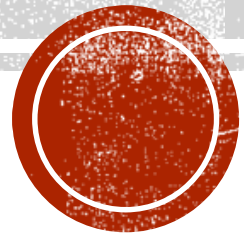
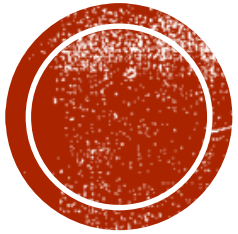
GENETICS

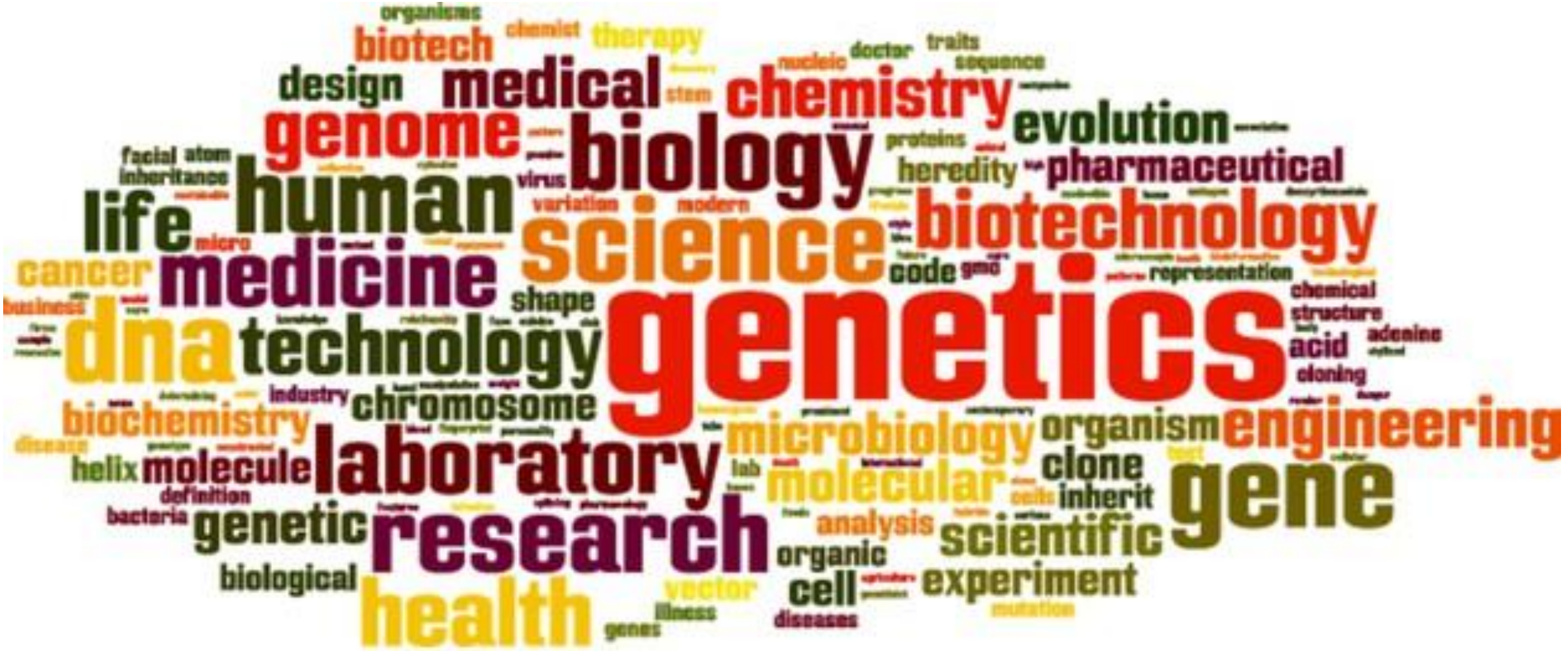
Benilda Ramos-Butron





WHAT IS GENETICS?

Definition of Genetics


organisms
biotech
chemist
therapy
doctor
traits
nucleic
sequence
design
medical
stem
chemistry
genome
biology
evolution
proteins
facial
atom
inheritance
virus
heredity
pharmaceutical
life
human
variation
modern
science
biotechnology
micro
cancer
medicine
code
representation
chemical
structure
shape
genetics
dna
technology
acid
adenine
cloning
industry
chromosome
biochemistry
microbiology
organism
engineering
disease
helix
molecule
laboratory
molecular
clone
gene
definition
inherit
bacteria
genetic
research
analysis
scientific
organic
biological
vector
cell
experiment
health
illness
diseases
genes
shutterstock.com · 229122931

genetics [*juh*-net-iks] SHOW IPA

SEE SYNONYMS FOR *genetics* ON THESAURUS.COM

noun (*used with a singular verb*)

1 *Biology*. the science of heredity, dealing with resemblances and differences of related organisms resulting from the interaction of their genes and the environment.

2 the genetic properties and phenomena of an organism.

dictionary.com

Definition of 'genetics'

genetics

Collins COBUILD

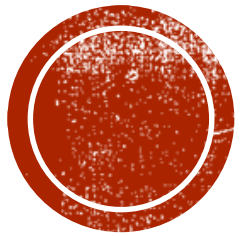
Word Frequency

(dʒɪnetɪks)

UNCOUNTABLE NOUN

Genetics is the study of heredity and how qualities and characteristics are passed on from one generation to another by means of genes.

Collins Dictionary



BRANCHES OF GENETICS

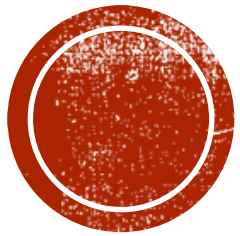
Branches	Definition
Classic Genetics	highly relies on the principle of Mendel- the law of inheritance and independent assortments
Cytogenetics	study the structure and numbers of chromosomes and thereby find abnormalities
Molecular Genetics	studies genetics at the molecular level– DNA, nucleotide sequences and sequence alterations
Microbial Genetics	focusing on the study of the genetics of microorganisms– like bacteria, viruses, fungi, protozoa and archaea
Human Genetics	study of human DNA, genes, chromosomes, associated disorders and how alteration within the human genome occurs
Clinical Genetics	deals with the patient's care specifically in the diagnostic industry
Medical Genetics	finds the cause and work for the management of any disease
Population Genetics	studies the gene pool or biological composition of the entire single population, their effect on other populations, individuals and related consequences
Epigenetics	study of gene expression
Metagenomics	studies the entire pool of microbes or microbial diversity present in any specific sample
Plant Genetics	Studies the application of genetic technologies in plant research
Environmental Genetics	brings into focus microbial diversity from various ecosystems and their benefits for the same.
Evolutionary Genetics	study those forces and how they occurred over a course of time
Genetic Engineering	Modification of organism's genome using genetic tools and techniques
Bioinformatics	Subdiscipline of science that runs by computational power and helps in biological processes, testing, results, evaluations and interpretation
Transcriptomics	studies the transcriptome— the coding region or mRNA of the genome which is the expression profile of the entire genome of an organism

Branches	Definition
Preimplantation Genetics	Genetic testing performed at the stage of pre-implantation-at an early embryonic stage
Prenatal Genetics	Genetic testing are carried out directly on the fetus
Behavioral Genetics	Studies the behavior of an organism
Developmental Genetics	focuses on the role of genes and gene expressions in fetal development
Marine Genetics	studies dedicatedly marine life– organisms and ecosystems using genetic techniques and tools
Epidemic and Pandemic Genetics	finds the genetic cause of pandemics and epidemics and thereby helps a medical person prevent an outbreak
Statistical Genetics	study genetic data and draw quantitative conclusions using statistical methods
Neurogenetics	studies neurological disorders and their association with genetic factors
Conservation Genetics	includes biology, conservation, population, and genetic studies for preventing the extinction of any species on earth
Physiological Genetics	studies of the physiological traits of organisms and genetics
Biochemical Genetics	study of genes that translate various enzymes, their defects and their consequences at the biochemical level
Ecological Genetics	study includes investigations of different ecosystems, abiotic and biotic stress and ecological diversity
Quantitative Genetics	focus the study of qualitative traits like height, weight, etc, and genetic basis

APPLICATION AND IMPORTANCE OF GENETICS

Application of Genetics:

1. Characterization and diagnosis of genetic disease
2. Identification of pathogenic mutations
3. Preserving biodiversity
4. Identification and characterization of microbes
5. Studying inheritance patterns
6. Creating advanced plant species
7. Creating genetically modified organisms
8. DNA fingerprinting
9. Antibiotic resistance study and drug discovery
10. Genetic/DNA medicines
11. Genetic engineering
12. Crop improvement
13. Animal and Plant Breeding program
14. Infectious disease diagnosis
15. Screening, prognosis, and diagnosis of cancer



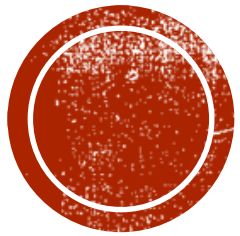
HISTORY OF GENETICS

A-HISTORY-OF-GENETICS-AND-GENOMICS-NARRATIVE-AND-OVERHEADS.PDF

GENETICTIMELINE.PDF

GROUP ACTIVITY

1. Make a concept map using the branches of genetics discussed. Connect the branches to each other in the map. To make sense of the different branches, learn more by clicking the link https://geneticeducation.co.in/30-branches-of-genetics-you-should-know/
2. Annotate, summarize and present one current research on Genetics. One article per group. Answer the following questions:
   - What branch of Genetics is this article most connected with?
   - What is the most important information this article present to the reader? Give all available information.
   - How will this article serve the community?



END.