



# Zebrafish as a Model Organism



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# Zebrafish as a Model Organism

## Research and Techniques

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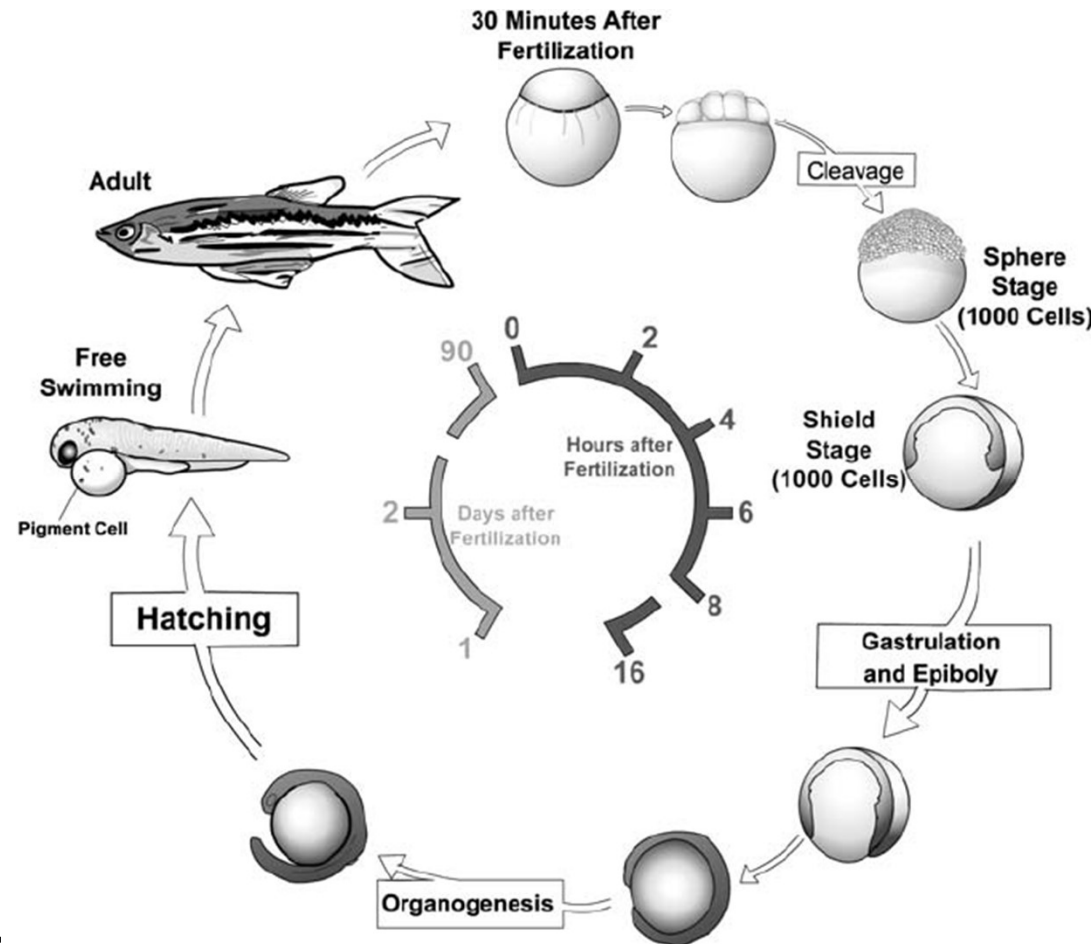
# Zebrafish as a Model Organism

- George Streisinger in the 1960's
- Pros of using Zebrafish as a vertebrate model system:
  - Small
  - Take up relatively little space
  - Relatively low maintenance
  - Cheaper than mice
  - Transparent
  - Have lots of transgenic lines
  - They develop very rapidly



# Zebrafish Life Cycle

- Zebrafish are fully grown in 3 months.
- 30 minutes after fertilization - the zygote is formed.
- ~ 2 hours after fertilization - Cleavage events continue.
- ~ 8-10 hours after fertilization - Gastrulation occurs
- ~ 24 hours after fertilization - Organogenesis.
- ~ 48 hours after fertilization - The Zebrafish begin to Hatch from their yolk sac.



# Actual Work with Zebrafish

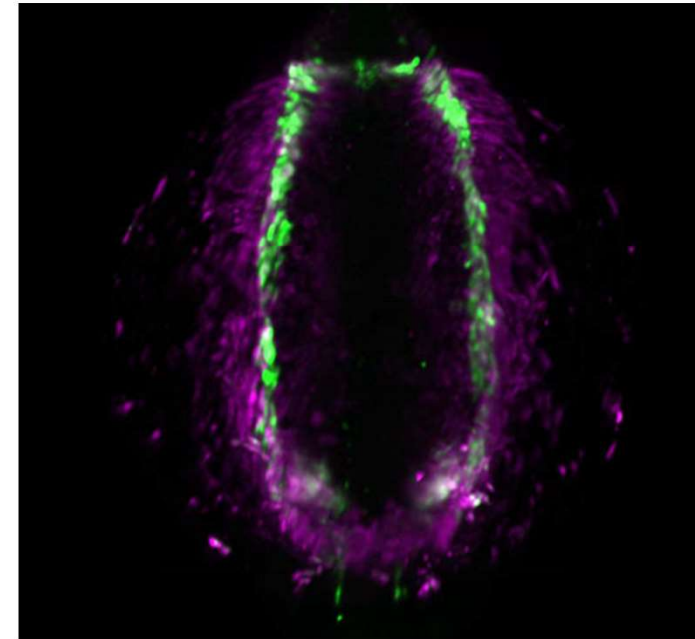
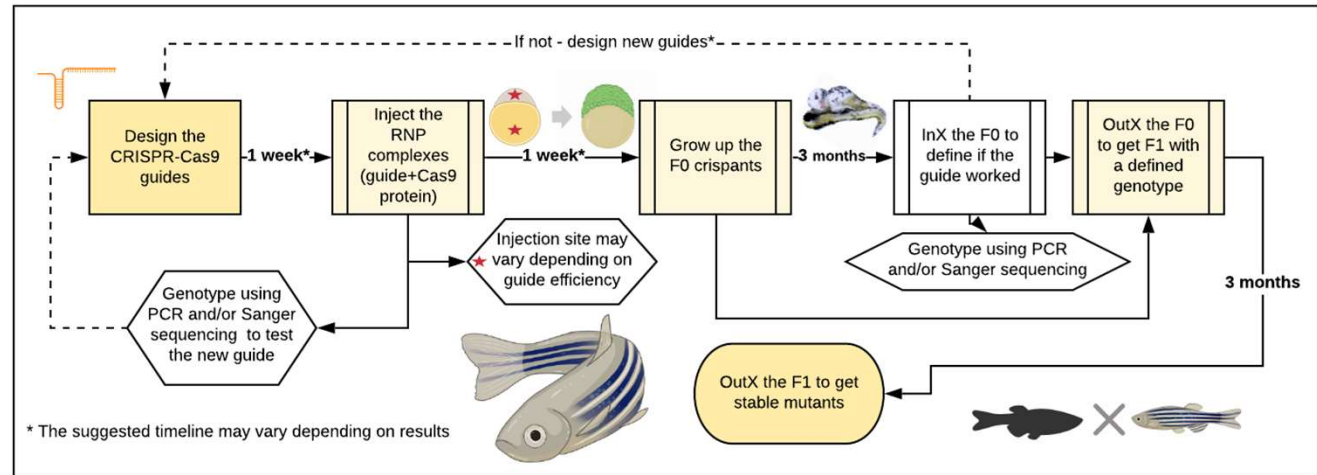
- Zebrafish in the fishroom:
  - Males and females are separated with dividers in double housing.
  - When the divider is removed in the morning, the fish will mate, and the eggs will collect in the main container.
  - The embryos are transferred into a petri dish and brought up to the lab. The embryos will then stay in the lab for 3 days post fertilization (dpf) where they can develop under the following conditions.
    - Normal development = 28°C
    - Slower Development = 21°C
    - Faster development = 32°C





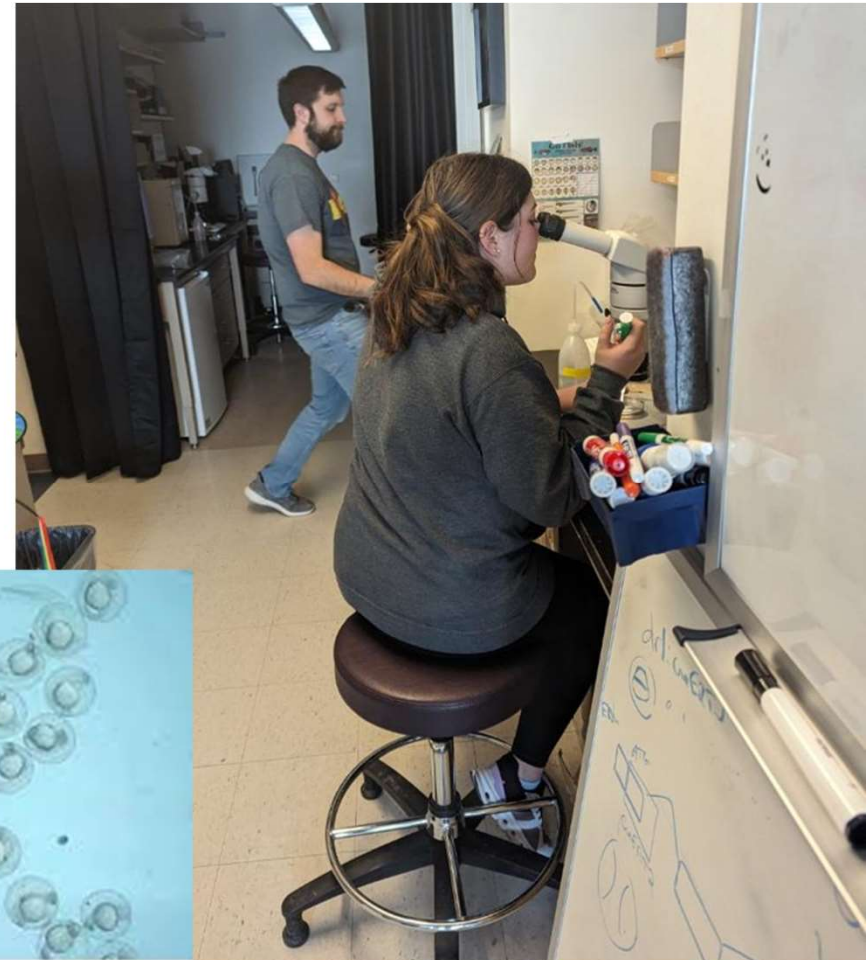
# How Mutant Zebrafish are Created

- CRISPR/cas9
- Microinjections
- Rescue morpholino with human mRNA
- The research being done at the lab on the mutants → screening, crossing, genotyping, PCR, gel, microscopy



# How I Applied My Classroom Learning in the Lab

- Experienced how the scientific method works in real world research
- Developed my micropipetting technique
- Learn how to apply techniques I was taught in the classroom
  - PCR tests
  - Gel Electrophoresis
  - Western blots
- Microscopes
  - Fluorescent
  - Compact
  - Scanning





# Cultural Aspect

- School Systems
- Driving Differences
- National Western Stock Show
- Cooking Class, Ethiopian Lentil Sambusa
- BeReal





# Acknowledgments

- The Mosimann Lab
- Fish Room Staff
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- Elizabeth Evans
- Agnese Kocere



# Resources

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