ACUTETOX ASSAY

Biobide is a biotechnology company offering drug discovery services to pharma, biotech, chemical and cosmetic companies. Our services are based on the zebrafish model and the capacity to offer highly efficient tailor made assays.

The zebrafish model is gaining relevance in pre-clinical trials due to its small size, transparency, ease to manipulate and rapid development. This model has a high genetic homology with humans (over 85%) as well as important parallels in organogenesis and functional mechanisms.

Following the OECD 236 Guideline (Fish Embryo Acute Toxicity Test), a convenient, rapid and inexpensive acute toxicity test has been set up

METHOD DESCRIPTION

Wild Type embryos at 2-4 hours post-fertilization stage (hpf) are incubated with 5 concentrations of the test chemical spaced by a constant factor not exceeding 3. Retinoic acid is used as the positive control.

During 96 hours of treatment, embryos are monitored and toxicity induction is measured as presence of any of the 4 main parameters described by the FET Guideline. Subsequently, significant effects images and a concentration-effect curve are given.

All the procedures are performed under Good Laboratory Practices (GLP) environment.

Embryos incubated with different drugs including retinoic acid, nitrendipine, ethanol and carbaryl were analysed at a pre-defined range of concentrations. Photomicrographs of significant effects detected are taken (Figure 1) and results of each embryo are described in heat tables (Figure 3).

Figure 1. Concentration response curve with carbaryl at 24 and 48 hours post treatment (hpt) (n=3). Results are used to extrapolate LD50 at 24 hpt (LD50=39.2µM) and 48 hpt (LD50=40.1µM).

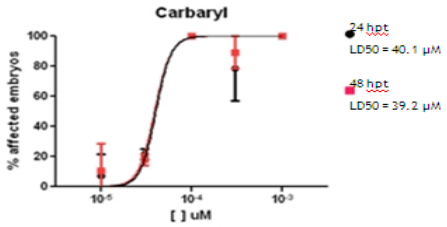


Figure 2. Photomicrographs (a) Control embryos at 24 hpf and (b) 48 hpf; Treated embryos (retinoic acid 10 µM) showed acute toxicity at (c) 24 hpf and (d) 48 hpf.

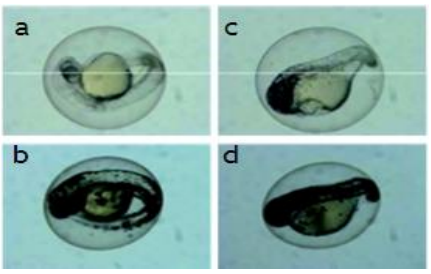
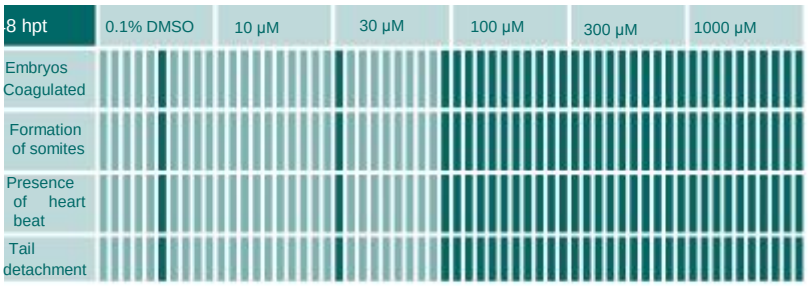


Figure 3. Heat map for carbaryl at 48 hpt. Each column represents a single embryo and each row a specific endpoint.



- Zebrafish Acute Toxicity studies are a good tool to evaluate the acute toxicity of potential drugs at an early preclinical phase.
- Acutetox Assay is a cost and time effective assay compared to other currently used assays.

[1] Fish Embryo Acute Toxicity (FET) Test. OECD Guidelines for the testing of Chemicals. Jul, 26, 2013 (adopted).