

Meeting the Biological Models

zebrafish and annual killifish



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Main vertebrate groups



Myxinoidea + Petromyzontoidea



Amphibia

Actinopterygii



Reptilia

Chondrichthyes



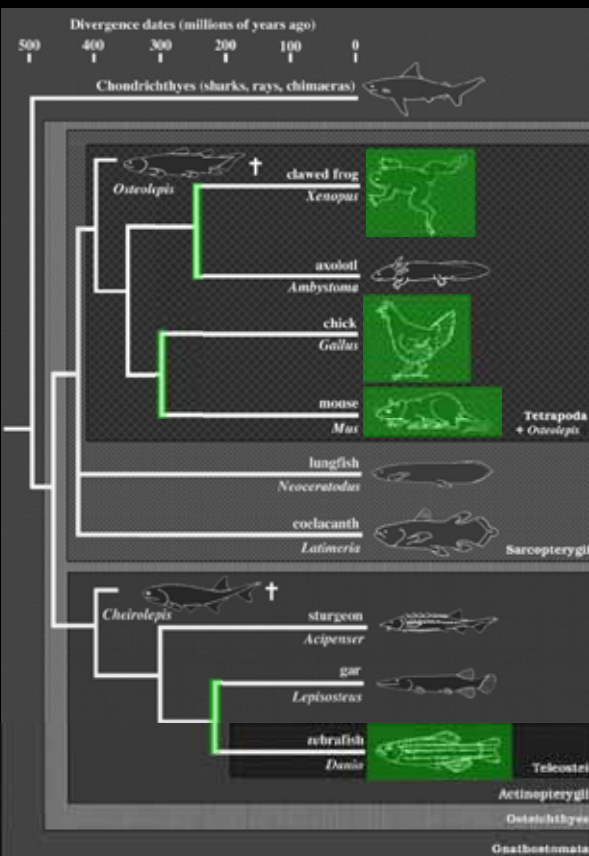
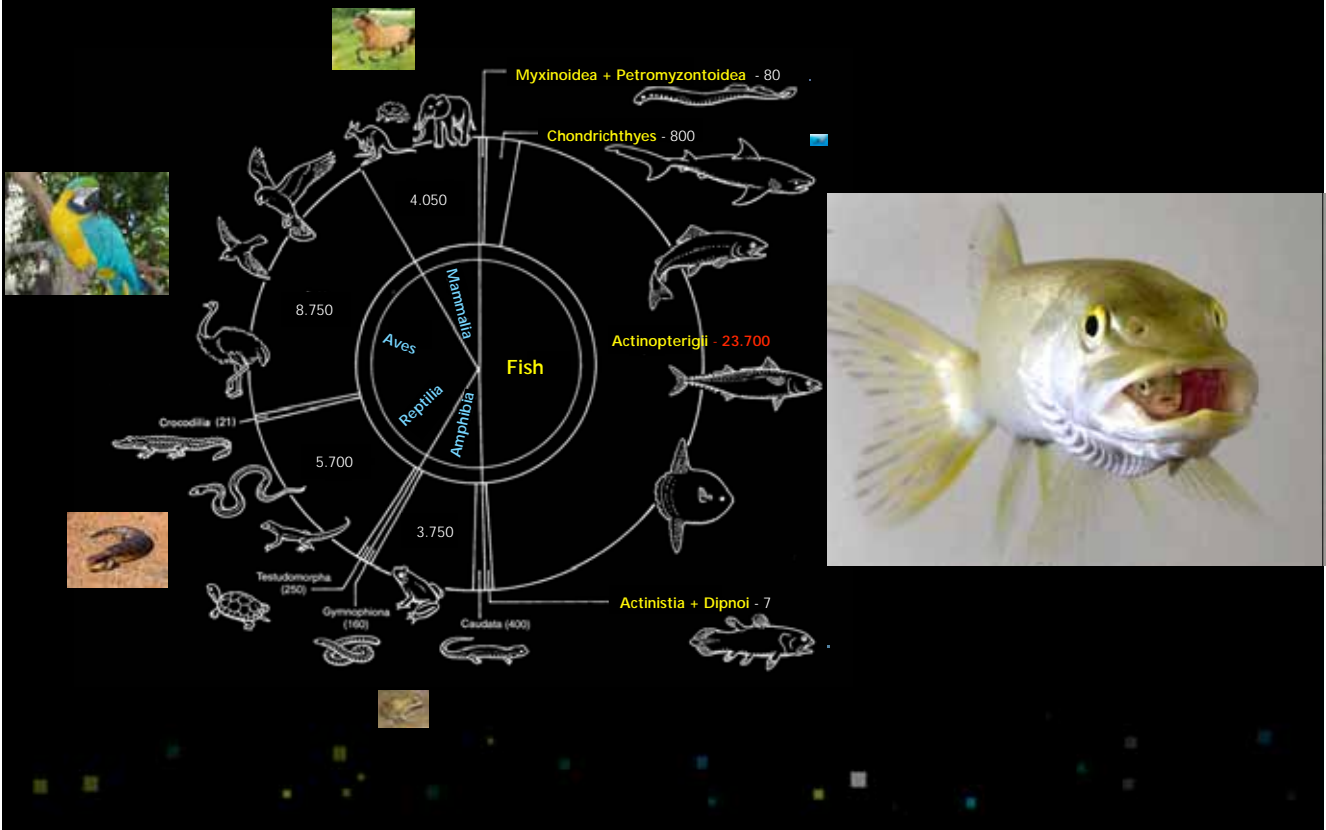
Aves

Actinistia + Dipnoi



Mammalia



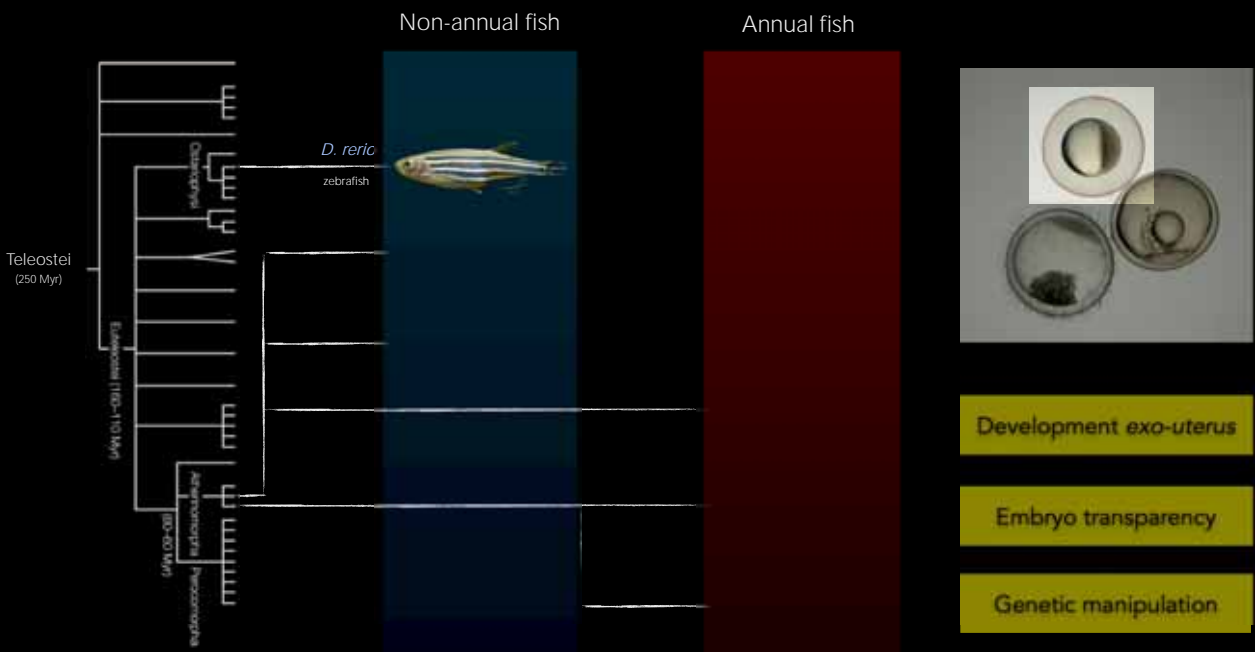
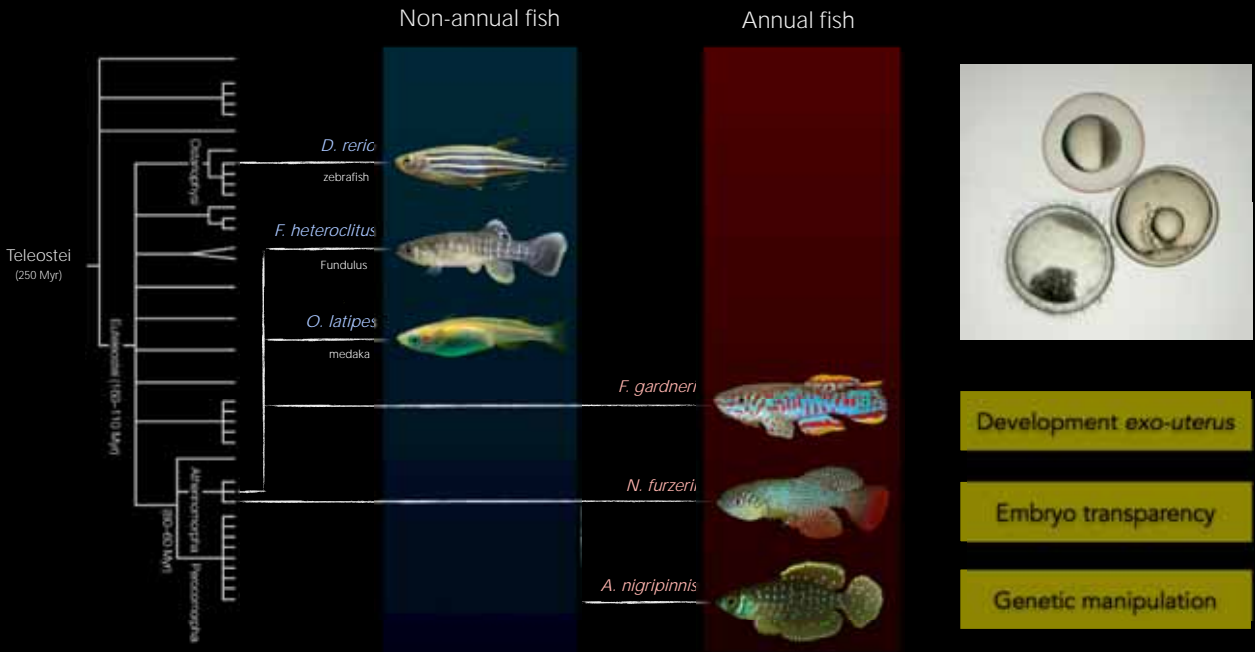


The lineage leading to zebrafish (the most known teleost model) diverged 200-300 m.y.a.. This is also observed for other vertebrate models.

Zebrafish had a long history of independent evolution when a large number of *derived* features were acquired.

Therefore, zebrafish can not be considered as more "primitive" or "advanced" than other vertebrate models

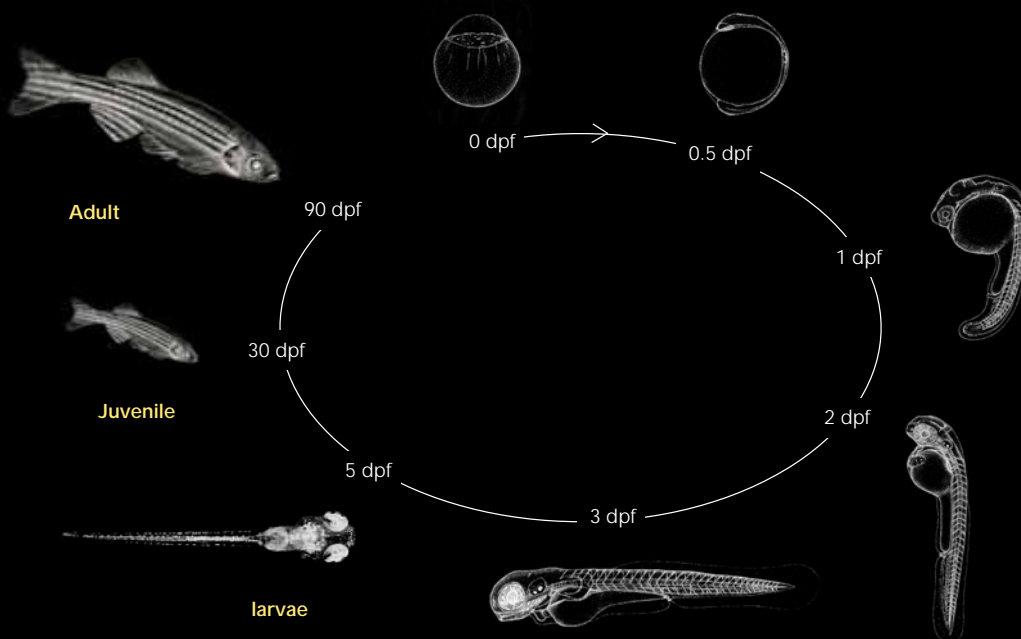
Zebrafish has gained the "model status" mainly for **practical reasons**, and not due to phylogenetic history.



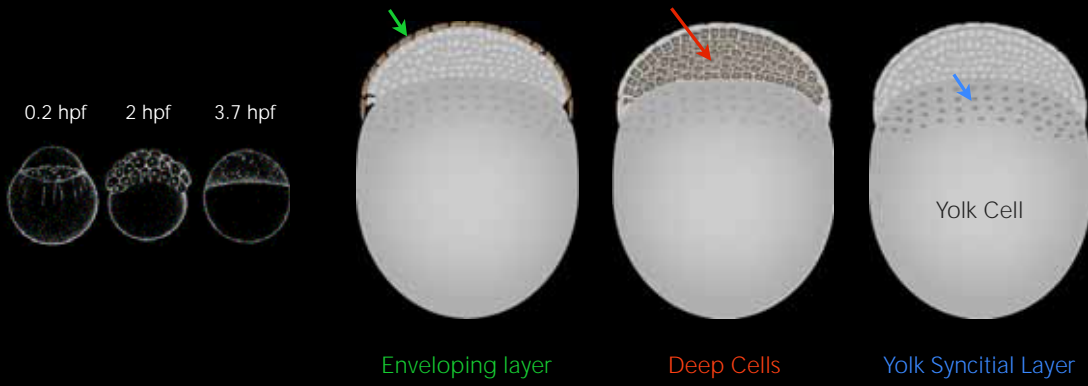
Small size, easily bred in the lab



Short life cycle - about 3 months



Three main cell types during embryonic development



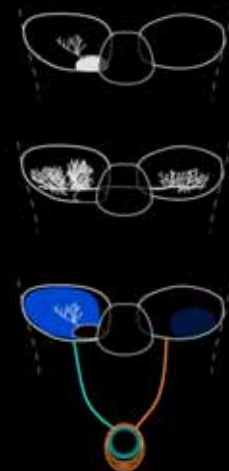
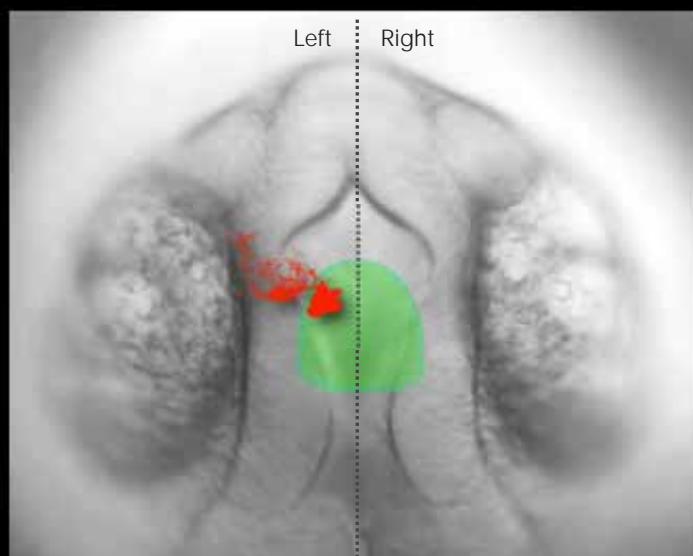
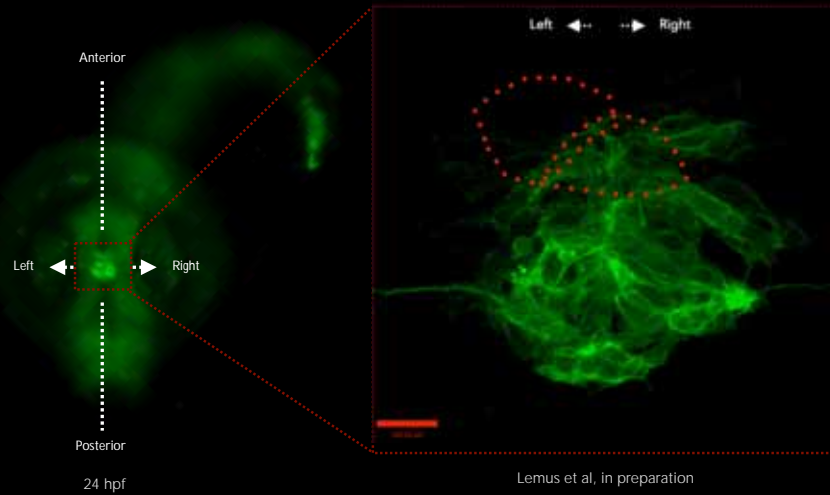
Short period of embryonic development

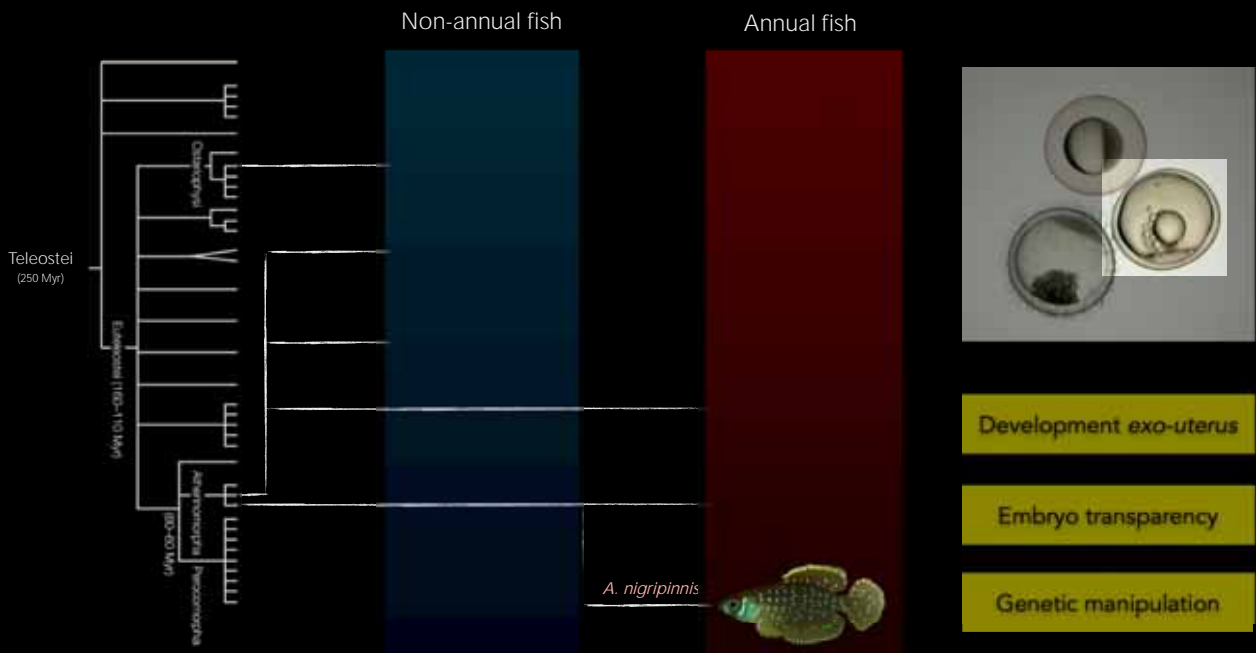


Karlstrom & Kane 1996 Development 123:461



$Tg(flh::gap43-EGFP)$





Main features

male

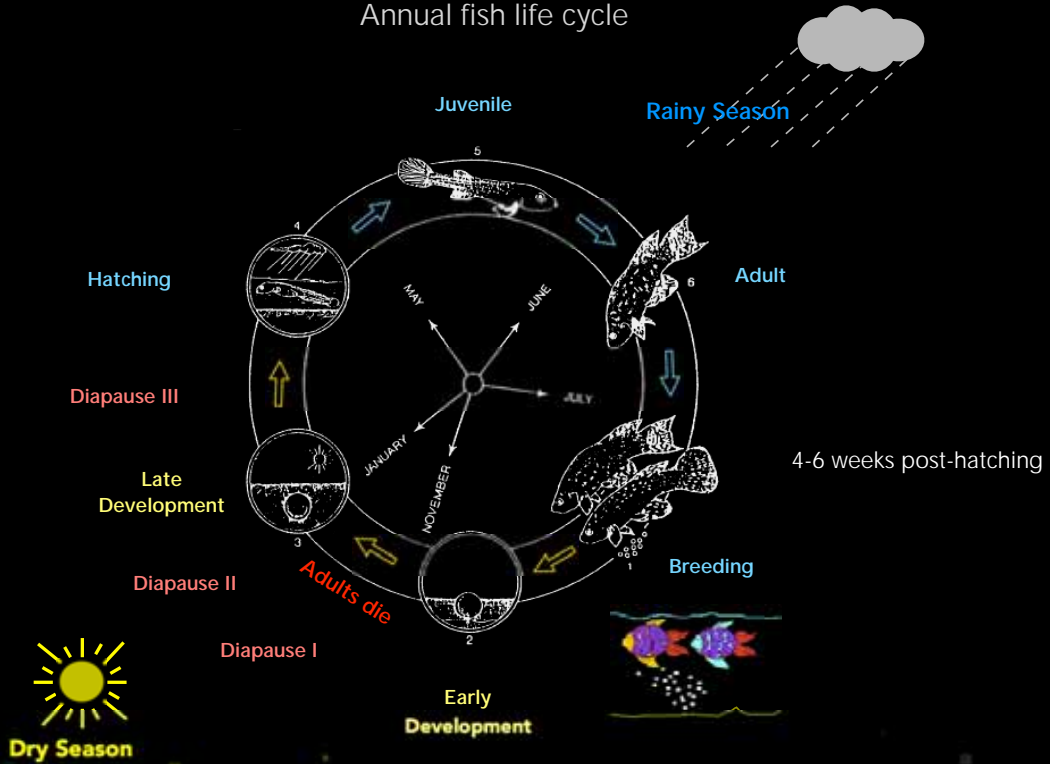


female



- Previously known as *Cynolebias*
- "Winter" annual fish (tolerate temperatures from 4 to 24°C)
- Many different color and shape variation
- Males (6.5 - 8 cm) larger than females (5 - 6 cm)
- Bottom spawners
- Egg diameter: 1.4 - 1.5 mm

Annual fish life cycle



Adapted from Wourms, 1972

Collecting fish



Stagnant water



Handling fish and breeding embryos



Gentle filtration (sponge filters + air)

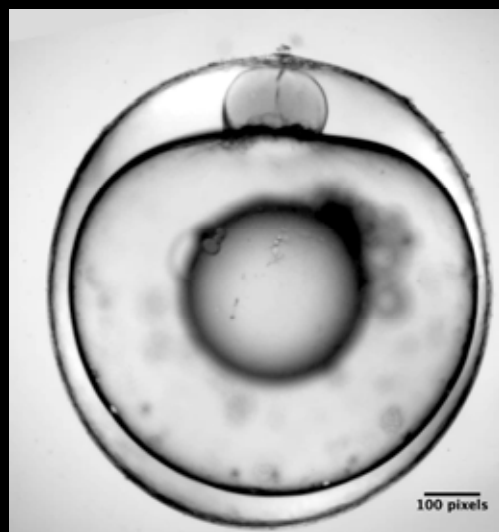


Spawning: peat moss



Spawning: glass beads

Early Development



Low deep-cell density

Epiboly precedes gastrula

