FLUXOME™
ingredients for life

FLUXOME
BETA GLUCAN

TRIPLE HELIX EFFICACY

The efficacy of beta glucans can vary significantly depending on the molecule structure and solubility. The immune enhancing effect of one dietary supplement containing beta glucans compared to another is therefore not necessarily the same. The bioactive beta glucans in Fluxome® Beta Glucan have been developed in order to provide completely intact molecules with a triple helix form. It is believed that beta glucans have a higher immune enhancing effect when their backbone structure consist of triple helix chains compared to single or double helix chains.

A study has been conducted in order to confirm the following:

- The triple helix structure of beta glucans influences the immune enhancing effect of beta glucans positively
- The active beta glucans in Fluxome® Beta Glucan have triple helix structures

A liquid product containing the same active beta glucans as Fluxome® Beta Glucan was compared to a pharmaceutical drug, which contained a similar type of beta glucans. The drug is known to have very powerful immune stimulating properties.

The Study

Blood samples were taken from human volunteers. The beta glucan liquid and the reference drug were subsequently added to the blood and the immune marker IFN-g was measured in all blood samples. The beta glucan liquid and the reference drug were added according to the doses listed in the table below.

Test products		Dosages, µg/ml
1	Beta glucan liquid (Fluxome)	3, 6, 12, 25, 50, 100
2	Beta glucan liquid (Fluxome) + NaOH	3, 6, 12, 25, 50, 100
3	Reference drug	25, 50, 100
4	Reference drug + NaOH	50, 100

Caustic soda (NaOH) is known to break down triple helix bonds to single helix bonds. It solely affects the structure of the beta glucan and does not cause any other harm to the molecule. By adding caustic soda to the beta glucans included in this study it has been possible to understand two things:

- Whether the tested beta glucans had triple helix structures or had already been broken down to single helix bonds during the manufacturing of the product
- To what extent the breakdown of a triple helix structure has a negative effect on the immune enhancing effect of the tested beta glucans.

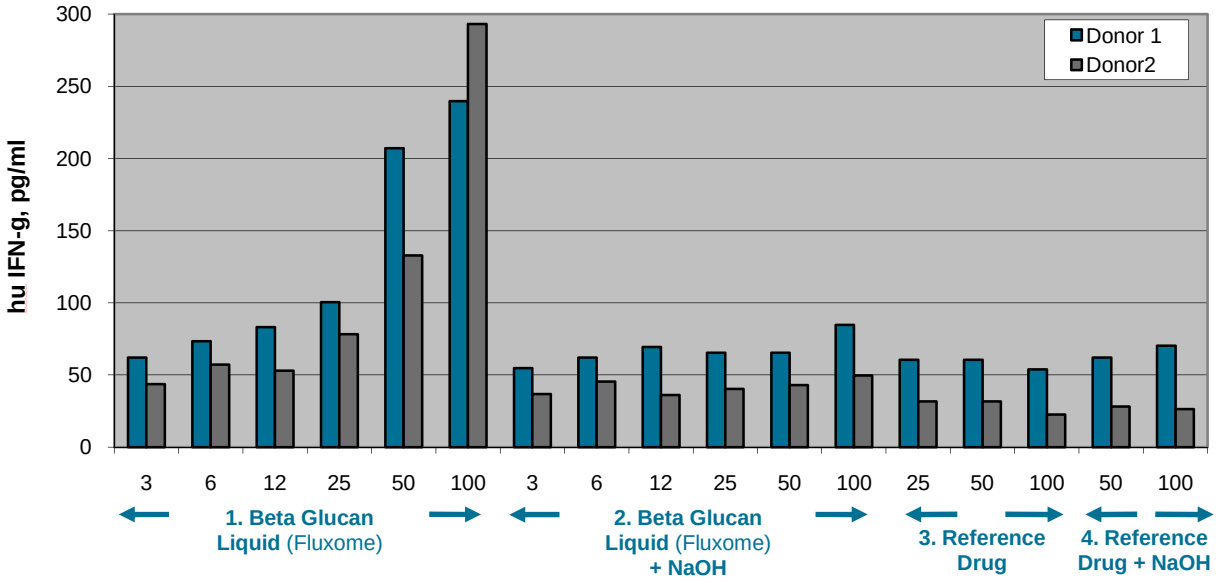
Results

The study suggests that the active beta glucans in Fluxome® Beta Glucan represent a higher efficacy than the beta glucans in the reference drug, when measured on the human immune marker IFN-g (interferon*). The results are summarized in graph 1 below.

The dose-response pattern of the beta glucan liquid (no NaOH added) clearly indicates how the beta glucans in Fluxome® Beta Glucan have immune stimulating properties. Moreover, it confirms that the addition of NaOH significantly restricts the dose-response effect and thus the immune stimulating effect of the beta glucans.

The reference drugs did not have a dose-response effect equal to the beta glucan liquid. Neither did the addition of NaOH to the drug cause any significant change to the immune stimulating effect. The drugs lack of negative response to the NaOH indicates that the triple helix structure had already been broken down to a simple helix structure prior to the study. The reason for this may be related to the use of chemical steps (e.g. use of solvents) in the manufacturing of highly purified pharmaceutical products.

Graph 1 – Dose response study with the beta glucans in Fluxome® Beta Glucan (with and without NaOH) and a pharmaceutical immune stimulating drug (with and without NaOH), respectively, in human blood. The human immune marker IFN-g was measured



Source: GlycaNova Norway AS, April 2008

Conclusion

The study confirms that the breakdown of beta glucans' triple helix structure results in a significant reduction in the immune enhancing effect. A triple helix structure thus influences the immune enhancing effect positively.

The active beta glucans in Fluxome® Beta Glucan were proven to have triple structures, which resulted in a significantly higher efficacy level and thus immune enhancing effect in comparison to an approved immune enhancing drug. The triple helix structure of the beta glucans in the reference drug had already been broken down prior to the study.

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