

专论与综述

RNA诱导沉默复合体中的生物大分子及其装配

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摘要 在RNA干扰机制中, 双链RNA诱导同源RNA降解的过程依赖于RNA诱导沉默复合体(RISC)的活性。RISC由Dicer酶, Argonaute蛋白, siRNA等多种生物大分子装配而成, 对这些大分子的结构和功能进行深入细致的研究, 有助于进一步了解RISC的形成过程、作用方式, 以及阐明整个RNAi过程的作用机制。研究表明, RISC中的Dicer具有RNaseIII结构域, 在RNAi的起始阶段负责催化siRNA的产生, 在RISC装配过程中起稳定RISC中间体结构和功能的作用; Argonaute蛋白是RISC中的核心蛋白, 有PAZ和PIWI两个主要的结构域, 前者为siRNA的传递提供结合位点, 后者是RISC中的酶切割活性中心; siRNA是RISC完成特异性切割作用的向导, 在成熟的RISC中虽然只包含siRNA的一条链, 但siRNA在RISC形成过程中的双链结构是保证RNAi效应的决定因素。尽管RISC中还存在其他一些功能未知的蛋白质, 但在RISC组分结构及功能研究方面取得的进展为建立一个可能的RISC装配模型提供了理论基础。

关键词 [RNA诱导沉默复合体](#) [装配](#) [Dicer](#) [Argonaute蛋白](#) [R2D2](#)

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Components and Assembly of RNA-induced Silencing Complex

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Abstract

Degradation of homologous RNA in RNA interference is carried out by functional RNA-induced silencing complex (RISC). RISC contains Dicer, Argonaute protein, siRNA and other components. Researching structures and functions of these components is primary important for understanding assembly and functional mechanism of RISC, as well as the whole RNAi pathway. Recent research works showed that Dicer, containing RNaseIII domain, is responsible for production of siRNA at the beginning of RNAi, however, guarantees the stability of RISC intermediate in assembly process. As the core component of RISC, Argonaute protein functions as slicer to cleave target RNA and offers the binding site of siRNA in its assembly, which are depended on PIWI domain and PAZ domain separately; Although there is only one strand of siRNA that is the guider of RISC, the double stranded structural character of siRNA is determinant of RNAi. Except that, there are still other components with unknown functions in RISC. Anyway, the knowledge about RISC components and assembly now, is basis of a presumed RISC assembly model.

Key words [RISC](#) [Assembly](#) [Dicer](#) [Argonaute protein](#) [R2D2](#)

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