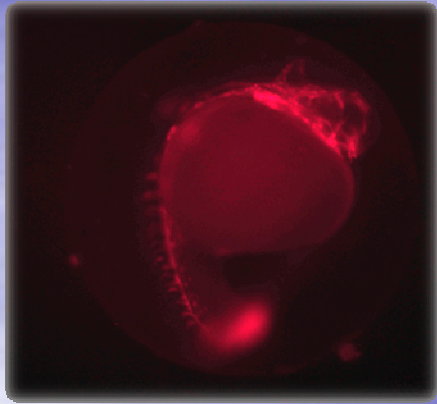


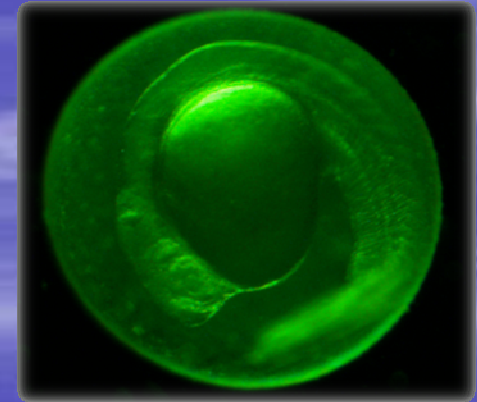
Victor Chang Cardiac Research Institute Aquarium
Zebrafish Facility
by Cecelia Jenkin

The 3 R's





Replacement



- Zebrafish can be seen as a replacement where non animal models are not feasible
- Zebrafish are a simple organism model
- The emergence of Zebrafish to replace higher organisms



Reduction



- Zebrafish ability to produce thousands of GM embryos over several months
- The longevity of up to 3 plus years resulting in reduced turn over of fish required.
- Early identification of GM embryos due to the transparent state reduces fish stock waste

Refinement

- Housing
- Breeding
- Environmental enrichment
- Dietary enrichment
- Transport shipping



Housing

- Zebrafish naturally school and spawn in larger numbers



- Companion fish reduce separation anxiety

- Sex ratios



Breeding

Fish school spawning within the tank



10L Tank →



→ 3 L Tank



Various spawning tanks



tanks 1L and 3L

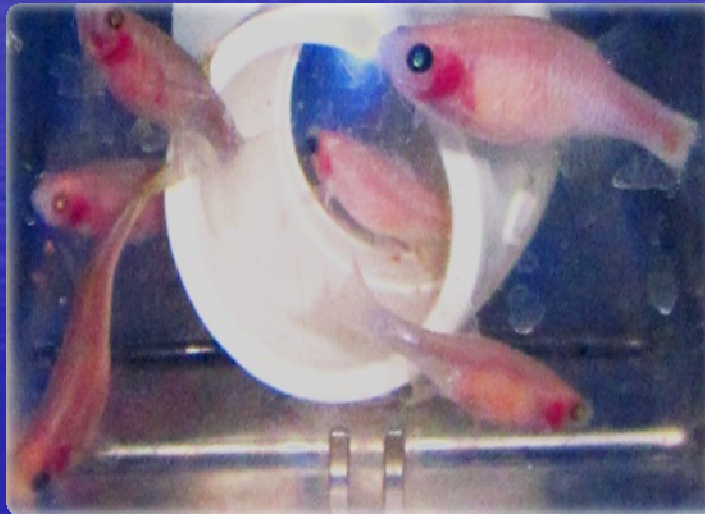
Environmental enrichment

- Enrichment reduces dominance behaviour

Plastic weed



Hiding pipes









Dietary enrichment

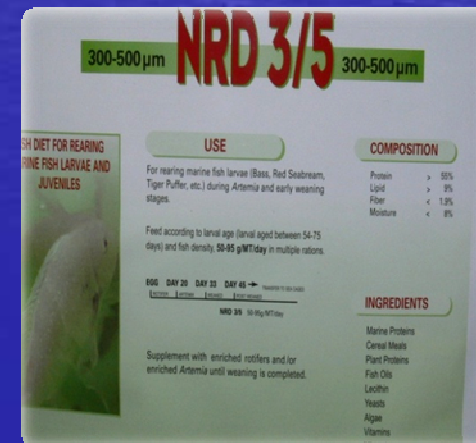
| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Adult |
|---------------|--------------|-------------|----------|----------|-----------|------------|----------|----------|-------|
| Days post DOF | 4 to 10 | 11 to 14 | 14 to 19 | 19 to 25 | 25 on | | | | 90 + |
| Paramecium | [Yellow bar] | | | | | | | | |
| Artemia | | [Green bar] | | | | | | | |
| Pellets | | | | | 200/400um | 300/500um | | | |
| Feeds / day | continuous | 3/day | 4 / day | 3-5 /day | 3-5 /day | 3 -5 / day | 3-5 /day | 3-5 /day | 3/day |



Paramecium caudatum
(highly magnified), John J. Lee



Artemia Salina Nauplius
Hatched
Artemia Reference Centre
Ghent University



Pellets: Primo Ridley AgriProducts

Transport shipping

- Purge fish for two days before transport to ensure minimal waste is excreted in the travel bag
- O₂ enriched water
- low stocking per shipment bag 5 to 8 small fish per 3L
- Double lined sealed plastic bags snug together inside a polystyrene shipping box to prevent movement

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