

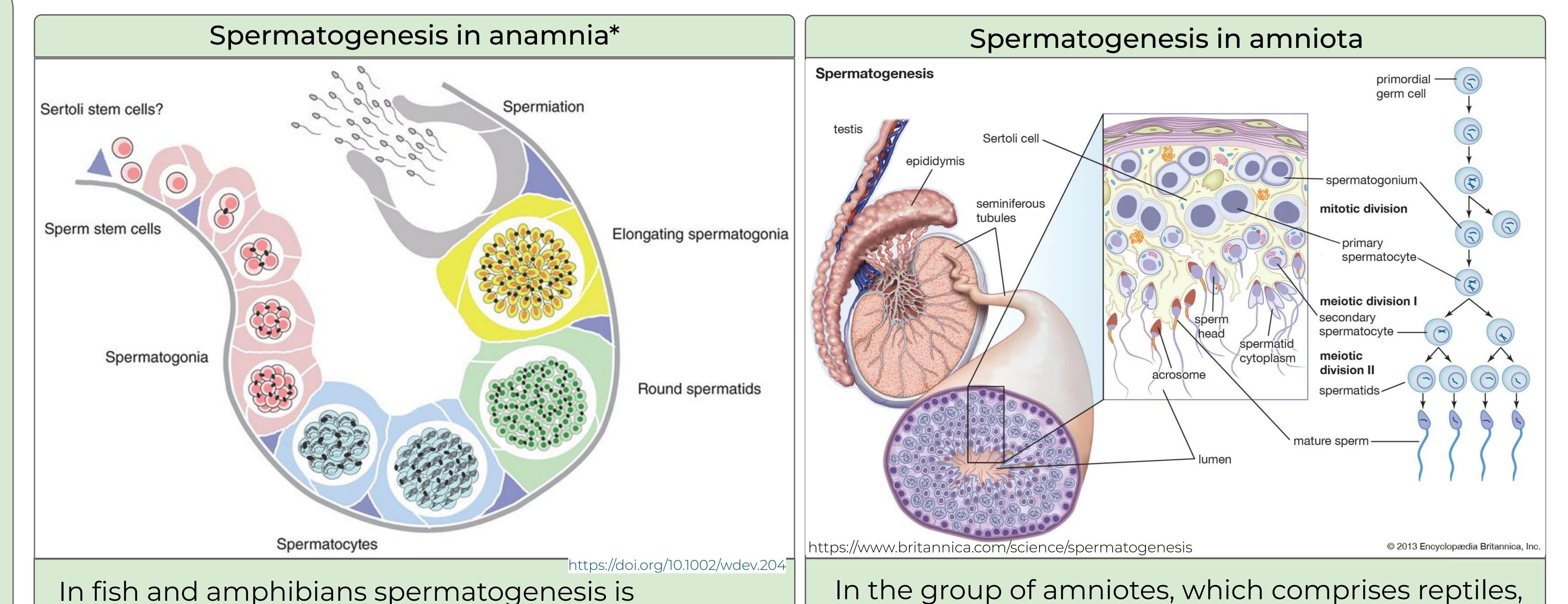
# Irreplaceable instrument: an insight into evolution of cell types of vertebrates' gonads



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#### Introduction

In the process of evolution, many organs appeared, changed and disappeared. But the structures that determine sex and produce germ cells were relevant for all organisms of any structural complexity. Their functions were extremely important, and the corresponding genes were under more pressure of stabilizing selection. However, the testes still gradually changed their morphological structure and, therefore, are an interesting object for testing the hypothesis of the conservative nature of the evolution of regulatory systems that determine the expression of genes that are specific to cell types. At present, an array of cellular-resolution expression profiling data has been



# Unconventional way of spermatogenesis in anamnia

accumulated to conduct a mass comparative analysis of expression patterns of cell differentiation genes in the testes.

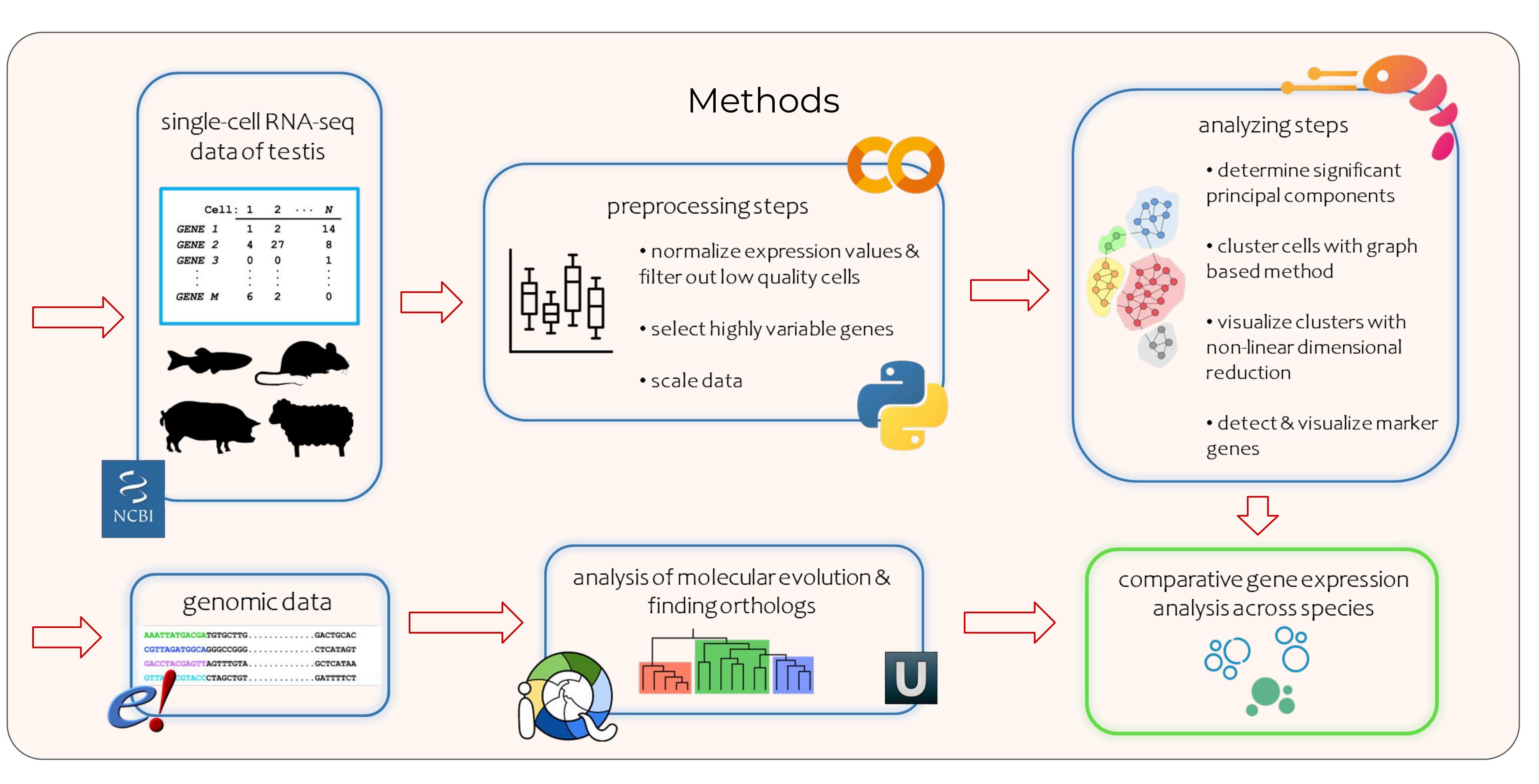
sometimes called 'cystic'. The maturation of spermatozoa takes place inside of the cysts formed by Sertoli cells. When spermatozoa fully mature, the cyst's wall ruptures releasing flagellated gametes. birds and mammals, spermatogenesis occurs in seminiferous tubules. The least differentiated cells are found on the periphery, while the most differentiated are closer to the center of a tubule.

### Aim of the research:

To determine evolutionary features of pattern of expression of genes, that specifically mark the main cell types of vertebrates' testes.

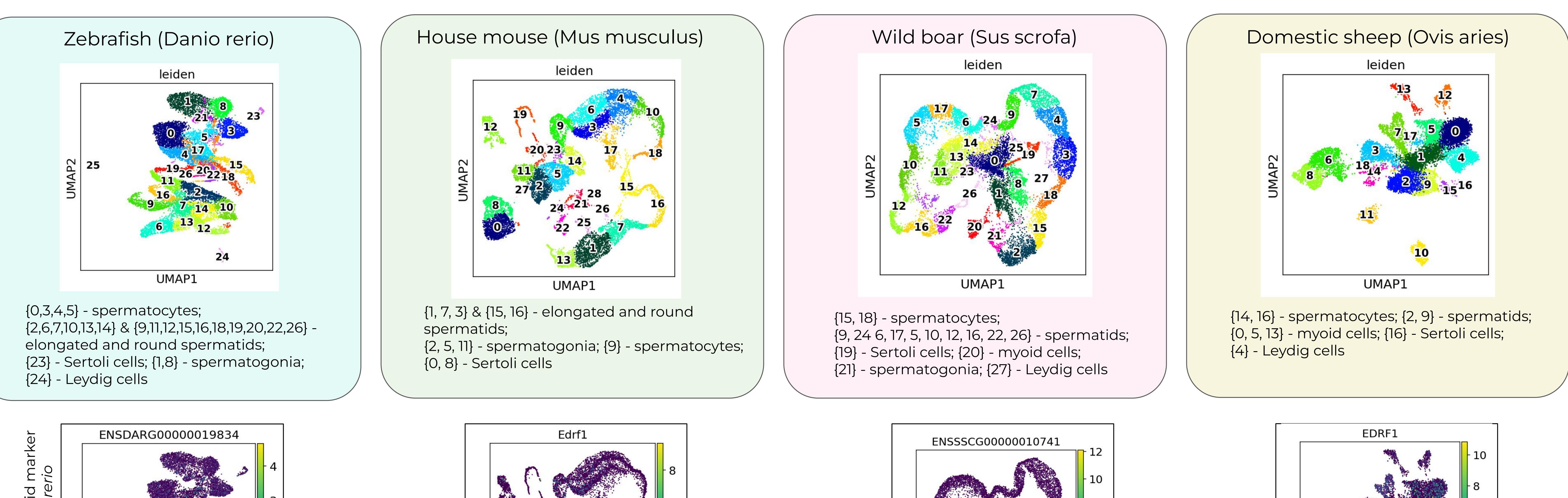
## Objectives

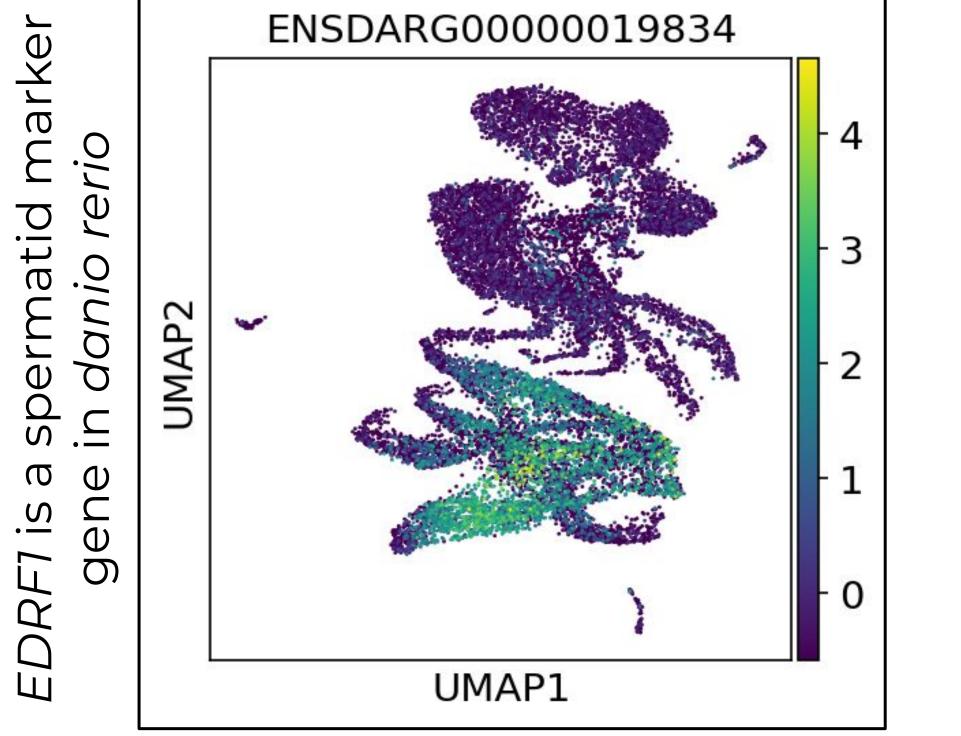
- To run a standardized analysis of scRNA data for a number of vertebrate species obtained by other research groups.
- To identify clusters that correspond with respective cell types of vertebrates' gonads.
- To determine marker genes of the cell types
- To analyze the molecular evolution for each species' marker genes, identify orthologs and paralogs.
- To compare expression distribution of marker genes of crucial cell types between the species of interest.

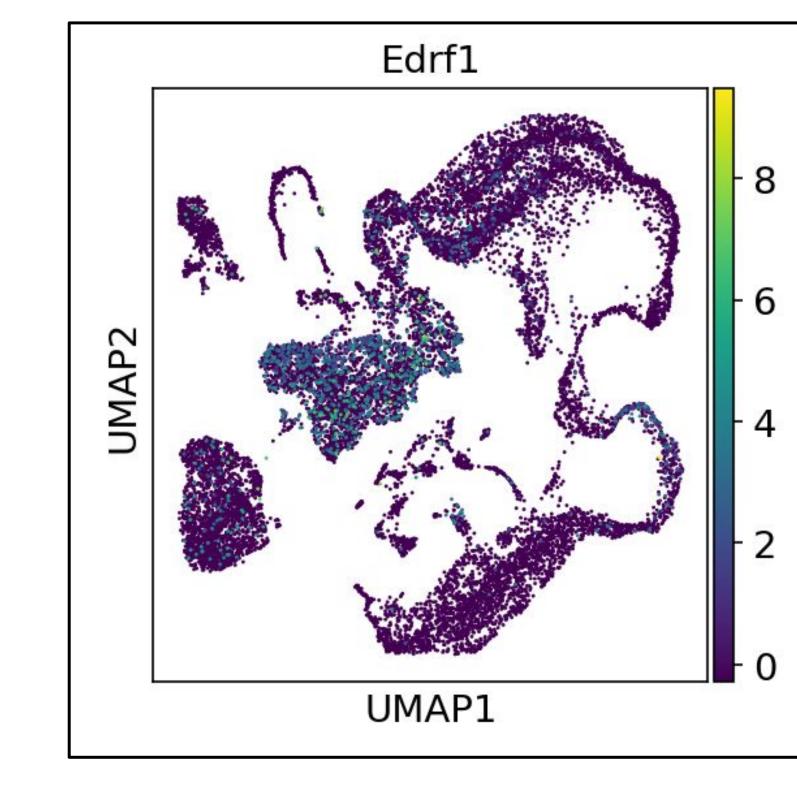


UMAP representation of clusters for all species & expression patterns of the marker genes.

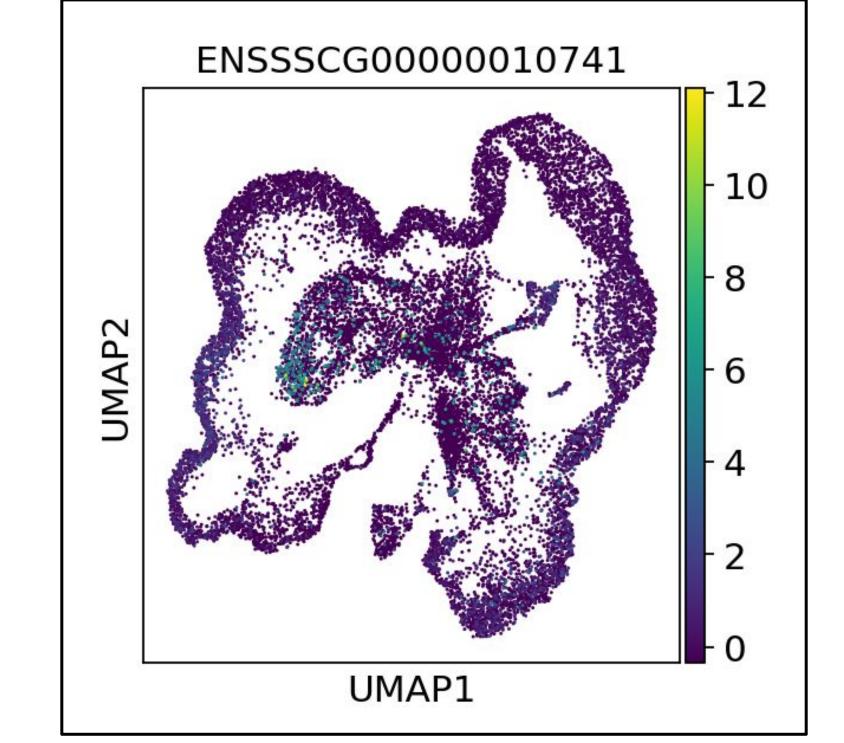
The colors from purple to yellow represent the expression levels from low to high.



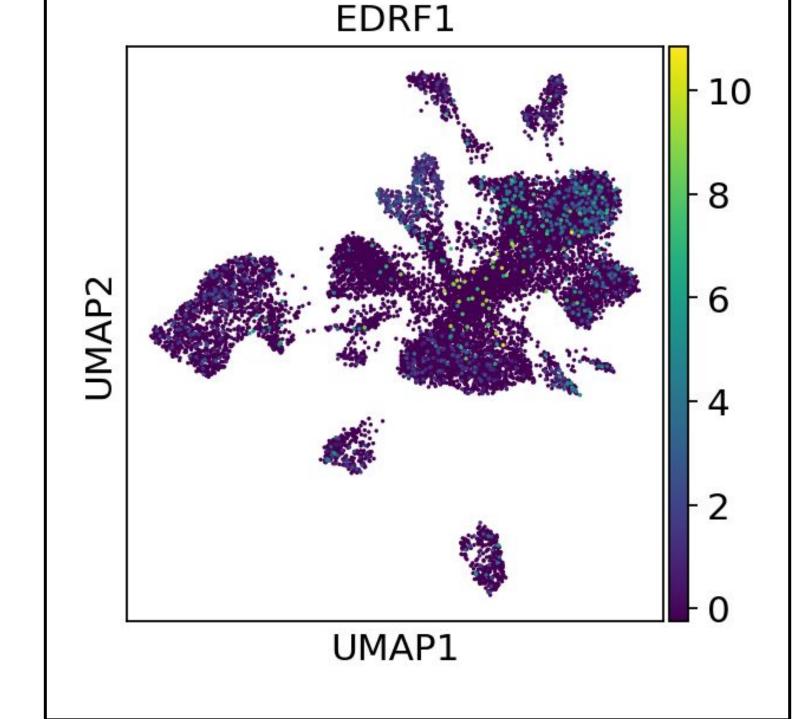


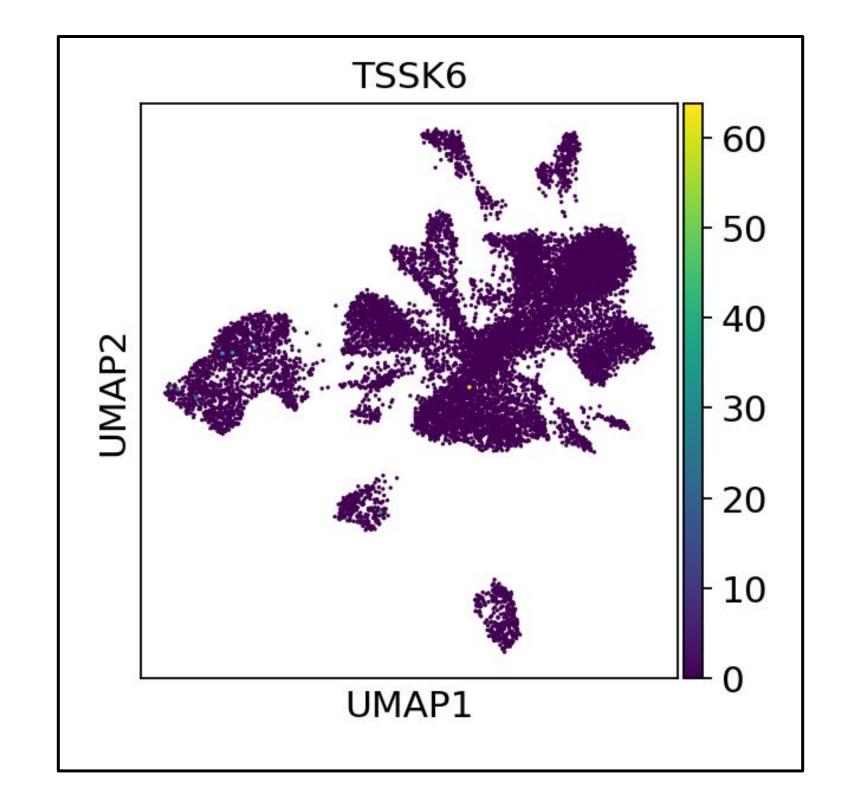


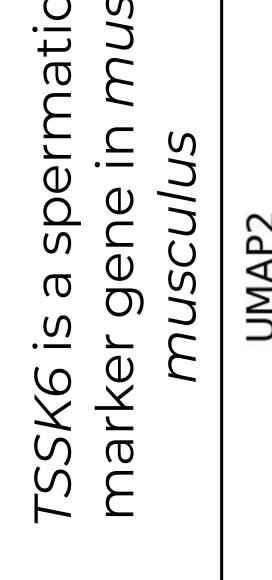
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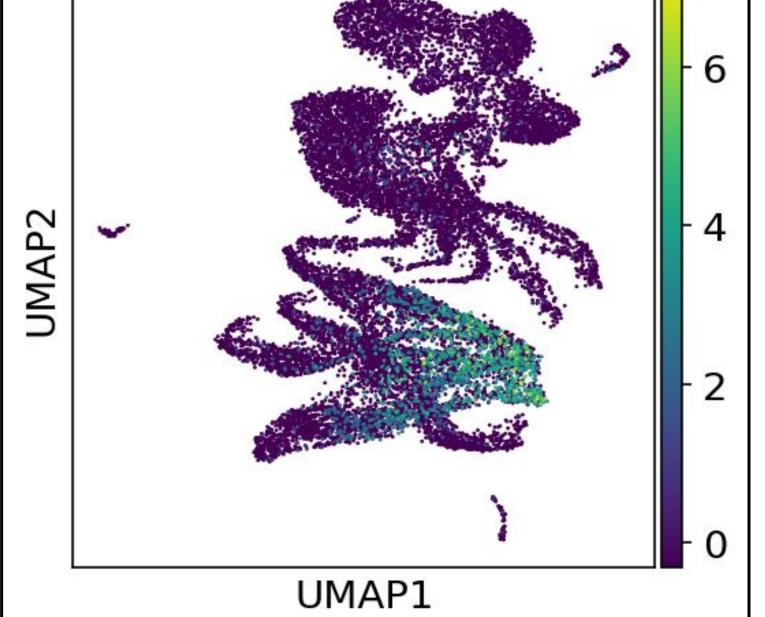


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