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• 中文摘要

aloe-emodin 爲 anthraquinone 類的化合物，可從 Aloevera 及 Rheirhizoma 中分離出來。近來關於 aloe-emodin 用來當作治療癌症之抗癌藥物引起廣泛的注意。雖然 aloe-emodin 已成功的被用於治療包括外胚層神經腫瘤、肺癌、血癌及肝癌，然而至今卻尚未被使用於治療胃癌。最近的研究顯示 aloe-emodin 可藉由誘發細胞程式死亡來抑制腫瘤的生長。例如 aloe-emodin 會造成肺癌細胞的 DNA 斷裂、cytochromeC 釋放以及 caspase-3、8、9 的活化。此外，以 aloe-emodin 處理肝癌細胞會引起細胞中參與細胞程式死亡的一些分子（如 Bcl-2 家族與 p53）量的改變。這些都是細胞程式死亡的特徵。酪蛋白磷酸激脢 II 長久以來被認爲是一個與細胞存活有關的磷酸激脢，最近有研究發現酪蛋白磷酸激脢可以將參與細胞程式死亡的分子磷酸化並使其不活化，因此被認爲會抑制細胞程式死亡。酪蛋白磷酸激脢 II 可被從 Rheumpalmatum 所分離出來的 emodin 所抑制，而本實驗室先前的實驗亦發現 aloe-emodin 會經由增加 caspase-3 的活性造成胃癌細胞的細胞程式死亡，在本計畫中包括：aloe-emodin 是否抑制酪蛋白磷酸激脢 II 的活性？Bcl-2 家族成員（如 Bid）量的變化、細胞中 cytochromeC 與 apoptosis-inducingfactor 是否從粒腺體釋放到細胞質？caspase-3 活性之變化？這些與細胞程式死亡有關的分子的改變都將進一步加以探討。

• 英文摘要

Aloe-emodin(1,8-dihydroxy-3-[hydroxymethyl]-anthraquione) is an anthraquinone compound that is present in some traditional medicinal plants such as Aloe vera and Rhei rhizoma. Considerable attention has been given recently to the possibility of utilizing aloe-emodin as a chemotherapeutic drug for the treatment of various types of cancers. The effect of aloe-emodin in gastric cancer, however, remains unexplored. Recent studies reveal that the antitumor mechanism of aloe-emodin may involve apoptosis. For example, aloe-emodin could induce apoptosis in lung carcinoma as judged by DNA fragmentation, release of cytochrome C and activation of caspase-3, 8 and 9. Casein kinase II (CK2), a ubiquitous serine／threonine kinase,

is one of the most highly conserved proteins in eukaryotes. Several studies indicate that CK2 is required for cell viability. In addition to cell survival, recent studies linking CK2 to apoptosis have yielded intriguing insights. Several proteins involved in apoptosis were phosphorylated and inactivated by CK2. It was found that the expression of CK2 could be inhibited by emodin isolated from Rheum palmatum. In our preliminary study, we found that aloe-emodin could exert apoptotic effect in two gastric cancer cell lines (AGS and NCI-N87) through activating caspase-3. In this project, we will examine if CK2 activity is inhibited by aloe-emodin. In addition, the modulation of Bcl-2 family (for example, Bid), the release of cytochrome C and apoptosis-inducing factor, and the induction of caspase-3 activity will be investigated in these two gastric cancer cell lines.