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Perspective

Nutritional Genomics in Precision Nutrition

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DESCRIPTION

Nutritional genomics is the study of how diet can affect the expression of genetic information in an individual and how an individual's genetic makeup affects metabolism and response to nutrients and other bioactive components in foods. How can you predict which regimen will work for which patients or clients? The next area of nutritional management is precision nutrition, which aims to personalize nutritional advice based on nutritional history and individual phenotypes and genotypes or additional molecular factors such as Gene expression, microbiome, proteomics and metabolites.

Nutritional genetics is considered as a combination of nutritional genetics and nutritional genetics. Nutrigenomics establishes the impact of ingested nutrients and other dietary components on gene expression and regulation. It will also determine individual nutritional needs based on the person's genetic makeup (personalized diet) as well as the relationship between the diet and chronic diseases, which will help in understanding etiological aspects of chronic diseases such as cancer, type 2 diabetes, obesity and cardiovascular disease (CVS).

Gene-diet interactions affecting metabolic pathways associated with disease risk are continually being discovered. Findings in the field of nutrition demonstrate that some people may benefit from following dietary guidelines differently from others, depending on their genotype.

The use of genetic engineering to assess how herbal (herbal) medicines may be affected by an individual's individual genetics is also being evaluated. Essentially, these new technologies have may be a way of providing personalized nutritional/herbal supplement advice for genetic predispositions to specific disease states and tailoring prescriptions to the individual.

The goals of nutritional genomics are:

* Identify genetic variants that may be important in understanding genetic responses to diet
* Identify genetic variants associated with associated diseases to diet
* Identifying effective dietary strategies to prevent or treat disease
* Improve population-level dietary recommendations

Studies have also focused on an aggregate of genetic variants, rather than individual genetic variants, to better capture genetic susceptibility. This approach was made possible with genome wide genetic data. For example, whether the intake of sugar-sweetened beverages interacts with BMI genetic susceptibility on changes in BMI was tested with the use of a Genetic Risk Score for obesity comprising 32 BMI-increasing variants.

Ninety-seven percent of the genes known to be involved in human disease result in monogenic diseases. Adjusting food intake may prevent some monogenic diseases [6], for example, in foods with phenylketonuria (PKU) containing the amino acid phenylalanine, including protein-rich foods such as fish, chicken, eggs, milk, cheese, beans, nuts and tofu should be avoided.

Diseases that involve the interaction between a number of genetic and environmental factors such as diet include many cancers, diabetes, heart disease, obesity, and some mental disorders, and CVD is a chronic disease. The main character is related to modern diet and inflammation is emerging as an underlying disease of many chronic disorders, including cardiovascular disease. Diet is considered to be one of the environmental influences, and the close relationship between dietary composition and cardiovascular disease risk is well established.

Cancer is a multi-stage process in which gene expression and function of proteins and metabolites begin to behave in an unusual way. Diet is considered to be a source of carcinogens (intrinsic or from the cooking process) present in certain foods or of protective components (vitamins, antioxidants, phytochemicals). Activation of detoxification enzymes, etc.), increases the risk of colorectal cancer with high consumption of red meat. The combination of excess weight and physical inactivity is estimated to cause one-fifth to one-third of many of the most common cancers, particularly breast (postmenopausal), bowel, and breast cancers. Colon, endometrium, kidney, and oesophagus (adenocarcinoma).

A syndrome called phenylketonuria is also managed with diet. PKA is caused by a mutation in the gene that encodes phenylalanine hydroxylase, an enzyme that breaks down the amino acid phenylalanine. People with this syndrome are prescribed a low-protein diet, which helps avoid serious long-term consequences, such as seizures.

The foods we like and dislike are also related to our genes. Preference for bitter or sweet foods is partially influenced by T2R and T1R taste receptors, which can lead to overeating sweet and sugary foods, while the ankyrinB gene variant activates glucose-storing adipocytes. at a much higher speed than usual. The desire to consume food is governed by many signals, such as blood sugar levels, the presence of certain nutrients, signals from the gastrointestinal tract, and many other sources of information. Genetic factors influencing these signals can lead to undernutrition or overnutrition.

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