Rate of Phagocytosis in Macrophages Stimulated by

Current research suggests that increases the efficiency of the immune system. IC-21 murine macrophages were exposed to a 1% tincture of . After stimulation for 24 hours, a phagocytosis assay was performed and it was determined that does have a positive effect on the rate of phagocytosis in these cells.

Introduction

The use of herbal supplements to stimulate the immune system has been used by eastern medicine for thousands of years. Current research has shown that these herbal supplements increase the effectiveness of leukocytes, thus increasing the effectiveness of the immune system (1). *Astragalus membranaceus* is one such supplement that is commonly taken at the first signs of an infection also known as general malaise. In recent years the amount of research done with *A. membranaceus has* increased significantly. One such study showed that *A. membranaceus* increases the production of interleukins in mice *in vivo* (2). It has also been shown that *A. membranaceus* increases the amount of antibody production in mice *in vivo* (3). The increased production of interleukins and antibodies may be attributed to many factors, in A y cell making it important in activating the se

increased rate of phagocytosis a speedier and more effective immune

would soon follow. When IC-21 macrophages are subjected to *A. memb*

rate of phagocytosis is expected to increase. To fully understand *A. membranaceus* and its effects on the rate of phagocytosis in IC-21 macrophages a series of phagocytosis assays were performed.

Methods

Cell Culturing

IC-21 (ATCC TIB-186) mouse macrophages were cultured in RPMI-1620 media supplemented with 10% fetal bovine serum and 1% pen/strep. Macrophages were incubated at 37° in 5% CO_2 with a relative humidity of 100%.

Media for *A. membranaceus*

exposed to a 1% concentration of *A. membranaceus* and allowed to phagocytose for a period of 60 or 90 minutes with nine replicates. The rate of phagocytosis in both the ethanol control and the media alone were identical, p=0.39. The average rate of phagocytosis of macrophages subjected to *A. membranaceus* for 60 minutes was 1.64 %(±0.60%), p=0.00054 and 1.61 %(±0.82%), p=0.00046 for 90 minutes (fig 1). We determined that the rate of phagocytosis in macrophages increased when subjected to 1% *A. membranaceus* and allowed to phagocytose for both 60 and 90 minutes.

Phagocytosis of Multiple Beads

We expected to see an increase in the amount of beads each macrophage phagocytosis, since this would also indicate an increased rate of phagocytosis. The macrophages were tested similarly to the prior experiment; however macrophages that phagocytosed more than bead were only recorded. The rate of phagocytosis of more than one bead for both the control, ethanol control and 1% *A. membranaceus* for 60 minutes were close to the same, p=0.38 and 0.44. The average rate of phagocytosis in macrophages subjected to *A. membranaceus* and allowed to phagocytose for 90 minutes was 0.27 %(±0.26%), p=0.0017. From this we determined that *A. membranaceus* did not have an effect on the amount of beads phagocytosed, instead time was the main factor (fig 2).

Discussion

From the results it is apparent that *A. membranaceus* has a significant effect on the overall rate of phagocytosis in IC-21 macrophages. When the macrophages

were subjected to *A. membranaceus*

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Figures

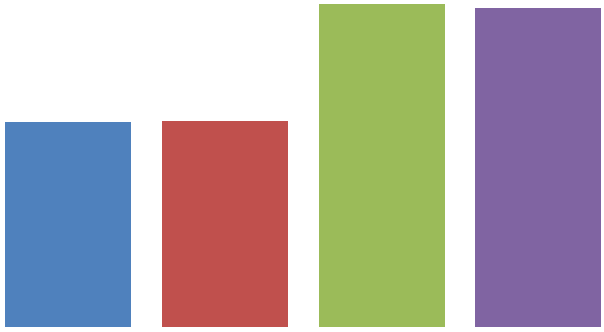

Figure 1- Rate of phagocytosis of IC-21 macrophages

Figure 2- Rate of phagocytosis of IC-21 macrophages of more than one bead.

References

1- Sakurai, Matsumoto, Kiyohara, Yamada (1999) “B-cell proliferation activity of pectin polysaccharide from a medicinal herb, the roots of *Bupleurum falcatum*