



# CDB SEMINAR

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Thursday, December 17, 2009

15:00~16:00 A7F Seminar Room

### **The Tetrahymena Argonaute-binding protein Giw1p directs a mature Argonaute-siRNA complex to the nucleus**

#### **Summary**

Emerging evidence indicates that RNAi-related mechanisms act not only in the cytoplasm but also in the nucleus. However, it is poorly understood how the RNAi machinery is transported into the nucleus. The Tetrahymena Argonaute protein Twi1p localizes to the nucleus and is crucial for small RNA-directed programmed DNA elimination. We show that the nuclear localization of Twi1p depends on both the endoribonuclease (slicer)-activity of Twi1p and the novel Twi1p-binding protein Giw1p. The slicer activity is necessary for the removal of the passenger strand, which leads to the formation of the functionally mature Twi1p-scrRNA complex. The slicer activity is also required for the Twi1p-Giw1p interaction, indicating that Giw1p is able to sense whether the Twi1p-associated scrRNA is single or double stranded, and only binds to the mature, single stranded form. Our results suggest that Giw1p is a sensor for the state of Twi-scrRNA complexes and selectively transports mature complexes to the nucleus. We further show that Giw1p binds to both PAZ and Piwi domain of Twi1p. We propose that the scrRNA passenger-strand removal changes the distance between the PAZ and the Piwi domain, as it has been shown for an archaeal Argonaute protein, and we believe that this conformational change allows Giw1p to bind these domains.

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