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CANXIDA RESTORE

WHITE PAPER



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The aim of this whitepaper is to provide a comprehensive overview of the role of gut health in overall wellbeing, probiotics, their benefits, and their impact on Candida. Within this, the most up-to-date scientific evidence will be reviewed, highlighting the key studies and information underlying probiotics in gut health, Candida, and the design of CanXida Restore (RST).

INTRODUCTION

The intestinal microbiome plays an important role in human health and influences the development of many diseases¹. Consisting of a community of around 200 bacteria, viruses, and fungi, the intestinal microbiome in the gastrointestinal (GI) tract carries out specialized metabolic processes that are essential to the host¹. Dysregulation in the microbiome has been associated with inflammatory bowel disease (IBD), type 2 diabetes (T2D), cardiovascular disease (CVD), and colorectal cancer¹.

The gut mycobiome consists of the fungal component of the microbiome, and has emerged as a small, but essential, part of the GI tract and overall human health². Intestinal fungi species are involved in the regulation of homeostasis, as well as pathophysiological and physiological processes². Imbalances in intestinal fungi (as commonly seen with Candida and Saccharomyces) and interactions with other components of microbiome have implicated the gut mycobiome in a range of autoimmune and metabolic diseases, neurological disorders, and cancer².

UNDERSTANDING PROBIOTICS

Following an expert panel convened by the Food and Agriculture Organization of the United Nations and the World Health Organization, the formal definition of probiotics was published as “Live microorganisms that when administered in adequate amounts confer a health benefit on the host”³. Since the definition was published, scientific investigation of probiotics has grown substantially, and the rate of discovery of novel organisms with potentially therapeutic benefits for human health is progressing at an unprecedented rate³.

Initial probiotics contained only one species of microorganisms, mainly *Saccharomyces* or *Lactobacillus*, and were effective in the prevention of infectious diarrhea and post-antibiotic diarrhea⁴. Modern probiotics now usually contain a large variety and number of microorganisms, ranging from 108 to more than 1010 organisms⁴. Research is ongoing into the roles and benefits of probiotics in many areas of human health including the gut microbiome ecosystem, psychopathology, antibiotic resistance, and other pharmacological therapies⁴.

Recently, probiotics have been proposed as an alternative, or complementary, treatment for the management of *Candida* infections and candidiasis⁵. Increasing evidence has emerged supporting the usefulness of probiotics in the management of both oral and vulvovaginal candidiasis⁵. The most frequently-studied probiotics for *Candida* infections are *Lactobacillus*, *Bifidobacterium*, and *Saccharomyces*⁵. However, there is a lack of research into other types of candidiasis (particularly skin candidiasis), highlighting the need for further *in vivo* and *in vitro* research into probiotics for the management of candidiasis⁵.

Candida infections and candidiasis can be treated with antifungals and antibiotics, which are effective in clearing *Candida* but also lead to disruption of the gut microbiome, impair beneficial microbes, and make way for drug-resistant fungi². After the effective removal of *Candida* infections, it is therefore essential to restore and maintain normal and healthy gut function. By re-populating the intestine with beneficial bacteria and enzymes that promote digestion, yeast and harmful bacteria are unable to return, thereby protecting against further infection.

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A pair of hands is held up, palms facing forward, against a background of lush green ferns. The entire image is overlaid with a semi-transparent purple filter. The Canxida logo is centered over the hands.

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THE POWER OF TIME-RELEASE

CanXida RST is a powerful, full-spectrum blend of key probiotics and enzymes designed to recolonize the gut following Candida infection treatment using CanXida RMV. CanXida RST re-colonizes the gut with the best probiotic strains for the inhibition of yeast, harmful bacteria and parasites, maintaining normal and healthy gut function.

A key aspect of CanXida RST is the timed-release formulation. With this, CanXida RST is guaranteed and patented to survive stomach acid, ensuring that no probiotics are lost before release in the small intestine. To achieve an observable biological effect, a single dose of probiotics needs to contain 10^8 - 10^9 colony-forming units (CFU) prior to passage into the GI tract⁶. Different strategies have been employed to preserve the viability of probiotic strains, and strategies have also evolved alongside probiotic development⁶.

Early probiotics were administered in the form of live and/or lyophilized bacterial cells not covered with a capsule or microcapsule, which resulted in a survival rate of just 7-30%⁶. Second and third generation probiotics encapsulated lyophilized strains in polymeric capsules or matrices, increasing the survival of microorganisms to 80-90%⁶. Finally, fourth generation probiotics consist of encapsulated bacterial cells in the form of biofilms, enabling increased survival and release of sufficient CFU into the intestine⁶.



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PROBIOTIC STRAINS USED AND THEIR BENEFITS

The CanXida RST Formula has been designed with 6 probiotic strains and 7 digestive enzymes, including the exact beneficial bacteria required to tackle yeast, parasites and harmful bacteria, whilst also providing digestive support. Each capsule contains over 18 billion beneficial bacteria, shown to inhibit yeast and restore digestive function.

LACTOBACILLUS ACIDOPHILUS

Lactobacillus acidophilus is a widely researched probiotic strain and one of the most commonly recommended microorganisms for dietary use⁷. *L. acidophilus* contributes to the host microbiome mainly through the production of metabolites and regulation of intestinal microbiota⁷.

It has long been understood that *L. acidophilus* is capable of producing metabolites that are capable of inhibiting *C. albicans* growth⁸, highlighting the usefulness of the bacteria in the management of Candida overgrowth and infection. Specifically, *L. acidophilus* releases lactic acid, which interferes with Candida's metabolism, and lowers the pH to create an environment where Candida, harmful bacteria, and parasites cannot reproduce⁹.

LACTOBACILLUS PLANTARUM

Lactobacillus plantarum is a probiotic strain of bacteria commonly found in the lactic acid of fermented food, including sauerkraut, brined olives, salted gherkins, and sourdough¹⁰. *L. plantarum* was found to colonize human intestinal mucosa when orally administered, and has since seen increased interest as a probiotic, with much research still ongoing¹⁰.

L. plantarum has several desirable features of an efficient probiotic, including the ability to survive in both low and high pH environments, enabling the bacteria to transit through the GI tract and influence the gut microbiome¹⁰. The presence of *L. plantarum* has also been shown to enhance intestinal barrier function by maintaining epithelial integrity and preventing gut permeability¹¹. Other functions include the modulation of immune function and the secretion of antimicrobial peptides to protect against pathogens¹¹.

LACTOBACILLUS CASEI

Lactobacillus casei is a strain of bacteria that has been well researched due to its commercial, industrial and applied health potential¹². L. casei has been found to produce many bioactive metabolites that confer host benefits when consumed, and therefore have proven probiotic effects¹². The probiotic actions of L. casei have a broad range of applications, including drug-resistant therapeutics, immunoregulatory functions, limiting the infectivity of GI tract pathogens, restoring intestinal balance, and improving neurological diseases¹³.

A key area in which L. casei can improve human health is in the management and treatment of intestinal disorders¹². L. casei can produce the metabolite pipecolinic acid in the gut, which can act as a metabolic mediator and alleviate constipation in adults¹⁴. Daily consumption of L. casei has also been shown to preserve the diversity of the gut microbiota and may relieve stress-associated responses of abdominal dysfunction¹⁵.

LACTOBACILLUS RHAMNOSUS

Lactobacillus rhamnosus is a strain of Lactobacilli that has long been studied due to its ability to survive and proliferate in acidic environments, such as those produced by stomach acid¹⁶. L. rhamnosus is able to produce a biofilm that can mechanically protect mucosa, and different soluble factors that benefit the gut by enhancing intestinal crypt survival and protecting the intestinal epithelium¹⁶.

Intake of L. rhamnosus has been explored as a potential solution across a number of different intestinal health applications¹⁷. A protein excreted from L. rhamnosus was found to have a beneficial effect on intestinal barrier function, highlighting it as a potential therapy for gut barrier dysfunction diseases such as colitis¹⁸. A number of studies have also shown that L. rhamnosus can exert a palliative effect on IBD through anti-inflammatory mechanisms such as the inhibition of pro-inflammatory cytokines and reactive oxygen species (ROS)¹⁹.

BIFIDOBACTERIUM BIFIDUM

Bifidobacterium species are some of the first microbes that colonize the human GI tract, and have been widely investigated due to their reported positive health benefits to the host²⁰. B. bifidum stimulates the production of B vitamins and Vitamin K in the large intestine, which are essential for maintaining energy levels, mood, cognitive function, and the digestion of proteins and carbohydrates²¹.

Several studies have investigated the beneficial potential of B. bifidum in intestinal health diseases such as colorectal cancer, diarrhea, necrotizing enterocolitis, and IBD²⁰. It has also been discovered that B. bifidum probiotics are effective in reducing gut inflammation caused by antibiotic disturbance and increased proinflammatory species²². Interestingly, a depletion of B. bifidum has also been associated with a symptomatic response to SARS-CoV-2 infection²³.

BIFIDOBACTERIUM LONGUM

Also coming from the Bifidobacterium family, B. longum shares many of the same properties of B. bifidum, including the ability to induce positive health benefits in their host²⁰. B. longum is able to produce lactic acid, which can exert positive effects in the GI tract, including balancing the gut microbiome²¹.

Again, the application of B. longum as a probiotic has been explored across several disorders and diseases related to gut health. Animal studies and clinical trials have demonstrated that B. longum has a preventative and protective impact on IBD, ulcerative colitis, and Crohn's disease²⁴. Other studies have established B. longum as a multi-functional probiotic capable of alleviating gastrointestinal, immunological and infectious diseases²⁵. Finally, the immunomodulatory effects of B. longum have been demonstrated in the management of intestinal mucosal immune injury²⁶.

DIGESTIVE ENZYME FORMULATION

CanXida RST also contains 7 digestive enzymes, designed to amplify the effects of probiotics during Candida recovery (Table 1).

Table 1. CanXida RMV Sustained-Release Additives.

ENZYME	ACTIVITY
Amylase	Involved in the breakdown of carbohydrates (starch) to help reduce bloating, gas, and abdominal pain ²⁷ .
Cellulase	Reduces bloating and discomfort when transitioning to an anti-candida diet by aiding with the breakdown of fiber ²⁸ .
Glucoamylase	Involved in the breakdown of starches found in vegetables and grains (brown rice, quinoa, buckwheat). May aid in the tolerability of these food types ²⁹ .
Hemicellulase	Increases the bulk of stools to help with constipation and the regulation of bowel movements by aiding in the breakdown of carbohydrates and fiber from plants ²⁸ .
Invertase	Aids in the breakdown and absorption of sugars, which has anti-aging and physical rejuvenation benefits ³⁰ .
Protease	Involved in the breakdown of protein, aiding in the digestion of meat, eggs, fish and vegetable proteins found in nuts, seeds, and legumes ³¹ .
Serratiopeptidase	Binds to immune complexes (toxins) in blood to break down debris created by yeast and bacteria. Serratiopeptidase is particularly effective at tackling leaky gut and auto-immune diseases and is not included in many other probiotic formulas ³² .

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A woman with long dark hair and a hoop earring is lying on her back in a field of clover. She is smiling and looking upwards. Above her head is a glowing, translucent sphere. The entire image has a purple color cast. The word "canxida" is overlaid in white text, with a green leaf-like shape above the 'x' in "xida".

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CONCLUSION

Candida infections and candidiasis can be treated with antifungals and antibiotics, which are effective in clearing Candida but also lead to disruption of the gut microbiome. After the effective removal of Candida infections, it is essential to restore and maintain normal and healthy gut function. By re-populating the intestine with beneficial bacteria and enzymes that promote digestion, yeast and harmful bacteria are unable to return, thereby protecting against further infection.

CanXida RST is a powerful, full-spectrum blend of 6 probiotics and 7 enzymes designed to recolonize the gut following Candida infection treatment using CanXida RMV. CanXida RST re-colonizes the gut with the best probiotic strains for the inhibition of yeast, harmful bacteria and parasites, maintaining normal and healthy gut function.

The formulation of CanXida RST has been designed based on scientific evidence, including the optimal probiotic strains that are beneficial to intestinal health and enzymes that amplify their effects. CanXida RST is also therefore suitable as a preventative treatment, contributing to normal and healthy gut function, and fighting against infection.



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