

ImmunoTools *special* Award 2014



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Investigation of immune modulatory capacities and their molecular mechanisms of polysaccharides from Chinese medicinal fungi

A large number of studies have shown that polysaccharides from Chinese medicinal fungi, for example β -D-glucans from *Ganoderma lucidum*, can modulate the function of many components of the immune system such as the antigen-presenting cells, T and B lymphocytes (Boh et al., 2007), NK cells (Chen et al., 2004), neutrophil granulocytes (Hsu et al., 2003) and dendritic cells (Cao and Lin, 2002). GLIS, a proteoglycan isolated from the fruiting body of *Ganoderma Lucidum* can stimulates directly the activation, proliferation and production of immunoglobulins of spleen-derived B lymphocytes. GLIS can also activates the bone marrow-derived macrophages and stimulates its production of important immunomodulatory substances, such as IL-1 β , TNF- α and reactive nitrogen intermediates, like NO (Fan et al., 2010). In my PhD project i will investigate the function and mechanisms of some new polysaccharides from different Chinese medicinal fungi *Ganoderma lucidum*, *Lentinula edode*, *Sargassum* and *Juncus effuses* in immune system. In my study it has been found that this polysaccharides can stimulates the proliferation of mice spleen lymphocyte *in vitro*. The proliferations and activations of bone marrow-derived macrophages from mice were not stimulated, but the NO-production after treatment of Polysaccharide from *Sargassum*, the macrophage-mediated tumour cytotoxicity and their phagocytosis activity were markedly raised after treatment of polysaccharide from *G.Lucidum* for 48h *in vitro*. It has also been found that the polysaccharides from these four different fungi have Anti-Inflammatory activity, because they can inhibits the binding of L-selectin with its specifics partner sulphated tyrosine and the tetrasaccharide Sialy-LewisX by SPR-based binding assay.

In my next work I will use the specific antibodies for flow cytometry (CD2, CD3, CD4, CD8, CD19, CD25, CD69, CD71, CD86, a/b TCR and g/d TCR) to study the differentiation of lymphocytes subpopulation in spleen and the activation of NK-cells. I will use the ELISA-set to analyse the cytokines production (IL-4, LI-6 from T-cells and IL-12p40 from macrophage) after treatment of this polysaccharide. To that end, I want to use the antibodies CD95 and Annexin-V to measure the immun cytokines mediated tumor death (apoptosis).

Interestingly, the antibodies and cytokines mentioned in the **ImmunoTools** human and mouse reagent covers most of the required ones that I am planning to use for my work. I strongly believe that the support provided by **ImmunoTools** will contribute greatly to my research project.

References

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ImmunoTools special AWARD for **Kai Zhang** includes 25 reagents
FITC - conjugated anti-human CD2, CD3, CD4, CD25, CD71, CD86, Annexin V,

PE - conjugated anti-human CD3, CD8, CD19, CD69, CD95, IL-6, Annexin V,

human IL-4 ELISA-set for 96 wells, human IL-6 ELISA-set for 96 wells, human IL-12p40 ELISA-set for 96 wells (each 3 reagents),

FITC - conjugated anti-mouse CD3e, CD4, CD8a, a/b TCR,

PE - conjugated anti-mouse CD3e, CD19, g/d TCR,

APC - conjugated anti-mouse CD25

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