

Probiotics and its Mechanism of Action

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Probiotics are the live cultures of bacteria and yeast consumed especially to improve digestion in humans when administered in adequate amounts. They replenish the micro flora of gut and hence compensates for the loss done by the antibiotics. Probiotics have recently gained fame in the commercial industry but its roots can be found in the time when cheese making and fermentation techniques emerged. For instance LAB (Lactic Acid Bacteria) in curd is basically fermentation of lactose sugar in milk but also serve as a probiotic dairy product. Moreover, it is suitable for people intolerant to lactose sugar and also helps to improve digestion [1].

Significant mechanism of action with respect to probiotics includes

- **Production of Anti- Microorganism Substances:** Probiotic microorganisms produce organic acids (lactic acid and acetic acid) and anti-microbial compounds called bacteriocins. The fermenting bacteria or LAB ferments the sugar and produce lactic acid which enters into the cytoplasm of pathogenic microbes. In the cytoplasm the lactic acid dissociates and lowers the intracellular pH causing death of the pathogen. On the other hand, bacteriocins released interfere with the metabolic reactions of pathogens and hinders their growth either directly or indirectly [2].
- **Probiotics and the Immune System:** Nearly 70% of our immune cells reside in the gut and hence gut is an important place for our immune system to work efficiently. All the good bacteria i.e. Probiotics are also present in the gut and since we don't live in a sterile environment therefore pathogenic microbes enter our gut time to time. So, the good bacteria utilizes the space and resources to make it unavailable for pathogens and hence keep them at bay [3].
- **Competitive Exclusion of Pathogens:** Some of the probiotic microbes are found to compete for receptor binding site required by pathogenic microorganisms. The probiotics are known to have better susceptibility to-

wards the receptor and hence prevents the pathogen from binding. Consequently, it hinders the formation of colonies by the pathogen in the gut leading to its termination later [4].

- **Enhancement of the Epithelial Barrier:** Epithelial layer of the intestine is as selectively permeable membrane which inhibits the entry of pathogen from intestine into the blood stream. Probiotics such as *lactobacilli* promotes the gene which is responsible in maintaining the functional properties of the epithelial layer and improving its activity against the action of pathogens. As a result, strengthening the epithelial barrier and improving overall health [5].

Mankind is using probiotics as source of health supplement since centuries and recent studies have shown the significant potential for preventive and repairing offered by different probiotics. However, it is important to consider the fact that many benefits of probiotics are still not justified by the scientific experimentation and some probiotic microbes even have side effects if taken in large amounts. Therefore, nutritional awareness is of most importance when making dietary choices.

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