

## **Synergistic Effect of Combining Glucan 300® and BiAloe®**

In their scientific journal article (*Open Glycoscience*, 2010), Dr's Vetvicka and Vetvicova demonstrated and concluded that not all commercially available beta glucan ingredients and products were created equal. One specific beta glucan brand in particular, Glucan 300®, demonstrated superior bioactivity as compared to competing brands. A copy of the referenced research paper can be found on our web site.

In 2011, a hypothesis was formed by Rob Donnelly (Ultra Immune Co-founder) that combining BiAloe®, the superior form of Aloe Vera extract and acemannan used in Ultra Immune® products, with Glucan 300® could result in improved performance over either ingredient alone.

Ultra Immune commissioned a study with Dr. Vetvicka in 2012 that would produce the exact same set of experiments used in his original study to benchmark the two ingredients separately as well as a combined product and test any possible synergistic effects.

Specifically, the study was a combined in-vivo and in-vitro set of experiments measuring the following key immune system pathways (based on prior research publications):

- Phagocytosis
- Antibody Production
- IL-2 Production
- Superoxide Anion and Nitrite Oxide Production

The result was a significant improvement in the bioactivity of the combined ingredients, demonstrating superior immune related activity and synergistic effects.

Below is Dr. Vetvicka's quoted Conclusion from the Ultra Immune Study:

“Tested sample [BiAloe®] is clearly a biologically active material, particularly in higher dose. Its activity of mostly lower than control glucan [Glucan 300®] - (but it is important to note that this glucan is in most reactions the most active glucan on current market). The activity is focused most on cellular immunity and antibody response, almost no effects were found on IL-2 productions.

“In most cases we found significant synergistic effects of the combination of these two samples (1:1 ratio). The use of these two compounds together can be recommended. “

Professor Vaclav Vetvicka Ph.D.  
University of Louisville  
Department of Pathology

On the following page are a set of graphs based on the experiments and independent, placebo controlled results of the Ultra Immune® Glucan 300® & BiAloe® Study.

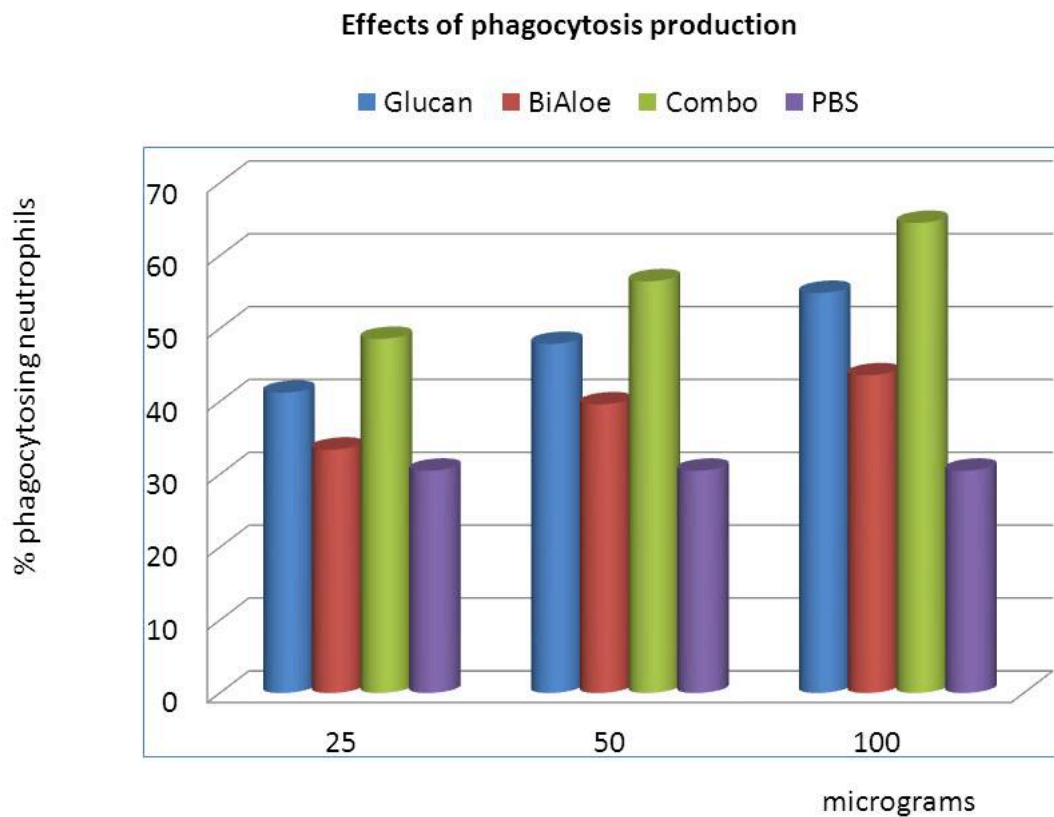
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**Study Results and Key:**

1. Glucan: Glucan 300®
2. BiAloe: BiAloe® (Acemman)
3. Combo: Blend of Glucan 300® and BiAloe®
4. PBS: Control or placebo

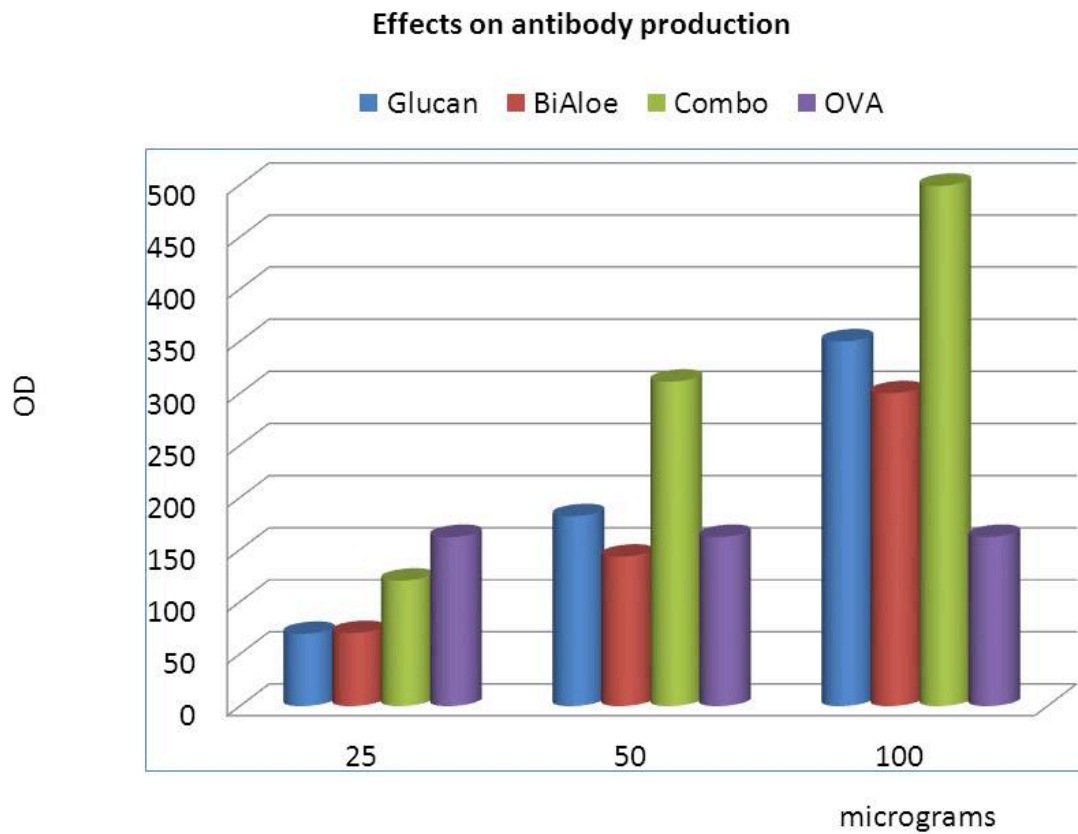
**Phagocytosis**

I. Phagocytosis is the engulfing of foreign particles and cells by the body's natural immune cells or macrophages.



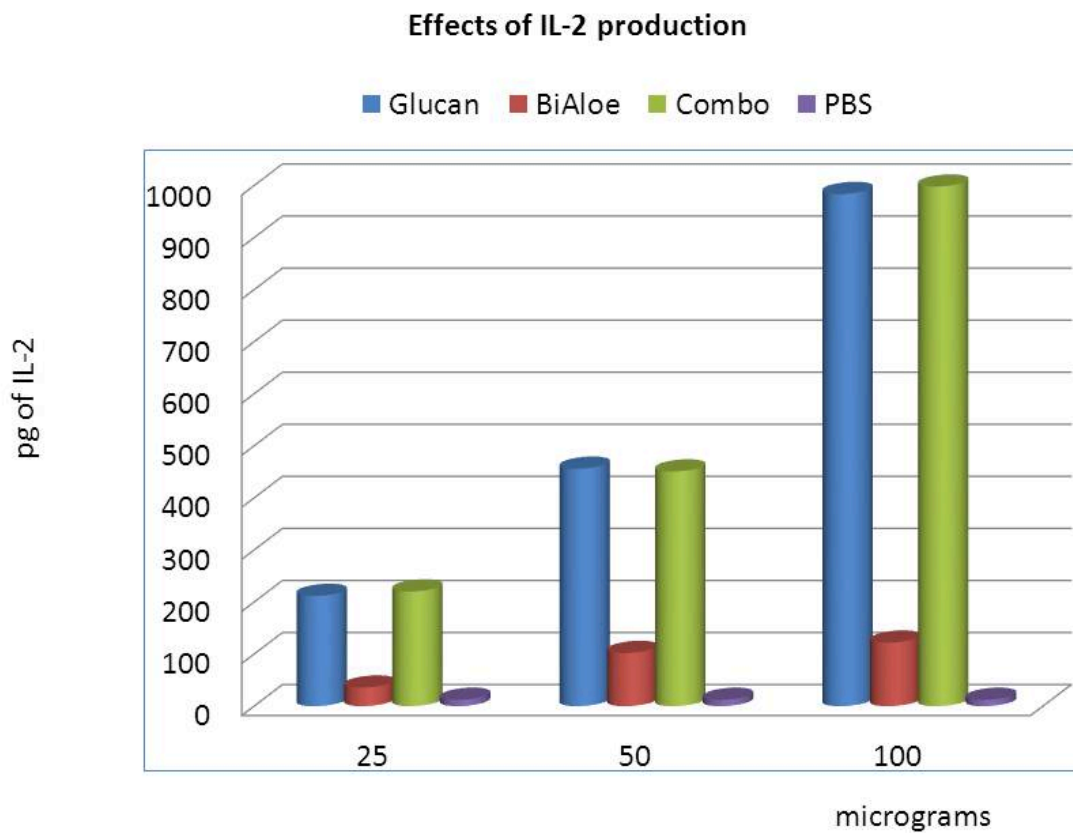
### Antibody Production

II. An antibody (Ab), also known as an immunoglobulin (Ig), is a large Y-shaped protein produced by B-cells that is used by the immune system to identify and neutralize foreign objects such as bacteria and viruses.



### Immunomodulation

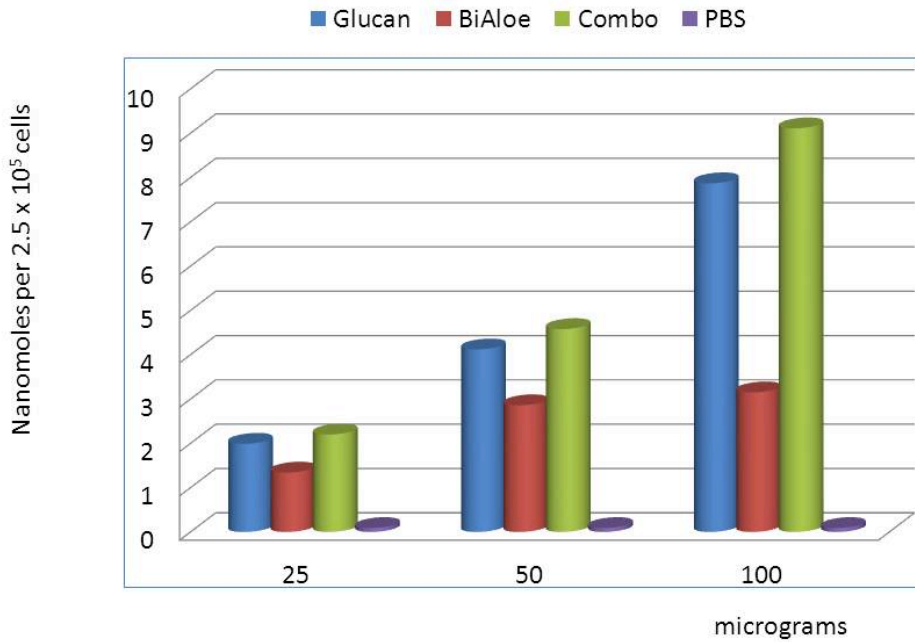
III. The addition of BiAloe to Glucan 300 causes no appreciable change in IL-2; evidence of immunomodulation.



### Nitrite Oxide & Superoxide Anion

Both Nitrite and Superoxide production have been recognized as key contributors to healthy immune function.

Effects on nitrite oxide production



Effects on superoxide anion production

