

## GENETIC CHARACTERIZATION OF KNOWN AND NOVEL COMPONENTS OF PIWI PATHWAYS IN *DROSOPHILA MELANOGASTER* GONADS

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In the germ tissues, the RNA interference pathway provides a crucial defence mechanism against transposons, which are primarily transmitted by inheritance. In *Drosophila*, the specialized Piwi-interacting RNA (piRNA) pathways repress transposons and other repetitive sequences in gonads. piRNAs are generated by a Dicer-independent mechanism and function through the Piwi, rather than the Ago, Argonaute subfamily proteins. Flies have three closely related Piwi proteins, Piwi, Aubergine and Ago3, which use piRNAs to silence transposons and other parasitic DNAs in gonads (Ghildiyal and Zamore, 2009). In ovaries, distinct piRNA pathways with differing components function in ovarian germ and somatic cells (Li et al., 2009; Malone et al., 2009). The two piRNAs pathways produce piRNAs with two molecular mechanism: the primary piRNA pathway, Piwi-dependent, acting in the somatic cells, the so called ping-pong pathway, Aub- Ago3-dependent, acting in the germline (Sentia and Brennecke, 2010).

In testes, the piRNAs production remains largely unknown. In fly testes the most abundant piRNAs (~70%) associated with Aubergine corresponding to *crystal* and *Stellate* sequences (Nagao et al., 2010). The *crystal-Stellate* system is one of the most studied examples of heterochromatin-euchromatin interaction (Bozzetti et al., 1995). The modifiers of the *crystal-Stellate* system were demonstrated to be key genes implicated in the piRNA pathway, as *aubergine*, *spindle E*, *hsp83* (Klattenhoff and Theurkauf, 2008; Specchia et al., 2008; Specchia et al., 2010).

Here we show the data on the behavior of some *crystal-Stellate* modifiers, in particular *hsp83* and the *Drosophila* Fragile X homolog gene, *dFmr1*, in the silencing of somatic or germline specific transposable elements and *Stellate*-like sequences. This study contributes to shed light on the mechanisms of the piRNAs production and function in *Drosophila melanogaster* gonads.

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