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L-carnitine intake and high trimethylamine N-oxide plasma levels correlate with low aortic lesions in apoE$^{-/-}$ transgenic mice expressing hCETP

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Trimethylamine N-oxide (TMAO) plasma levels have been associated with atherosclerosis development in ApoE$^{-/-}$ mice. To better understand the mechanisms behind this association, we conducted *in vivo* studies looking at the effect of TMAO on different steps of atherosclerotic disease progression. Male ApoE$^{-/-}$ mice transfected with human cholesteryl ester transfer protein (hCETP) were fed L-carnitine and/or methimazole, a flavin monooxygenase 3 (FMO3) inhibitor that prevents the formation of TMAO. Following 12 week treatment, L-carnitine and TMAO plasma levels, aortic lesion development, and lipid profiles were determined. High doses of L-carnitine resulted in a significant increase in plasma TMAO levels. Surprisingly and independently from treatment group, TMAO levels inversely correlated with aortic lesion size in both aortic root and thoracic aorta. High TMAO levels were found to significantly correlate with smaller aortic lesion area. Plasma lipid and lipoprotein levels did not change with treatment nor with TMAO levels, suggesting that the observed effects on lesion area were independent from lipid changes. These findings suggest that TMAO slows aortic lesion formation in this mouse model and may have a protective effect against atherosclerosis development in humans.

Biography

Aouatef Bellamine has earned her PhD in Life Sciences from the University of Sorbonnes in Paris, France 20 years ago. She has an extensive experience in both academia at Vanderbilt University and in pharma/biotech field focusing on metabolic diseases and nutrition. She was part of the development and the launch of metabolic compounds at Bristol-Myers Squibb and was involved in the research around cardiovascular attributes of these compounds. She authored over 20 publications and chapter books in peer reviewed journals in lipid metabolism, endocrinology and nutrition. She is currently heading the research and clinical development at Lonza.

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