**Title**: Piwi Matters

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**Abstract**: Stem cells have the ability to self-renew and differentiate. This case discusses how these properties of germline stem cells are regulated by a protein called Piwi, that is highly conserved in many species. Presence and function of this protein is required for producing large numbers of eggs in fruit flies. The RNA binding ability of this protein is critical for its function. The case begins with watching a video about a researcher in this field describing how the role of Piwi was identified and is currently studied to understand its structure-function relationships.

**Learning Objectives**: The case was developed for introductory genetics courses where students are introduced to the molecular structural basis for ovary development. Through the case students

* Learn to identify and access data from various biological databases and integrate information to understand the structure and functions of this protein.
* Develop some basic understanding of biomolecular structure-function relationships

Note: The explorations may be expanded to a laboratory exercise where students can develop hypothesis about Piwi's structure-function relationships and design experiments to test them.

**Molecules explored**: Molecular structures of Piwi complexes are explored to understand structure function relationships.

**Implementation**: The case can be implemented using either a flipped approach and/or in-class discussions. Detailed teaching notes, mini lessons, and discussion prompts for open ended discussions are available for download to guide the in-class activity.

**Subject Headings**: Biology (Introductory), Chemistry (Introductory), Biochemistry, Genetics, and Molecular Biology

**Keywords**: Piwi; Papi; Siwi; post-transcriptional; germline; self-renewal; conserved.

**Topical Area**: Scientific method; Molecular structure representation; Visualization

**Educational Level**: Undergraduate lower division

**Formats**: word file and Website

**Type/Method**: Flipped, Interrupted

**Language**: English

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