# The Crucial Role of Gut Microbiome in Cardiovascular Health

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## Madam,

The intestinal microbiome refers to the vast assortment of tiny organisms in the human digestive tract. These bacteria support the body's physiological processes and biochemical responses via the compounds they generate. Research suggests that variations in gut microbiota may influence a variety of human health disorders, notably those involving the heart. Recent studies have shown that changes in the types and activities of bacteria in the intestines, known as gut microflora dysbiosis, can hasten the course of cardiovascular illnesses.[1] Another research also tied gut microbiota to heart disease, but this time by demonstrating how metabolites like trimethylamine N-oxide (TMAO) will increase risk, indicating that dietary and probiotic strategies could be used for remedy.[2]

A recent study from April 2024 identified Oscillibacter and Eubacterium as synergistic cholesterol metabolisers. The intermediate products that these bacteria form while converting cholesterol are finally degraded by other bacteria and flushed out from the body, reducing gut cholesterol and modulating the host's biochemical pathways, hence reducing both faecal and plasma cholesterol levels. The results may serve to facilitate novel potential interventions, for example targetting the microbiome in cardiovascular disease (CVD) treatment.[3] A novel association was observed that higher serum C-reactive protein (CRP) levels correlate with Parabacteroides merdae and unclassified Firmicutes strongly associate with plasma cholesterol. As for Firmicutes a well-defined metagenomic species pangenome (MSP) from this phylum, termed msp_120, was found to be associated with higher cholesterol levels that indicate its role in cholesterol metabolism and thus possibly also as a determinant of cardiovascular disease risk factors concerning high serum-cholesterol level. This finding reveals a beholden link between the gut microbiome and systemic inflammation with CVD.[3]

In Pakistan, where CVDs are a major health concern, there is a significant research gap regarding the local gut microbiome's role in CVD. We conducted thorough research on PubMed and found no original research articles studying the relationship of gut microbiome with CVD except for a few review articles[4,5]; this is indicative of the lack of attention to this topic in Pakistan. It is important to perform ethnic-specific studies for these unique interactions in the Pakistani population. Research in this direction may point out the specific role of gut microbiota so probiotic interventions and dietary recommendations can be used to improve cardiovascular health in the Pakistani population.

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