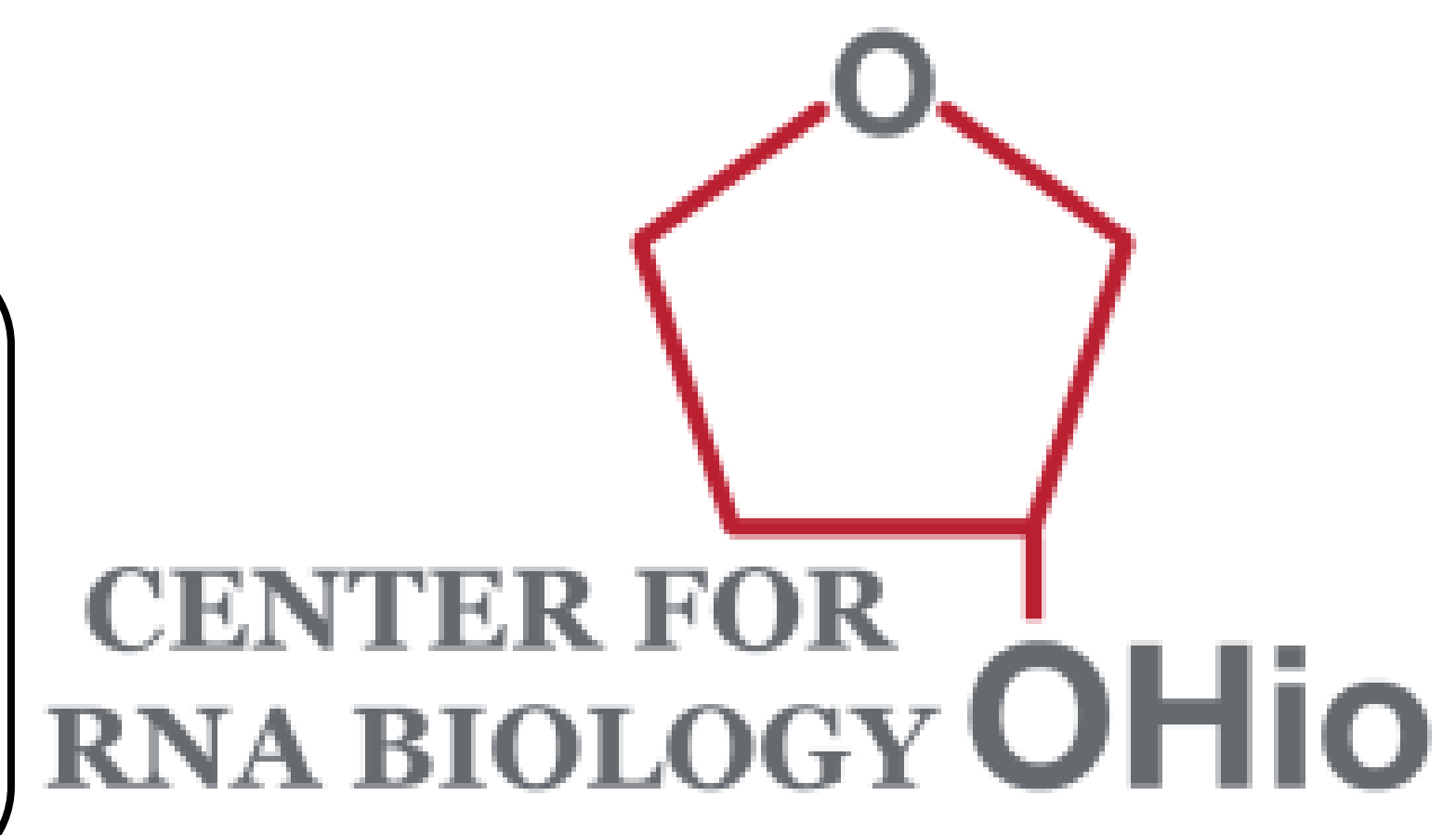


PIWI RNAs tackle transposons to safeguard fertility across the animal kingdom

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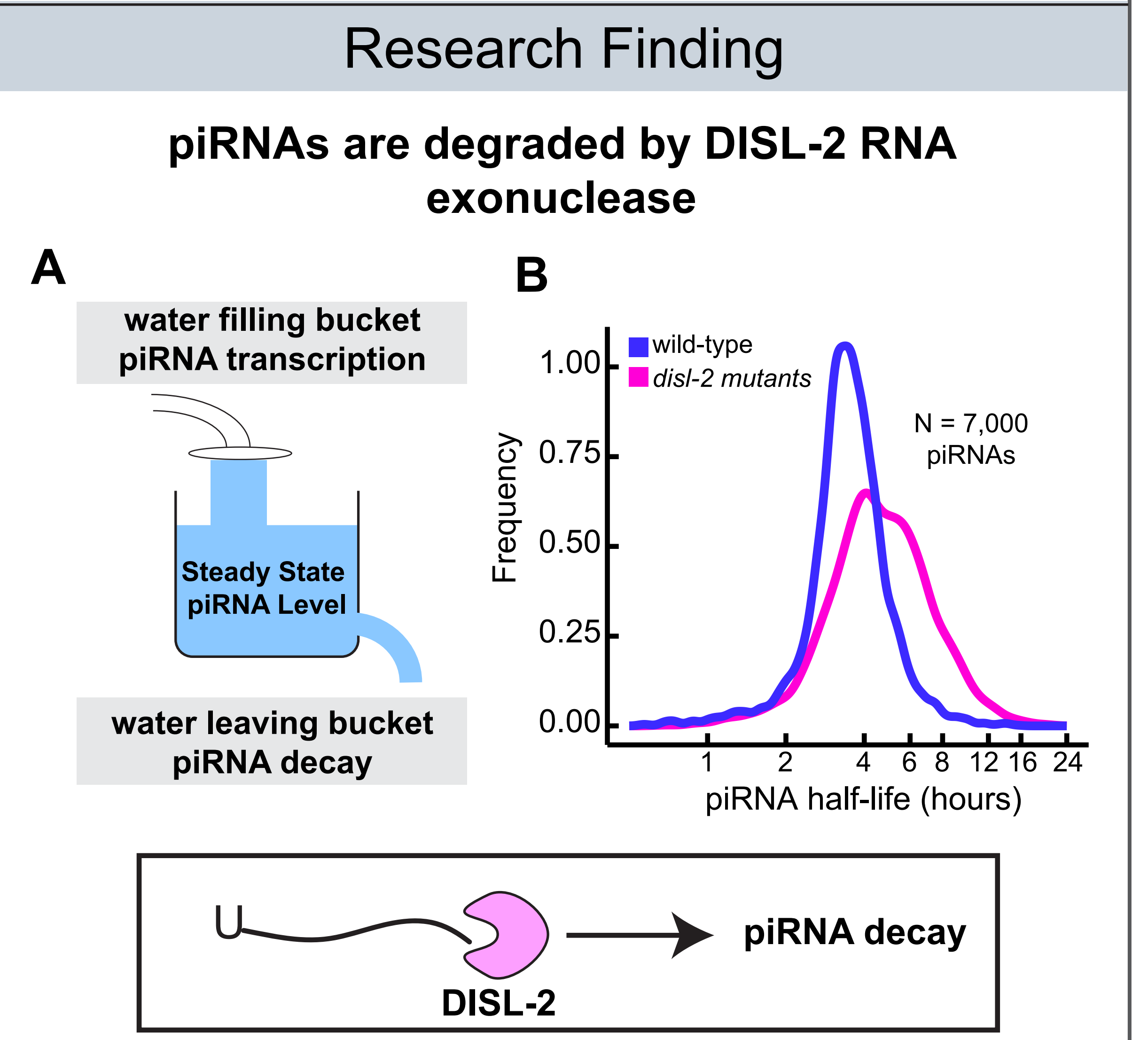
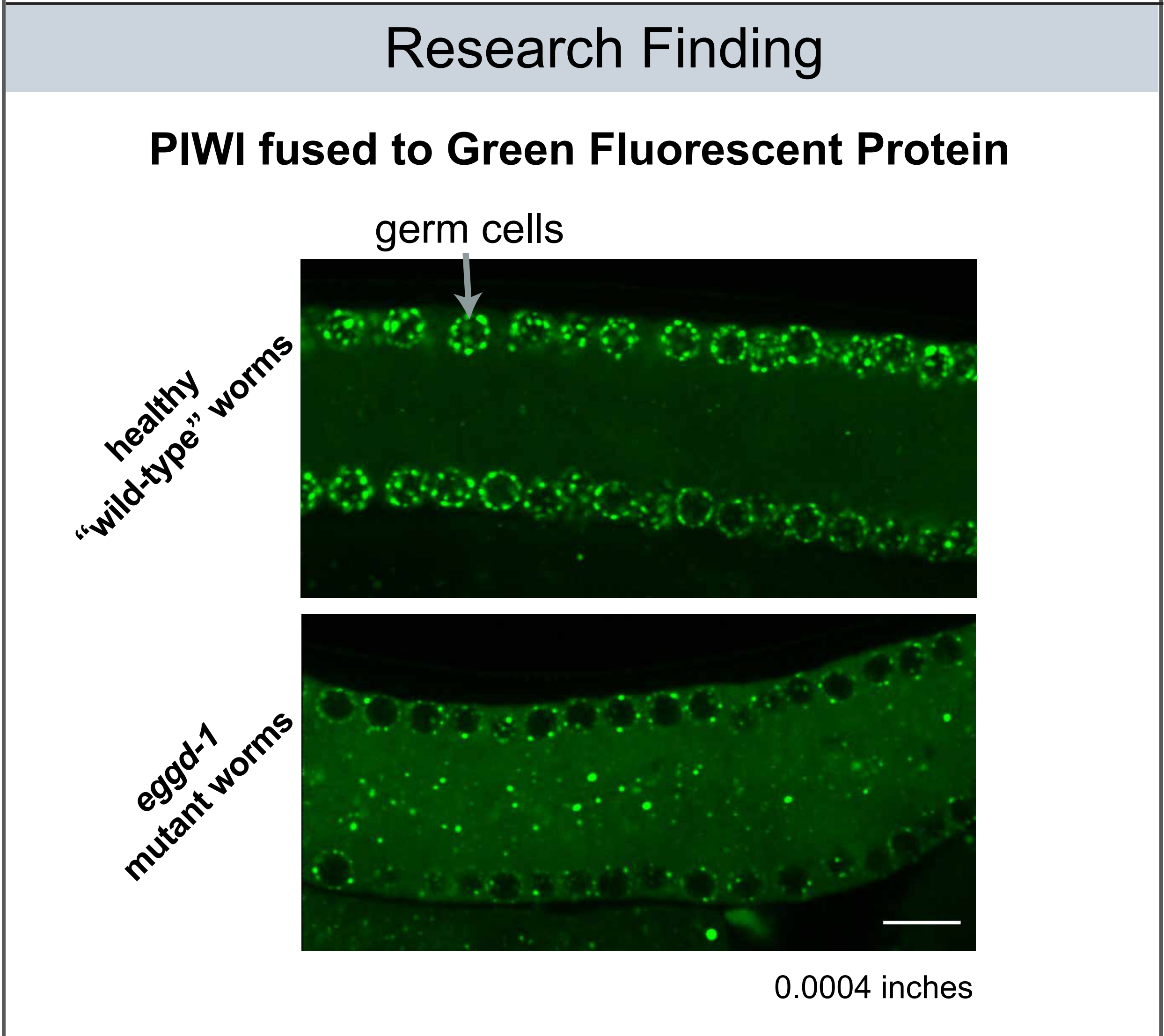
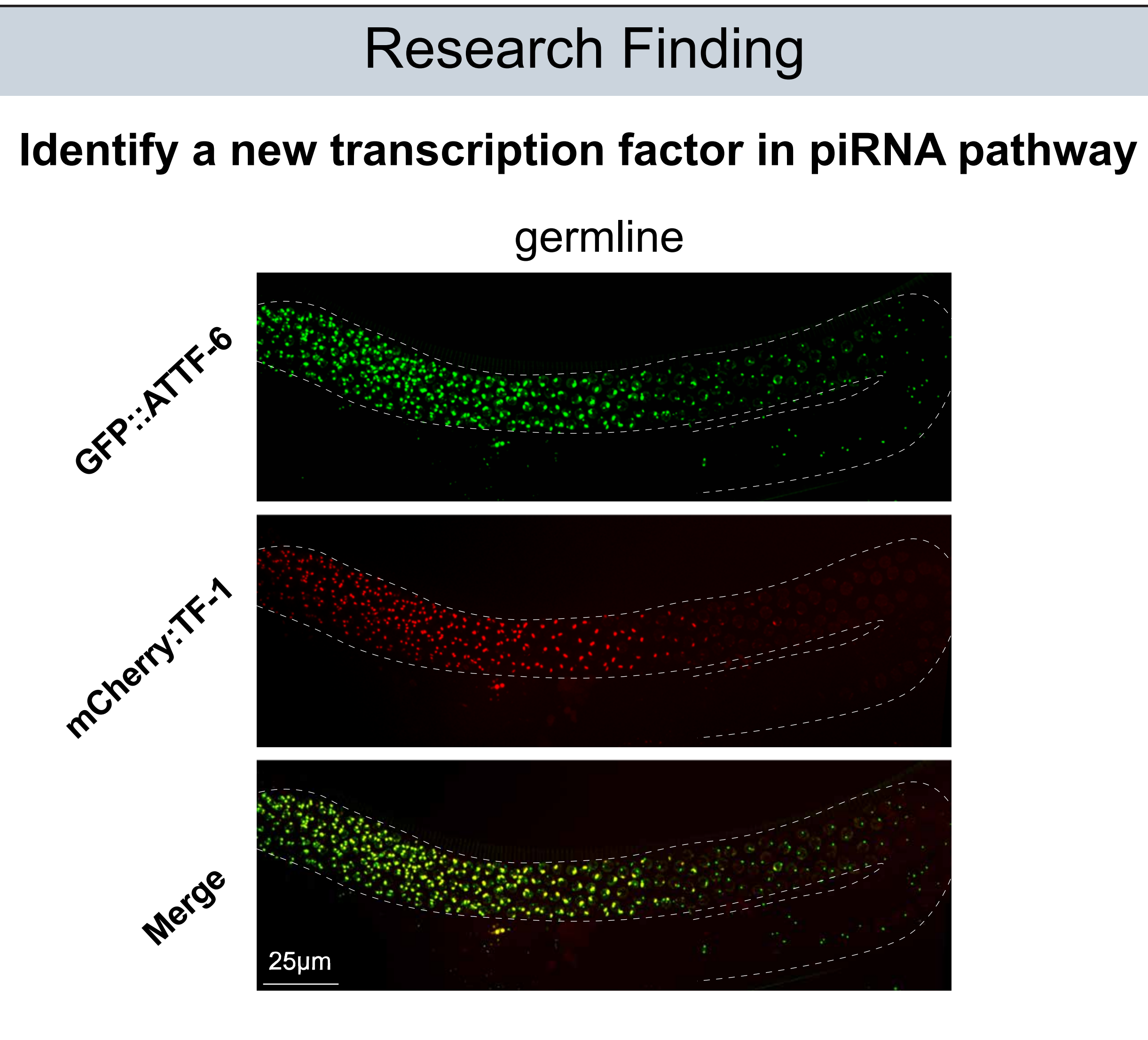
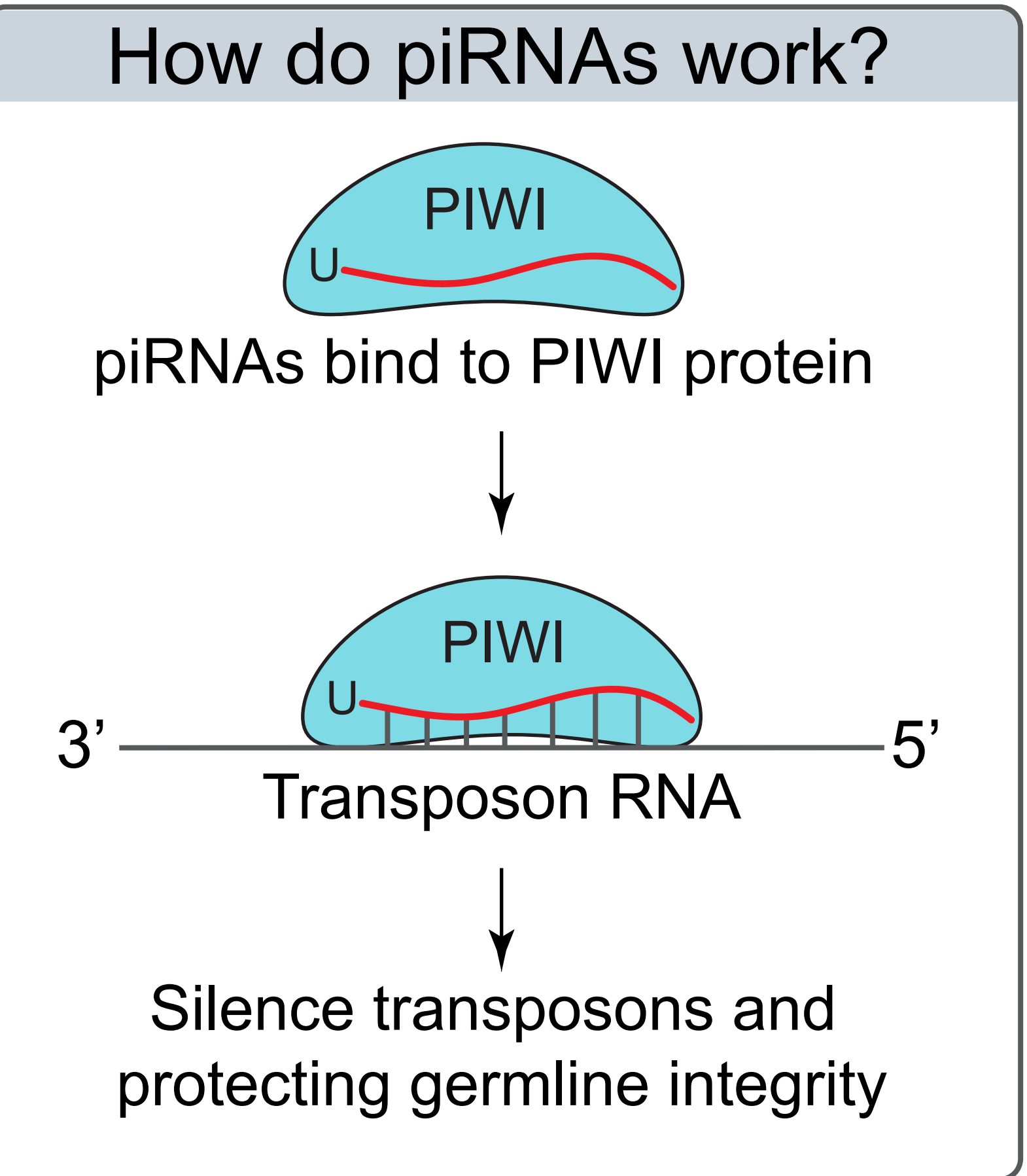
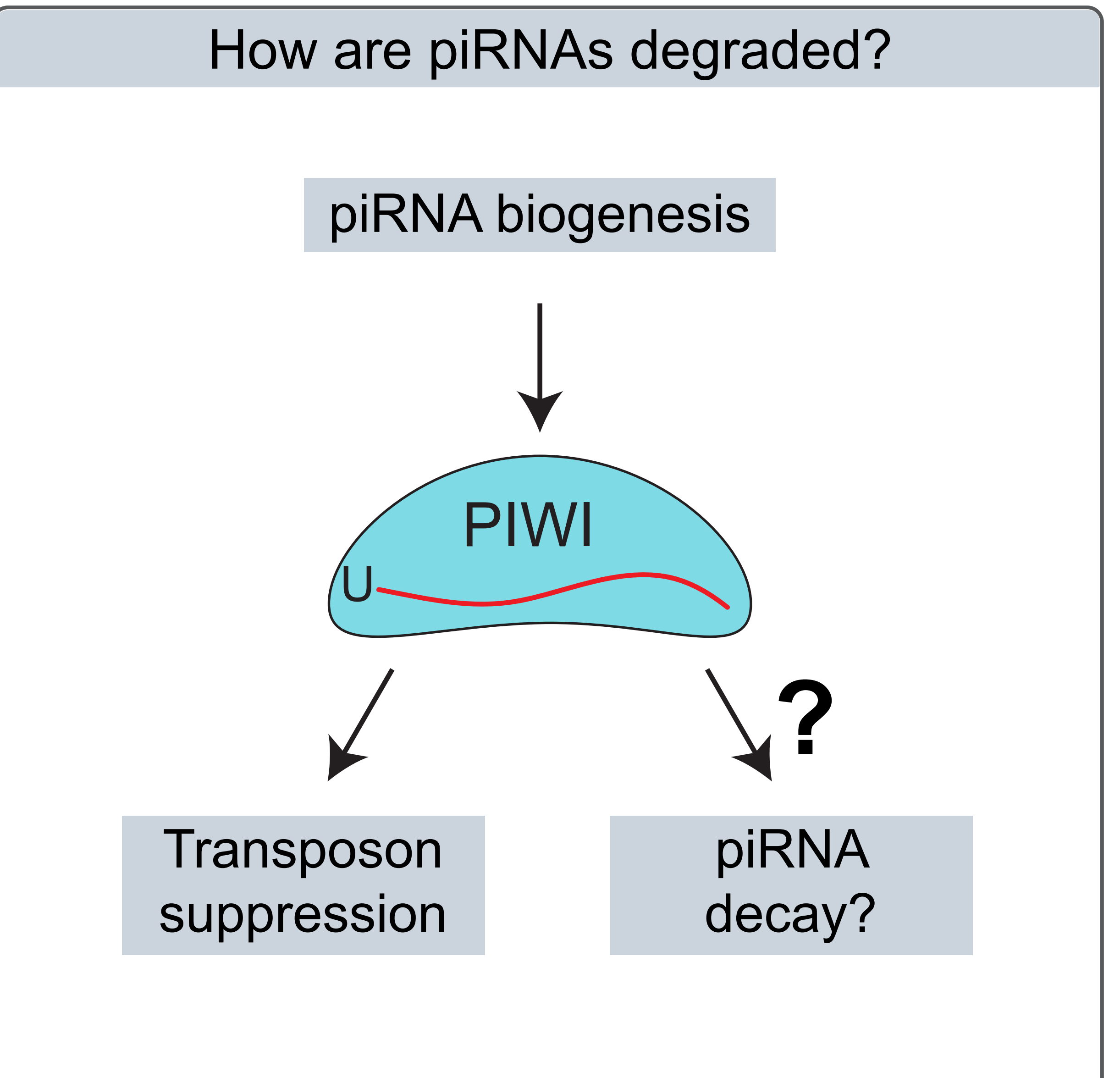
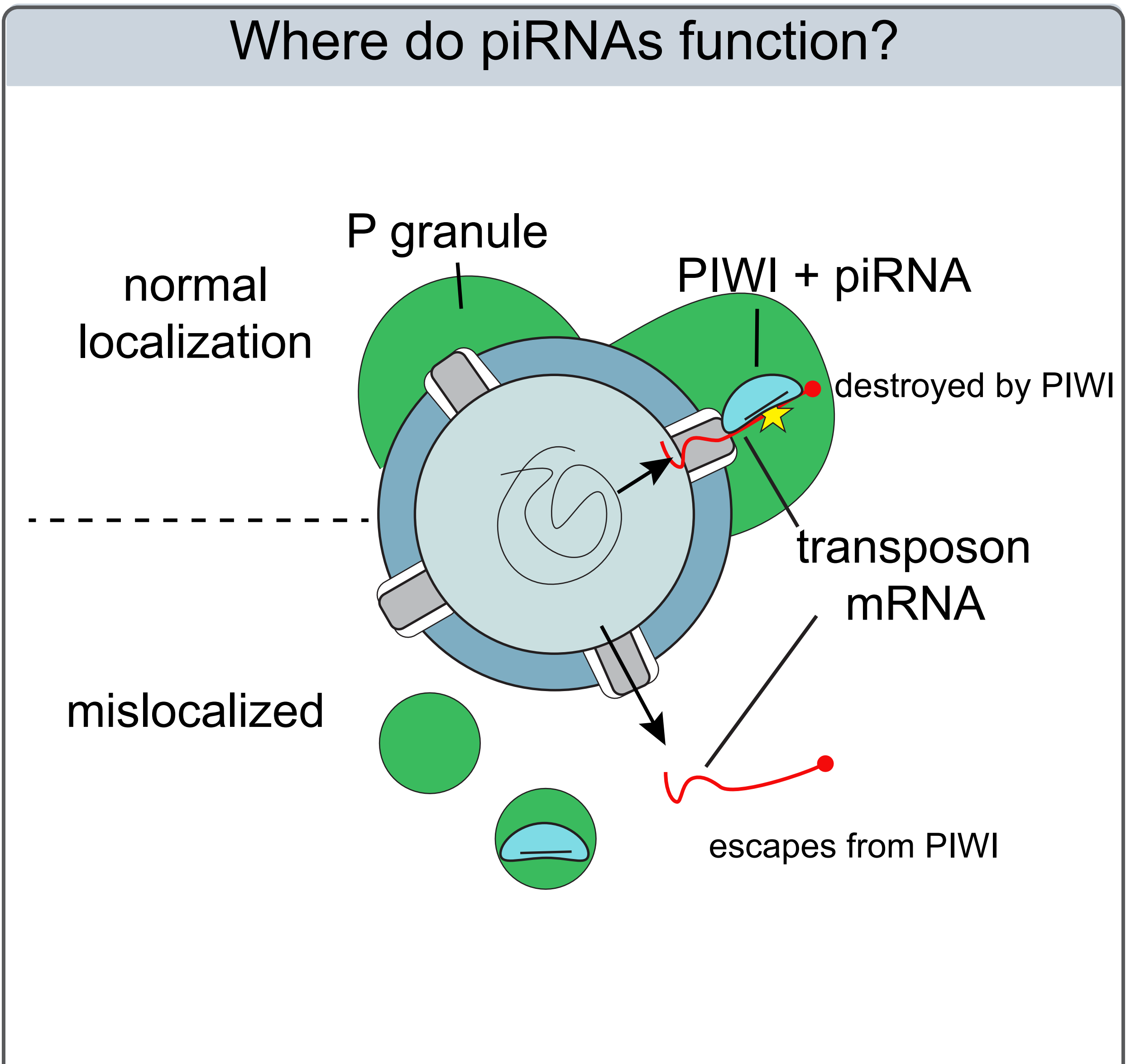
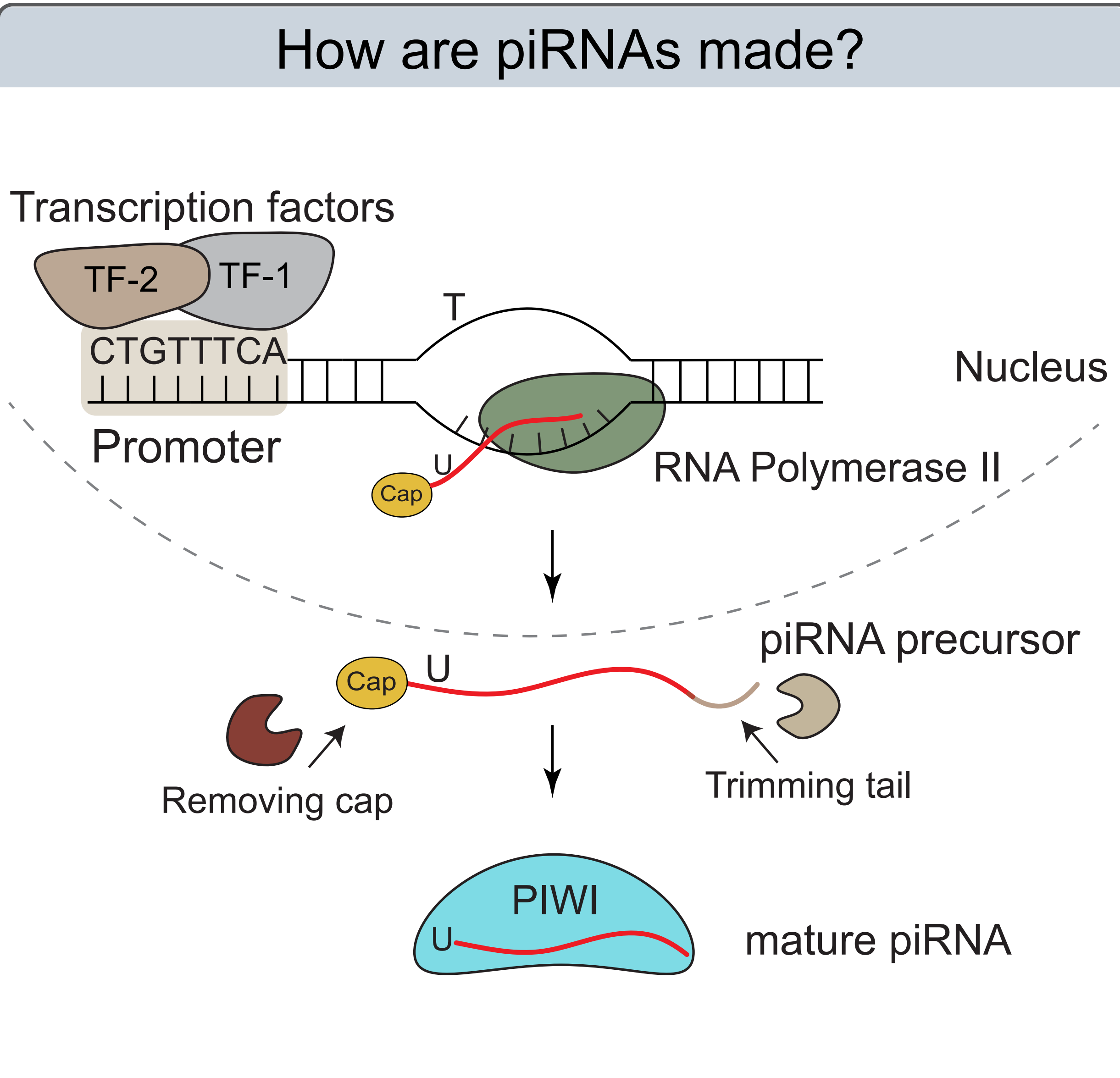
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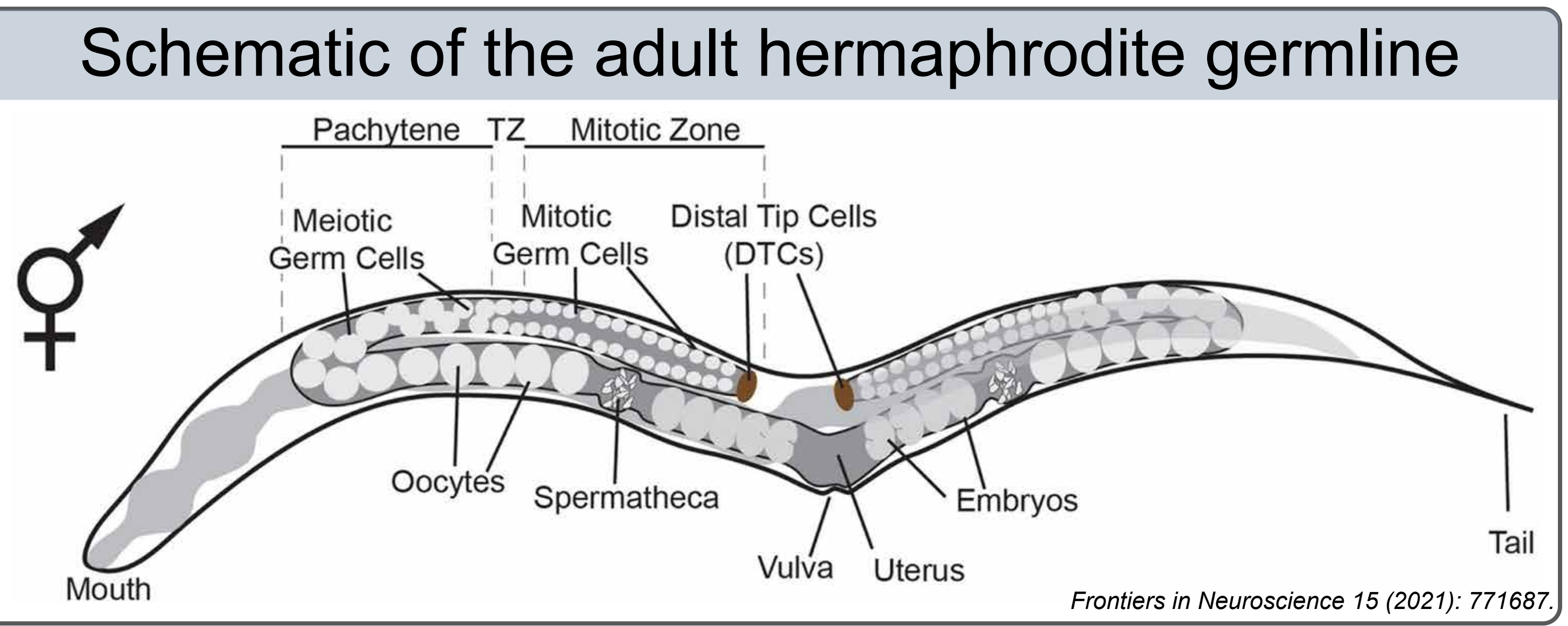


RESEARCH AREAS:

What are piRNAs?
 PIWI-interacting RNA, or piRNA, is a class of small non-coding RNA molecules, typically 21 to 32 nucleotides in length, that play a key role in silencing transposable elements (TEs) and maintaining genome integrity in animal germline cells (sperm and egg cells). They are named after their association with PIWI proteins, a subfamily of Argonaute proteins.



- Animal model: *Caenorhabditis elegans***
- Advantage:**
1. Simple and well-characterized organism
 2. Short lifespan and rapid reproduction
 3. Transparent body
 4. Powerful genetic manipulation tools
 5. Conserved piRNA pathway
 6. Inexpensive and easy to maintain



Processing defect:
 PNLDC1 plays a key role in trimming the 3' end of pre-piRNAs, which is a crucial step in their maturation. When the Pnlc1 gene is mutated in mice, it causes a buildup of unprocessed piRNAs, leading to fewer mature piRNAs in the testes. This results in a failure to silence transposons and disrupts the process of sperm development.

Mislocalization:
C. elegans eggd-1 is similar to the human genes *tard5* and *tard7*. Mutations in *tard5* and *tard7* in patients have been identified to cause male infertility. Additionally *tard7* mutations can cause pediatric cataracts and glaucoma.

piRNA decay and DISL-2 in humans :
 The function of piRNA decay in animals is not yet known. Yet, studying piRNA decay in worms may lead to insights into human fertility diseases. Additionally, humans with mutations in DISL2 (DISL-2 ortholog) experience Perlman's syndrome. Thus, studying DISL-2 in worms can help yield insight into the pathogenesis of this disease.