Anticancer activity of melanoxoin in human non-small cell lung cancer cells in vitro and in vivo

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Abstract
Aim: There are various anticancer drugs, which derived from natural products. In this study, we screened a serious of compounds isolated from *Pterocarpus santalinus* to identify their cell cytotoxicity and antitumor mechanisms. **Methods:** We performed the MTT assay to evaluate the cytotoxic effects of test compounds against several human cancer cell lines. We used Human OneArray® v5 to comprehensive analysis the DNA transcription of H1299 cells. Cell cycle distributions were analysied by flow cytometry. We performed the in vitro tubulin polymerization assay to examine whether the test compound affects microtubule organization. We used comet assay to measuring DNA strand breaks. We examined in vivo antitumor activity of melanoxoin in nude mice bearing human lung tumor xenografts. **Results:** Among the serious of compounds isolated from Pterocarpus santalinus, melanoxoin showed the highest cytotoxic effects with a IC50 of 1.98 μg/ml in the human non-small cell lung cancer H1299 cells. It showed that melanoxoin regulated the transcription of several cell cycle regulators in the H1299 cells. Melanoxoin inductions of tubulin depolymerization suggest that melanoxoin causes G2/M arrest and then increased tumor cell apoptosis. The neutral comet assay revealed that the treatment with melanoxoin induced significant DNA damage in H1299 cells. Our mice xenograft models show the in vivo efficacy of melanoxoin. **Conclusion:** We are interested in the development the molanoxoin as a new source of anti-cancer drug.

Keywords: *Pterocarpus santalinus*; melanoxoin; apoptosis