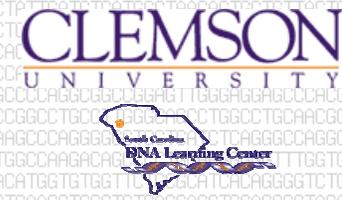




Genomics

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Genomics is the branch of genetics that studies an organism's entire DNA sequences, or its genome.

Comparative Genomics – analyzes DNA sequence patterns of different organisms side by side to identify genes and determine functions.

Functional Genomics – is the ambitiously thorough approach to understanding the parts and functions of genomes – how it works.

How can the study of Genomics help people?

1. To help develop new strategies to combat human diseases.

For example, the human genes that cause the genetic disease muscular dystrophy, have close relatives in Puffer fish.

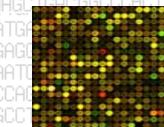


Mice are the favorite laboratory specimen in studying human diseases. Mice and humans both have about 20,000 genes - and share 99% of them.



Drosophila melanogaster is an invaluable model organism, partly because it shares so many genes with humans. Two-thirds of human genes known to be involved in cancer have counterparts in the fruit fly raising the possibility of these tiny insects serving as a new models for testing therapies for cancer

2. Genome sequencing has provided a wealth of data, driving the creation of new disciplines including microarrays, bioinformatics, & proteomics



Microarray is a tool used to sift through and analyze gene expression activity within a genome or proteome.

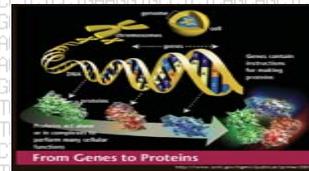
Bioinformatics: An interdisciplinary area intersecting biological, computer, and information sciences used to manage, process, and understand large amounts of data. For instance, the large databases containing information about plants and animals are used in discovering and developing new drugs.



Proteomics, a novel concept called proteome (PROTEin complement to a genOME) studies all the proteins that make up an organism; the way they interact, the changes that they undergo, and the effects that they have within the organism.

One of its challenges is deciphering the sequence data which leads to creating a genomic map that will pinpoint where genes are in relation to one another in a chromosome

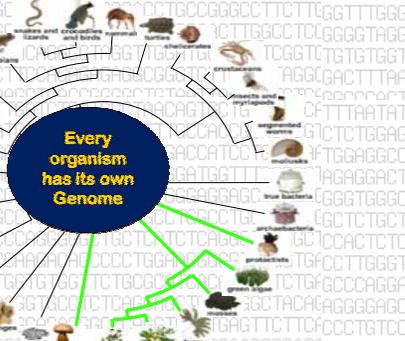
Functional genomics is a general approach toward understanding how the genes of an organism work together by assigning new functions to unknown genes.



We gain better understanding of gene function as gene are located and phenotypes are pinpointed. For instance genes producing a defective phenotype **NonV**, are clustered in central regions of the chromosomes except on the X because it does not carry a lot of the **NonV** phenotypes



The ultimate goal is to place the genes of all organisms and their corresponding products on a functional network with the help of full computerized automation.



Every organism has its own Genome

