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Title:

The versatility of RNA: RNA structure, function and modelling

Abstract:

RNA, an essential molecule in all living organisms, has proven to be remarkably versatile in various biological processes. Understanding the intricate relationship between RNA structure, function, and modeling has become an active area of research in molecular biology. This talk aims to provide a comprehensive overview of the versatility of RNA, focusing on its structure, diverse functions, and the modeling techniques employed to study its behavior.

The structure of RNA molecules, including secondary and tertiary structures, plays a crucial role in determining their functions. RNA folding, aided by base pairing and non-Watson-Crick interactions, allows for the formation of complex structures that facilitate diverse functions such as catalysis, regulation of gene expression, and molecular recognition. Advances in experimental techniques, such as X-ray crystallography and cryo-electron microscopy, have greatly contributed to our understanding of RNA structure and function.

In recent years, computational methods and modeling approaches have become invaluable tools for studying RNA. RNA structure prediction algorithms have provided insights into RNA dynamics, stability, and interactions with ligands. Additionally, RNA modeling has been instrumental in drug design, as it allows for the identification of potential therapeutic targets and the optimization of RNA-targeting compounds.

Overall, the versatility of RNA is evident in its ability to adopt diverse structures and perform multiple functions within cells. The integration of experimental and computational approaches has significantly advanced our understanding of RNA biology, paving the way for innovative therapeutic interventions.