

# Short-Chain Fatty Acids and its Effects on the Cardiovascular System

Kenza Cope\*

*Department of Pharmacy, Medical University of Sofia, Bulgaria*

## EDITORIAL

Short-chain fatty acids (SCFAs) are the main metabolites produced by the microbiota in the large intestine through the anaerobic fermentation of indigestible polysaccharides such as dietary fiber and resistant starch. SCFAs might influence gut-brain communication and brain function directly or indirectly.

SCFAs have distinct physiological roles in host metabolism: they contribute to shaping the gut environment, influence the physiology of the colon, they can be used as energy sources by host cells and the intestinal microbiota and they also participate in different host-signaling mechanisms and are also used to produce

Short- and medium chain fatty acids are absorbed directly into the blood via intestine capillaries and travel through the portal vein. Long-chain fatty acids, on the other hand, are too large to be directly released into the tiny intestine capillaries.

The development of cardiovascular diseases is often attributable to loss of endothelial functions of the vascular tissue or to decreased contractile function of the heart muscle. These disturbances are

often caused by imbalances in lipid and glucose metabolism. For instance, these imbalances can result in a low-grade inflammatory state of affected endothelial tissue, causing macrophages and fat-rich lipoproteins to accumulate in the sub-endothelial space. Short-chain fatty acids feature a regulatory function in the cellular metabolism of fatty acids, glucose and cholesterol in various peripheral tissues, both directly as well as at a genetic level. In addition, the strong expression of short-chain fatty acid receptor Ffar2 on various leukocyte populations facilitates a regulatory effect of the fatty acids on various functions of these immune cells. The immunoregulatory effect and influence on lipids, cholesterol and glucose metabolism of short-chain fatty acids can thus contribute to the development of metabolic conditions that promote preservation or recovery of endothelial functions and thereby reduce the risk of development or aggravation of cardiovascular diseases. The current study addresses the effects of short-chain fatty acids on the human cardiovascular system and investigates potential novel interventions for prevention and treatment of cardiovascular disorders using these fatty acids.

**Correspondence to:** Kenz Cope, Department of Pharmacy, Medical University of Sofia, Bulgaria, E-mail: kenzc@gmail.com

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