

## Probiotics: Potent Immune Modulators

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In the search for alternatives to aid in the prevention and treatment of diseases by inducing a more effective immune response, the probiotics, living micro-organisms that confer health benefits, have been widely used. Among the various probiotics that have been studied are yeast *Saccharomyces boulardii*, the bacteria *Bacillus cereus* var. *toyoi*, *Lactobacillus casei* among others. There are many works in the medical area about the use of probiotics for the prevention or treatment of diseases such as acute or persistent diarrhea, bacterial genito-urinary tract infections, irritable bowel syndrome, intestinal neoplasms, and some parasitoses [1-4]. Studies has shown protective effect against protozooses in experimental models, such as in *Giardia intestinalis* infection by administration of *Enterococcus faecium* and *Lactobacillus johnsonii*; in *Cryptosporidium parvum* and *Plasmodium chabaudi* by the administration of *Lactobacillus casei* [5]. In addition, it has been demonstrated in patients with intestinal amebiasis that the probiotic *Saccharomyces boulardii*, associated with the conventional treatment, promoted a reduction in the time of diarrhea and the parasitological cure [6]. *S. boulardii* it's the probiotic already recognized for promoting immunomodulatory action on the intestinal mucosa. Other study demonstrated that the *S. boulardii* acted like a protective agent in *Toxocara canis* infection, reducing the intensity of infection in mice [7]. The probiotic *Enterococcus faecalis* was also evaluated and showed a reduction in the intensity of infection of the acute phase of murine toxocarosis [8]. The use of *S. boulardii* has presented important results, reducing episodes of diarrhea in children and hospitalization time [1]. This yeast is able to inhibit bacterial toxins, is also immunostimulating and anti-inflammatory in the intestinal mucosa [9]. In addition, it is safe and commercially available for human use and several studies carried out with *S. boulardii* point to this as an efficient biotherapeutic agent for the prevention and/or treatment of various gastrointestinal diseases [1,10]. The probiotic *B. cereus* var. *toyoi* it's also used in humans, being innocuous, resistant and stable to the conditions of the digestive. It's also widely used in veterinary medicine, for stimulating the immune response and favoring the animals' weight gain [11,12]. Was described that the probiotic *Lactobacillus casei* induces the activation of the innate immune response by the action of macrophages and dendritic cells in the intestinal mucosa [9]. Others modulatory mechanisms of probiotics has been described in bacterial infections and intestinal protozooses: intestinal microbiota balance and increase of the epithelial barrier against pathogens [13]; increased humoral immune response [10]; antagonistic effect and competition with pathogens by connection sites [14] and increased IgA response at the systemic level [15].

In conclusion, there are increasing evidence that the intestinal microbiota is an important regulator of the immune system and that the use of probiotics may be an alternative to assist in the control and treatment of various diseases.

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