

〈講 演〉

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動く遺伝子 (トランスポゾン) から私たちのゲノムを守る仕組み

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**Mechanisms that Silence Transposable Elements to Maintain Genome Integrity**

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**Abstract**

One of the most striking aspects of mammalian genomes is the extraordinary abundance of transposable elements (TEs). A recent reannotation of genome sequences indicated that 75% or more of the human genome may be a product of past TE activities. Mobilization of TEs can lead to natural insertion mutations that generally have negative effects on the host genome. Thus, host species have evolved control mechanisms that restrict TE activity. Recent studies have shown that TEs are largely repressed by epigenetic mechanisms which are frequently interrelated and mutually reinforced. One such mechanism is RNAi/RNA silencing, in which small RNAs 20–30 nucleotides in length trigger multiple forms of sequence-specific gene silencing by guiding Argonaute/Piwi complexes or RNA-induced silencing complexes (RISCs) to target RNAs by means of base-pairing. RNAi/RNA silencing is thought to have evolved as a form of nucleic acid-based immunity to inactivate viruses and transposable elements.

**Key words:** transposable elements, RNAi, Argonaute/Piwi proteins, small RNAs, epigenetics.