



Documentation

Nutramunity™ Beta-Glucan (NBG®)
A naturally-derived and versatile
immune health ingredient

Baker's yeast beta-1,3/1,6-glucan

DOCUMENTATION

Nutrunity™ is a beta-1,3/1,6-glucan, a naturally-derived bioactive component isolated from the cell walls of baker's yeast (*Saccharomyces cerevisiae*). In its purified form, this beta-glucan functions as a signal that alerts the innate immune system and prepares it to respond quickly and adequately. Beta-1,3/1,6-glucan from baker's yeast has been studied by a number of independent research groups and companies worldwide. Below is an excerpt of the scientific literature concerning this beta-glucan.

IMMUNE FUNCTION

Clinical studies have shown that beta-glucan from baker's yeast improves immune function. Substantial preclinical research constitutes the foundation for the clinical studies.

- Rice, *et al.*, **Oral delivery and gastrointestinal absorption of soluble glucans stimulate increased resistance to infectious challenge.** J Pharmacol Exp Ther, 2005.314(3):1079-1086. †
- Tsukada, *et al.*, **Immunopotential of intraepithelial lymphocytes in the intestine by oral administrations of beta-glucan.** Cell Immunol, 2003.221(1):1-5. † ➔
- Javmen, *et al.*, **Beta-glucan from *Saccharomyces cerevisiae* induces IFN-gamma production in vivo in BALB/c mice.** In Vivo, 2015. 29(3):359-363. †
- Lehne, *et al.*, **Oral administration of a new soluble branched beta-1,3-D-glucan is well tolerated and can lead to increased salivary concentrations of immunoglobulin A in healthy volunteers.** Clin Exp Immunol, 2006.143(1):65-69.* ➔
- Biotec Pharmacon ASA, **NBG® reduced sick leave with 44,2 % in a one year study.** Internal company information, 2008.* ➔
- Talbott and Talbott, **Baker's yeast beta-glucan supplement reduces upper respiratory symptoms and improves mood state in stressed women.** J Am Coll Nutr, 2012.31(4):295-300.*
- Samuelsen, *et al.*, **Effects of orally administered yeast-derived beta-glucans: a review.** Mol Nutr Food Res, 2014.58(1):183-193. †

HEALTHY INFLAMMATORY RESPONSE

Beta-glucan from baker's yeast promotes healthy inflammatory response.

- Breivik, *et al.*, **Soluble beta-1,3/1,6-glucan from yeast inhibits experimental periodontal disease in Wistar rats.** J Clin Periodontol, 2005.32(4):347-352. † 
- Sandvik, *et al.*, **Oral and systemic administration of beta-glucan protects against lipopolysaccharide-induced shock and organ injury in rats.** Clin Exp Immunol, 2007.148(1):168-177. † 
- Sener, *et al.*, **Protective effect of beta-glucan against oxidative organ injury in a rat model of sepsis.** Int Immunopharmacol, 2005.5(9):1387-1396. †
- Aarsaether, *et al.*, **Cardioprotective effect of pretreatment with beta-glucan in coronary artery bypass grafting.** Scand Cardiovasc J, 2006.40(5):298-304.* 
- Preus, *et al.*, **A randomized, single-blind, parallel-group clinical study to evaluate the effect of soluble beta-1,3/1,6-glucan on experimental gingivitis in man.** J Clin Periodontol, 2008.35(3):236-241.* 
- Kirmaz, *et al.*, **Effects of glucan treatment on the Th1/Th2 balance in patients with allergic rhinitis: a double-blind placebo-controlled study.** Eur Cytokine Netw, 2005.16(2):128-134.*
- Talbott, *et al.*, **Beta-glucan supplementation, allergy symptoms, and quality of life in self-described ragweed allergy sufferers.** Food Sci Nutr, 2013.1(1):90-101.*
- Oriental Yeast Company, **Report: Internal survey on allergy symptoms in humans.** Internal company information, 2004.* 

SKIN HEALTH

Beta-1,3/1,6-glucan from baker's yeast has been used as an ingredient in skin care for a long time and is attractive because of its positive effects on skin tissue and potential in skin repair.

- Wolk and Danon, **Promotion of wound healing by yeast glucan evaluated on single animals.** Med Biol, 1985.63(2):73-80. †
- Berdal, *et al.*, **Aminated beta-1,3-D-glucan improves wound healing in diabetic db/db mice.** Wound Repair Regen, 2007. 15(6):825-832. † 

- Karaaslan, *et al.*, **Case series of topical and orally administered beta-glucan for the treatment of diabetic wounds: clinical study.** J Cutan Med Surg, 2012.16(3):180-186.*
- Medeiros, *et al.*, **Effects of purified *Saccharomyces cerevisiae* (1->3)-beta-glucan on venous ulcer healing.** Int J Mol Sci, 2012.13(7):8142-8158.*
- Zykova, *et al.*, **Macrophage stimulating agent soluble yeast beta-1,3/1,6-glucan as a topical treatment of diabetic foot and leg ulcers: A randomized, double blind, placebo-controlled phase II study.** J Diabetes Investig, 2014.5(4):392-399.* 
- Cognis, **Report: Highcaren GS- and GP-β-Glucans for effective anti-wrinkle-products.** Internal company information, 1999.* 

HEALTH AND PERFORMANCE IN ATHLETES

Beta-glucan from baker's yeast has positive effects on the immune status of athletes. Athletes expose themselves to hard physical (muscular, circulatory as well as respiratory) stress, which renders their immune system particularly vulnerable.

- Biotec Pharmacon ASA, **NBG® reduced sick leave with 44,2 % in a one year study.** Internal company information, 2008.* 
- Talbott and Talbott, **Effect of beta-1,3/1,6-glucan on upper respiratory tract infection symptoms and mood state in marathon athletes.** J Sports Sci Med, 2009.8(4):509-515.*
- Carpenter, *et al.*, **Baker's yeast beta-glucan supplementation increases monocytes and cytokines post-exercise: implications for infection risk?** Br J Nutr, 2013.109(3):478-486.*

CHILDREN

The positive effects of beta-1,3/1,6-glucan from baker's yeast on mucosal immunity that have been found in adults, have been demonstrated also in children.

- Richter, *et al.*, **Clinical trials of yeast-derived beta-(1,3) glucan in children: effects on innate immunity.** Ann Transl Med, 2014.2(2):15.*
- Richter, *et al.*, **Beta-glucan affects mucosal immunity in children with chronic respiratory problems under physical stress: clinical trials.** Ann Transl Med, 2015.3(4):52.*
- Vetvicka, *et al.*, **Placebo-driven clinical trials of yeast-derived β-(1-3)-glucan in children with chronic respiratory problems.** Ann Transl Med 2013.1(3):26.*
- Zhou, *et al.*, **Baker's yeast beta-glucan decreases episodes of common childhood illness in 1- to 4-year-old children during cold season in China** J Parenter Enteral Nutr 2016.40(1): 115-144.*



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