

Target gb-X™

GUT-BRAIN AXIS



PURITY | POTENCY | PERFORMANCE

- Clinically demonstrated to support positive mood[†]
- Powered by Ecologic BARRIER
- Protected by PROBIOACT® Technology

[†]These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

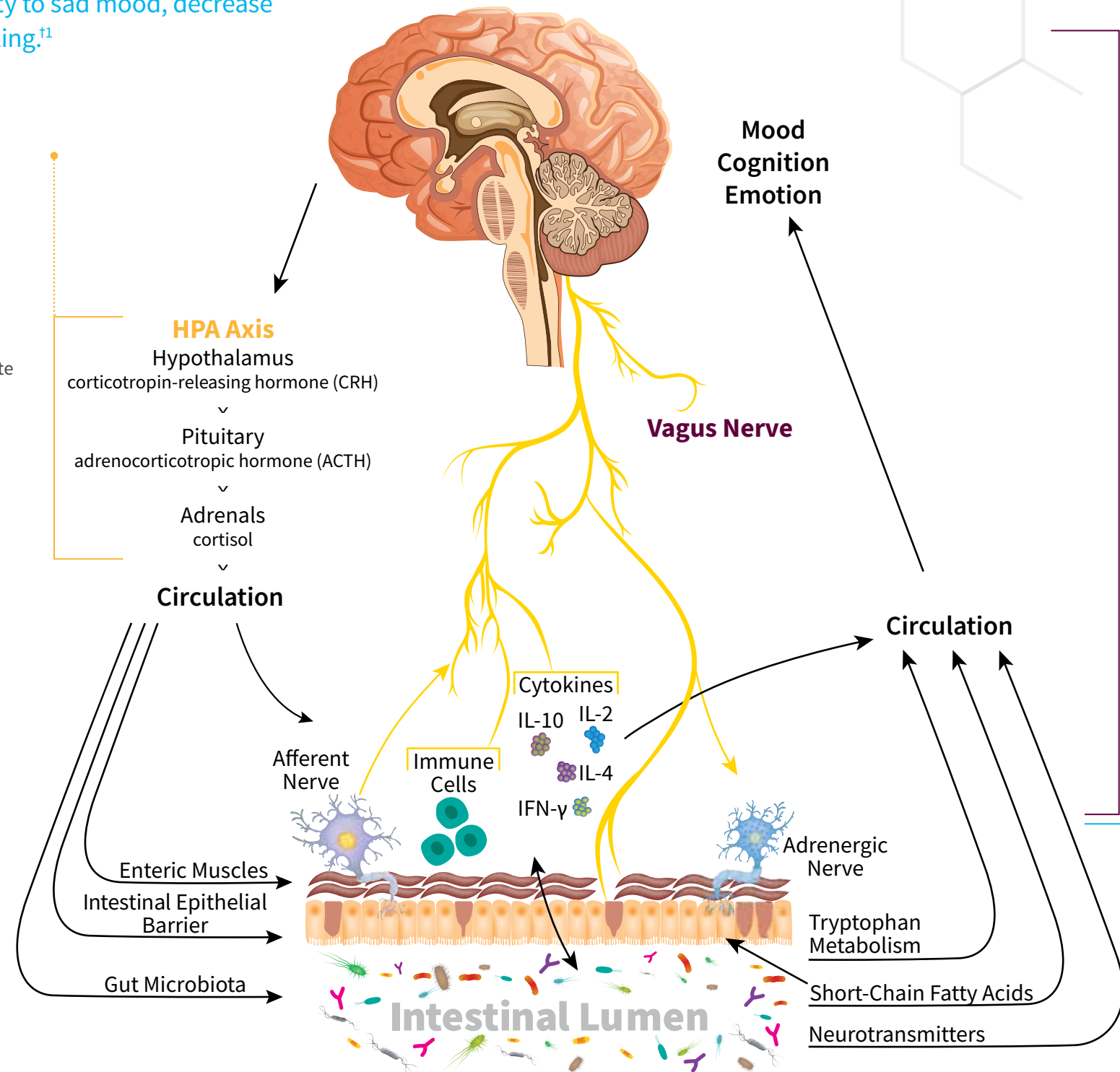
How does it work?

Target gb-X is a specialty probiotic formulation targeted to provide robust gut-brain axis support. It is the first probiotic clinically demonstrated to reduce cognitive reactivity to sad mood, decrease rumination, and diminish aggressive thinking.¹¹

HPA Axis

Animal studies have demonstrated that commensal intestinal microbes are required for healthy adaptive hypothalamic-pituitary-adrenal (HPA) axis response.² Moreover, the gut microbiota continuously affects the HPA axis through inflammation modulation. Target gb-X strains have demonstrated the ability to:¹³

- Shift cytokine production toward T-cell derived IL-10, IL-2, IL-4, and IFN- γ , which are known to modulate inflammation and support central nervous system (CNS) structural plasticity
- Shift cytokine production away from the macrophage-associated TNF- α and IL-6 associated with significant mood alteration



Vagus Nerve

Bidirectional gut-brain communication along the 10th cranial nerve directly influences inflammatory, hormonal, and neurotransmitter response.

- Vagal afferent nerves respond to cytokines and endotoxins, transmitting intestinal inflammation information to the brain
- The vagus nerve influences an anti-inflammatory response through cholinergic and humoral means and balancing neurotransmitter production

Barrier Function

The strains selected for Target gb-X support intestinal barrier tight junctions as demonstrated by transepithelial electrical resistance (TEER) and direct in vitro analyses.⁴ Multiple direct and indirect mechanisms affect barrier integrity:

- Direct competition for adhesion sites limits colonization by gram-negative bacteria
- Digestion of lipopolysaccharide endotoxin improves inflammation response
- Short-chain fatty acid production nurtures epithelial cells and supports mucus production
- Modulation of corticotropin-releasing hormone (CRH) supports mast cell integrity and healthy stress-associated gut permeability
- Toll-like receptor signaling, defensin expression, antimicrobial peptide production, and B- and T-cell stimulation serves to support protective, innate, and adaptive immune response

1. Steenbergen L, et al. A randomized controlled trial to test the effect of multispecies probiotics on cognitive reactivity to sad mood. *Brain Behav Immun*. 2015 Aug;48:258-64.
 2. Sudo N, et al. Postnatal microbial colonization programs the hypothalamic-pituitary-adrenal system for stress response in mice. *J Physiol*. 2004;558(Pt1):263-75.
 3. Abildgaard A, et al. Probiotic treatment reduces depressive-like behaviour in rats independently of diet. *Psychoneuroendocrinology*. 2017 May;79:40-48.
 4. Van Hemert S, Ormel G. Influence of the multispecies probiotic Ecologic Barrier on parameters of intestinal barrier function. *Food and Nutrition Sciences*. 2014;5:1739-1745.

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Target gb-X™

Product Code: GBX

- 5 billion CFU
- 9-strain blend
 - *L. casei* W56
 - *L. acidophilus* W37
 - *L. brevis* W63
 - *Lc. lactis* W58
 - *B. lactis* W52
 - *Lc. lactis* W19
 - *L. salivarius* W24
 - *B. bifidum* W23
 - *B. lactis* W51
- Hypoallergenic*
- Non-GMO
- Shelf stable
- Convenient, single-serving sachets**



*Free of the following common allergens: milk/casein, eggs, fish, shellfish, tree nuts, peanuts, wheat, gluten, and soybeans. No artificial additives, colors, flavorings, preservatives, sugar, or salicylates are used. Contains corn.

**Best taken on an empty stomach with water or dairy.

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