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MGN-3, a Novel Antitumor Agent

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There is great interest among health care professionals to explore the value of naturally derived biological response modifiers to enhance immune function. MGN-3 is a biological response modifier that is an Arabinoxylan compound which is a polysaccharide containing hemicellulose-B extract of rice bran, modified by enzymes from Shiitake mushrooms reported previously to be a potent immunomodulator. We have previously shown that treatment with MGN-3 had an augmentory effect on natural killer (NK) cell activity in healthy control subjects, in patients with breast cancer, and in patients infected with HIV-1.

In these studies, an effect on NK cell activity was noted as early as 4 weeks and did not show hyporesponsiveness with continued treatment for over 12 months, with absence of notable side effects. In present study, we demonstrate a direct effect on MGN-3 on tumor cell growth and cytokine production. Preliminary results showed that incubation of a breast cancer cell line (MCF-7) with MGN-3 arrested tumor cell growth, whereas control MCF-12A cells grown in a media in the absence of added MGN-3 continued to increase in cell number.

Employing flow cytometry procedures, results showed that after 16 hours of treatment of MCF-7 cells with MGN-3 a marked stimulation in production of interleukin 10 (IL-10). ELIZA analyses of the culture media bathing the cells 16 hours after treatment with MGN-3 also showed an increase in IL-10 production, little change in INF-g concentration. However, a marked elevation in interleukin-12 was also observed at 16 hours.

In conclusion, our findings indicate that MGN-3 acts by not only enhancing the activity of NK cells as previously reported, but also through a direct action on tumor

cell production of cytokines. The production of cytokines such as IL-10 by cancer cells to alter the activity of the immune system is well known.

Our findings indicate that the biological response modifier MGN-3 can alter the production and secretion of cytokines such as IL-10 and IL-12 by cancer cells such as MCF-7; and thereby the activity of the immune system. Findings that treatment of cultures of MCF-7 cells with MGN-3 also can arrest cell growth.

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