nisation of methods for future research, surveillance and monitoring, and for evaluation of interventions and policies; (II) Identification of determinants of dietary, physical activity and sedentary behaviours across the life course and in vulnerable groups; and (III) Evaluation and benchmarking of public health and policy interventions aimed at improving dietary, physical activity and sedentary behaviours. During the three-year funding period which started in November 2013, DEDIPAC KH will organise, develop, share and harmonise expertise, methods, measures, data and other infrastructure. This should strengthen European health research and improve the broad multidisciplinary approach needed to study the interactions between multilevel determinants in influencing dietary, physical activity and sedentary behaviours. Eventually, new knowledge will be gained and will be translated into more effective interventions and policies for promotion of healthier behaviours and more effective monitoring and evaluation of the impacts of such interventions.

**Metabolomics in food and nutrition research at the max rubner-institut (MRI)**

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The Max Rubner-Institut (MRI) advises the German Federal Ministry of Food and Agriculture (BMEL) in the area of nutrition, nutritional behavior as well as food quality and safety. A prerequisite for advising the BMEL is the knowledge and application of the latest analytical tools in nutrition and food sciences. Metabolomics has recently become an important approach in nutrition and food research, which is rapidly developing within this field. It allows analyzing a wide range of small molecules present in biological systems including foods (food metabolome) as well as human blood and urine (human metabolome). Currently, the major determinants of the composition of the human metabolome are not yet well defined, e.g. the impact of the consumption of specific foods, of acute and long-term food consumption, and of the level of physical activity. In addition, environmental factors such as cultivation conditions, but also the diversity of food processing technologies (from storage conditions to the latest technologies) have a substantial impact on the food metabolome, but detailed studies are also lacking. Based on data available so far, metabolomics is particularly suitable to gain a deeper understanding of these processes.

The primary objective of the MRI was to establish an analytical multi-platform for metabolome analysis covering a large number and a broad range of diverse metabolites representative of the whole metabolome. Therefore, the MRI platform set-up comprises different analytical methods including NMR, GCxGC-MS, and LC-MS, combining targeted and untargeted approaches. In case of GCxGC/MS a complete workflow for data processing including a new drift correction algorithm was developed. Data are analyzed by univariate and multivariate methods including predictive modelling using different machine learning algorithms.

The multiplatform is used for different tasks: In order to gain insight into the major determinants of the human metabolome, a cross-sectional study (KarMeN; Karlsruhe Metabolomics and Nutrition) was set-up to assess the human metabolome in a well-defined healthy cohort and its major life-style-related determinants (diet, physical activity, age, gender) under highly-standardized and controlled conditions. In the case of food metabolomics projects to understand the postharvest physiology of fruits are currently in the focus of interest. Further details of the metabolomics research at the MRI are presented by Weinert et al., Frommherz et al. and Rist et al. at the FENS 2015.

**MIRDIET Circulating microRNAs as markers of dietary intake**

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The MIRDIET project aims to identify circulating miRNAs as quantitative biomarkers for dietary intake. The project focuses on 4 dietary end-points i) calorie intake; ii) polyphenol enrichment; iii) dietary protein intake and iv) glycemic index/glycemic load.

miRNAs have prolonged stability in various sample preservation conditions making them suitable biomarkers. Profiling of miRNAs is possible using microarrays or next generation sequencing, and miRNA can be easily and accurately quantified using real-time quantitative PCR.

Adipose tissue has a pivotal role in obesity-related complications as a key tissue in the inter-organ crosstalk, dysregulation of which can lead to the development of metabolic and cardiovascular diseases, as well as cancer. In vitro and in vivo mouse studies have shown that miRNAs control a variety of processes in adipose tissue.

MIRDIET applies data from dietary interventions with careful assessment of the nutritional contents, as well as collected adipose tissue and blood samples. Already initiated adipose tissue miRNome studies are being analyzed to identify miRNAs associated with dietary intake parameters. The next step is to verify whether these adipose tissue miRNA species are present in blood with similar associations. The candidate circulating miRNAs can then be validated in large dietary interventions and habitual dietary conditions.

The MIRDIET consortium is composed of 3 French laboratories (ICAN Paris Prof. K. Clément, CARMEN Lyon Prof. M. Laville and I2MC Toulouse Prof. D. Langin) gathered in the F-CRIN-labeled FORCE (French Obesity Research Center of Excellence) consortium, two Swiss entities at Department of Physiology (Prof. L. Tappy), University of Lausanne and Service of Endocrinology, Diabetes and Metabolism (Prof. F. Pralong) at Lausanne University Hospital and a Dutch center, NUTRIM (Prof. E. Blaak) at Maastricht University.

**JPI HDHL Joint Action: BioNH**

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