

### Outline

- Small RNA sequencing
- Quality control
- Read mapping

---

---

---

---

---

---

---

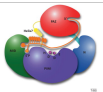
---

### Small RNAs

**Three categories:**

1. **piwi-interacting RNAs (piRNAs)** - 21-32 nt long, predominantly germline small RNAs that bind PIWI proteins (related to Argonautes). Found only in animals.
  - Essential roles in regulating transposons.
2. **microRNAs (miRNAs)** - 20-24 nt long small RNAs expressed throughout development that bind to Argonaute proteins. Found in plants and animals.
  - Regulate mRNAs throughout development.
3. **Small interfering RNAs (siRNAs)** - 20-26 nt long small RNAs expressed in various tissues that bind to Argonaute proteins. Found in plants, some fungi, and animals.
  - Various roles, including regulating transposons.

Unifying features: size and protein binding partners (Argonaute/Piwi).



Kuhn and Joshua-Tor (2013)

---

---

---

---

---


---

---

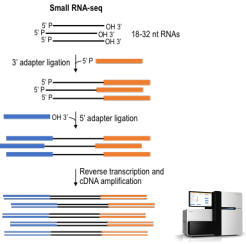
---

### Small RNA experiment


wild type *C. elegans*




**Small RNA-seq**



*prg-1* mutant *C. elegans*



Which small RNA pathway does PRG-1 function in?



---

---

---

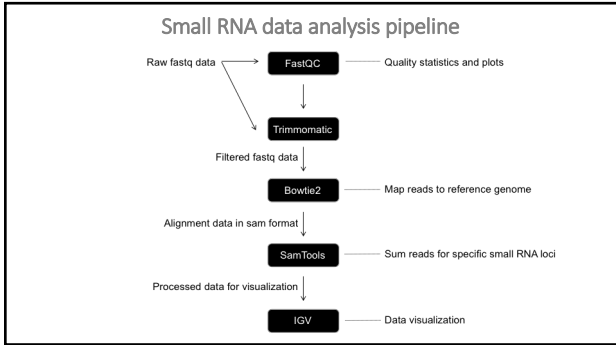
---

---

---

---

---



---

---

---

---

---

---

---