

## History of Genetics

### What is Genetics?

Generally, **Genetics** is the science of study of inheritance that deals with the structure, organization, transmission and function of genes and the origin of variation”.

- **Heredity** : is the study of the way traits are passed on from parent to offspring
- **Traits** are characteristics. Same hair color, eye color, or skin color.
- **Cytogenetics**:- Study of various aspects of chromosomes and their effects on the development of character of organisms

### What people wondered earlier ?

Ever since people began to wonder at the world around them they began to ask questions like.... i. How a horse always gives birth to a horse? ii. Why does a baby always resemble it"s parents or it"s grandparents? The first theories came down through the thoughts of the early Greek philosophers also called the natural philosophers. But before they explained these questions in rational terms they were already answered by myths, old enough.

About six thousand years ago people started keeping record of pedigrees of domestic animals such as horses and food plants like rice. The ideas or theories which have been forwarded from time to time to explain the phenomenon of inheritance can be categorized as....**THEORIES**

- **VAPOUR AND FLUID THEORIES**
- **PREFORMATION THEORIES**
- **PARTICULATE THEORIES**

### **Genetic theory**

The processing transmission of characters from one generation to another, either by gametes—sperms and ova—in sexual reproduction or by the asexual reproductive bodies in asexual reproduction, is called inheritance or heredity. Heredity is the cause of similarities between individuals. This is the reason that brothers and sisters with the same parents resemble each other and with their parents. Variation is the cause of differences between individuals. The ideas or theories which have been forwarded from time to time to explain the phenomenon of inheritance can be categorized under the following headings:

### **1- Vapors and Fluid Theories**

Early Greek philosophers such as Pythagoras (500 B.C.) proposed that every organ of animal body gives out some type of vapors. These vapors unite and form a new individual. While, Hippocrates (400 B.C.) believed that the reproductive material is handed over from all parts of the body of an individual, so that the characters are directly handed over to the progeny. Finally, Aristotle (350.B.C.) thought that the semen of man has some “vitalizing” effect and he considered it as the highly purified blood. According to him the mother furnishes inert matter and the father gives the motion to the new life.

### **2-Preformation Theories**

Leonardo da Vinci (1452–1519) proposed a theory that the male and the female parents contribute equally to the heredity of the offspring. By the seventeenth century, sperm and egg has been discovered, and the Dutch a scientist (Swammerdam) theorized that sex cell contain miniature of the adults. Wolff offered experimental evidence that no preformed embryo existed in the egg of the chicken .But, maupertuis in France recognizing that preformation could not easily account for transmission of traits to the offspring from both parents, has proposed that the body of each parent gives rise minute particles. In sexual reproduction, the particles of both individuals unite together to form a new individual. He reasoned particles from the male parent might dominate those from the female, and other cases the reverse might be true.

### 3- Particulate Theories

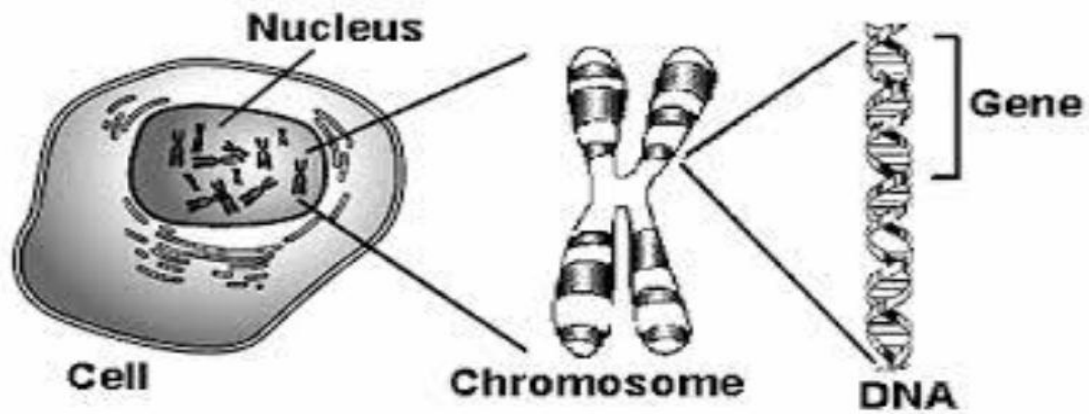
Charles Darwin suggested (pangenesis) in which each part of body produced minute particles (gemmules) that were found in the blood of the entire body but eventually concentrated in the reproductive organs – thus an individual would represent a (blending) of both parents. acquired characters would be inherited because as parts of the body changed, so did the par genes they produced e.g. champion weight lifter, therefore should produce children with strong arm muscles. Pangenesis was disproved by Weismann (germs biologist) in well – known experimental, he cut off the tail of mice for 22 generations yet each new lot of offspring consisted only of animals with tails. .

Mendal laid the ground work for our modern concept of the particulate theory because:

- 1- He took care for his experimental on one traits or many traits clearly observed.
- 2- He have been done limited hybridization .in which he selected the parents or two traits which they were selected obviously.
- 3- He suggested that the factors controlled the appearance of the traits which they called (genes).

#### 4- Gene Theory

The Gene Theory is one of the basic principles of biology. The main concept of this theory is that traits are passed from parents to offspring through gene transmission. Genes are located on chromosomes and consist of DNA. They



are passed from parent to offspring through reproduction.

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