

## **Immunomodulatory activities of arabinoxylan on human colon adenocarcinoma cells *in vitro***

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### **Background:**

Arabinoxylans are hemicelluloses composed mainly of xylose and arabinose residues. They are found in a variety of agricultural products such as rice, wheat and corn. Arabinoxylans have been reported to confer numerous health benefits, such as protecting the body against allergies, infections, as well as having antioxidant properties. Arabinoxylans can stimulate innate and adaptive immune systems by enhancing macrophage phagocytosis and natural killer cell activities. Modified arabinoxylans increase the susceptibility of cancer cells to various cytotoxic drugs. Colon cancer is one of the most common malignancies worldwide. It causes millions of deaths annually. Adenocarcinoma constitutes 95% of all colorectal cancer. Treatment of colon cancer is still a challenge.

### **Aims**

The aims of this study were to evaluate the arabinoxylans from different sources on the viability of colon cancer cells, and identify their immunomodulatory effects on cancer cells *in vitro*.

### **Methods**

The viabilities of HT-29 cells incubated with arabinoxylans for 24 hours were tested by CCK-8 assays. Intracellular Ca<sup>2+</sup> levels were measured using colorimetric calcium assay. Real-time PCR and western blot were used to examine the changes of the expressions of inflammatory cytokines in HT-29 cells following arabinoxylans treatment.

### **Results**

CCK-8 assays demonstrated /We found that the treatment of 1000 µg/ml arabinoxylans alone had no effects on the viabilities of HT-29 cells in 24 hours. However, there were synergistic effects on reducing HT-29 cell viabilities when a combination treatment of 1000 µg/ml arabinoxylans and 200 µM hydroxyurea were applied. Arabinoxylans increased the HT-29 intracellular calcium ion levels as well. HT-29 cells treated with arabinoxylans had up-regulated expressions of IL-8, TNF-α, TLR4, and down-regulated expression of CLEC7A, MCP-1 in comparison with untreated with cells. However, when HT-29 cells were pre-treated with lipopolysaccharides (LPS), arabinoxylans showed anti-inflammatory effects via inhibiting IL-8 and TLR4 expression, but stimulating IL-10 expressions.

### **Discussion and conclusion**

These results indicate that arabinoxylans have potential applications in adjuvant therapy for colon cancer. Their contrasting immunomodulatory effects might be associated with the status of cancer cells. Further studies are required, especially using *in vivo* models to exploit fully the potential of the immunomodulatory effect of arabinoxylans on colon cancer.