[S3-3] [10/17/2002 (Thurs) 14:40~15:00/Hall A]

Anticancer and Antiviral Effect of Some Triterpenes Isolated from the Natural Sources

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The diverse, widespread, and exceedingly numerous family of natural products constructed from five carbon building-units and so comprising compounds with C_5, C_{10}, C_{15}, C_{20}, $\cdots$, C_{40} skeletons (together with a few higher members) are synoymously termed terpenes or terpenoids. Among the terpene classses, the triterpenes (C_{30} skeletones) form the largest group and are widely distributed in the plant kingdom, either in the free state or as esters or glycosides, although a few important members found in the animal kingdom such as squalene and a number of tetracyclic component including lanosterol.

All the triterpenes originate biogenetically from squalene, a tail-to-tail condensate of farnesol, a sesquiterpene alcohol. However, a great structural variety of triterpenes has been found in nature and so they are classified into several distict categories such as a limear or squalene type, a tetracyclic type comprising mainly lanostane and dammarane group and a pentacyclic type consisted of lupane, oleanane, ursane and hopane series.

More than 7,000 kinds of individual triterpenes (including the glycosides) has been found during the last half century by the aid of various developed spectral analysis techniques and more than half amount of them were categorized in pentacyclic triterpene.

Even though lots of triterpenes had been found from the plant, most of them do not appear to possess any particular biological properties so far. However, during the last few decades, the development of various biology techniques enabled to find out the biological and pharmacological property of many triterpene compounds. The biological activities of triterpenes are extensively investigated in many therapeutic area but most of them are focused on the anti-tumor activity (including the chemopreventive action, angiogenesis inhibition, eukaryotic DNA polymerase inhibition, etc), anti-virus activity(anti-HIV) and anti-inflammatory activity together with anti-ulcer, hypoglycaemic, hypotensive, hypercholesterolaemic, hepatoprotective, antiatherosclerotic and antithrombotic activities.

We have evaluated the anti-tumor activity of some common triterpenes in lanostane, lupane, oleanane and ursane series on the base of the inhibitory effect on the proliferation of cultured human tumor cell lines, *i.e.*, A549 (non small cell lung), SK-OV-3 (ovary), SK-MEL-2 (melanoma), XF498 (central nerve system) and HCT-15 (colon), *in vitro*. Several unusual triterpenes in lanostane (cucurbitacin) isolated from the root of *Trichosanthes kirilowii* exhibited a profound inhibition upon the proliferation of each cell lines. However, the betulinic acid, ursolic acid and oleanolic acid, which were representative pentacyclic triterpenes most commonly found in nature, also demonstrated a significant inhibition upon the tumor cells *in vitro*. These common triterpene compounds were also demonstrated an increased antiviral activity against Herpes simplex virus type 1 (HSV-1) evaluated by the plaque reduction assay.

In this seminar, the anti-tumor and anti-viral properties (including anti-AIDS) of some common triterpene compounds, which had been studied in my group will be presented briefly together with the recent progress of these compounds as a new lead for the anti-tumor and/or anti-AIDS agent.

References

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