

S009 Mass spectroscopy for vitamin E research: stable-isotope and metabonomic approaches

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Vitamin E has generated much research interest due to its potent antioxidant and non-antioxidant functions and its putative cardio-protective role. Therefore it is useful to understand factors that influence vitamin E status and metabolism. It is possible to monitor vitamin E physiology in humans using stable-isotope labelled (deuterated) alpha tocopherol and measuring the deuterated form in blood components over time. Using this approach we have, in a number of studies, investigated the influence of various dietary, biochemical and genetic factors on vitamin E biokinetics, as well as the influence of cigarette smoking as a model of oxidative stress. These studies have provided data into what factors determine vitamin E status. More recently we have employed LC/MS based metabonomics to examine the influence of vitamin E supplementation on metabolite profiles. Metabonomics is a new technique which enables the metabolite profiling of biological samples incorporating multivariate analysis to identify patterns of change. Confirmatory analysis enables the identification of those metabolites influenced by vitamin E supplementation which may provide insights into how oxidative stress and vitamin E modify metabolic pathways. These studies demonstrate the potential of these approaches to understand vitamin E physiology and how this can be potentially modulated by oxidative stress.