

Metabolic regulation of growth and body composition: key modulators of long-term health

From 2013-10-01 **to** 2018-09-30, ongoing project

Project details

Total cost:	Topic(s):
EUR 2 491 200	ERC-AG-LS7 - ERC Advanced Grant - Diagnostic tools, therapies and public health
EU contribution:	Call for proposal:
EUR 2 491 200	ERC-2012-ADG_20120314 See other projects for this call
Coordinated in:	Funding scheme:
Germany	ERC-AG - ERC Advanced Grant

Objective

Nutrient exposure during pregnancy and childhood strongly affects growth and induces persistent metabolic programming of lifelong health. Recent data show that obesity and related disorders are induced by both fast childhood weight gain, and by formula feeding that promotes higher weight gain than breastfeeding. Lower protein in infant formula at levels similar to breast milk normalizes early weight gain and reduces later obesity risk as much as 2.5fold. Optimizing growth through improved substrate supply is of major importance for health prevention, but information is lacking on key mediators, effects on body composition and mechanisms of action, e.g. epigenetic modification. We use innovative approaches to identify key substrates that may mediate growth and body composition in humans, e.g. branched chain amino acids, n-6 polyunsaturated fatty acids, and others, and their epigenetic effects. We employ novel methods for high throughput targeted metabolomic and lipidomic profiling, genome-wide DNA methylation analysis, and state of the art bioinformatics. These powerful tools are applied to five well designed prospective cohort studies covering critical time periods from pregnancy to puberty. All cohorts offer precise phenotyping incl. body composition and are already or will be established. Comparative analyses across studies and populations provide added scientific value. We will identify which metabolic signals induce rapid weight gain and body fat deposition throughout childhood. We aim at identifying susceptible age periods, nutrient effects on epigenetic DNA methylation, and whether early metabolic exposures induce persistent or fluid metabolomic and epigenetic changes over time. The results should provide answers to key questions on the regulation of growth, with major benefit for scientific understanding, opportunities for future research, promotion of public health, nutrition recommendations, and development of improved food products.

Related information

Report Summaries	Mid-Term Report Summary - META-GROWTH (Metabolic regulation of growth and body composition: key modulators of long-term health)
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