



Functional Genomics Services Section Home

History

The history of functional genomics can be traced back to the advent of molecular biology and the deciphering of the genetic code. The Human Genome Project marked a turning point by providing a reference sequence for the entire human genome. This paved the way for functional insights into how genes work together to orchestrate cellular processes.

Evolution till Date

Functional genomics has evolved from individual gene studies to genome-wide analyses encompassing transcription, translation, regulation, and interactions. Advances in DNA sequencing, microarray technology, and bioinformatics have expanded our capacity to investigate gene functions at a systems level.

Drug Discovery

Functional genomics identifies potential drug targets and biomarkers.

2.

Cancer Genomics

Functional genomics uncovers genetic drivers of cancer.

4.

Gene Expression Analysis

Functional genomics studies gene expression patterns.

6.

Functional Networks

Genomic data helps construct protein-protein interaction networks.

8.

Comparative Genomics

Genomic comparisons elucidate gene functions across species.

10.

Functional Biomarkers

Genomic data identifies biomarkers for diseases and conditions.

12.

Metabolic Pathways

Genomic data aids in reconstructing metabolic pathways.

14.

Synthetic Biology

Functional genomics guides the design of synthetic gene circuits.

16.

Neurogenomics

Functional genomics explores gene functions in the nervous system.

18.

Agricultural Genomics

Functional genomics improves crop yield and resistance.

20.

Future Prospects

The future of functional genomics holds immense promise with advancements in single-cell genomics, CRISPR-based technologies, and integrative omics approaches. Improved techniques for analyzing gene functions in specific cellular contexts and comprehensive systems-level models will enhance our understanding of complex biological processes.

Functional genomics stands as a pivotal discipline in molecular biology, offering insights into the functions and interactions of genes on a global scale. Its historical development, notable contributors, diverse applications, and potential to transform our understanding of biology underscore its significance. As technology continues to advance and interdisciplinary collaborations flourish, functional genomics will remain at the forefront of biological research, unraveling the intricacies of gene functions, regulatory networks, and their implications for health, disease, and evolution.