

## Gut Microbes as Probiotics and their Role in Health and Diseases

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### Gut Microbes

Recent research has enlightened today's world with significance and the potent of gut microbes in human health and diseases. They have captured the attention of the research community to toil their necessity for human life [1,2]. The first and foremost importance of gut microbes is to resist the colonization by enteric pathogens. Second main attribute is the contribution to immune development. These are supported by many research papers published [3,4]. Metabolism is also an important criterion that is influenced by the structure of bacterial flora in the intestine. This in-turn drives the pro-inflammatory and anti-inflammatory response. For example the short chain fatty acids produced by the microbes helps in proliferation and differentiation of intestinal epithelial cells. Hence the balancing of homeostasis provokes the immunity whereas imbalance leads to disorders.

### Emphasis on probiotics

Probiotics, a family member of commensals are the live microorganisms when given alter the host conferring a health benefit and helps in balancing the homeostasis. The main criteria to be a successful probiotics, the strain should tolerate the gastric acidity in the intestine and the bile concentration in the upper digestive tract. They should also possess the stability, adhesion potency, energy utilization and competitiveness, antimicrobial production, resistant to antibiotics, immunogenicity and adjuvanticity. Most of lactic acid bacteria and bifidobacteria has been widely used as probiotics [5]. They make a change in the inflammatory and metabolic system by changing the gut microbes [6,7]. The probiotics on administration have a talk with the immune system to induce a tissue metabolic function by recognizing the receptors or the metabolites of the probiotics. Resembling commensals, they are able to adhere to the intestinal epithelium, activate macrophages and induce gut associated lymphoid tissue immunity. With a varsity in immune response the epithelial cells along with probiotics triggers the immune cascade producing a specific immune response in lamina propria. They also produce soluble compounds that themselves can trigger the immune response [8,9]. Immuno modulation by probiotics shows an increase in natural killer cells activity, costimulatory molecules expression and cytokine production [10]. They are recognized by pattern recognition receptors viz TLRs which signals about the presence of the organism [11-13]. The mechanism by which they confer a health benefit is still more to be elucidated. The immune modulation varies based on the strain administered. They have been used in treatment of allergy, metabolic disorders, to control dysbiosis due to antibiotic therapy etc [14]. Hence the usage of probiotic strategy will be a right boulevard for treating infectious disorders due to its direct involvement.

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