

A multi-platform metabolomic approach to identify new markers of micronutrient status in human plasma

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Recommended Dietary Allowances (RDA) for micronutrients fluctuate noticeably within European Union countries. The Network of Excellence EURRECA (EUROpean micronutrient RECommendations Aligned) aims at harmonising micronutrient intake recommendations through population groups. The lack of proper markers of status for some micronutrients limits progress in this area: metabolomics could help identifying such new markers.

An original metabolomic strategy is developed here. A list of 270 metabolites known to be influenced by the micronutrient of interest has been established [1].

In order to monitor the largest fraction of these metabolites in plasma, a protocol based on plasma fractionation has been set up. It starts with a cold methanol precipitation followed by an extraction with a chloroform/methanol mixture. The aqueous fraction is analysed by UPLC-QTOF. The lipophilic compounds in the organic layer are fractionated using an aminopropyl SPE cartridge. The 3 resulting fractions are analysed either by UPLC-QTOF in positive and negative mode or GC-MS. The method has been applied to a plasma sample and the analysis repeated 10 times to validate the protocol. Two types of background subtraction have been used, with chemical blanks or software algorithms. Signal variabilities and intensities, as well as peak annotation out of these data are presented. The usefulness of fractionation for better detection and precision of metabolites will be discussed.

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[1] Van Ommen, B. et al., *Brit. J. Nutr.*, 2008, 99; S72-S80