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3-*O*-acetyloleanolic acid induces apoptosis *via* TRAIL signaling-related death receptor in human cancer cells

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Objectives

The anti-cancer effect of 3-*O*-acetyloleanolic acid, an oleanolic acid derivative isolated from seeds of *Vigna sinensis* K., was investigated using human colon carcinoma HCT-116 cells.

Materials and Methods

○ Materials

3-*O*-acetyloleanolic acid was obtained from Natural Products Chemistry laboratory (Graduate School of Biotechnology, Kyung Hee University, Yongin, Korea). Human colon carcinoma (HCT-116) cells, originated spontaneously from human colon, were obtained from the Korea Cell Line Bank (KCLB, Seoul, Korea). MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide), dimethyl sulfoxide, propidium iodide and RNase A were purchased from Sigma. RPMI-1640 medium and FBS (fetal bovine serum) were purchased from Hyclone.

○ Methods

Culture of HCT-116 cells, MTT assay, FACS analysis, Annexin-V analysis, real-time PCR and western blot analysis.

Results

3-*O*-acetyloleanolic acid showed a dose-dependent cytotoxicity and increased the sub-G1 cell population in HCT-116 cells. The number of immunostained cells with anti-Annexin-V-FITC was also increased. Expression of TRAIL-mediated apoptosis signaling-related death receptors were increased in 3-*O*-acetyloleanolic acid-treated HCT-116 cells. Activation of caspase-8, -9 and -3, critical mediators of apoptosis signaling, were also increased by 3-*O*-acetyloleanolic acid. Taken together, our results indicated that 3-*O*-acetyloleanolic acid leads to TRAIL-mediated apoptosis signaling extrinsic pathway though death receptor 5 in HCT-116 cells.

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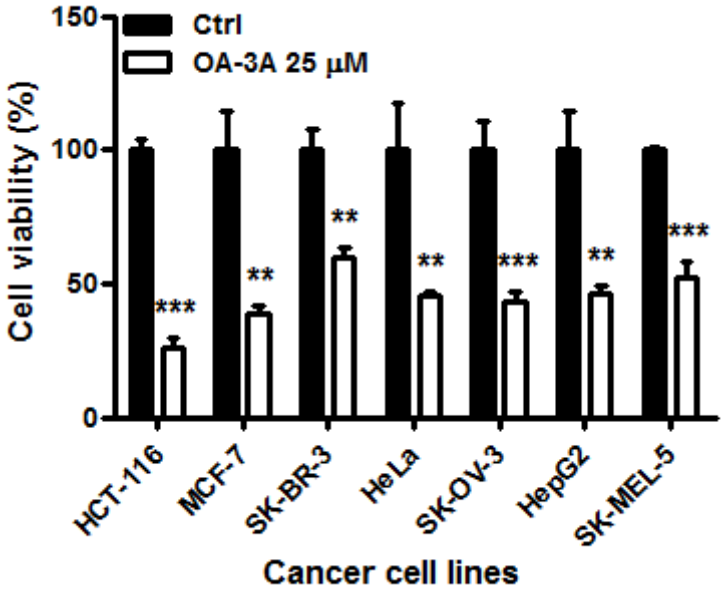

Figure 1. Effect of 3-*O*-acetyloleanolic acid in the cytotoxicity of various cancer cells. 3-*O*-acetyloleanolic acid inhinited the viability of seven cancer cell lines. Cells were treated with 25 μM 3-*O*-acetyloleanolic acid. After 24 h of incubation, cell viability was assessed using an MTT assay. Data are presented as mean ± S.D. Statistically significant differences between treated and control cells were determined using Student's *t* test (** $p<0.01$, *** $p<0.001$).