수상 1

Reversal of P-glycoprotein-mediated multidrug resistance by Red Ginseng

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Multidrug resistance (MDR) has been a major problem in cancer chemotherapy. To overcome this problem, red ginseng and it's components were searched for inhibition of MDR. Of several fractions, ginseng saponins were found to be effective for inhibition of MDR. Further analyses revealed that in vitro and in vivo modulations of MDR by ginsenoside Rg(3). In flow cytometric analysis using rhodamine 123 as an artificial substrate, Rg(3) promoted accumulation of rhodamine 123 in drug-resistant KBV20C cells in a dose-dependent manner, but it had no effect on parental KB cells. Additionally Rg(3) inhibited [^{3}H] vinblastine efflux and reversed MDR to doxorubicin, COL, VCR, and VP-16 in KBV20C cells. Reverse transcriptase-polymerase chain reaction and immuno-blot analysis after exposure of KBV20C cells to Rg(3) showed that inhibition of drug efflux by Rg(3) was due to neither repression of MDR1 gene expression nor Pgp level. Photo-affinity labeling study with [3H]azidopine, however, revealed that Rg(3) competed with [^{3}H]azidopine for binding to the Pgp demonstrating that Rg(3) competed with anticancer drug for binding to Pgp thereby blocking drug efflux. Furthermore, Rg(3) increased life span in mice implanted with DOX-resistant murine leukemia P388 cells in vivo and inhibited body weight increase significantly.