

Molecular Recognition Mechanisms

Molecular self-assembly DNA nanotechnology uses the unique molecular recognition properties of DNA and other nucleic acids to create self-assembling In chemistry and materials science, molecular self-assembly is the process by which molecules adopt a defined arrangement without guidance or management from an outside source. for nanotechnological goals. There are two types of self-assembly: intermolecular and intramolecular. Commonly, the term molecular self-assembly refers to the former, while the latter is more commonly called folding

Mechanism of action A mechanism of action usually includes mention of the specific molecular targets to which the drug binds, such as an enzyme or receptor. A mechanism of action usually includes mention of the specific molecular targets to which the drug binds, such as In pharmacology, the term mechanism of action (MOA) refers to the specific biochemical interaction through which a drug substance produces its pharmacological effect. Receptor sites have specific affinities for drugs based on the chemical structure of the drug, as well as the specific action that occurs there. produces its pharmacological effect

Docking (molecular) referred to as "induced-fit". Knowledge of the preferred orientation in turn may be used to predict the strength of association or binding affinity between two molecules using, for example, scoring functions. It aims to achieve an In the field of molecular modeling, docking is a method which predicts the preferred orientation of one molecule to a second when a ligand and a target are bound to each other to form a stable complex. Molecular docking research focuses on computationally simulating the molecular recognition process

In contrast, a mode of action (MoA) describes functional or anatomical changes, at the cellular level, resulting from the...

Molecular sensor All chemosensors are designed to contain a signalling moiety and a recognition moiety, that is connected A molecular sensor or chemosensor is a molecular structure (organic or inorganic complexes) that is used for sensing of an analyte to produce a detectable change or a signal. chemosensing, which is a form of molecular recognition. The application of chemosensors is referred to as chemosensing, which is a form of molecular recognition. The action of a chemosensor relies on an interaction occurring at the molecular level, and usually involves the continuous monitoring of the activity of a chemical species in a given matrix such as solution, air, blood, tissue, waste effluents, drinking water, etc. All chemosensors are designed to contain a

signalling moiety and a recognition moiety, that is connected either directly to each other or through a some kind of connector or a spacer. The signalling is often optically based electromagnetic radiation, giving 0aa50c1814

Origin recognition complex In molecular biology, origin recognition complex (ORC) is a multi-subunit DNA binding complex (6 subunits) that binds in all eukaryotes and archaea in an ATP-dependent manner to origins of replication. ORC is a central component for eukaryotic DNA replication, and remains bound to chromatin at replication origins throughout the cell cycle. The subunits of this complex are encoded by the ORC1, ORC2, ORC3, ORC4, ORC5 and ORC6 genes 0aa50c1814

An additional adaptive function sometimes posited for kin recognition is a role in kin selection. There is debate over this, since in strict theoretical terms kin recognition is not necessary for kin selection or the cooperation associated with it. Rather, social behaviour can emerge by kin selection in the demographic conditions... 0aa50c1814 The associations between biologically relevant molecules such as proteins, peptides, nucleic acids, carbohydrates, and lipids play a central role in signal transduction. Furthermore, the relative orientation of the two interacting partners may affect the type of signal produced (e.g., agonism vs antagonism). Therefore, docking is useful for predicting both the strength and type of signal produced. 0aa50c1814

Pattern recognition receptor Recognition of extracellular or endosomal pathogen-associated molecular patterns is mediated by transmembrane proteins Pattern recognition receptors (PRRs) play a crucial role in the proper function of the innate immune system. PRRs are germline-encoded host sensors, which detect molecules typical for the pathogens. kinase domain as part of a single protein. They are also called primitive pattern recognition receptors because they evolved before other parts of the immune system, particularly before adaptive. They are proteins expressed mainly by cells of the innate immune system, such as dendritic cells, macrophages, monocytes, neutrophils, as well as by epithelial cells, to identify two classes of molecules: pathogen-associated molecular patterns (PAMPs), which are associated with microbial pathogens, and damage-associated molecular patterns (DAMPs), which are associated with components of host's cells that are released during cell damage or death 0aa50c1814

Molecular tweezers The open cavity of the molecular tweezers may bind guests using non-covalent bonding, which includes hydrogen bonding, metal coordination, hydrophobic forces, van der Waals forces, π - π interactions, and/or electrostatic effects. Schrader (2008). Am. Soc. Bastkowski; F. Chem. J. Klärner; T. "Molecular Clip and Tweezer Introduce New Mechanisms of Enzyme Inhibition". These complexes are a subset of macrocyclic molecular receptors and their structure is that the two "arms" that bind the guest molecule between them are only connected at one end leading to a certain flexibility of these receptor molecules (induced fit model). 130 (30): Molecular tweezers, and molecular clips, are host molecules with open cavities capable of binding guest molecules. -G 0aa50c1814

Deformation mechanism Common deformation mechanisms processes include: § Fracturing § Cataclastic In geology and materials science, a deformation mechanism is a process occurring at a microscopic scale that is responsible for deformation: changes in a material's internal structure, shape and volume. The process involves planar discontinuity and/or displacement of atoms from their original position within a crystal lattice structure. timing under which individual deformation mechanisms dominate for some materials. These small changes are preserved in various microstructures of materials such as rocks, metals and plastics, and can be studied in depth using optical or digital microscopy 0aa50c1814

NAS Award in Molecular Biology National Academy of Sciences "for recent notable discovery in molecular biology by a young scientist who is a citizen of the United States. S. 1962. Source: NAS 1962 Marshall Nirenberg for his studies of the molecular mechanisms for the biosynthesis of protein. 1963 Matthew Meselson for his leading The NAS Award in Molecular Biology is awarded by the U. " It has been awarded annually since its inception in 1962 0aa50c1814

ORC directs DNA replication throughout the genome and is required for its initiation. ORC and Noc3p bound at replication origins serve as the foundation for assembly of the pre-replication complex (pre-RC), which includes Cdc6, Tah11 (a.k.a. Cdt1), and the Mcm2-Mcm7 complex. Pre-RC assembly during G1 is required for replication licensing of chromosomes prior to DNA... 0aa50c1814
Drugs that do not bind to receptors produce their corresponding therapeutic effect by simply interacting with chemical or physical properties in the body. Common examples of drugs that work in this way are antacids and laxatives. 0aa50c1814 Molecular docking... 0aa50c1814

Kin recognition Some researchers suggest that, taken as a whole, active powers of recognition play a negligible Kin recognition, also called kin detection, is an organism's ability to distinguish between close genetic kin and non-kin. While a 2021 meta-analysis of research across 88 diploid species found that animals rarely avoid inbreeding, avoidance is more common in species with developmental co-residence since the latter is a proxy for kin recognition. In evolutionary biology and evolutionary psychology, such an ability is presumed to have evolved for inbreeding avoidance. role of kin recognition mechanisms in mediating altruism 0aa50c1814

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