



## Lucia Aronica<sup>1,2</sup>

**Christopher Gardner<sup>2</sup>, Robert W Haile<sup>2</sup>,  
Megan P Hitchins<sup>2</sup> and Karl-Heinz Wagner<sup>1</sup>**

<sup>1</sup>University of Vienna, Austria

<sup>2</sup>Stanford University, USA

### Epigenetic markers of diet response for personalized weight loss strategies

**Background:** Although diet is key to successful weight loss, dietary intervention studies have reported large variability of weight loss response between subjects, ranging from highly successful to highly unsuccessful. The aim of this study was to investigate whether epigenetic factors may affect individual weight loss responses to diet interventions.

**Objectives:** 1) Determine the effect of a healthy low-fat (HLF) diet vs a healthy low-carbohydrate (HLC) diet on DNA methylation (DNAm); 2) Assess whether baseline DNAm may predict individual weight loss response to a diet intervention.

**Methods:** DNAm was analyzed in peripheral blood lymphocytes (PBL) samples collected at baseline and 12 months of the DIETFITS randomized clinical trial with 609 obese non-diabetic subjects randomly assigned to a HLF or a HLC diet (Gardner *CD et al.*, 2018, JAMA). Whole genome bisulfite sequencing (WGBS) was carried out in a discovery cohort consisting of the eight “biggest losers” defined as those who lost the most weight at six months, and who also sustained their weight-loss up to the 12-month visit.

**Results:** Weight loss on a HLF diet or a HLC diet is associated with significant, diet-specific DNAm changes at several genomic loci including obesity- and diabetes-related genes.

**Conclusions:** A HLF diet and a HLC diet are associated with distinct changes in DNAm across the genome. Follow-up analyses will assess whether baseline methylation of some of these genomic loci may be used as a biomarker to predict weight loss response for personalized weight-loss strategies.

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#### Speaker Biography

Lucia Aronica is a Lecturer in Nutritional Genomics at the Stanford Prevention and Research Center and at Stanford Continuing Studies. She is currently leading the EU project OBEDIA-Mark in collaboration with Stanford University. The focus of her research is investigating how diet affects the epigenome, and whether we can use epigenetic biomarkers to design personalized weight loss plans. She also serves as an advisor for companies active in the personal genomics and precision health field. She received PhD from the University of Vienna, and has research experience from the University of Oxford, University of Southern California, and University Federico II of Naples. She has published research papers in top-ranked peer reviewed journals such as *Cell*, *Genes and Development*, and the *EMBO Journal*.

e: [laronica@stanford.edu](mailto:laronica@stanford.edu)

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