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Ouabain inhibits anchorage-independent growth in human lung cancer cells via integrin αvβ3 reduction

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Physiological effects of ouabain (Fig. 1A), a human endogenous hormone, have been intensively investigated nowadays. Recent studies demonstrate anticancer activity of ouabain in sensitization of apoptosis and suppression of migration in lung cancer cells [1,2]. Focusing on metastatic process, the ability of cancer cells to grow in an anchorage-independent condition determines the success of cancer metastasis [3]. Thus, this study aimed to evaluate the effect of ouabain on anchorage-independent growth in human lung cancer cells.

The proliferative effect of physiological concentrations of ouabain in human lung cancer H460 cells was firstly evaluated. H460 cells were cultured in the absence or presence of ouabain (5–20 pM) for various time points. Cell viability was determined by the MTT assay at 24, 48 and 72 h, respectively. The results show that treatment with ouabain at concentrations ranging from 2.5 to 20 pM caused no alteration on proliferation of H460 cells at 24 and 48 h, while 10 and 20 pM of ouabain significantly inhibited such effect at 72 h (Fig. 1B). Soft agar colony formation assay reveals that the colony size was reduced in response to ouabain treatment (Fig. 1C). Meanwhile, there was no significant difference in terms of colony number, suggesting that the effect of ouabain against an anchorage-independent growth mainly caused the inhibition of cell growth without changing cell survival. Since integrin $\alpha_v\beta_3$ was shown to potentiate metastasis, our data also demonstrated that ouabain was able to suppress the anchorage-independent growth through the inhibition of integrin $\alpha_v\beta_3$ expressions. This finding may help fulfill the knowledge regarding the role of ouabain in the regulation of cancer behaviors

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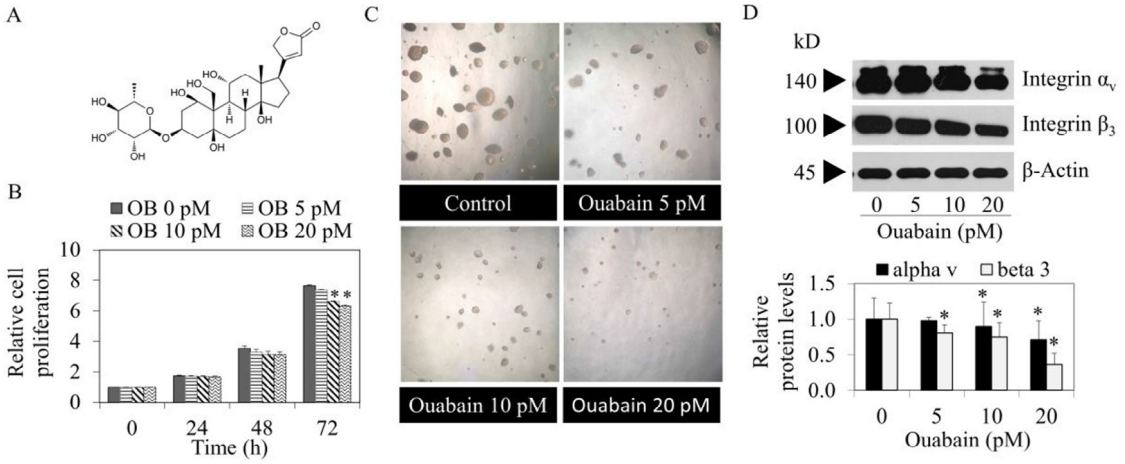

Fig. 1 – Structure of ouabain (A), Cell proliferation (B), Anchorage-independent growth (C), and Anchorage-independent growth regulatory proteins (D).

and encourage the development of this compound against cancer metastasis.

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