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## The effect of dietary choline on lipid partitioning and protection from metabolic syndrome

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It is well known that it is beneficial to reduce fatty acid availability in obesity however there is an unmet need for discovering new dietary compounds that can reduce fat accumulation and stimulate fatty acid oxidation under conditions of elevated obesity. We established that dietary choline could inhibit fatty acid formation by lipogenesis and stimulate mitochondrial oxidation. Metabolomic analysis of plasma and tissues established that choline supplementation stimulates one carbon cycle, membrane phospholipid turnover and adipose tissues triglyceride degradation by lipolysis, strongly directing fatty acids towards oxidation in a Pcyt2 deficient mouse model of metabolic syndrome. The extensive metabolic studies as well as analyses of the gene expression and insulin signaling pathways provided strong evidence for a direct stimulation of fatty acid metabolism with dietary choline. The impact of this work is not only how to expand the future use of choline but also to continue to investigate the regulation of the membrane phospholipid turnover and the basic function of the lipid regulator Pcyt2. This is the first time to be demonstrated that choline stimulates membrane biogenesis and mitochondrial metabolism under pathological conditions of metabolic syndrome.

### Biography

Marica Bakovic has completed her BSc in Chemistry and PhD in Biological Chemistry at the University of Alberta. She has received Postdoctoral awards from Medical Research Council and Alberta Heritage Foundation. Before coming to the University of Guelph, she has worked in the area of molecular and cell biology of lipid metabolism at the Faculty of Medicine, University of Alberta. Currently, she is a Professor in the Department of Human Health and Nutritional Sciences at the University of Guelph. She has a long lasting interest in nutrition and metabolism, especially in the area of regulation of membrane phospholipids, fatty acids and methyl group donors.

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