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TITLE: Exploring the contribution of genetic background and gut microbiome profile on precision nutrition

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ABSTRACT

Personalized nutrition aims to preserve or improve human health taking into account medical, lifestyle, dietary and other information about individuals in order to achieve tailored eating behaviors and other nutritional products. Genetic background and gut microbiome information can also produce insightful results for evaluation toward application to precision nutrition, however their utility remains underexplored. Further, inclusion of genetic and gut microbiome information in personalized nutritional products such as mobile applications for dietary purposes seems to be a promising strategy aiming to healthy diet and disease prevention. Here, in the frame of PROTEIN project, four research centers (CHARITE from Germany, KUL from Belgium, IHU and CERTH from Greece) enrolled 88 participants (20 with T2D, 14 with CVD, 18 with obesity, 8 being overweight, and 28 as healthy/controls) who used the PROTEIN app and provided whole blood and fecal samples for a pilot time period. First, we profile the genetic background of participants using PMDA SNP genotyping array (including >850K SNPs). Second, we profile the gut microbiome composition before and after the use of PROTEIN app (duration depends on the center) by sequencing the V3-V4 hypervariable regions of 16s rRNA. Our objectives are to explore associations between genetic background and gut microbiome with nutritional data e.g. dietary preferences and nutrients uptake, to find differences across disease categories and to investigate the impact of a mobile precision nutrition application on the gut microbiome. The ultimate goal is to integrate biological information derived from genetic and microbiome data into precision nutrition approaches aiming to disease prevention and well-being.

BIOGRAPHY

Konstantinos Rouskas is a Postdoctoral researcher in the Institute of Applied Biosciences (INAB) of the Center for Research and Technology Hellas (CERTH). He holds a diploma in Biology, a Msc in Applied Genetics and Biotechnology and a PhD in human genetics. His main research interests focus on the understanding of the relationships and the underlying biological mechanisms between nutrition and health through the use of multi-omics approaches (e.g. genetics, gut microbiome, transcriptomics) and big data analysis. Dr Rouskas has 11 publications in scientific journals, participated in National and European projects in the field of genomics and molecular biology and he is a peer-reviewer of international scientific journals (PloS One, BMC Medical Genetics, Eur J Nutr).

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