

Comparison of asymmetric RNA localization within Sterlet and African clawed frog oogenesis

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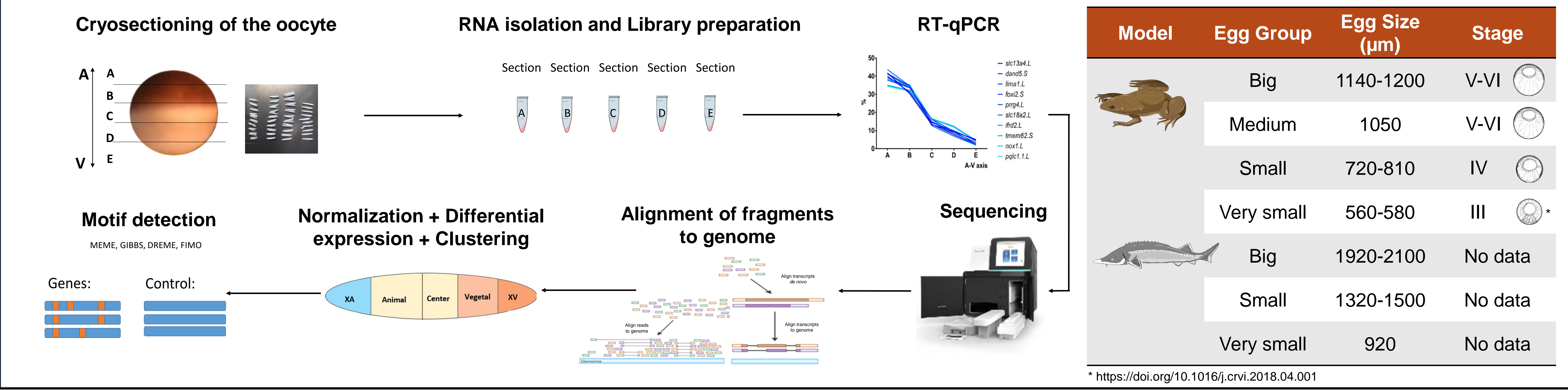
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Introduction

- Organism development is a complex process involving biomolecule organization, axis formation, development of the germ layers and tissue specification.
- Some of the **RNAs** and proteins **are accumulated during the first stages of oogenesis within the vegetal pole**, where they are shifted by METRO and late pathways.
- During oocyte development, **RNAs and proteins can be found throughout the whole egg and form animal/vegetal (A/V) axis**. However, the principles behind their distribution within the developing egg have still not been completely determined.
- Sterlets** are ray-finned bony fishes that **share** strong cytological **similarities during oogenesis with Amphibians**.

Aim: To better understand these mechanisms, we studied the oocytes from the African clawed frog (*Xenopus laevis*) and sterlet (*Acipenser ruthenus*) which belong to different classes: *Amphibia* and *Actinopterygii* respectively.

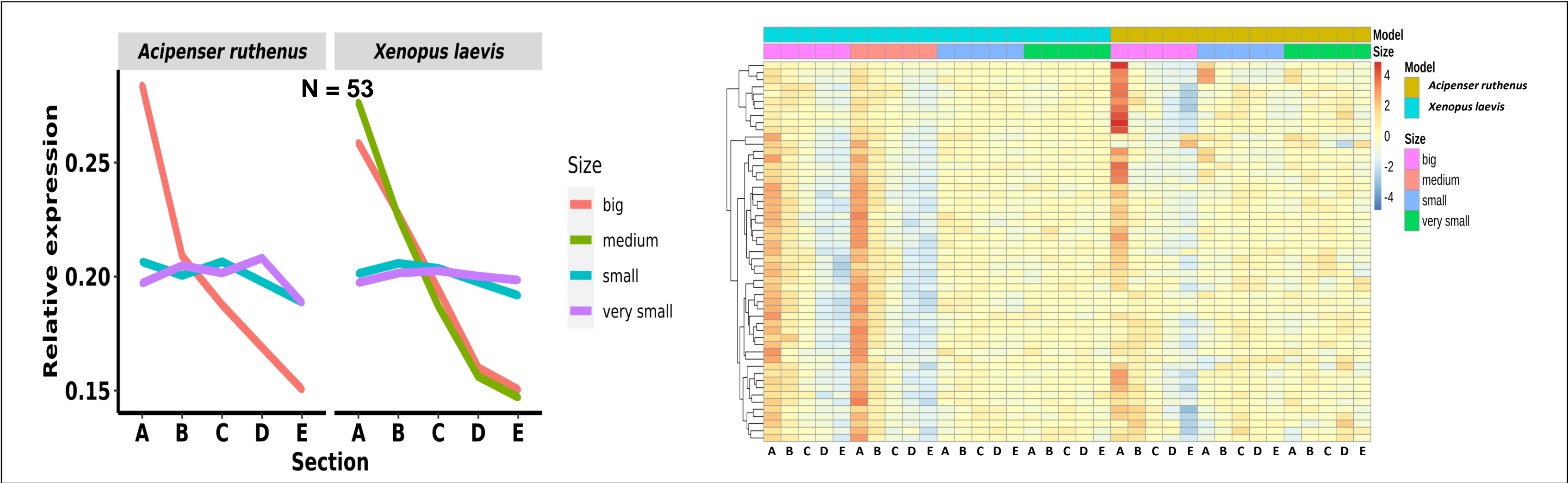
Materials and Methods



Results: Animal genes

Key point:

Genes are evenly distributed during early stages then establish animal profile in later stages

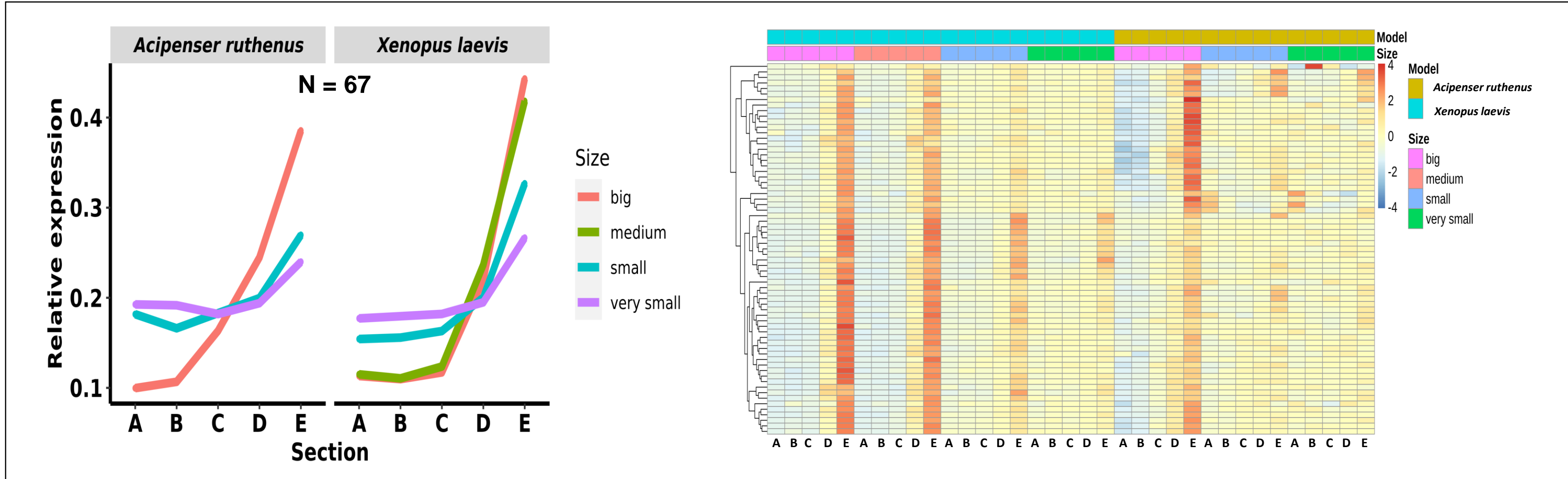


Clustered GO term	Gene symbol
Double-strand break repair	POLQ, INO80, BRCA2
Cell cycle	NOLC1, ERH, MCM2
DNA repair	POLQ, SMG1, INO80D, INO80
mRNA export from nucleus	SMG1, NUP210
Others	ANO1, NBEAL1

Results: Vegetal genes

Key point:

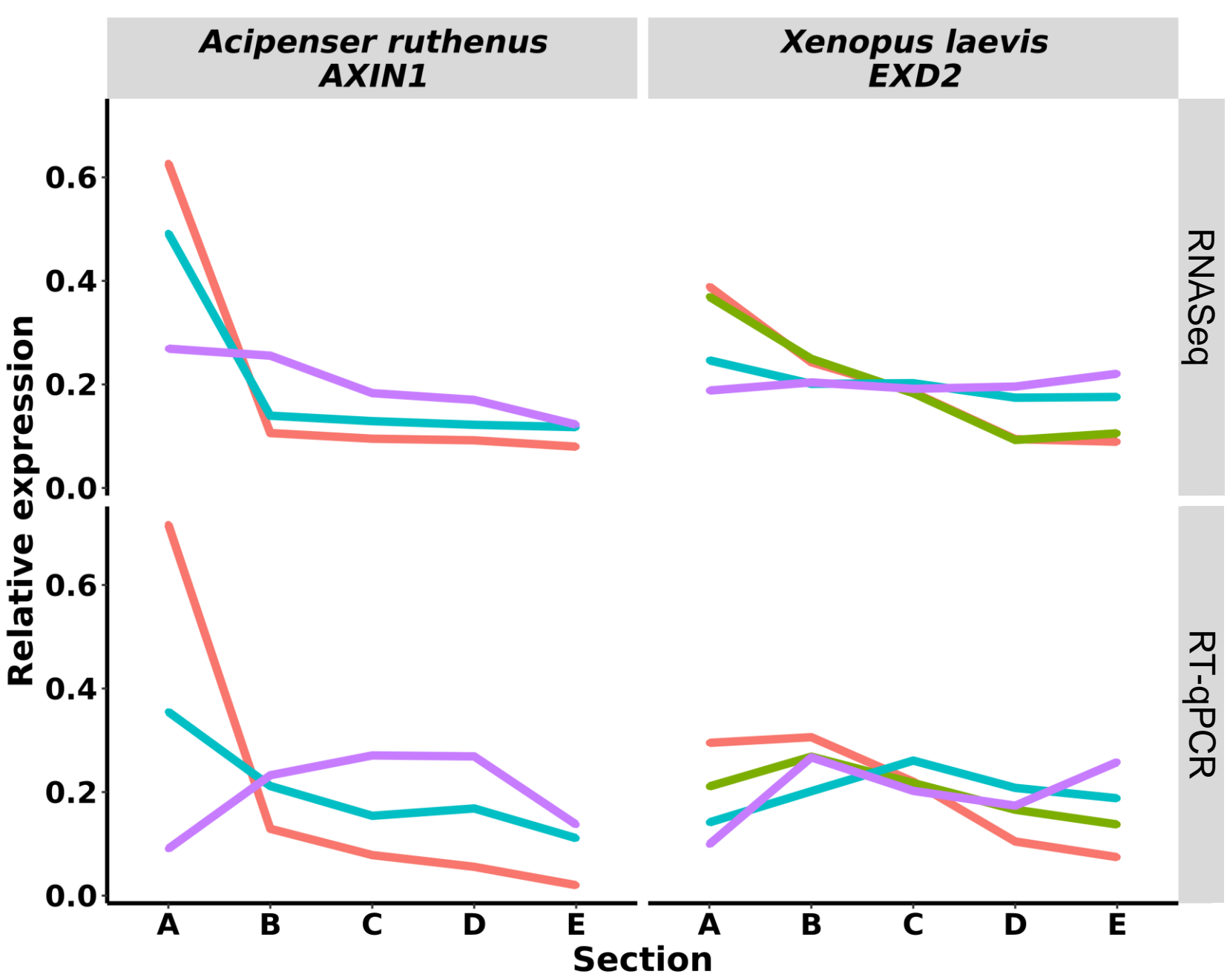
Profile of vegetal genes become even more pronounced in the later stages.



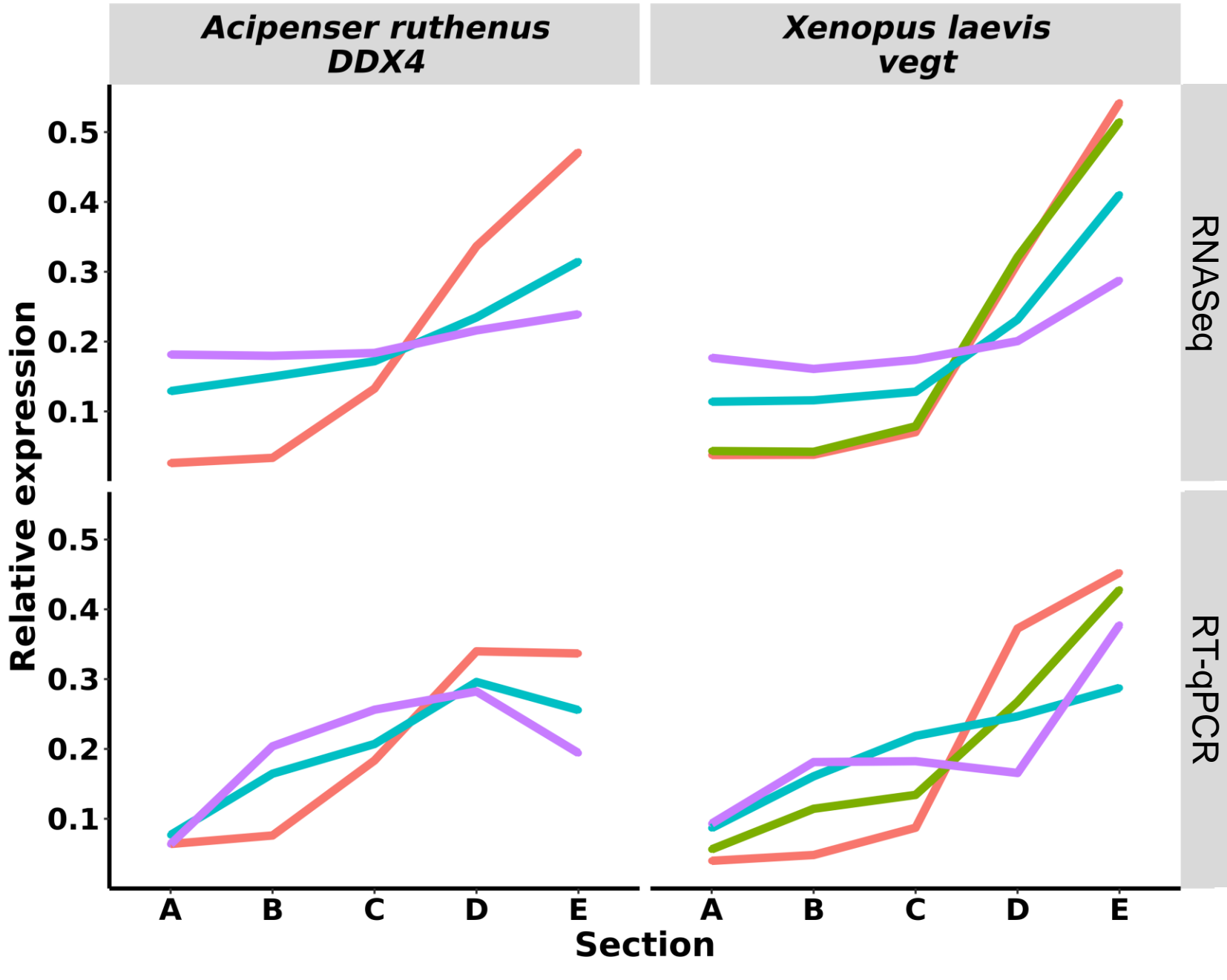
Clustered GO term	Gene symbol
Regulation of cell morphogenesis	CAMSAP1, ZRANB1
Protein transport	ARFIP1, PLK3, PCNT, STX2
Signal transduction	ARL9, RAB35, RALGDS, RALGPS2, P2RX4, CTNND2, KIF13B, CREM, GNG12, IGF1R
Gonad development	WNT5A, RNF38, ARID5B
Others	IKZF4

Results: RT-qPCR

Animal genes



Vegetal genes



Conclusion

- Establishment of **asymmetry** of some genes **is stage dependent**.
- Subsets of animal and vegetal **genes** appear to establish its final **localization pattern in the later stages**.
- Apparent **establishment of an animal profile** and it occurs during the later stages.
- Establishment of some **vegetal profiles** appear during the **early stages** but becomes more distinct in the later stages.
- Potential **de novo transcription** within the egg for some genes.