

GTP-mediated macromolecular interactions: The common features of different systems

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G proteins that serve to transduce external signals in membranes share with protein synthesis factors and tubulin structural and functional features that are common to proteins that participate in reversible GTP-mediated macromolecular interactions. These proteins can bind GTP and GDP with high affinity, adopting different structures depending on whether they are complexed with the nucleotide diphosphate or triphosphate. The GTP · protein complex has high affinity for an acceptor macromolecule (or complex of macromolecules) and interacts with it, affecting its activity. These GTP-binding proteins also possess an intrinsic GTPase activity that is generally stimulated by its interaction with the acceptor. The GTPase activity converts the bound GTP to GDP, switching the configuration of the complexed protein to one of low affinity for the acceptor and causing its dissociation. The protein · GDP complex must exchange its GDP for GTP to allow the protein to acquire the high-affinity structure