

PROLAC-T™ : UNIQUE POSTBIOTICS

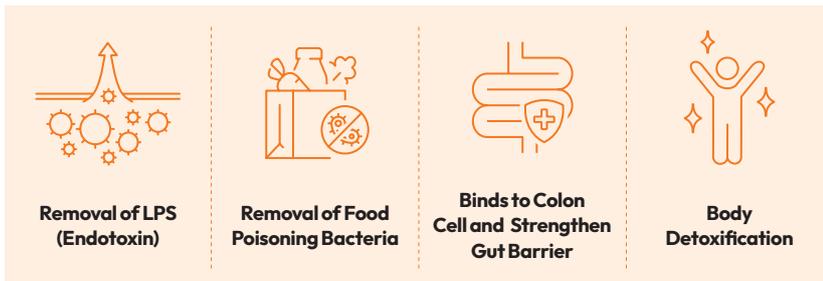
Novel Antibacterial Compounds Targeting
Pathogenic Bacteria and Facilitating LPS Detoxification

Microbiome for Human Health
Pioneering Innovative Probiotic Solutions

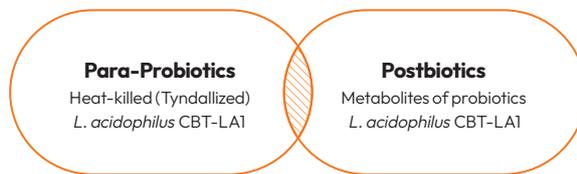
 CELL BIOTECH

WHAT IS PROLAC-T™ ?

BENEFITS OF PROLAC-T™

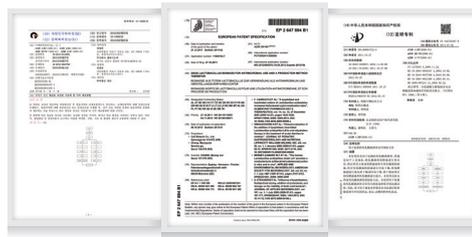


PROLAC-T™



GLOBAL PATENTS

- Korea KR 101369219
- China ZL 201180004722.9
- Europe EP 2647694 B1



NOVEL ANTIBACTERIAL COMPOUNDS TARGETING PATHOGENIC BACTERIA AND FACILITATING LPS DETOXIFICATION

Prolac-T™ comprises **para-probiotics** (heat-killed *L. acidophilus* CBT-LA1) and **postbiotics** (*L. acidophilus* CBT-LA1) produced through a process called tyndallization, where cells are broken down, releasing lactic acid, fatty acids, bacteriocins, and minerals.

Prolac-T™ effectively **binds to lipopolysaccharides (LPS), a harmful factor in endotoxin-induced inflammation, facilitating their removal from the body.**

Lipopolysaccharides (LPS) are released from the outer membrane of Gram-negative bacteria when the bacteria are killed either by antibiotics treatment or as part of an inflammatory response.

Additionally, Prolac-T™ also **binds to harmful food poisoning bacteria** such as Salmonella by preventing their adhesion to cells.

The removal ability of these harmful factors from the body is possible because Prolac-T™ consists of non-viable dead bacteria that freely pass through the intestine without colonizing it and are expelled from the body. As a result, Prolac-T™ serves as a beneficial substance with detoxifying properties.

OUR PROLAC-T™ PRODUCTS



ESPECIALLY RECOMMENDED TO

Frequent Travelers



Weakened Gut in Seniors



Long-term Antibiotic Treatment



Chronic Diarrhea and AAD (Antibiotic Associated Diarrhea)

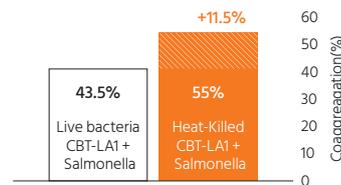


WHAT ARE THE BENEFITS OF PROLAC-T™ ?

PREVENTING INFECTIONS CAUSED BY FOODBORNE PATHOGENS¹

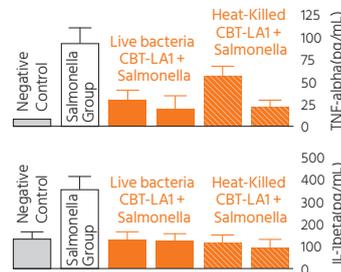
HIGHER COAGGREGATION WITH SALMONELLA

The heat-killed bacteria (CBT-LA1) showed a higher coaggregation ability of 55% compared to the live bacteria's 43.5%, indicating that heat-killed bacteria demonstrate better coaggregation with *Salmonella typhimurium*.



LOWER LEVEL OF PRO-INFLAMMATORY CYTOKINE (TNF- α AND IL-1 β)

The expression level of proinflammatory cytokines was lower in both the live and heat-killed bacteria groups compared to the *Salmonella* infection group, indicating a reduction in intestinal mucosal inflammation caused by *Salmonella typhimurium* due to their coaggregation ability.



BETTER ADHESION ABILITIES TO COLON CELLS

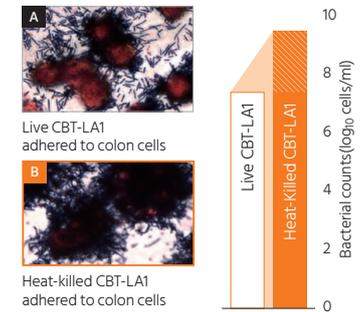
In much of the microscopic field, the heat-killed bacteria showed better adhesion ability than the live probiotics.



STRENGTHEN GUT BARRIER & BINDING AND REMOVAL OF LPS²

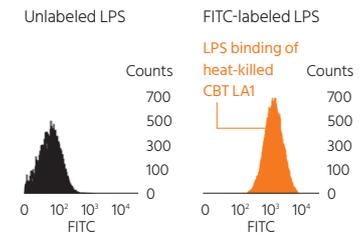
ADHESION OF CBT-LA1 TO COLON CELL CULTURES AS GUT BARRIER

As shown in Figure, the highest number of bacteria adhered to colon cells was observed with heat-killed CBT-LA1, which is approximately 356-fold higher than that with live CBT-LA1. This indicates that heat-killed CBT-LA1 may efficiently prevent the colonization of pathogens by forming an epithelial barrier in the intestine.



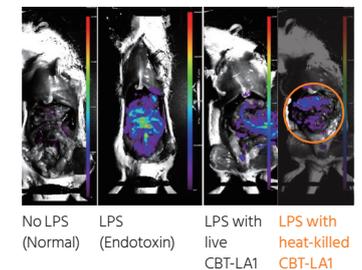
HIGHER LPS-BINDING ABILITY

Flow cytometry analysis revealed that 86.2% of heat-killed CBT-LA1 bound to FITC-labeled LPS, while only 54.4% of live CBT-LA1 was bound, indicating a higher LPS-binding ability for heat-killed CBT-LA1.



REMOVAL OF LPS (ENDOTOXIN)

The bioluminescence signal intensity significantly decreased in rats treated with live or heat-killed CBT-LA1, indicating substantial removal of LPS from the intestine by CBT-LA1 treatment. Heat-killed CBT-LA1 appeared more effective in LPS removal, as evidenced by weaker fluorescent signals compared to live CBT LA1-treated rats.



¹ Kim, Min-Soo, et al. "A study on the prevention of salmonella infection by using the aggregation characteristics of lactic Acid bacteria." *Toxicological research* 29.2 (2013): 129-135.
² Shin, Joo-Hyun, Joong-Su Lee, and Jae-Gu Seo. "Assessment of cell adhesion, cell surface hydrophobicity, autoaggregation, and lipopolysaccharide-binding properties of live and heat-killed *Lactobacillus acidophilus* CBT LA1." *Korean Journal of Microbiology* 51.3 (2015): 241-248.

WHAT ARE THEY?



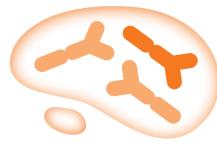
PREBIOTICS



PROBIOTICS



POSTBIOTICS

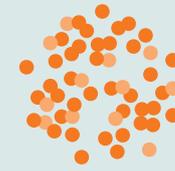


PARA-PROBIOTICS



PROBIOTICS

Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host



PREBIOTICS

Substrate that is selectively utilized by host microorganisms conferring a health benefit



SYNBIOTICS

A mixture of live microorganisms and substrate(s) that are selectively utilized by host microorganisms and confer a health benefit to the host



PARA-PROBIOTICS

Paraprobiotics (also called inactivated or 'ghost' probiotics) are non-viable microbial cells (either intact or broken) or crude cell extracts that, when administered (either orally or topically) in adequate amounts, confer benefits to humans and animals.



POSTBIOTICS

Preparation of inanimate microorganisms and/or their components that confers a health benefit on the host. Effective postbiotics must contain inactivated microbial cells or cell components, with or without metabolites, that contribute to observed health benefits.

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