



Rna Structure Prediction Services Section Home

History

The pursuit of understanding RNA structures dates back to the early days of molecular biology. The discovery of secondary structures, such as the hairpin loop, fueled curiosity about the more complex tertiary structures that are crucial for RNA's functional diversity. With the advent of computational tools and experimental techniques like X-ray crystallography and NMR spectroscopy, researchers began to unravel the mysteries of RNA folding.

Frances Crick

His proposal of the "wobble hypothesis" laid the foundation for understanding the genetic code and RNA structure.

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Evolution till Date

RNA structure prediction has advanced remarkably with the integration of experimental data and computational modeling. Early methods focused on predicting secondary structures, while more recent techniques explore tertiary interactions and dynamics. Innovations like comparative genomics and machine learning have accelerated progress in this field.

Drug Discovery

Identifying RNA structures as drug targets, such as riboswitches and ribozymes.

2.

Viral Research

Understanding RNA structures in viruses for antiviral strategies.

4.

Gene Regulation

Deciphering RNA structures involved in post-transcriptional regulation.

6.

Biotechnology

Designing RNA aptamers for specific ligand binding.
8.

Bioinformatics Tools

Developing software for RNA structure prediction and analysis.
10.

Metabolic Engineering

Modulating RNA structures for metabolic pathway optimization.
12.

Disease Biomarkers

Identifying diagnostic RNA structural motifs.
14.

Transcriptomics

Inferring RNA structures from high-throughput sequencing data.
16.

Neuroscience

Studying structured RNAs implicated in neurodegenerative disorders.
18.

RNA World Studies

Investigating early evolution of RNA structures.
20.

Future Prospects

The future of RNA structure prediction holds immense potential:
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Single-Molecule Techniques

Direct observation of RNA folding dynamics.
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Functional Insights

Linking RNA structures to biological functions with higher precision.

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RNA Nanotechnology

Designing novel nanostructures for diverse applications.

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