

## Selective Effect of Berberine on Tumor and Normal cell

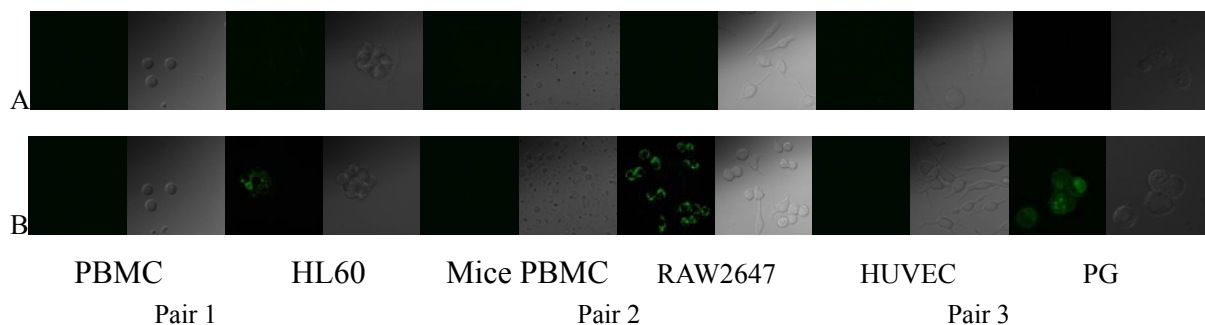
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**Key Words:** Selective Effect, Berberine, Fluorescence

The common approach of all chemotherapy is to decrease the growth rate (cell division) of the cancer cells, but most agents suffer side effects from their limited selectivity against cancer cells over healthy ones, which would decrease the living quality of cancer patients. Therefore, a “smart” anti-cancer drug with tumor cell selectivity is the dream from cancer clinic.

Berberine is a kind of alkaloid founded in many medicinal plants of the *Genera Berberis* and *Coptis Rhizoma*. It is a folk medicine used in China as in treatment of dysentery, jaundice and hypertension. Recent advances have shown that berberine exerts anticancer activities both *in vitro* and *in vivo* through different mechanisms. In this study, the effect of Berberine on 3 pairs of normal and its cancerous cell was observed.

The result demonstrated that berberine at 10,5,2.5  $\mu\text{g/ml}$  can inhibit the proliferation of tumor cell but had no obvious toxicity on normal cell. In order to trace the distribution of berberine in both normal and cancerous cell, cells were treated with berberine and the fluorescence signal of berberine was detected at 2 min interval for continuously 10 min at 488nm by confocal laser scanning microscope. The result showed that berberine could be observed in tumor cell in 10min while the normal cells could not be detected. The disperse speed is various due to different tumor cell.



Pair 1: human Peripheral blood mononuclear cell (PBMC) and human T—cell leukemia cell line Jurkat

Pair 2: mice Peripheral blood mononuclear cell and Mice macrophage cell line RAW2647

Pair 3: Human Umbilical Vein Endothelium Cell and human lung adenocarcinoma cell line a549/ddp

A: 0min B:10min

Our results showed that berberine could inhibit the proliferation of tumor cell while have no affect on normal cell. We hypothesise that cell membrane structure is different between normal and cancerous cell. Berberine could penetrate into tumor cell and start the trigger to decrease the proliferation rate of tumor cell. It has the potential to be a selective anti-cancer drug in the future. Further research is going on for its mechanism.