Anticancer activity of 3-O-acylated betulinic acid derivative obtained by enzymatic synthesis

ABSTRACT

An easy and efficient strategy to prepare betulinic acid esters with various anhydrides was used by the enzymatic synthesis method. It involves lipase-catalyzed acylation of betulinic acid with anhydrides as acylating agents in organic solvent. Lipase from Candida antarctica immobilized on an acrylic resin (Novozym 435) was employed as a biocatalyst. Several 3-O-acyl-betulinic acid derivatives were successfully obtained by this procedure. The anticancer activity of betulinic acid and its 3-O-acylated derivatives were then evaluated in vitro against human lung carcinoma (A549) and human ovarian (CAOV3) cancer cell lines. 3-O-glutaryl-betulinic acid, 3-O-acetyl-betulinic acid, and 3-O-succinyl-betulinic acid showed IC(50)<10 microg/ml against A549 cancer cell line tested and showed better cytotoxicity than betulinic acid. In an ovarian cancer cell line, all betulinic acid derivatives prepared showed weaker cytotoxicity than betulinic acid.

Keyword: Enzymatic synthesis; Novozym 435; 3-O-acyl-betulinic acid; Betulinic acid; Anticancer agents