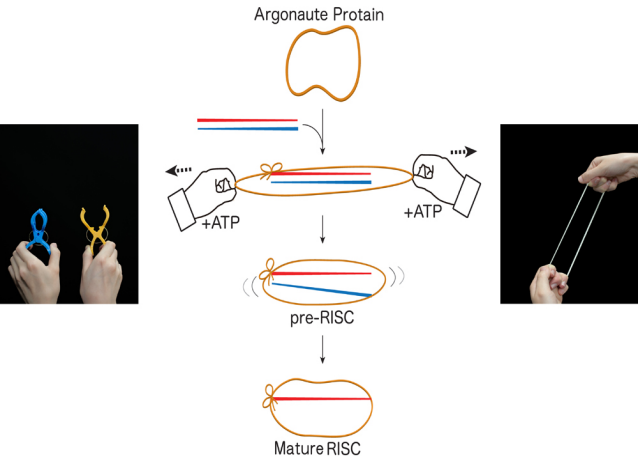


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- ◆ Recognition of the pre-miRNA structure by Drosophila Dicer-1 Tsutsumi A, Kawamata T, Izumi N, Seltz H, *Tomari Y. *Nat Struct Mol Biol.* 2011 Sep 18.
- ◆ 3'-end formation of Pri-mi-interacting RNAs in vitro Kawaoka S, Izumi N, Katsuma S, *Tomari Y. *Mol Cell.* 2011 Sep 16;43(6):1015-22.
- ◆ Multilayer checkpoints for microRNA authenticity during RISC assembly. *Kawamata T, Yoda M, *Tomari Y. *EMBO Rep.* 2011 Sep 1;12(9):944-9.
- ◆ Hsc70/Hsp90 chaperone machinery mediates ATP-dependent RISC loading of small RNA duplexes. Iwasaki S, Kobayashi M, Yoda M, Sakaguchi Y, Katsuma S, Suzuki T, *Tomari Y. *Mol Cell.* 2010 Jul 30;39(2):292-299.
- ◆ Sorting of Drosophila small silencing RNA. *Tomari Y, Du T, *Zamore PD. *Cell.* 2007 Jul 27;130(2):299-308.

Chaperoning RISC assembly



Date: **November 21 Mon, 2011** Time:17:00-18:30 Place: **NEKKEN 1F Main meeting room**
 Daisuke Hayasaka, Institute of Tropical Medicine (NEKKEN), Tel:095-819-7828 E-mail:hayasaka@nagasaki-u.ac.jp

[Abstract]

MicroRNAs and small interfering RNAs induce posttranscriptional gene silencing of their target mRNAs via the RNA-induced silencing complex (RISC). These small RNAs are born double-stranded. Loading of small RNA duplexes into Argonaute proteins, the core component of RISC, requires ATP. Subsequently, the two strands of a small RNA duplex are separated within Ago protein. Unexpectedly, this unwinding process does not require ATP.

Why ATP hydrolysis is required for RISC loading—seemingly a mere binding of a small RNA duplex and Ago protein—but not for unwinding—a process that disrupts <20 base pairs—has been unclear. We recently show that Hsc70/Hsp90 chaperone machinery is specifically required for RISC loading of small RNA duplexes, but not for unwinding, target cleavage, or release of the cleavage products. We envision that the chaperone machinery consumes ATP and mediates a conformational opening of Ago proteins so that they can receive bulky and rigid small RNA duplexes.

I will discuss such actions of the chaperone machinery as the driving force for RISC assembly.