

Human Cancers: The Interplay Between Protein-Coding Genes and Non-Coding RNAs

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ABSTRACT

The discovery of non-coding RNAs (ncRNAs) dramatically changed the understanding of cancer mechanisms in the last decade. The ncRNAs interplay with protein-coding genes and their abnormalities represents one of the most unexpected and important discoveries in the cancer field. Cancer initiation, progression and dissemination causally involve the effects of small regulatory ncRNAs named microRNAs, mainly due to deregulation of expression of cancer protein coding genes. miRNAs can act as oncogenes (activating malignant potential) or tumor suppressors (inhibiting malignant potential) directly on the tumor cells or via communication with tumor microenvironment cells. Understanding the roles of miRNAs and other ncRNAs in malignant cells uncovers a new layer of protein coding and non-coding gene regulation; furthermore, provides new markers for early diagnosis and improved prognosis, as well as novel therapeutics for cancer patients. Herein I will expose what is known about the miRNA function and describe examples and the challenges for clinical use of miRNAs in the near future.

Key words: microRNAs, oncogene, tumor suppressor, cancer, diagnosis, therapy