

专论与综述

植物基因组中的非LTR反转录转座子SINEs和LINEs

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摘要

反转录转座子是基因组进化的推动者之一。分为LTR和非LTR两种类型。前者是真核基因组的主要组分,结构和转座方式与逆转录病毒类似。后者是最初发现于动物基因组新近发现在植物基因组中也广泛存在的新型重复序列,包括LINEs(long interspersed nuclear elements)和SINEs(short interspersed nuclear elements)两个亚型。它们大多因自身或受宿主基因组的调控而失去转座活性。其转座机理目前还不十分清楚,推测LINEs可以自主转座,SINEs依赖其他转座子被动转座。种系分析认为LINEs可能是最古老的反转录转座子,SINEs的起源未知。文章对以上内容进行了归纳和讨论。

关键词 [非LTR反转录转座子](#) [LINEs](#) [SINEs](#) [逆转录酶](#)

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Non-LTR Retrotransposons: LINEs and SINEs in Plant Genome

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Abstract

Retrotransposons are one of the drivers of genome evolution. They include LTR (long terminal repeat) retrotransposons, which widespread in Eukaryotagenomes, show structural similarity to retroviruses. Non-LTR retrotransposons were first discovered in animal genomes and then identified as ubiquitous components of nuclear genomes in many species across the plant kingdom. They constitute a large fraction of the repetitive DNA. Non-LTR retrotransposons are divided into LINEs (long interspersed nuclear elements) and SINEs (short interspersed nuclear elements). Transposition of non-LTR retrotransposons is rarely observed in plants indicating that most of them are inactive and/or under regulation of the host genome. Transposition is poorly understood, but experimental evidence from other genetic systems shows that LINEs are able to transpose autonomously while non-autonomous SINEs depend on the reverse transcription machinery of other retrotransposons. Phylogenetic analysis shows LINEs are probably the most ancient class of retrotransposons in plant genomes, while the origin of SINEs is unknown. This review sums up the above data and wants to show readers a clear picture of non-LTR retrotransposons.

Key words [non-LTR retrotransposon](#); [LINEs](#); [SINEs](#); [reverse transcriptase](#)

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