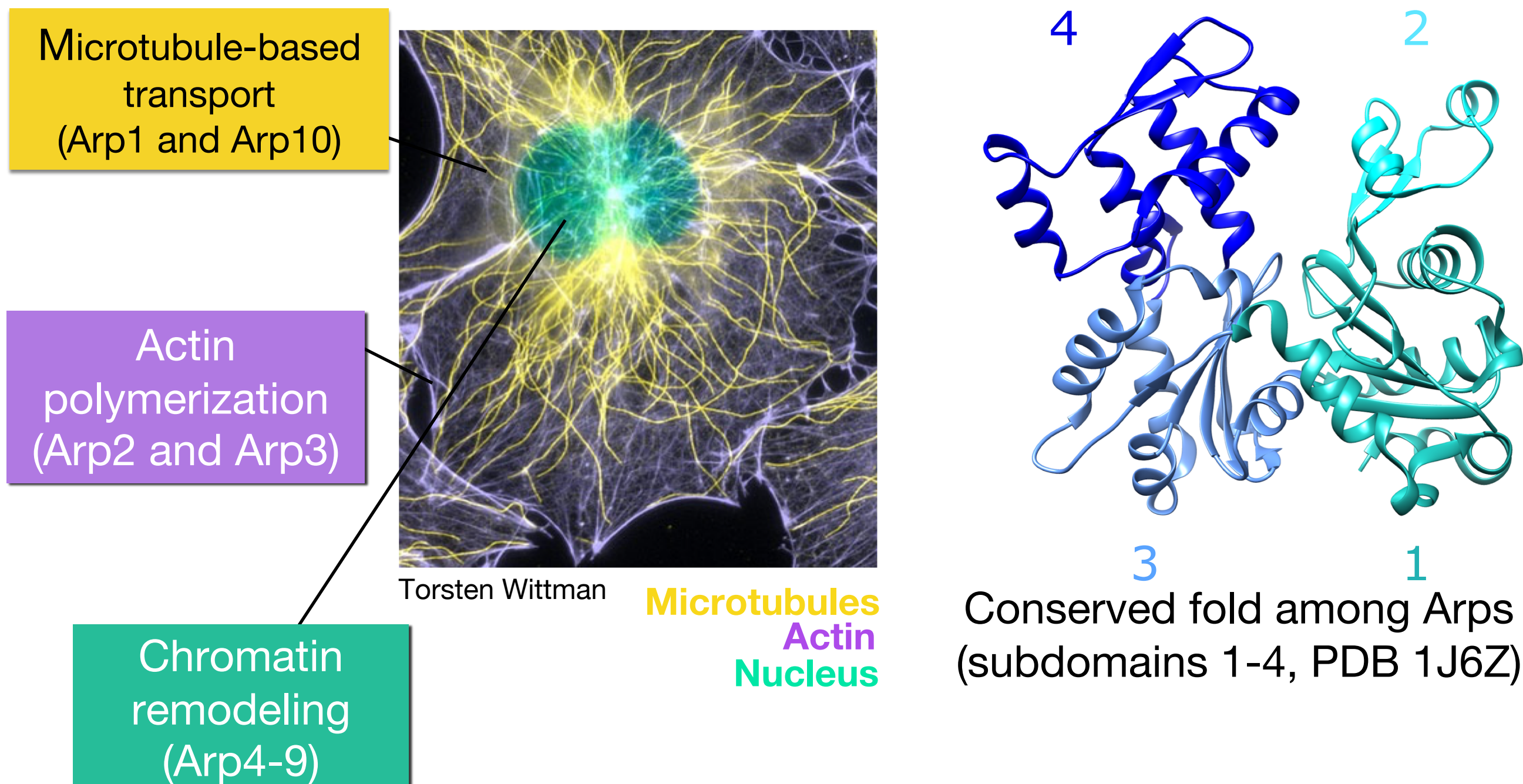


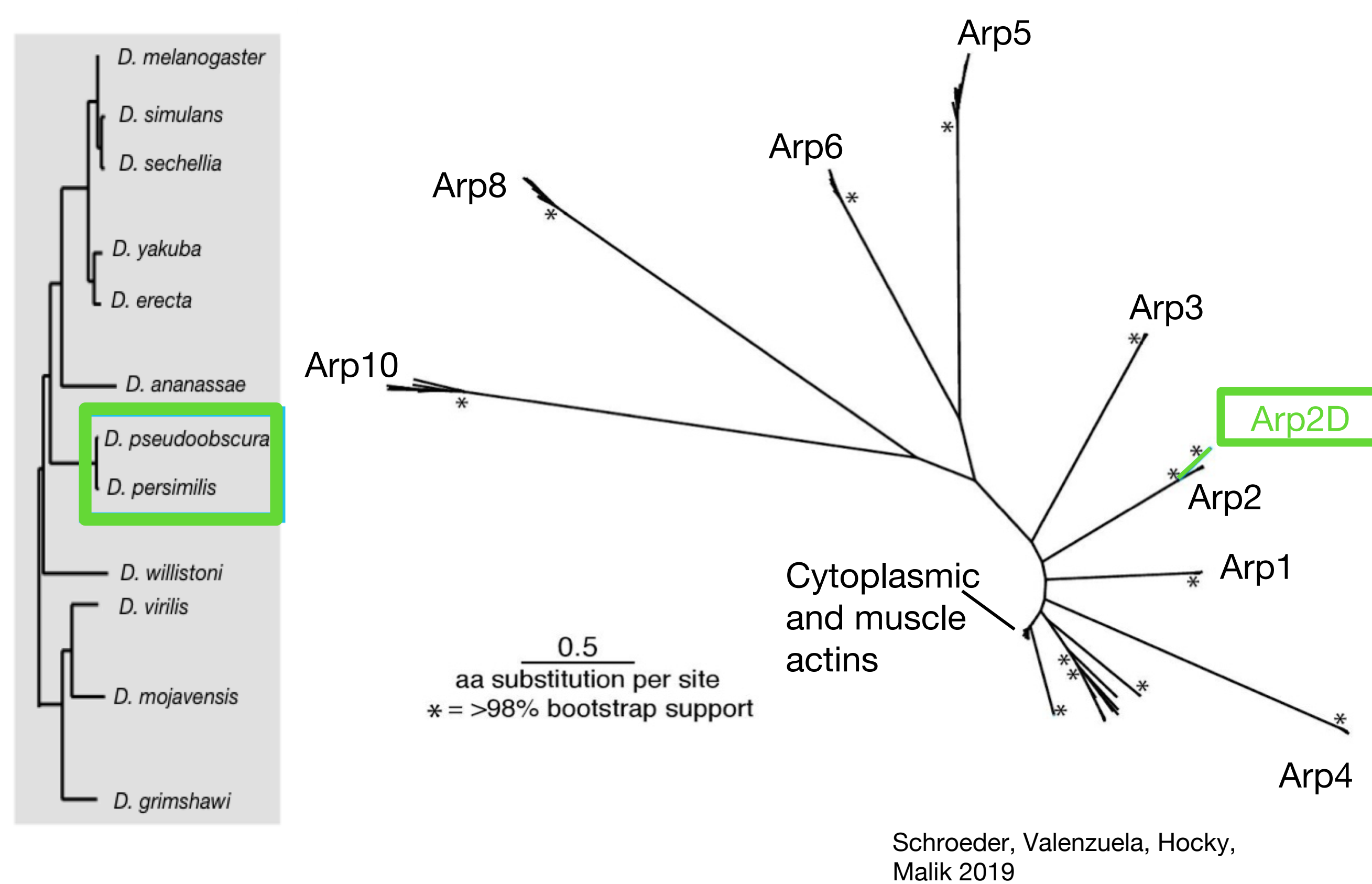
Background

- Actin is an evolutionarily ancient cytoskeletal protein that is critical for many architectural and signaling roles.
- Before the last common ancestor of eukaryotes actin genes duplicated and diversified into the superfamily of actin-related proteins (Arps) with diverse functions.

Actin-related protein superfamily



Arp2D Evolution



Gene Duplicate Arp2D:

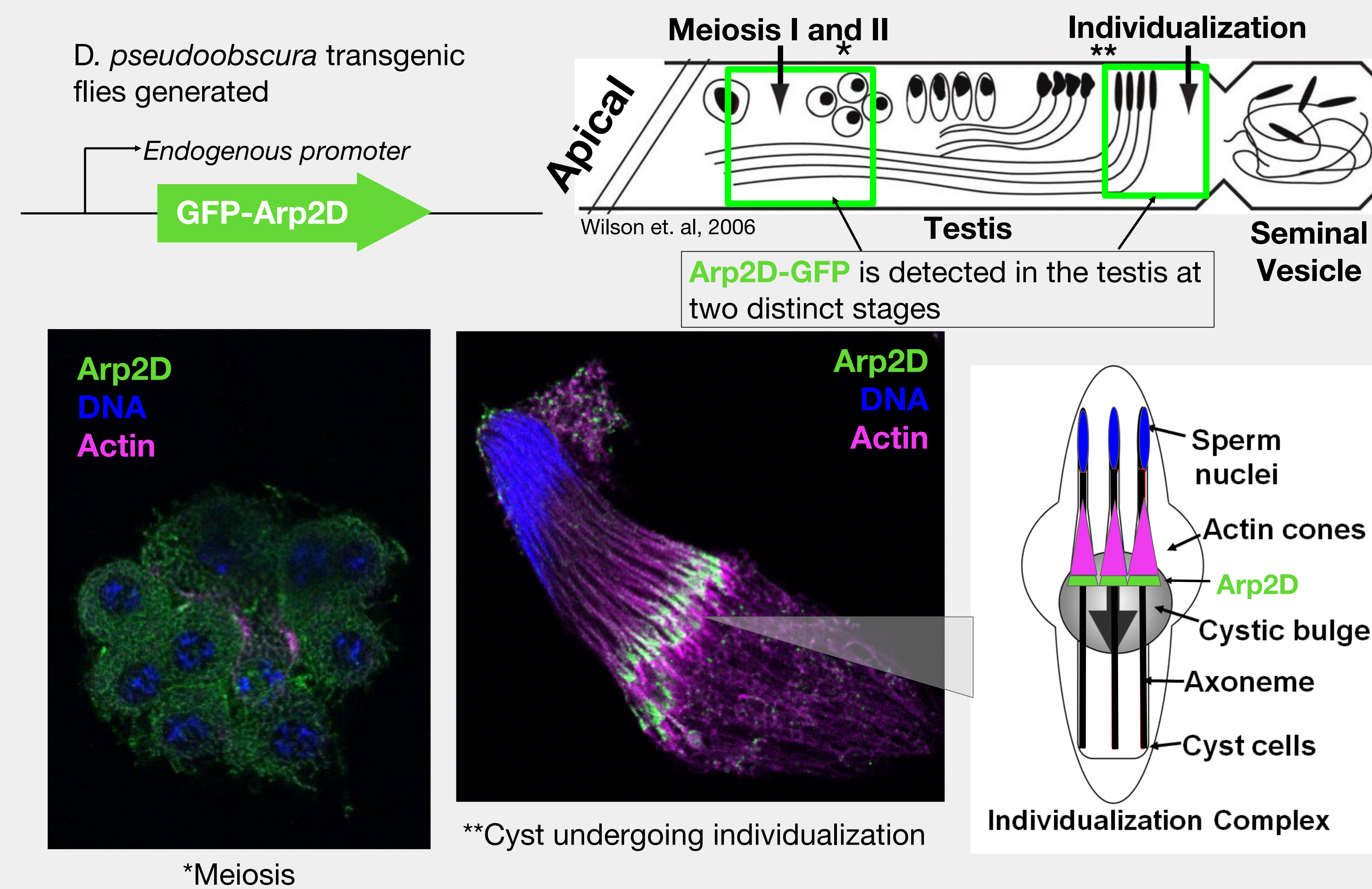
- present in one clade of *Drosophila* (Obscura clade)
- rapidly evolving
- expressed in the testis with unknown function

Questions:

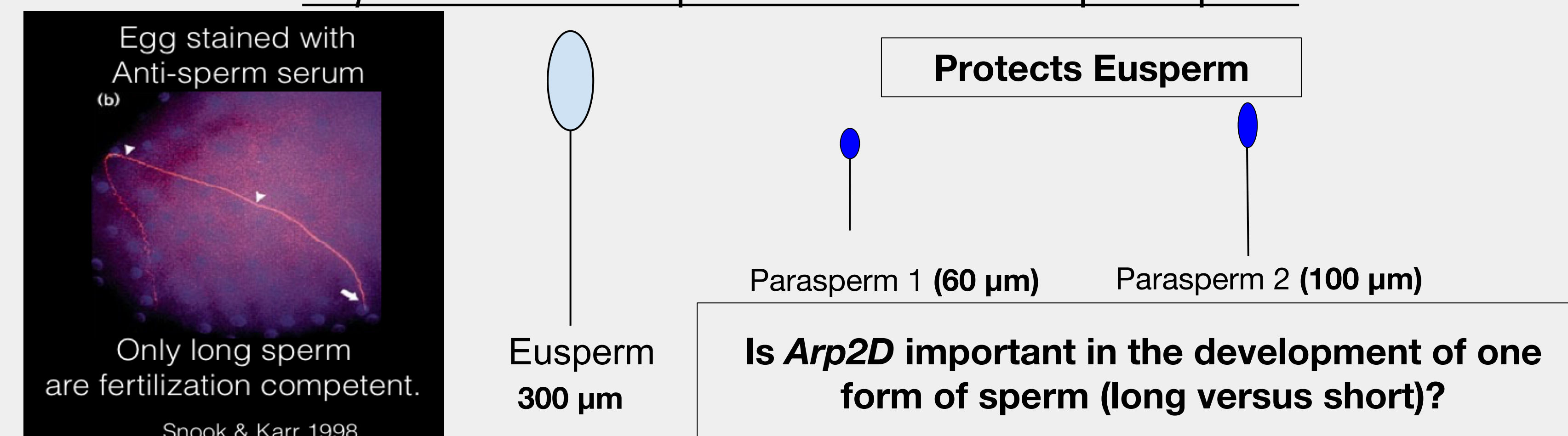
- What is the function of Arp2D?
- How does Arp2D differ from its parental gene Arp2?

Arp2D's localization in *D.pseudoobscura*

GFP-Arp2D is expressed at specific stages of spermatogenesis

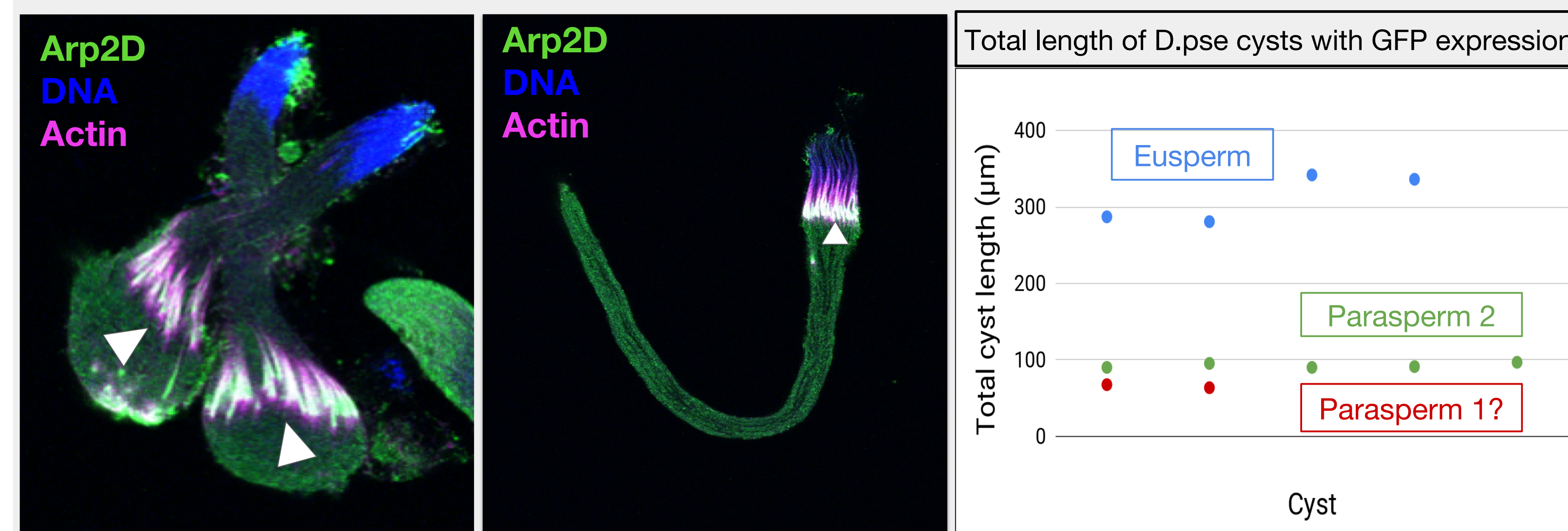


D. pseudoobscura produces heteromorphic sperm



Approach: Examine expression of Arp2D in long versus short cysts

Results:

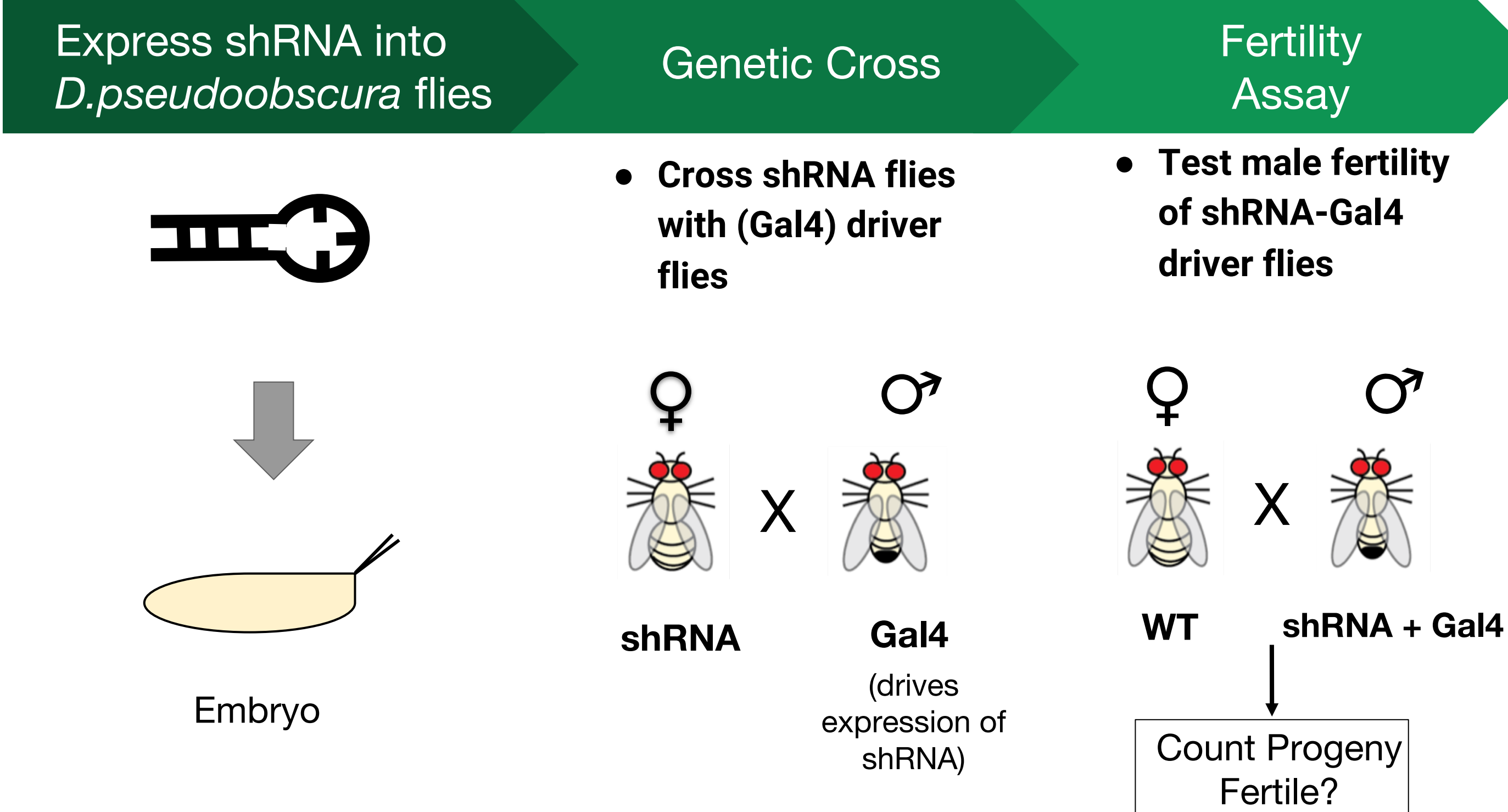


Cysts with GFP were measured.

Finding: Arp2D appears to be in all three sperm classes.

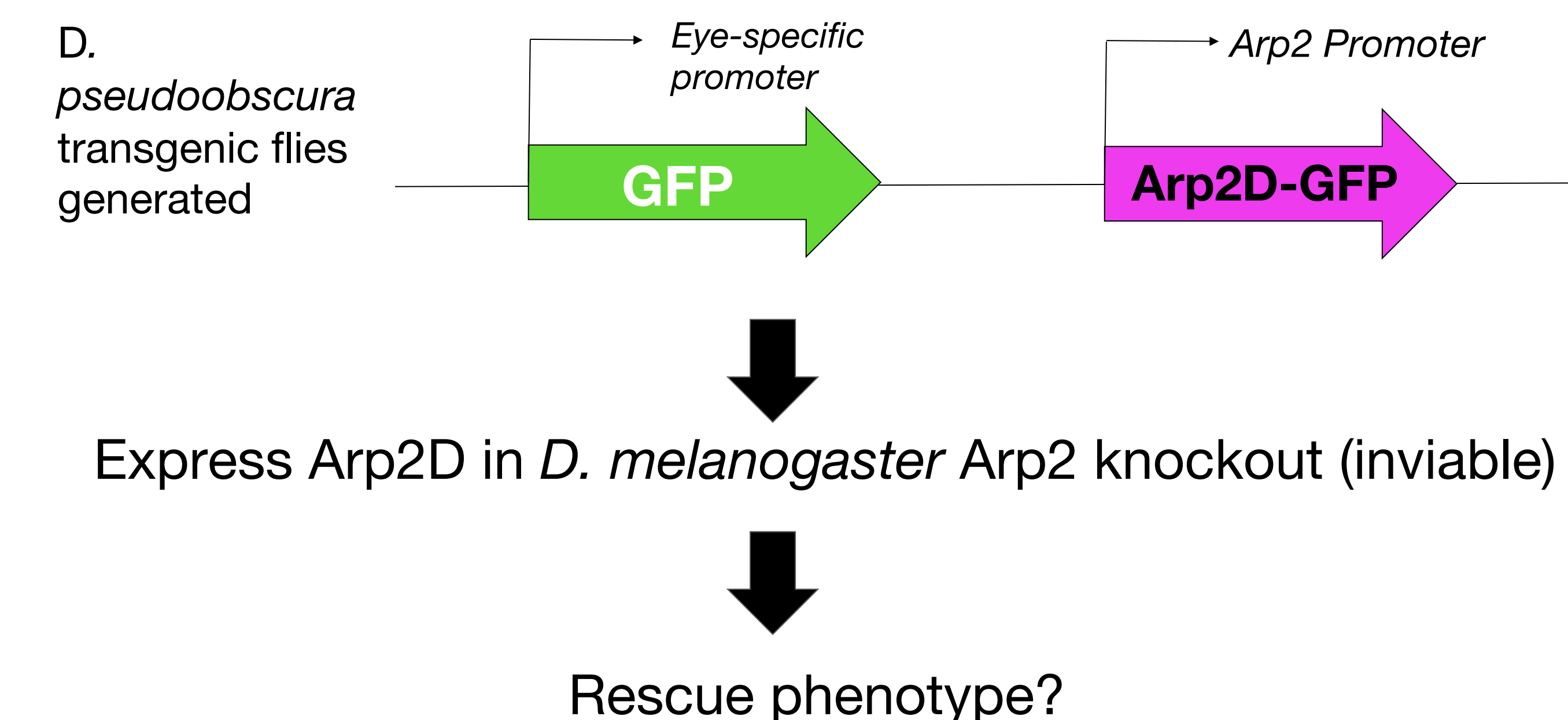
Arp2D's role in male fertility

Approach: Reduce expression of Arp2D and test male fertility



Can Arp2D replace Arp2?

Approach: Swap Arp2 with Arp2D in *D. melanogaster*



Current Questions

- Is Arp2D expressed more frequently in one sperm class than the others?
- Does reduced expression of Arp2D impede motility of actin cones?
- Does Arp2D alleviate genetic conflict by playing a meiotic role, while Arp2 plays somatic roles?
- Is Arp2 expressed during meiosis in *D.pse* and compete with Arp2D?

Acknowledgements

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