Molecular Mechanisms of Pediatric Nutrition

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Over the last years, major scientific advances allowed to decrypt the human genome with over 22,000 protein-coding genes. We do know some of these genes, but yet only few of their functions and even less of their control and regulation as well as the complex interplay between different genes and their products. Genotyping allows to analyze particular genes but it cannot predict phenotypes. What can we expect from the recent scientific advances with regard to the needs of the developing child or adult and the intention to prevent disease and/or to improve life quality? We address two particular points in this review: the (direct/indirect) interaction of nutrition with genes of the host and the impact of genetic variations (polymorphisms) on requirements, tolerance or metabolism of nutrition. Over the last 5 years, major research efforts were made to address the potential interaction of nutrition and genes, now named nutrigenomics (interaction of nutrition and genes) and nutrigenetics (impact of gene variants on nutrition and/or their metabolism). We give in this review examples of molecular approaches in the understanding of this bidirectional interaction between nutrition and genes, focusing also on epigenetic imprinting.