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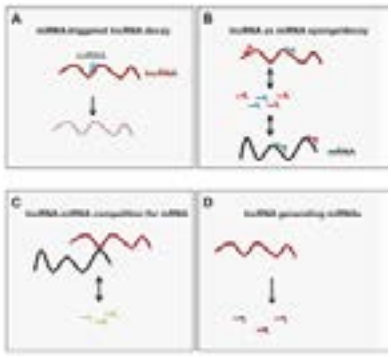
Small or large, the non-coding RNAs maintain order in the genome world and therefore can be used for a therapeutic aim

In mammalian cells, the vast majority of transcribed RNAs are noncoding. Many of them are processed to generate small RNAs, including microRNAs, the best-known class of small RNAs. Other transcripts, so- called long noncoding RNAs or lncRNAs, remain larger than 200 nucleotides in their mature form. Through their interaction with DNA, RNA, and proteins, ncRNAs affect all levels of gene regulation, including chromatin remodeling, transcription, pre-mRNA splicing, mRNA turnover, mRNA translation, and protein stability. Through this multi-leveled influence on protein expression patterns, these vast families of noncoding RNAs affect all aspects of cell metabolism, including cell division, senescence, differentiation, stress response, immune activation, and apoptosis. It has recently become apparent that it exists a mutual regulatory influence between microRNAs and lncRNAs. A number of studies over the past decade have also begun to uncover the interaction among mammalian lncRNAs and miRNAs. (1) LncRNAs are targeted by miRNAs to reduce lncRNA stability. (2) LncRNAs can also function as molecular decoys or sponges of microRNAs, reported in a few circular RNAs studies. In addition, (3) LncRNAs can also compete with miRNAs for binding to shared target mRNAs and (4) are precursors for the generation of miRNAs to silence target mRNAs. All these mechanisms will directly alter the cellular response in physiologic and pathologic processes, making them therapeutic targets of great interest. A nanobiotechnology-based method, called Bio Immune (G)en Medicine, has dared to take up the challenge and uses these interactions between non-coding RNAs to regulate gene expression in a large number of pathologies exhibiting significant deregulation at the immuno-genetic level. Some clinical examples, in particular in oncology, will illustrate the method and facilitate its understanding.

Recent publications

1. Yoon J H et al. (2014) Functional interactions among microRNAs and long noncoding RNAs. Semin Cell Dev Biol. 34: 9-14.
2. Paraskevopoulou M D, Hatzigeorgiou A G (2016) Analyzing miRNA-LncRNA interactions. Methods Mol Biol. 1402:271-286.
3. Jalali S, Bhartiya D, Lalwani M K, Sivasubbu S, Scaria V (2013) Systematic transcriptome wide analysis of lncRNA-miRNA interactions. PLoS One. 8(2):e53823.
4. Li C H, Chen Y (2013) Targeting long non-coding RNAs in cancers: progress and prospects. Int J Biochem Cell Biol. 45(8):1895-910.
5. Bayoumi A S, Sayed A, Broskova Z, Teoh J P, Wilson J et al. (2016) Crosstalk between Long Noncoding RNAs and MicroRNAs in Health and Disease. Int J Mol Sci. 17(3):356.



Biography

Gilbert Glady acquired expertise in Immunology and Immunogenetics, and also developed interest for Alternative Medicines during the last twenty years that lead him to Nanomedicine and Nanobiotechnology. He became the creator of the BI(G)MED method (Bio Immune(G)ene Medicine) and Director of EBMA, the European association for training the medical profession in BI(G)MED in 2010. He has participated in numerous international congresses in the field of Immuno-Allergology, Infectiology and Oncology with posters and oral presentations.

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