New Technion Zebrafish Research Facility - Zebrafish as a model in Biomedical Research
Limor Freifeld, freifeld@bm.technion.ac.il

**Brand-new Technion zebrafish research facility**
- Currently includes wild-type zebrafish, pigment-free fish, fish expressing various Ca$^{2+}$ indicators, fish with fluorescently labeled nuclei and more.
- For more details, advice regarding the use of zebrafish in your research, and a full list of available lines, please contact: freifeld@bm.technion.ac.il

**General background information**
- Zebrafish (*Danio rerio*) are small 4-6 cm, freshwater fish that originate from southeast Himalaya Nepal and India. They belong to the cyprinidae family.
- They are omnivorous fish, have a life span of 2-3 years and become sexually mature within ~3 months.

**Zebrafish as an alternative to a mammalian model**
- Zebrafish are vertebrates, and share a high degree of sequence and functional homology with mammals, including humans.
- They are a genetic model organisms, can be used as disease models, or be made to express transgenes with which structure and function can be revealed.
- External fertilization has made zebrafish a popular model in developmental biology. Their transparency and small size make them a highly useful model in neuroscience. For example, activity throughout the entire brain of a larval zebrafish can be imaged non-invasively, in real-time with cellular resolution. Moreover, this can be combined with optogenetic manipulation of activity; or simultaneous behavior tracking.
- Zebrafish larvae absorb pharmacological agents placed in their media, making them a popular model for drug-screening. In addition, as a whole-organism they can provide much more information compared with cultured cells.
- Zebrafish are characterized with high fecundity. A pair of fish can produce ~200 offspring every ~10 days.
- Replacement is one of the 3R’s principles. Animal suffering is minimized by using the least sentient organism. Moreover, breeding zebrafish is relatively easy and cost effective.

**Zebrafish development**

![Zebrafish development images](https://example.com/zebrafish-development.jpg)

Gomez de la Torre Canny et al., 2009

**Activity imaging in larval zebrafish**

![Activity imaging images](https://example.com/activity-imaging.jpg)

Ahrens et al., 2013

A mitotic cell within an *in vivo* imaged zebrafish embryo

**Click here for a short movie on the use of the zebrafish model by the Neuro-engineering lab at the Technion**