

Parallel Session RTD Line 2 / Nutrigenomics

Lecture 4: Pepti/proteomics approaches in the Diogenes study

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Abstract

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The objectives of RTD2 WP2.3 are to identify plasma peptides and proteins as biomarkers of nutritional status and/or weight change and as predictors of an individual's response to nutrients in terms of weight change, which can guide a diet-based treatment. To reach those objectives, 3 peptidomics/proteomics approaches are applied. [1] Targeted plasma protein/peptide profiling is conducted by Maastricht University. By outsourced multiplex immunoassays and in-house ELISAs, presently 36 targeted blood proteins and 3 steroid hormones are being investigated. [2] Protein profiling is conducted by the Nestlé Research Centre. Depleted plasma samples are being fractionated and proteins are analysed by tandem mass spectrometry. About 70 proteins have been selected for quantitative measurements. [3] Holistic peptide profiling is conducted by Proteome Sciences R&D. Using a stable-isotope labelling strategy with tandem mass spectrometry, peptide signatures in both pre- and post-OGTT plasma samples are being quantitatively identified. The study cohort is composed of subjects selected from the Diogenes RTD1 dietary intervention with variation in food protein content and glycemic index to study their effect on weight maintenance after weight loss. From 4 diet groups 97 Caucasian pre-menopausal women have been selected, who are categorized as successful or unsuccessful with respect to weight maintenance, to form the study cohort for targeted proteomics and peptidomics. A subset of 24 subjects from 2 diet groups has been selected for protein profiling.

The outcome of the plasma peptide/protein profiling will be combined with the available biochemical and clinical data to search for biomarkers and predictors. Initial results will be presented, since the analyses are still in progress.