

Natural Pharmacy

Products, Techniques, and Services You Can Use

Beta-1,3-Glucan for Immune System Activation

Ever since the 1940s, scientists have been honing their knowledge of the remarkable abilities of a simple substance derived from baker's yeast to effectively stimulate and activate the immune system and to work therapeutically in cancer, ulcers, radiation exposure, infection, and trauma.

Beta-1,3-glucan, a simple sugar derived from the cell wall of a common yeast called *Saccharomyces cerevisiae*, is now available in a daily supplement form as MacroForce(tm) from ImmuDyne, Inc., in Houston, Texas. MacroForce's beta-1,3-glucan is a purified isolate and does not contain any yeast proteins that would otherwise provoke allergic reactions in sensitive individuals, according to Leonid Ber, M.D., vice president of research and development for ImmuDyne.

The research supporting the claims for beta-1,3-glucan as an immune system activator has been building steadily in recent decades. In 1996 alone, 144 scientific studies were published on the medical uses of beta-1,3-glucan. One fact has consistently emerged from these studies: beta-1,3-glucan produces its multiple broad-scale immune effects by being a nonspecific immune stimulator. This means it causes a response capable of being directed at many conditions, perhaps all.

Research at Harvard University in the 1980s showed that the macrophage—a key immune system white blood cell that "eats" unwanted, foreign microbes—has a specific receptor for beta-1,3-glucan. In nontechnical terms, we might say the yeast talks directly to the immune cell. When the macrophage is activated by this contact, it starts a "cascade of events turning the cells into 'an arsenal of defense,'" explains Donald J. Carrow, M.D., a physician based in Tampa, Florida, who has used beta-1,3-glucan successfully with many patients.

Dr. Carrow further notes that the specificity of this macrophage receptor site may explain why beta-1,3-glucan "is one of the most potent stimulators of the immune response." Dr. Carrow says that "there is now evidence to show that beta-1,3-glucan is, from an evolutionary point of view, the most widely and most commonly observed macrophage activator in nature."

Beta-1,3-glucan's beneficial role in treating cancer was illuminated in 1975 by Peter W. Mansell, M.D., and colleagues, as reported in the *Journal of the National Cancer Institute*. Nodules of malignant skin cancer in nine patients were injected with beta-1,3-glucan. The size of the cancer lesions was "strikingly reduced in as short a period as five days" and in small lesions "resolution was complete," Dr. Mansell reported.

In the mid-1980s, researchers at Tulane University School of Medicine reported that beta-1,3-glucan injected directly into chest-wall malignant ulcers (in women who had already undergone mastectomy and radiation therapy for breast cancer) healed the sores completely.

Beta-1,3-glucan's radiation protection effects were shown in 1985 when the U.S. Armed Forces Radiobiology Research Institute announced the results of their recent experiments. Myra D. Patchen, M.D., and her team at the Institute exposed mice to lethal doses of

radiation. When the mice were given an oral dose of beta-1,3-glucan after the radiation exposure, 70% were completely protected from the damaging effects.

The ingestion produced measurable increases in the production of key immune cell components, Dr. Patchen reported. She also noted that the strongest benefits were observed one day before, one hour before, and one hour after radiation exposure. Dr. Patchen also suggested that beta-1,3-glucan should be considered as an effective way of rebuilding the immune system and preventing infection following chemotherapy and radiation in cancer treatment.

Dr. Patchen further suggested that beta-1,3-glucan appears to work as a free-radical scavenger. She believes it may even protect the macrophages from damage by radiation, toxins, heavy metals, invading microbes, and other poisons (collectively called free radicals) in the body.

When it comes to resisting infections, beta-1,3-glucan's capabilities are well documented. Scientists at the State University of São Paulo in Brazil tested beta-1,3-glucan's ability to stimulate the immune system against a fungal skin infection. Nine patients with serious fungal infections were given beta-1,3-glucan intravenously once weekly for one month, followed by monthly doses for 11 months. They also received a conventional antifungal drug.

There was only one case of relapse among these patients, while another group of eight infected patients who were treated only with the antifungal drug had five relapses. The researchers also observed that the nine patients in the first group had far lower residual traces of the fungal infection in their blood chemistry, concluding that "the patients who received glucan, in spite of being more seriously ill, had a stronger and more favorable response to therapy."

Evidence from animal studies demonstrates that beta-1,3-glucan can reduce the amount of conventional antibiotics required in infectious conditions such as peritonitis (inflammation of the membrane lining of the abdominal and pelvic cavities). In mice infected with a bacteria to produce peritonitis, a combination of beta-1,3-glucan and a standard antibiotic increased the long-term survival by 56%.

Bacterial counts were noticeably down within eight hours of the injection and the numbers of key immune cells were markedly higher. "Clinical use of immunomodulators [a substance that directs immune response] may alter conventional use and dosage of antibiotics," study director William Browder, M.D., of Tulane University in New Orleans, suggested in 1987.

Dr. Browder also reported on the benefits of using beta-1,3-glucan to stimulate immune response and prevent infection in patients undergoing surgery for physical trauma. In his study, 21 patients received beta-1,3-glucan intravenously every day for one week. Dr. Browder reported that the incidence of infection in these patients was "significantly reduced" (only a 9.5% incidence of infection) compared to the rate among those who did not receive glucan therapy (49%). The glucan-treated patients also had a greater increase in key immune factors within three days and a much lower mortality rate (0% compared to 29%) than the non-glucan-treated group.

In his own clinical practice, Dr. Carrow has tested beta-1,3-glucan on a variety of conditions, including cancer and ulcers, and for general health maintenance. Dr. Carrow injected a skin cancer lesion with 10 mg of beta-1,3-glucan and within three months the tumor had completely disappeared, he reports. Five breast cancer patients undergoing radiation took 7.5 mg daily of beta-1,3-glucan and were free of radiation injuries to the skin. By applying beta-1,3-glucan topically to ulcers on two patients, Dr. Carrow was able to heal them completely within two months.