

长链非编码RNA的作用机制及其研究方法

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摘要 长链非编码RNA(Long non-coding RNA, lncRNA)通过多种机制发挥其生物学功能, 这些机制包括基因印记、染色质重塑、细胞周期调控、剪接调控、mRNA降解和翻译调控等。lncRNA通过这些作用机制在不同水平进行基因表达调控。在研究lncRNA功能的过程中, 研究方法的建立和应用起着非常重要的作用。目前用于lncRNA研究的主要方法有: 微阵列、转录组测序、Northern印迹、实时荧光定量逆转录-聚合酶链反应、荧光原位杂交、RNA干扰和RNA结合蛋白免疫沉淀等。文章着重介绍了3种前沿方法, 即: 在线快速预测RNA与蛋白质相互作用的catRAPID、RNA纯化的染色质分离(Chromatin isolation by RNA purification, ChIRP)以及非编码RNA沉默与定位分析技术(Combined knockdown and localization analysis of non-coding RNAs, c-KLAN)。

关键词: [长链非编码RNA](#) [作用机制](#) [基因表达调控](#) [研究方法](#)

Abstract: Long non-coding RNAs (lncRNAs) play biological roles through a variety of mechanisms, including genetic imprinting, chromatin remodeling, cell cycle control, splicing regulation, mRNA decay, and translational regulation. lncRNAs are involved in the regulation of gene expression through the above mechanisms in different levels. Establishment and application of research technologies are important in understanding of lncRNAs functions. Microarray, RNA sequencing, Northern blot, real time quantitative reverse transcription-polymerase chain reaction, fluorescence in situ hybridization, RNA interference, and RNA-binding protein immunoprecipitation are major tools of exploring biological functions of lncRNAs. Here, we highlighted three advanced methods, i.e., fast predictions of RNA and protein interactions and domains (catRAPID), chromatin isolation by RNA purification (ChIRP), and combined knockdown and localization analysis of non-coding RNAs (c-KLAN).

Keywords: [long non-coding RNAs \(lncRNAs\)](#), [acting mechanisms](#), [gene expression regulation](#), [research methods](#)

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