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Protein Nucleic Acid Interactions Structural

The structural biology of protein-nucleic acid interactions is in some ways a mature field and in others in its infancy. High-resolution structures of protein-DNA complexes have been studied since the mid 1980s and a vast array of such structures has now been determined, but surprising and novel structures still appear quite frequently.

Protein-Nucleic Acid Interactions: Structural Biology (RSC

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Protein-Nucleic Acid Interactions (RSC Publishing)

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Introduction to protein-nucleic acid interactions Proteins interact with DNA and RNA through similar physical forces, which include electrostatic interactions (salt bridges), dipolar interactions (hydrogen bonding, H-bonds), entropic effects (hydrophobic interactions) and dispersion forces (base stacking).

Overview of Protein-Nucleic Acid Interactions | Thermo ...

Protein-Nucleic Acid Interactions We use a variety of structural tools to uncover how enzymes, and transcriptional and translational regulators interact with nucleic acids to affect cellular development and disease outcome.

Laboratory of Protein-Nucleic Acid Interactions - Dept of ...

Protein-RNA interactions: structural characteristics and hotspot amino acids. Krüger DM(1), Neubacher S(2), Grossmann TN(1)(2). Author information: (1)Chemical Genomics Centre of the Max Planck Society, 44227 Dortmund, Germany. (2)Department of Chemistry and Pharmaceutical Sciences, VU University Amsterdam, 1081 HV Amsterdam, The Netherlands.

Protein-RNA interactions: structural characteristics and ...

Last Updated: April 17, 2019 Proteins are constructed through an intricate action blueprinted and carried out by the nucleic acids deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). The process is known as protein biosynthesis and involves the construction of protein chains from individual amino acids in a particular sequence.

Proteins and Nucleic Acids | Biology Dictionary

Protein Interactions Calculator (PIC) is a server which, given the coordinate set of 3D structure of a protein or an assembly, computes various interactions such as disulphide bonds, interactions between hydrophobic residues, ionic interactions, hydrogen bonds, aromatic-aromatic interactions, aromatic-sulphur interactions and cation- π ...

PIC: Protein Interactions Calculator | Nucleic Acids ...

Protein and Nucleic Acid Relationship As molecules, proteins and

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nucleic acids are not similar in structure. They look nothing alike, either as large molecules or in terms of their building blocks. While they're both made up of mostly carbon, hydrogen, nitrogen, and oxygen, the elements are assembled in vastly different ways.

How Are Protein & Nucleic Acids Related? | Livestrong.com

The thermodynamic data available in ProTherm and ProNIT are widely used by researchers to study the underlying mechanisms of protein stability upon mutations and protein-nucleic acid interactions (see the reference sections on both the websites). This paper describes the major updates and enhancements to these databases for the last few years.

ProTherm and ProNIT: thermodynamic databases for proteins ...

Hydrogen bonding in the polypeptide chain and between amino acid "R" groups helps to stabilize protein structure by holding the protein in the shape established by the hydrophobic interactions. Due to protein folding, ionic bonding can occur between the positively and negatively charged "R" groups that come in close contact with one another.

Four Types of Protein Structure - ThoughtCo

- Proteins typically recognize DNA sequence via direct hydrogen bonding or van der Waals interactions with the constituent nucleotides.
- Concomitant conformational changes in DNA — sequence-dependent kinking, helical dislocation, untwisting, intercalation, etc. — contribute to the fit of protein against DNA.

Protein-nucleic acid interactions - Rutgers University

Structural studies of DNA-binding proteins and their complexes with DNA have proceeded at an accelerating pace in recent years due to important technical advances in molecular genetics, DNA synthesis, protein crystallography and nuclear magnetic resonance.

Structural studies of protein-nucleic acid interaction ...

Protein-nucleic acid interactions play key roles in many

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biological processes. In a large group of such events, the binding of the proteins to their respective nucleic acid counterpart affects some regulatory outcome such as transcriptional and translational regulation and protein synthesis.

Protein Nucleic Acid Interaction - an overview ...

Abstract. Guanine quadruplexes (G4s) are four-stranded secondary structures of nucleic acids which are stabilized by noncanonical hydrogen bonding systems between the nitrogenous bases as well as extensive base stacking, or pi-pi, interactions. Formation of these structures in either genomic DNA or cellular RNA has the potential to affect cell biology in many facets including telomere maintenance, transcription, alternate splicing, and translation.

On Characterizing the Interactions between Proteins and

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Although similar modes of secondary structure interactions have been observed in RNA and DNA binding proteins, the current analysis emphasises the differences that exist between the two types of nucleic acid binding protein at the atomic contact level. Received October 10, 2000; Revised and Accepted December 22, 2000.

Protein-RNA interactions: a structural analysis | Nucleic

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Highlights of the progresses include uncovering the modular organization, determining the structures of the structural domains, realizing the roles of protein disorder in protein-protein and protein-nucleic acid interactions, and visualizing the ribonucleoprotein (RNP) structure inside the virions.

The SARS coronavirus nucleocapsid protein - Forms and

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Multivalency is nature's way to establish firm and specific interactions when the binding sites of a protein receptor have only low affinity for monovalent ligands. Recently, researchers are increasingly using nucleic acid architectures for multivalent ligand presentation to unravel the mechanisms of multivalency-enhanced interactions and create high affinity binding agents.

Nucleic acid constructs for the interrogation of ...

Controlling the structure and activity of nucleic acids dramatically expands their potential for application in therapeutics, biosensing, nanotechnology, and biocomputing. Several methods have been developed to impart responsiveness of DNA and RNA to small-molecule and light-based stimuli. However, heat-triggered control of nucleic acids has remained largely unexplored, leaving a significant ...

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