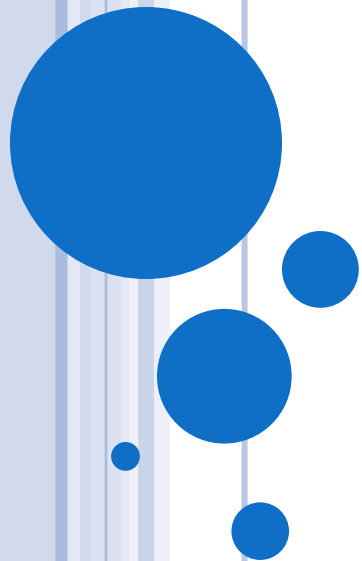




Centurion
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Different types of “omics” study – basic idea





- The study of the consequences of the influence of nutrients and other bioactive food components on the expression of the genetic material

DEFINITION



- “Seeks to examine dietary signatures in cells, tissues and organisms and to understand how nutrition influences homeostasis” (Muller and Kersten,2003)
- “The interface between the nutritional environment and cellular/genetic processes” (Kaput and Rodriguez,2004)

NUTRIGENOMICS

- ⑩ Nutrigenomics is a branch of nutritional genomics and is the study of the effects of foods and food constituents on gene expression.

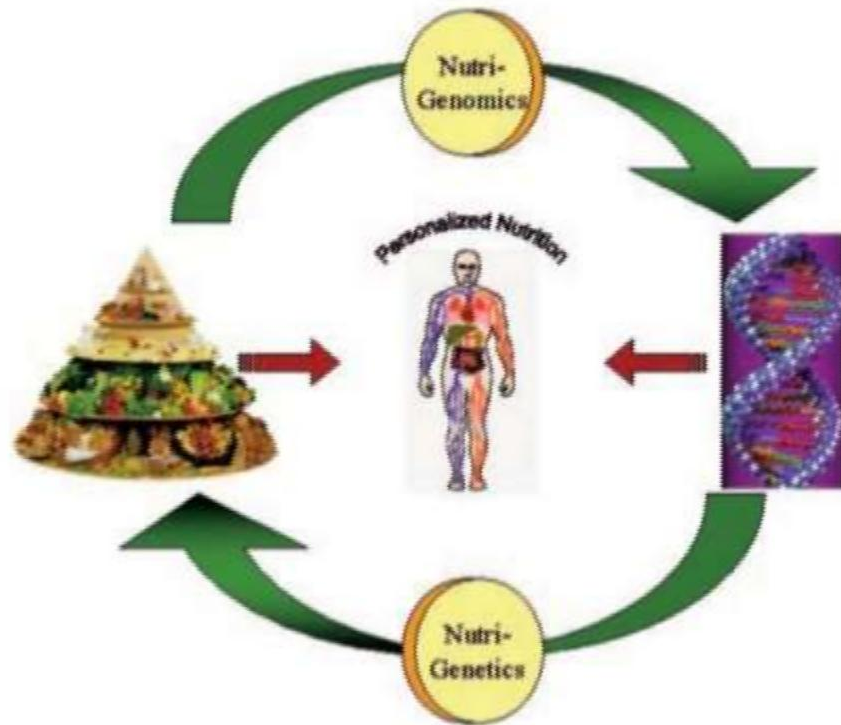
INTRODUCTION

- Nutrigenomics is establishing the effects of ingested nutrients and other food components on gene expression and gene regulation
- It will also determine the individual nutritional requirements based on the genetic makeup of the person as well as the association between diet and chronic diseases
- It will identify the genes involved in physiological responses to diet and the genes in which small changes, called polymorphisms and the influence of environmental factors on gene expression

NUTRIGENETICS

- Nutrigenetics identifies how the genetic make up of a particular individual co-ordinates his or her response to various dietary nutrients
- It also reveals why and how people respond differently to the same nutrient

Nutrigenomics



Senthil Natesan

THE FOUR BASIC TENETS OF NUTRIGENOMICS ARE:

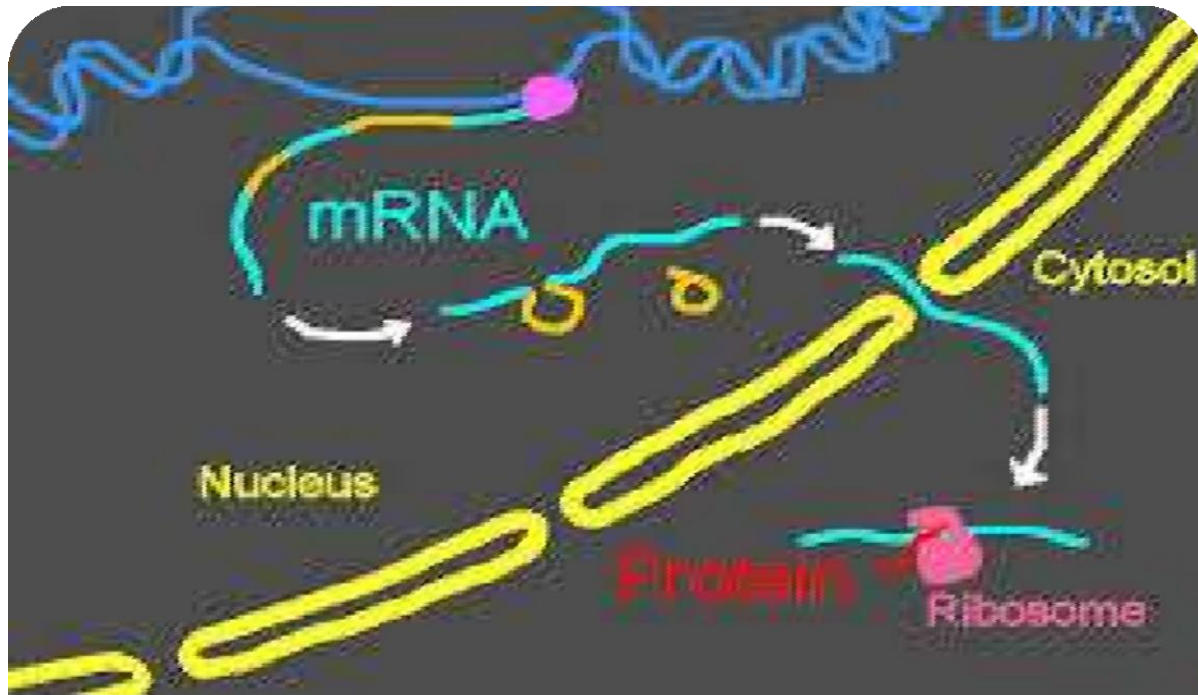
- i. Improper diets are risk factors for disease.
- ii. Dietary chemicals alter gene expression and /or change genome structure.
- iii. The degree to which diet influences the balance between healthy and disease states may depend on an individuals genetic makeup.
- iv. Some diet-regulated genes are likely to play a role in the onset, incidence, progression, and/or severity of chronic diseases.

NUTRIGENOMICS/NUTRIGENITCS DEAL WITH FEW, THOUGH IMPORTANT, CONCEPTS

1. Specific dietary profiles can modulate the delicate balance between health and disease acting, either directly or indirectly, on gene expression.
2. The individual genetic makeup, that is, the presence of polymorphisms in nutrient regulated genes, affects individual risk of diseases.
3. Personalized diets, which take into account individual genotype, represent the ultimate goal of Nutrigenomics/Nutrigenitcs studies, as they can lower risk in genetically predisposed individuals or population groups.

HOW DOES DIET AFFECTS OUR GENE EXPRESSION ?

- Genes express themselves through proteins. Enzymes are special proteins designed to get things started.
- Our genome instructs ribosomes to produce many enzymes that destroy toxins.
- Some foods such as cauliflower, broccoli and brussels sprout contain chemicals that actually tell our gene to direct biosynthesis of these enzymes
- In some individuals genes give unclear instructions for making an enzyme that metabolizes the amino acid, phenylalanine. As a result this amino acid build up, thereby causing brain damage
- A diet restricting this amino acid will stop the damage if detected in early infancy



Advantages of Nutrigenomics

- Increased focus on a healthy diet and lifestyle
- Increased awareness of risk of certain conditions
- Improved health quantity of life
- Focus on prevention of diseases
- Decreased morbidity and premature mortality
- Reduced health care costs
- Better understanding of the mechanisms involved in disease susceptibility

Disadvantages of Nutrigenomics

- Attention is drawn away from other modifiable risk factors
- Focus only specific nutrients/foods
- Misleading claims
- Increased costs associated with personalized diets and designer foods

REFERENCES

- <http://nutrigenomics.ucdavis.edu/>
- <https://www.google.co.in>
- Kathleen L M and Sylvia E (2008) edn 12, Krause's Food and Nutrition Therapy, p.365

THANK YOU