**Piwi Matters**

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**Part 1: Getting to know Piwi (Sequence and Domains)**

Piwi appears to be a complex protein that interacts with many proteins and RNA to play an important role in gametogenesis. In this section, we will learn about the architecture and interactions of Piwi through a series of bioinformatics explorations.

To learn more about the functions and overall organization of the Piwi protein, we will explore a biological data resource called UniProt.

*Box 2: Resource*

**UniProt** (<https://www.uniprot.org/>) is a bioinformatics data resource that provides comprehensive, high-quality, freely accessible protein sequences, and their functional information. This information comes from research that has been published by others. For eukaryotic proteins, it also lists information about specific domains, post-translational processing and modifications, and pathology resulting from mutations in the protein. UniProt provides links to other biological data resources to access other relevant information about the protein, such as gene sequence, protein structures, functional annotations etc.

Search for Piwi in UniProt by typing the protein name in the top search box. From the results returned, select the entry for *Drosophila melanogaster* (Fruit fly) Piwi. Open the UniProt page and review the various types of information listed there. Refer to this page to answer the following questions:

Q1. What is the identifier of the UniProt entry that you have selected? (Hint: this is the set of alpha numerical string, listed at the top of the page, after UniProtKB -, and before the parenthesis.)

Q2. List three types of information that you found out about Piwi from this data resource. (Hint: click on the various tabs in the left hand menu. List the name of the tab and what interesting information you found about the protein).

Piwi domains: Like many other eukaryotic proteins, Piwi is composed of different domains.

*Box 3: Vocab*

A **domain** is a conserved part of a protein that can evolve, function, and exist independently of the rest of the protein chain. It usually has a stably-folded, three dimensional structure.

Explore the primary structure and domain organization of Piwi as listed in the “Family & Domains” section of the UniProt page for Piwi.

Q3. Draw a linear diagram of the Piwi protein. Mark all the positions (amino acid residue numbers) of the PAZ and Piwi domains and color them yellow and green respectively.

To learn more about the functions of the protein domains present in the Piwi protein, explore the Family and domain databases available from InterPro, Pfam, and PROSITE.

Q4. Describe in 2-3 sentences what you learned about the function(s) of each domain.