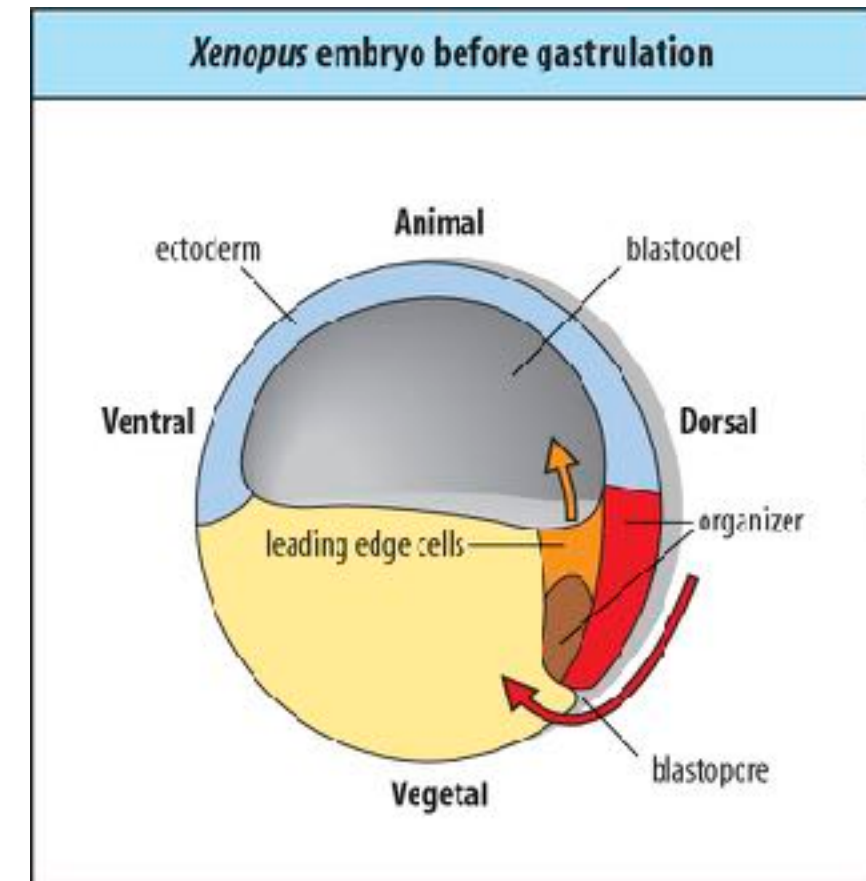
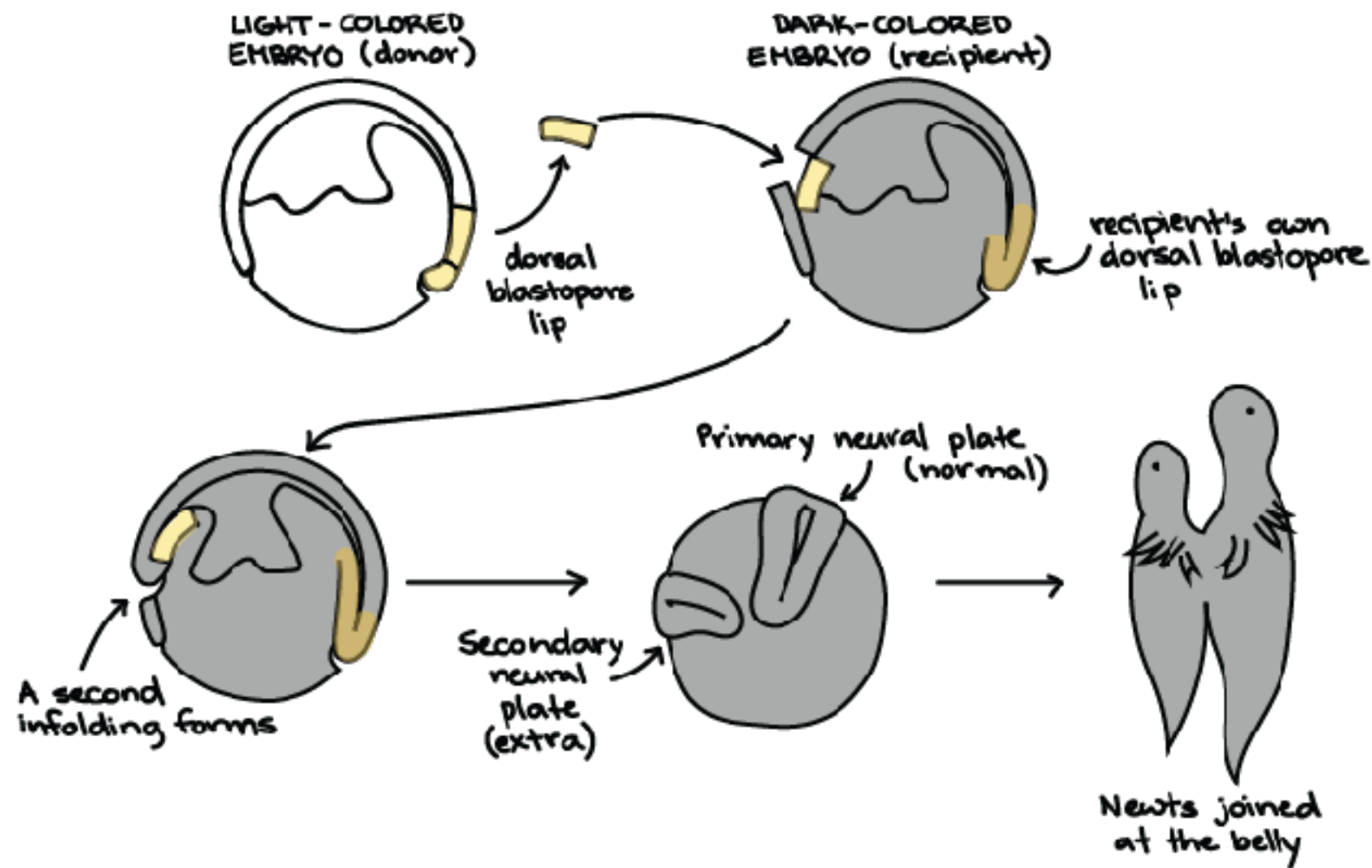


BIO-221

Exercises week 5

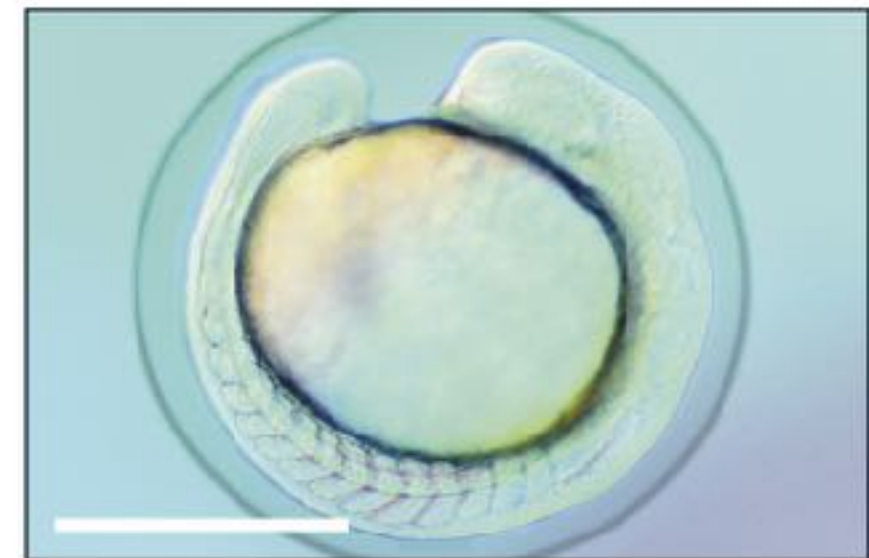
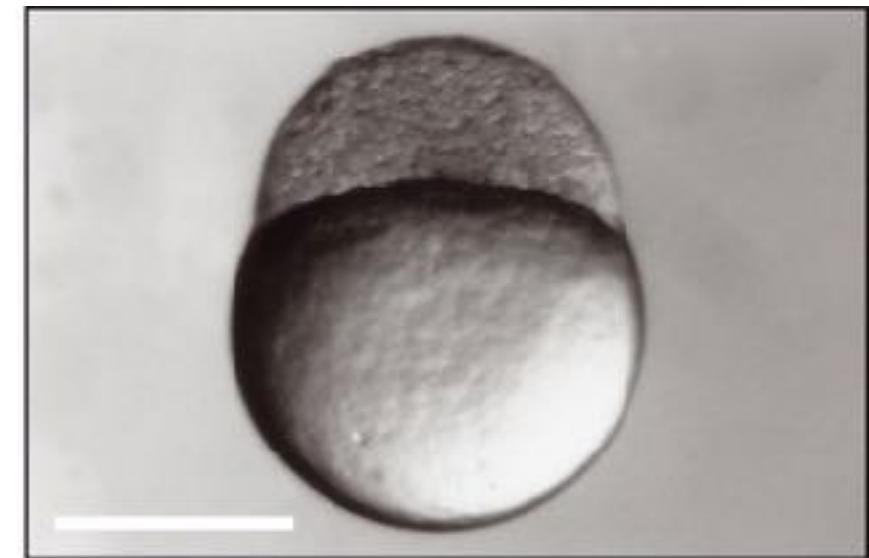
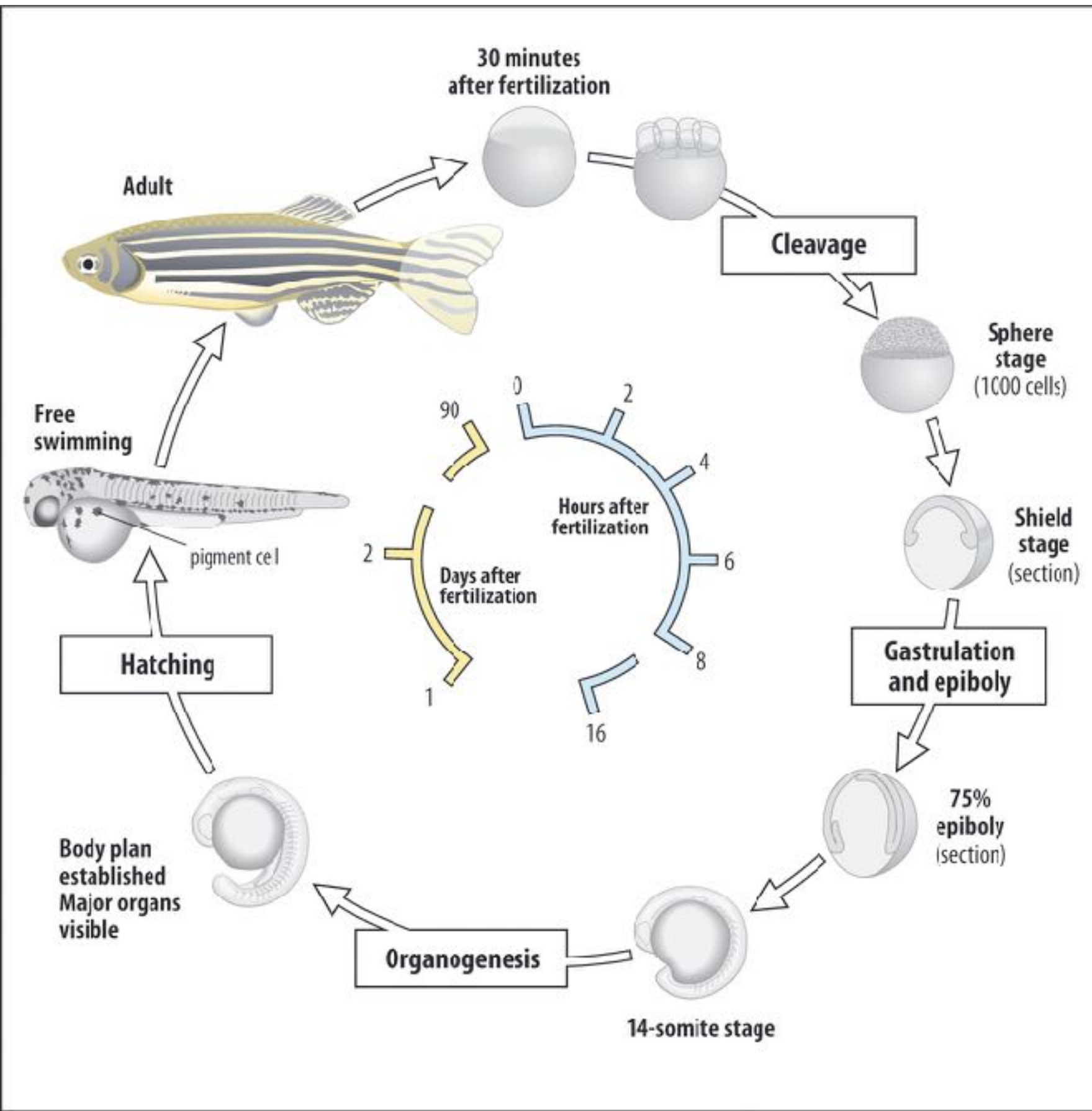
(Brief) introduction to zebrafish development

The organizer - a specialty of amphibia, or a general mechanism of development?

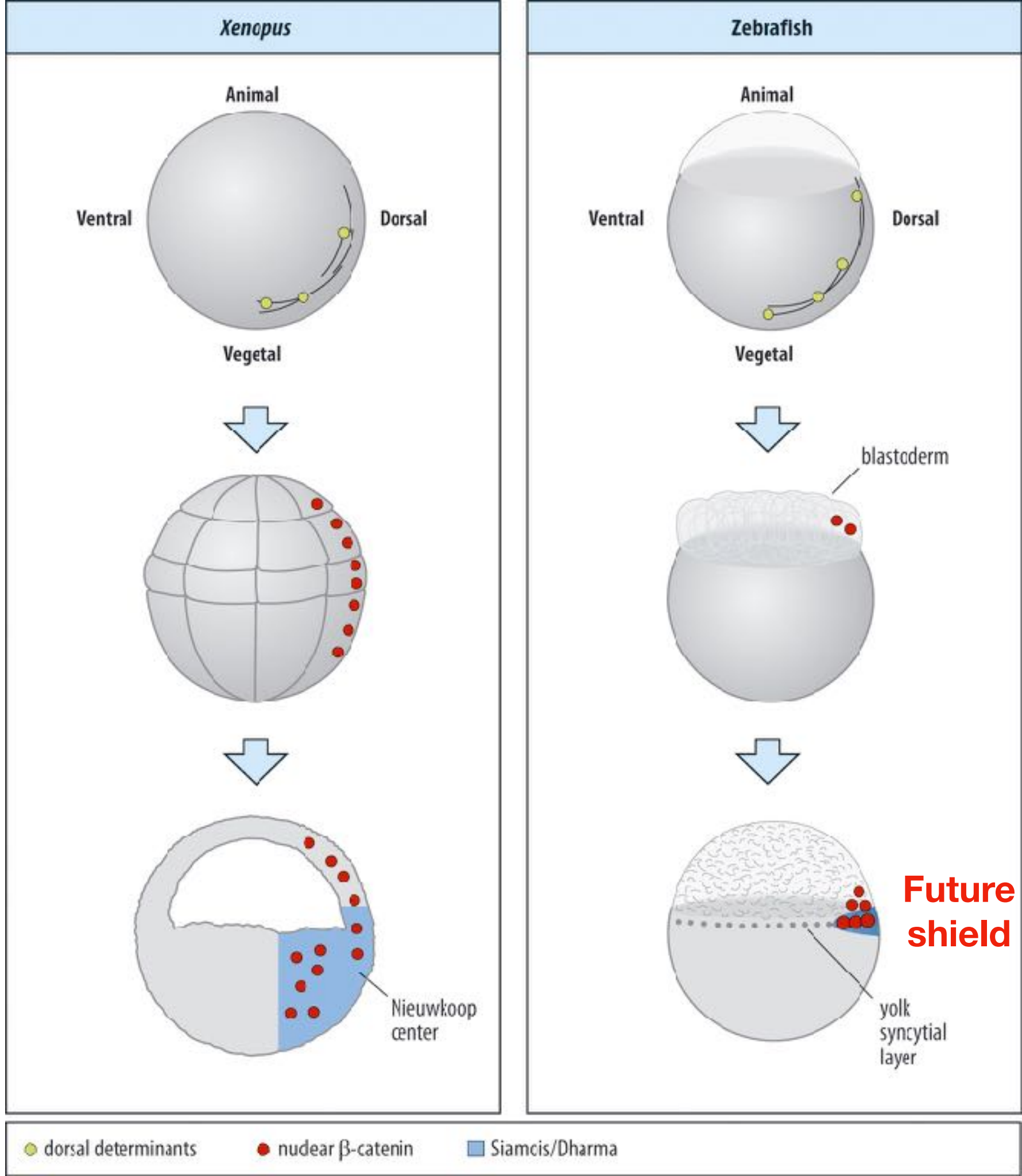


A signal from the light-coloured embryo instructed the dark-coloured embryo's cells to change their behaviour: "organizer" of a new blastopore

Zebrafish life cycle

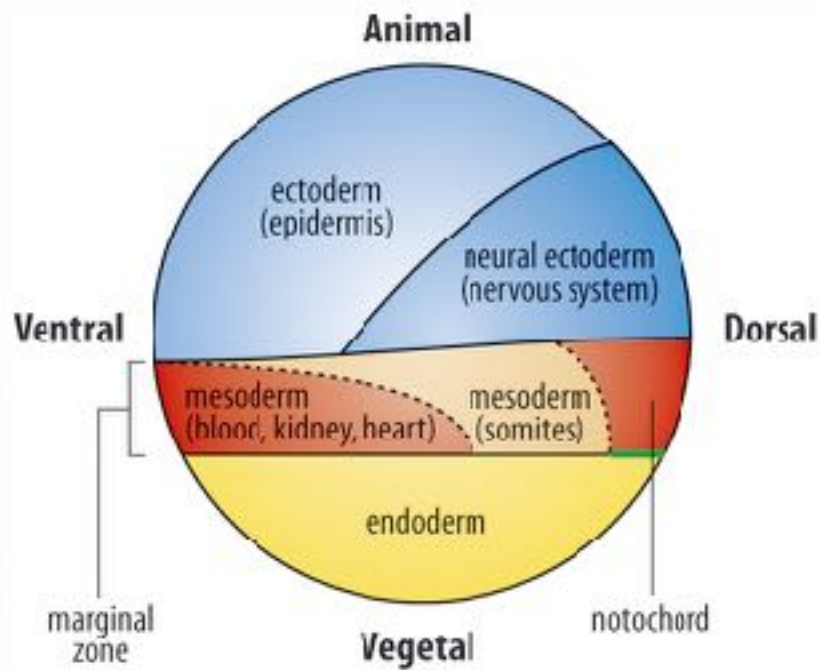


Zebrafish early symmetry breaking



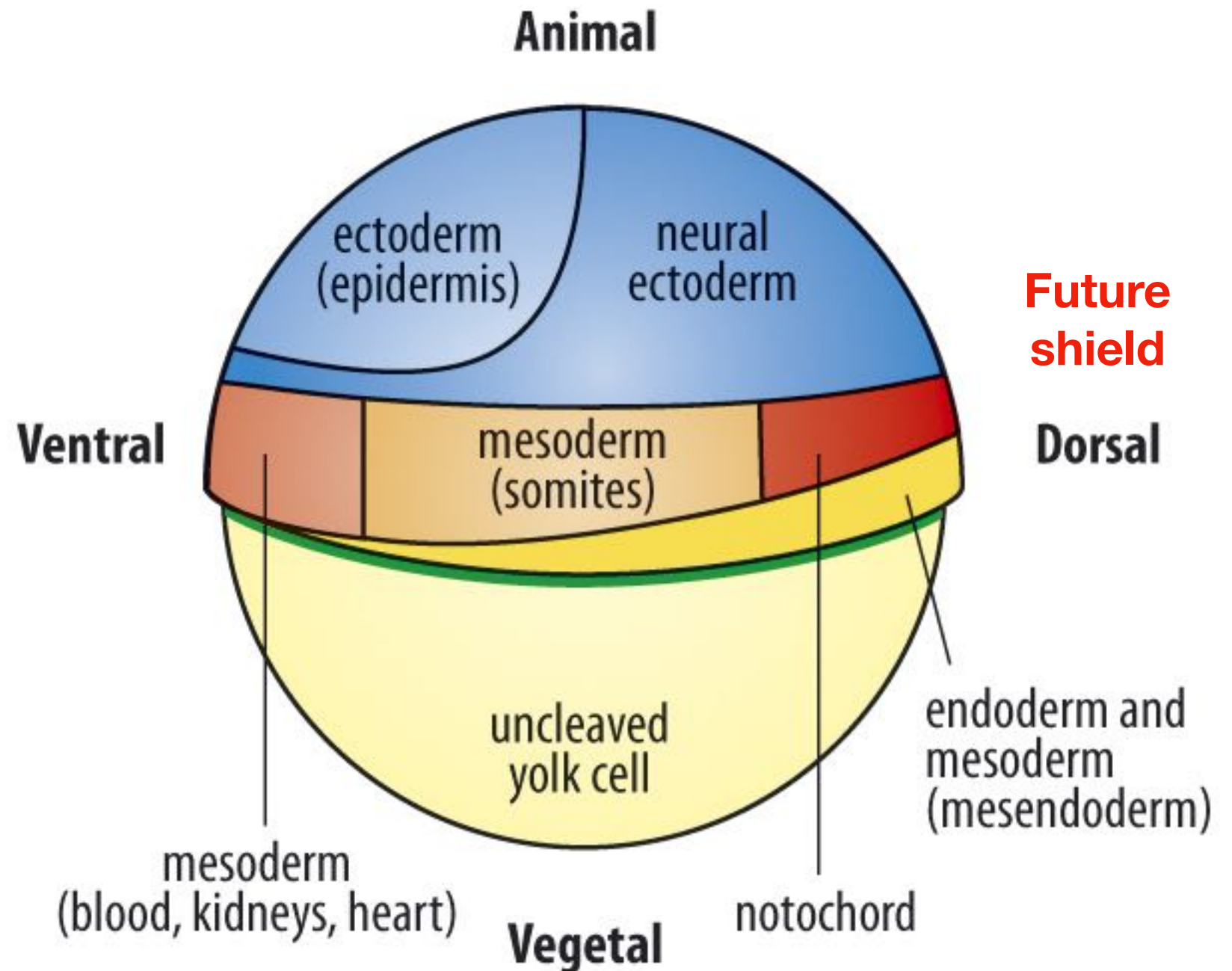
Zebrafish fate map

Fate map: lateral view



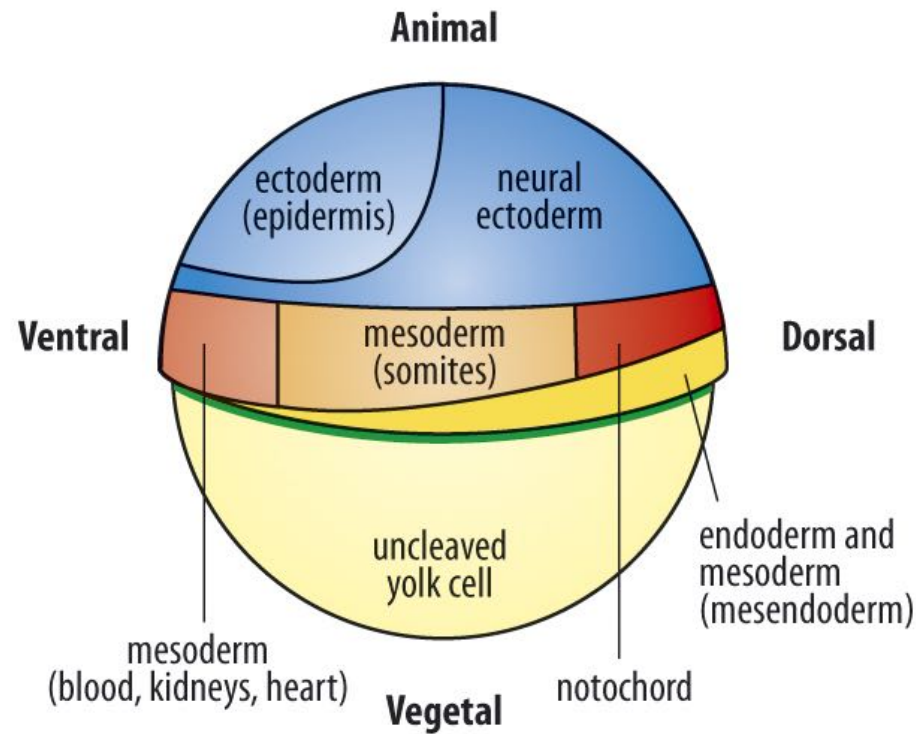
Xenopus

Fate map of zebrafish at the early gastrula stage



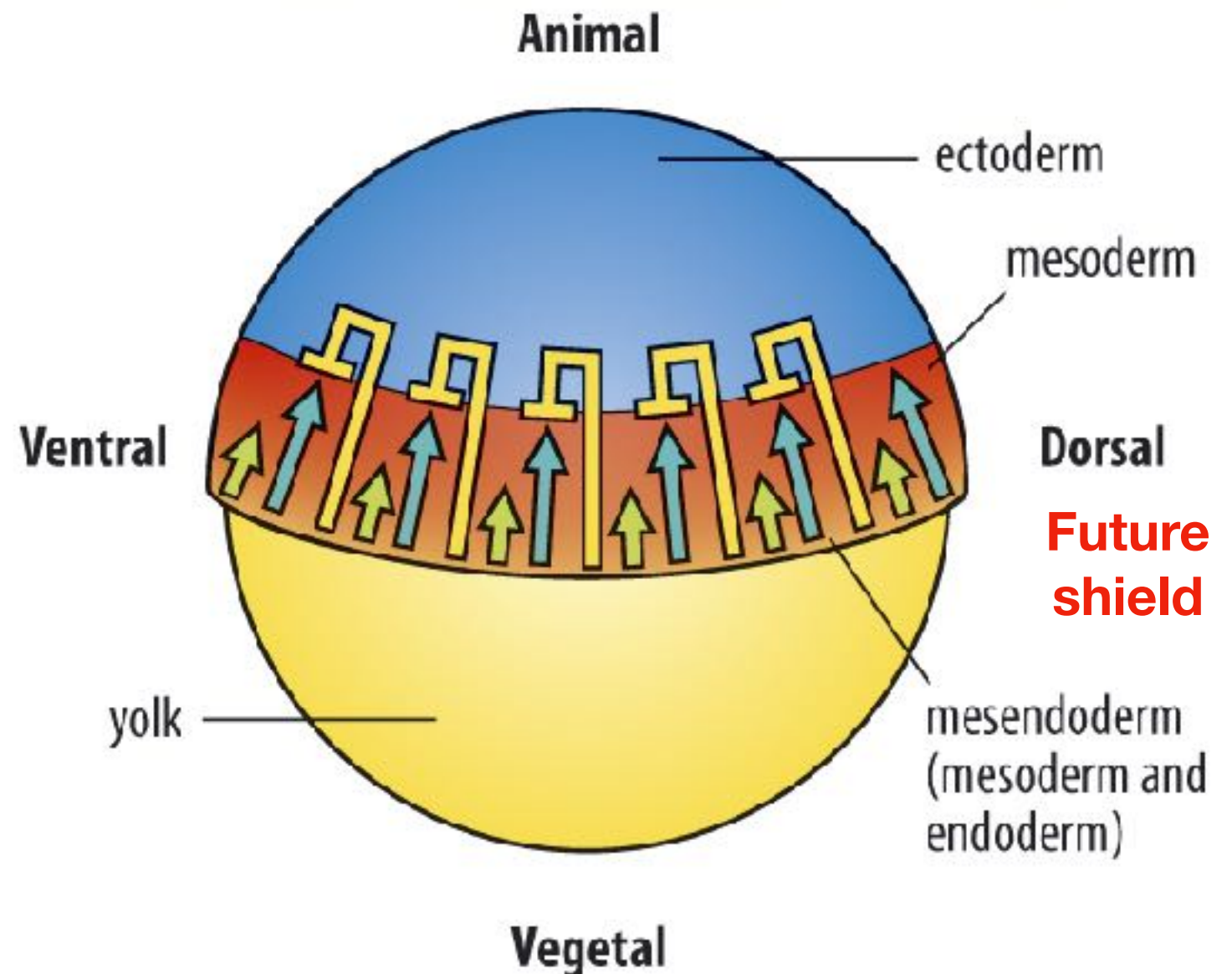
Zebrafish germ layer induction

Fate map of zebrafish at the early gastrula stage



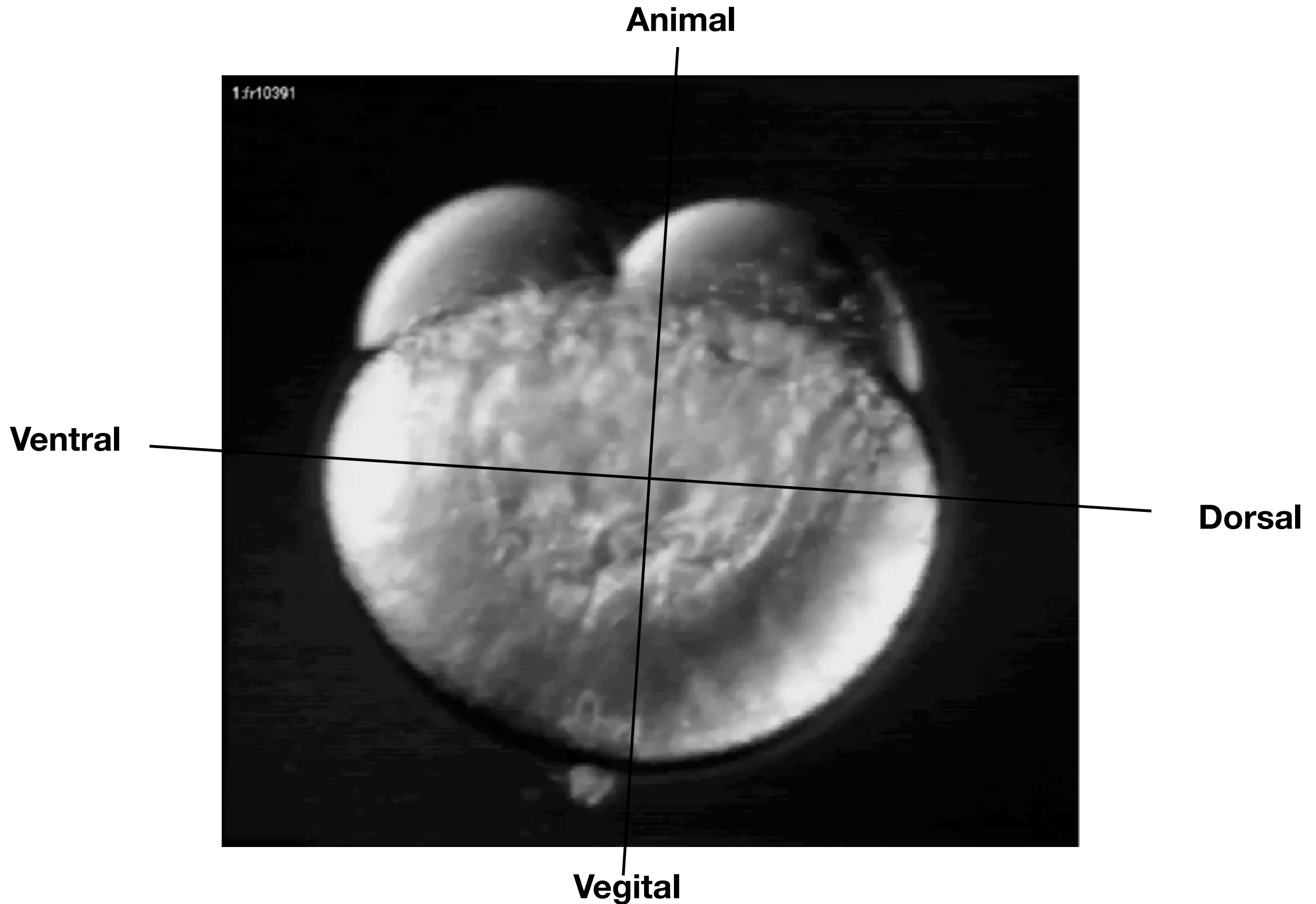
TGF beta family
Nodals
Activin
BMPs

Mesoderm and endoderm induction in zebrafish

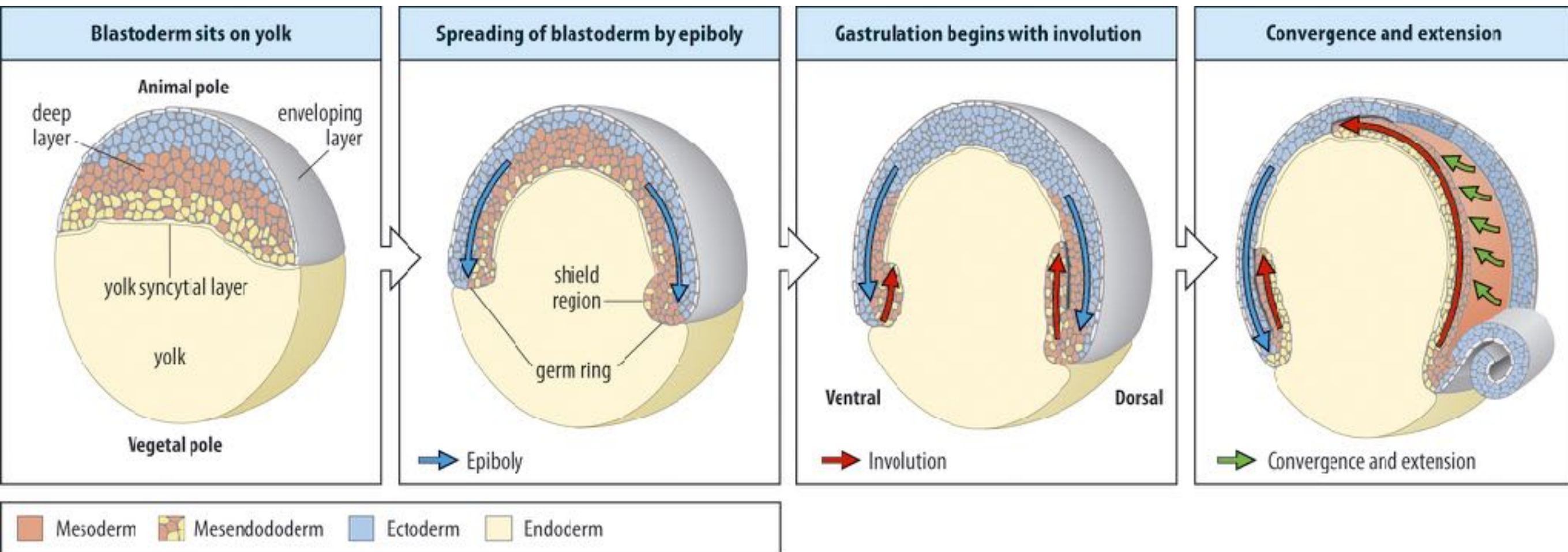


 Squint
  Cyclops
  Lefty

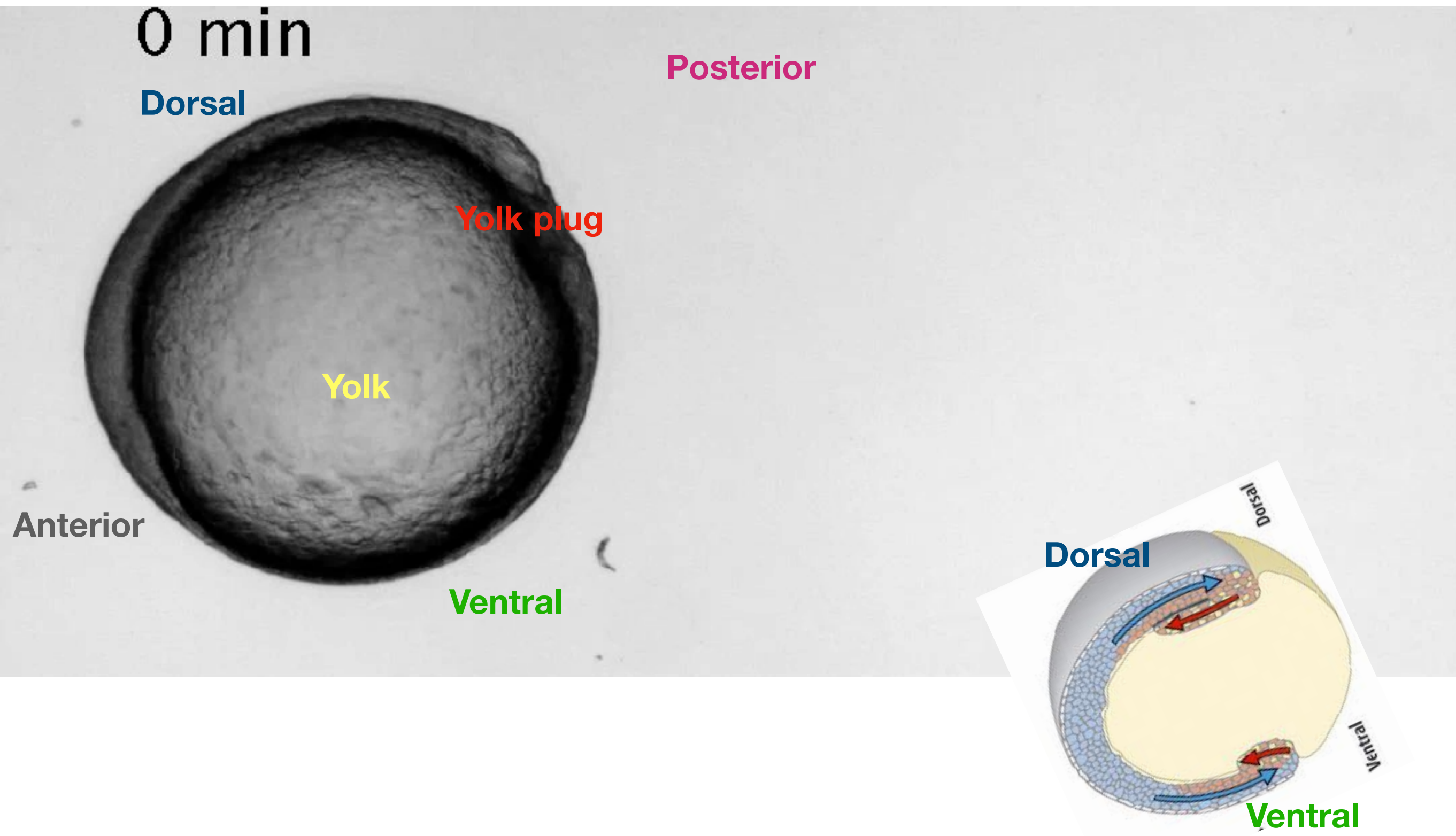
Zebrafish epiboly and gastrulation



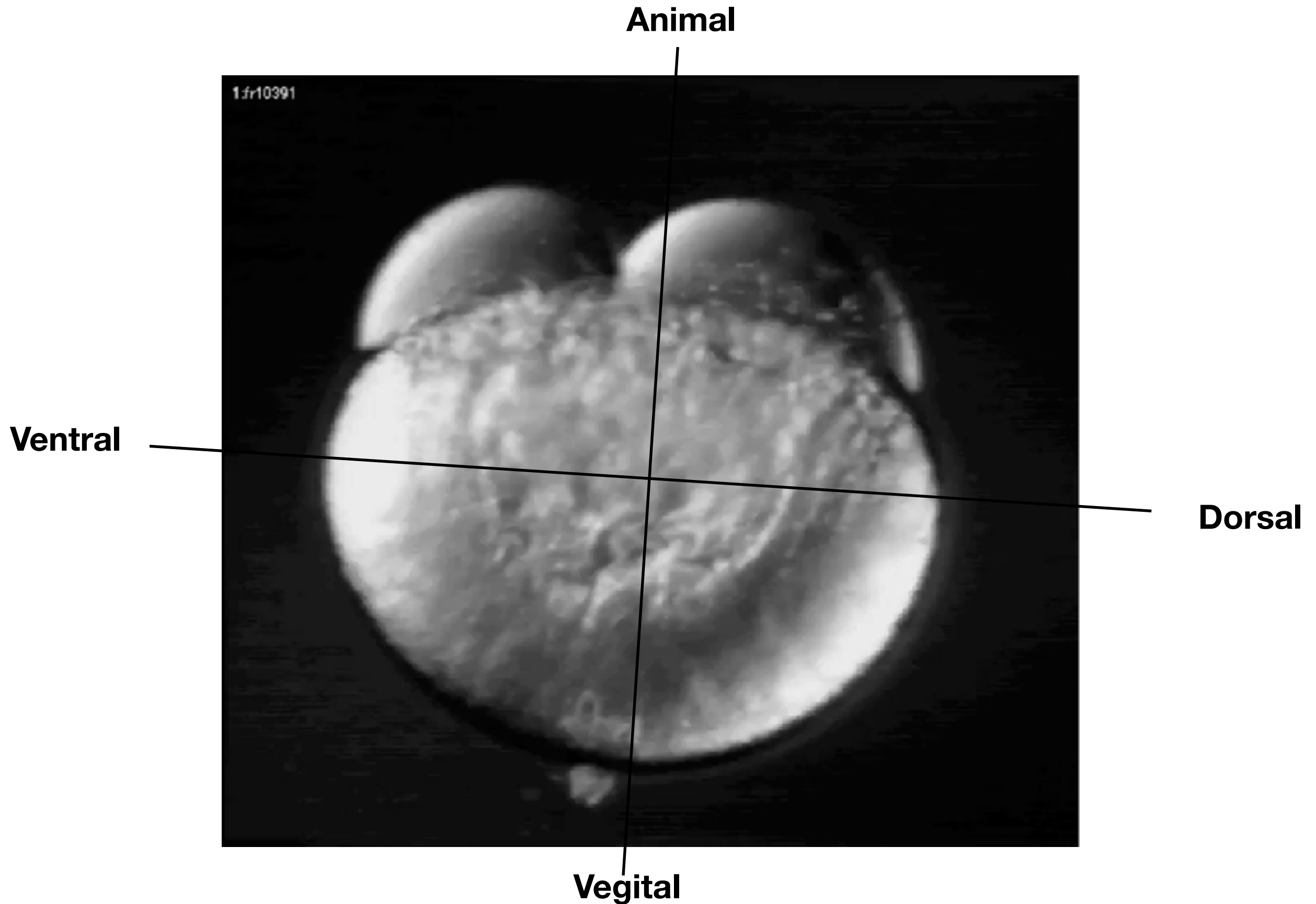
Zebrafish epiboly and gastrulation



Zebrafish development - segmentation stages



Zebrafish epiboly and gastrulation



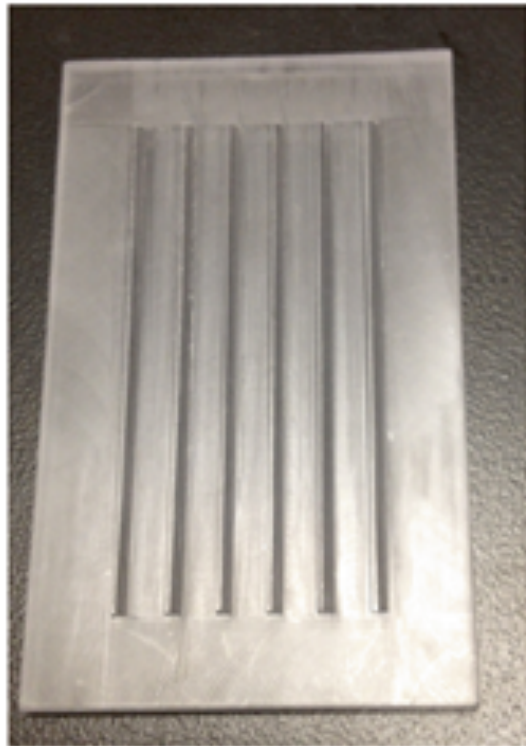
How do you test for organizer / function?

- **Definition of organizer?**
- **What developmental stage?**
- **Which structure(s)?**
- **What molecules?**

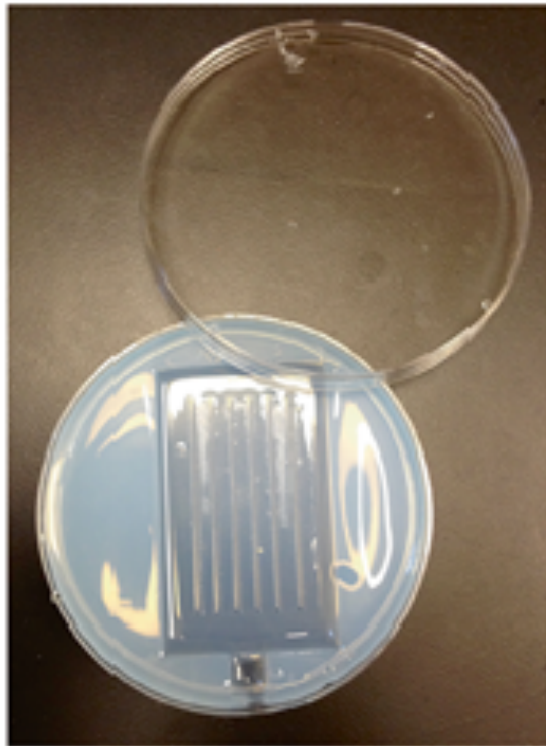
Simple techniques....

Microinjection

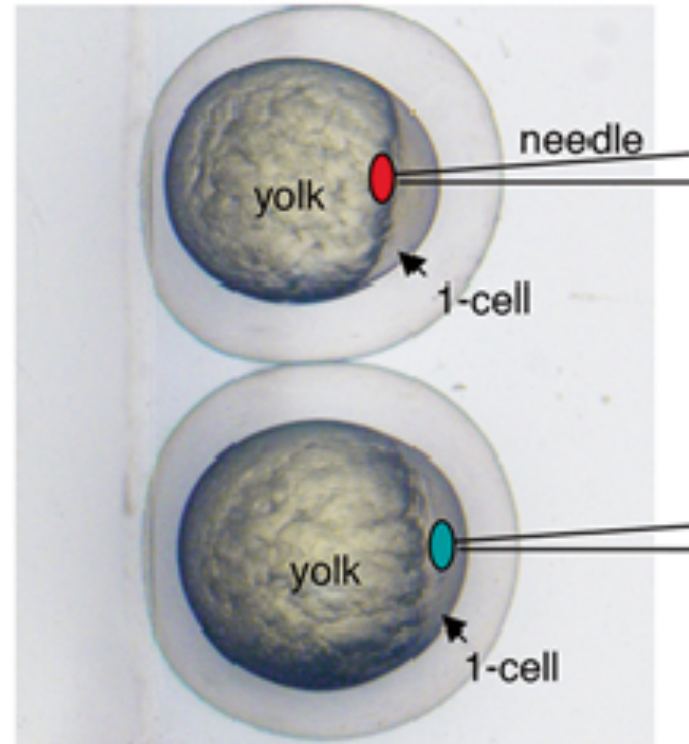
a



b



c



e



f



Transplantation

