

Not All Bacteria Are Bad: Probiotics Improve Health and Fight Disease**Harsharn Gill**

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The human gastrointestinal tract (GIT) harbours over 100,000 billion bacteria representing several hundred different species. While a majority of the indigenous bacteria are benign or exhibit health-enhancing properties, some possess the potential to cause disease. In healthy individuals, a balance exists between potentially pathogenic and health-promoting bacteria. However, when this delicate ecological balance is disturbed by environmental or physiological factors, it results in enhanced susceptibility to infectious and immunoinflammatory diseases. Several recent clinical studies have demonstrated that supplementation with probiotics could be used to modulate or optimise gut microflora and to enhance health; probiotics are defined as live microorganisms which when administered in adequate amounts confer health benefit on the host. For example, administration of specific strains of lactobacilli and/or bifidobacteria was found to be effective in the treatment/prevention of rotavirus, antibiotic-associated, nosocomial and community-acquired diarrhoea (1, 2). The ability of specific probiotics to enhance immune function, especially in subjects with less than adequate immune function such as the elderly, has also been reported (2). Encouraging evidence is also emerging for the effectiveness of probiotics in the prevention and management of pouchitis and paediatric atopic diseases, and the prevention of post-operative and urogenital tract infections. Efficacy of probiotics in the prevention of traveller's diarrhoea, sepsis associated with severe acute pancreatitis, and cancers, the management of ulcerative colitis and lowering of blood-cholesterol remains unproven (1, 2). Further studies are required to elucidate mechanisms by which probiotics modulate various physiological functions and to determine optimum dose, frequency and duration of probiotic treatment for specific health benefits, in different population groups.

Recent advances in DNA technology have made it possible to insert interesting genes into probiotics (especially lactic acid bacteria). This opens up new opportunities for improving physiological effects and technological properties of probiotics.