Definition: Genetics

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The history of genetics

The observation that living things inherit traits from their parents has been used since prehistoric times to improve crop plants and animals through selective breeding.

The modern science of genetics, seeking to understand this process, began with the work of the **Augustinian friar Gregor Mendel** in the mid-19th century (1822 – 1884)

Classical genetics

Mendel observed sharply contrasting and clearly defined characters in the garden pear and carried out breeding experiments (pants hybridisation experiments) to determine how these characteristics were transferred from parents to offspring and described the results mathematically.

Although this pattern of inheritance could only be observed for a few traits, Mendel's work suggested that heredity was particulate, not acquired and that the inheritance patterns of many traits could be explained through simple rules and ratios.[3]

Breeding or hybridation

A breeding or hybridisation experiment involves the artificial reproduction of an organism with defined characters.

In Mendel's pear experiment, this entails the isolation of pure breed parents with a given pair of contrasting characters.

Monohybrid inheritance

This is the study of inheritance of one pair of contrasting characters only. For example the lenght of a stem (short or tall), form of seeds(smooth or rinkle).

Molecular genetics

Molecular genetics is the study of the molecular structure of DNA, its cellular activities (including its replication), and its influence in determining the overall makeup of an organism.

Molecular genetics relies heavily on genetic engineering (recombinant DNA technology), which can be used to modify organisms by adding foreign DNA, thereby forming transgenic organisms.

Since the early 1980s, these techniques have been used extensively in basic biological research and are also fundamental to the biotechnology industry, which is devoted to the manufacture of agricultural and medical products. Transgenesis forms the basis of gene therapy, the attempt to cure genetic disease by addition of normally functioning genes from exogenous sources.