Environmental versus genetic influences on autoimmunity.

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Abstract

Insight into the molecular mechanisms involved in primary headaches is important to identify drug targets for improving treatment of patients, but essentially lacking. Genetic research is increasingly successful in pinpointing these mechanisms. Most progress has been made for Familial Hemiplegic Migraine, a rare subtype of migraine with aura. Three genes (CACNA1A, ATP1A2 and SCN1A) have been identified that all encode ion transporters. Cellular and transgenic mouse studies suggest that neuronal hyperexcitability and increased susceptibility to cortical spreading depression, the correlate of migraine aura, are important molecular mechanisms in migraine.

Keywords: Genetics, Heritability, Maternal effects, Phenotypic plasticity, Stochasticity.

Introduction

The study of genes, genetic diversity, and heredity in living things is known as genetics. It is a crucial area of biology because heredity plays a key role in how organisms evolve. The first person to conduct a scientific study of genetics was Moravian Augustinian friar Gregor Mendel, who lived and worked in Brno in the 19th century. Mendel investigated the patterns of trait inheritance, or the transmission of traits over generations from parents to children. He noted that distinct units of inheritance are how features are passed down via organisms (pea plants). This phrase, which is still in use today, gives a vague explanation of what is meant by the term "*gene*" [1].

The fundamental concepts of genetics are still trait inheritance and molecular mechanisms of gene inheritance in the twenty-first century, but modern genetics has expanded to examine the function and behaviour of genes. Within the context of the cell, the organism (such as dominance), and within the context of a population, gene structure and function, variation, and distribution are examined. Numerous subfields of genetics have developed, including population genetics, epigenetics, and molecular genetics. The diverse field of study includes organisms from all aspects of existence (archaea, bacteria, and eukarya) [2].

Nature vs nurture is a common term used to describe how genetic processes interact with an organism's surroundings and experiences to affect development and behaviour. A living cell or organism's intracellular or extracellular environment has the power to turn on or off gene transcription. Two genetically identical maize seeds, one planted in a temperate area and the other in an arid one, are a famous illustration (lacking sufficient waterfall or rain). The two corn stalks may have a genetically set average height that is equal, but because of a lack of water and nutrients in its surroundings, the corn stalk in the arid region only grows to half the height of the corn stalk in the temperate zone Because of genetic analysis, we need to understand a lot more about the biology of viruses. The virus's genome, which consists of 11 double-stranded RNA segments, is what makes it unique. The ability of the segmented structure of the genome to reassign genome segments during mixed infections is the main property of viral genetics [3].

The term genetic was first used in a hereditary sense by Imre Festetics, a Hungarian aristocrat who resided in Kszeg before Mendel. In his book The Genetic Laws of the Nature, he discussed a number of biological inheritance norms. Mendel published the identical second law as his. In his third law, he established the fundamental ideas underlying mutation (he can be considered a forerunner of Hugo de Vries). Festetics contended that observable changes in farm animals, plants, and people are the outcome of scientific rules [4, 5].

Conclusion

Festetics arrived at the empirical conclusion that traits are inherited rather than acquired by organisms. He proposed that qualities from earlier generations may reappear later and that organisms could create offspring with various characteristics in order to recognise recessive traits and intrinsic variety. By offering a crucial theoretical foundation for genetics in the 20th century, these discoveries serve as a significant forerunner to Mendel's theory of particle inheritance insofar as it features a movement of heredity from its status as a myth to that of a scientific profession.

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