demonstrate that the antioxidant effect of quercetin can enhance in the presence of different antioxidant and it might play an important role in anti-tumor effect.

[PC2-1] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

Expression and Characterization of ATP-binding-cassette(ABC) Transporter in Cephacillin Biosynthesis Gene Cluster of *Lysobacter lactamgenus*

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In order to confirm the biological function of ORF10 in cephalosporin biosynthesis gene cluster of *Lysobacter lactamgenus* as an ATP-binding-cassette (ABC) transporter, the gene for ORF10 was amplified and subcloned into pET-28a(+) expression vector. After gene induction with 0.5 mM IPTG at 30 °C and further cultivation at 30 °C for 8 hr, a lot of the recombinant ORF10 protein was produced as soluble form in cytoplasmic fraction as well as a membrane protein in the membrane fraction as likely as other ABC transporters. The membrane fraction of recombinant *E. coli* cells was separated by ultracentrifugation, and solubilized using 2.5% octyl- β -D-glucoside. The ORF10 protein was then purified from the solubilized membrane proteins through nickel affinity column chromatography. Because enough amount of ORF10 as a pure form was not obtained, the comparative analysis of biological activity was next done using membrane proteins of recombinant *E. coli* cells and host cells. For the accurate analysis, the artificial liposomes were reconstituted by octyl- β -D-glucoside dilution method. The generated liposomes about 2 μ m were tested for ATPase activity and substrate specificity. The artificial liposome made from recombinant *E. coli* membrane proteins showed slightly higher activity than that from host *E. coli* membrane proteins. In the measurement of membrane transport activity, the reconstituted liposome of recombinant *E. coli* membrane proteins exhibited a significantly high activity on cephalosporin C, a part of cephem nucleus of cephalosporin, but not on Ala-Ser, an oligopeptide side chain of cephalosporin. Further, slightly higher activity was observed in this liposome when both substrates of cephalosporin C and Ala-Ser were treated than when cephalosporin C alone.

[PC2-2] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

Cytotoxicity of Compound K and Ginsenoside R_{b2} against some tumor cells

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When ginsenoside R_{b1} and R_{b2} were anaerobically incubated with human fecal microflora, these ginsenosides were metabolized to compound K. When ginsenoside R_{g3} was anaerobically incubated with human fecal microflora, the ginsenoside R_{g3} was metabolized it to ginsenoside R_{b2}. Among ginsenosides, compound K and 20(S)-ginsenoside R_{b2} exhibited the most potent cytotoxicity against tumor cells: 50% cytotoxic concentrations of compound K in the media with and without fetal bovine serum (FBS) were 27.1 - 31.6 mM and 0.1 - 0.6 mM, and those of 20(S)-ginsenoside R_{b2} were 37.5 - > 50 and 0.7 - 7.1 mM mM, respectively. The cytotoxic potency of ginsenosides was compound K > 20(S)-ginsenoside R_{b2} >> 20(S)-ginsenoside R_{g3} > ginsenoside R_{b1} @ R_{b2}.

[PC2-3] [2003-10-10 09:00 - 13:00 / Grand Ballroom Pre-function]

Search for acetaldehyde trapping agents by using alcohol dehydrogenase assay

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