

Special Issue on
Metabolic Syndrome and Dietary Treatment: Let's Get Personal

CALL FOR PAPERS

Metabolic syndrome (MetS) is a clustering of key biomarkers that increase the risk of cardiovascular disease and type 2 diabetes (cardiometabolic disease). With complex gene environment interactions, including poor diet and sedentary lifestyle, MetS is characterised by dyslipidaemia, dysglycaemia, and hypertension, with insulin resistance as the primary cause. The international prevalence of MetS is increasing, mirroring the obesity epidemic. Weight loss can ameliorate MetS but weight regain often occurs, highlighting the importance of alternative dietary strategies. The mainstay dietary advice for most countries is to reduce dietary fat, especially saturated fatty acids, but evidence from recent meta-analyses on Mediterranean dietary patterns suggests a more moderate fat intake, with an emphasis on MUFA and PUFA, fresh fruit, vegetables, and nuts, and higher intake of oily fish and poultry rather than red meat. Low carbohydrate, higher protein, and glycaemic index/load diets are alternative approaches. Supplementation is also of key importance, as changes in dietary habits are challenging. The active ingredients EPA and DHA found in oily fish are especially effective at improving plasma triacylglycerols and small dense, low-density lipoprotein particles, key features of insulin resistance. Controversy remains on their recommendation due to a low-density lipoprotein cholesterol raising effect and sustainability. Therefore, evidence on alternative sources including krill oil, algal oils, and other formulations is warranted. Furthermore, vitamin D deficiency is associated with MetS but this may be due to interactions with other micronutrients such as magnesium, zinc, and Vitamin A and other compounding variables.

While international dietary advice varies, guidelines are based largely on a 'heart healthy' cholesterol lowering, high carbohydrate, and lower fat diet; MetS presents at all levels of serum cholesterol and this approach may not provide optimum outcomes for all sufferers of MetS. Indeed, recent advances in nutrigenetics, nutrigenomics, and metabolomics utilising 'omics' technology are making headway towards personalised nutrition. Omics data has been analysed in combination with epidemiological and outcome based data ('big data'), with high powered computational modelling, to advance knowledge in personalised nutrition. This 'quantum leap' enables a comprehensive spectrum of data, which will provide insight to dysregulation at baseline and potential reparation after nutritional intervention and may identify a 'finger print' pattern that identifies responders versus nonresponders.

While dietary and nutritional supplementation attention to MetS is well researched the evidence remains inconclusive for many nutritional factors. There is considerable debate in the nutrition field with respect to macro and isolated nutrients, and a move towards more food based interventions and dietary patterns is rapidly gaining interest. However, there remains a gap in the literature with well-powered randomised controlled trials that report individual/subgroup responses and integrate 'omics' based technology. Furthermore, personalised nutrition is rapidly advancing, and the role of modern internet and mobile devices will be highly instrumental.

The objective of this special issue is to provide a focus on personalised nutrition for MetS, based on phenotype and/or genotype and modern technology.

Potential topics include but are not limited to the following:

- ▶ The use of 'omics' technology in dietary/supplement intervention
- ▶ Genetic variation and individualised response to diet/nutrients
- ▶ Phenotypic variation and individualised response to diet/nutrients
- ▶ Diet gene interactions
- ▶ Food based interventions
- ▶ Integration of modern technology, for example, electronic devices and internet services

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Papers are published upon acceptance, regardless of the Special Issue publication date.

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