RNA as a Gene Regulation Modality

Phillip A Sharp*, Professor, Koch Institute for Integrative Cancer Research, MIT, Cambridge, MA, 02139, USA

The extensive roles of small RNAs in regulation of gene expression in biological systems have greatly expanded our understanding of normal and disease physiology. MicroRNAs are thought to interact with half of all vertebrate mRNAs and this may be an underestimate. Further, microRNA regulation varies between normal and stress conditions. Surprisingly microRNA regulation decreases under stress and formation of stress granules is dependent upon a novel system in the cytoplasm that is transient in nature and may explain some of the characteristics of this subcellular compartment. Many disease processes such as cancer are related to changes in microRNA activities.