



Active GABAergic compounds for epilepsy utilising a zebrafish bioassay

Epilepsy is a neurological disorder affecting both children and adults. Zebrafish is an excellent animal model for studying epilepsy due to its ease of handling and accessibility.

Zebrafish bioassays are widely used in toxicology, drug discovery, and environmental testing. The larval locomotor zebrafish assay, which is based in the UFS Department of Chemistry, was established in 2017 under the supervision of Prof Anke Wilhelm. Prof Wilhelm received her training at the University of Basel, Switzerland, and has trained many postgraduate students and staff members on this valuable tool in drug discovery. The assays are offered as a valuable specialised services to clients while also enhancing research capabilities and collaboration with departments and faculties.

INTRODUCTION

Zebrafish have emerged as a valuable live model for studying diseases of the central nervous system (CNS) due to the following advantages:

- **Genetic similarities:** Zebrafish share a significant portion of their genetic makeup with humans, including many genes associated with CNS development and function.
- **Transparent embryos:** Zebrafish embryos are transparent, which enables direct visualisation of the developing CNS. Researchers can observe their formation and functioning, which provides insights into early developmental processes and disease mechanisms.
- **Rapid development:** A fast ex utero development of embryos as well as development of all major organs within 36 hours of fertilisation.
- **High fecundity of adult fish:** This renders zebrafish larvae suitable for in vivo medium- to high-throughput screening in the 96-well format.
- **Behavioural analysis:** Zebrafish exhibit a diverse range of complex behaviours, including locomotion, social interaction, and learning abilities. Zebrafish models allow for the evaluation of the effects of drugs or genetic manipulations on behaviour, providing insights into potential therapeutic interventions.
- **Cost-effectiveness:** Maintaining zebrafish colonies and conducting experiments with zebrafish is generally more cost-effective compared to other animal models such as rodents or primates. This affordability enables broader access to zebrafish models and facilitates large-scale studies.

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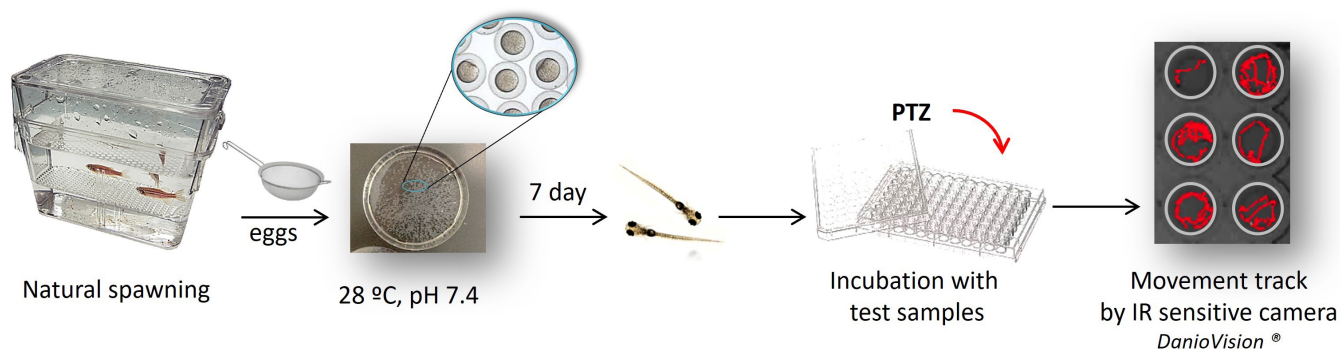
The zebrafish bioassay offering at the UFS includes the following key services:

- Toxicity screening: Conducting toxicity tests to assess the safety of pharmaceuticals, chemicals, and environmental contaminants.
- Drug screening: Evaluating the efficacy and toxicity of potential drug candidates using zebrafish models, facilitating early-stage drug discovery, and reducing costs.

COST OF SERVICES

A flexible pricing structure ensures that baseline prices are competitive while prices can be adjusted for large assignments and collaborative research initiatives.

PROCESS



Schematic flow of the activity bioassay from natural spawning to data collection with an infrared camera in the Noldus observation chamber.

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