

**Title :** Biological activity of chalcone and their derivatives in inhibiting HepG2 liver cancer cells via regulation of integrin expression.

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## ABSTRACT

Liver cancer as the highest incidence among the Thai population and arises from abnormal proliferation of hepatocytes, which leads to tumor formation and metastasis. Although targeted therapy with Osimertinib and chemotherapy with Doxorubicin have shown that high efficacy in inhibiting cancer cell growth, this targeted therapy continues to cause side effects in patients. Consequently, recent research has been conducted on natural extracts with anticancer properties. This study focuses on 2',4'-dihydroxy-6'-methoxy-3',5'-dimethylchalcone (DMC), a flavonoid derived from Ma-kiang (*Syzygium nervosum* A. Cunn. Ex.DC.), a plant commonly found in Northern Thailand. In addition, structural modification of DMC was performed to Coumarin derivatives with anticancer activity. The objective of this study was to evaluate the biological activities of chalcone and their derivatives in inhibiting HepG2 by using the MTT assay, and to compare their inhibitory efficacy with anticancer drugs. The results showed that the half-maximal inhibitory concentration (IC<sub>50</sub>) values for Doxorubicin, Osimertinib, Coumarin C12, DMC, and Coumarin C10 were  $9.96 \pm 3.06$ ,  $1.33 \pm 0.09$ ,  $0.15 \pm 0.01$ ,  $13.59 \pm 2.60$ , and  $8.79 \pm 0.92$   $\mu\text{M}$  respectively. However, future studies will investigate the molecular mechanisms of action by analyzing the expression of integrin-related signaling proteins via Western blot analysis and RT-PCR (Reverse Transcription Polymerase Chain Reaction). This aim is to evaluate the role of integrin receptors in mediating cancer cell apoptosis.

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