

Abstract

The process of RNA interference allows cells to regulate functions of their genes. This process is usually initiated by the presence of double-stranded RNA within a cell. Such double-stranded RNA is diced by a specific protein called Dicer into duplexes of small RNAs, usually 20-25 nucleotides long. Single-stranded small RNAs, released from the duplexes, are the heart of RNA interference and they can be categorized into several groups according to their biogenesis. There are two groups of small RNAs in plants: miRNA and siRNA. Small RNAs can associate with a protein called Argonaut and guide it to the target molecule on the bases of sequence complementarity. The Argonaut-small RNA complex can act on itself or it can interact with other proteins in a wide spectrum of processes. The complex can slice the target mRNA (which can be handled by the sole Argonaut and small RNA), it can suppress translation or it can direct chromatin modifications. The phenomena of RNA interference can be found in almost all Eukaryotes where it can serve many functions, for example it can control cell differentiation, participate in stress responses, direct changes in chromatin and defend the organism against viruses. A diverse set of operating modes of RNA interference can be found in plants, which we are only at the beginning to understand and appreciate their consequences.