

Multi-arm spreading tweezers

Simple, inexpensive, gentle, and rapid removal of the chorion from zebrafish embryos

Technology

Potential active pharmaceutical ingredients must be tested for embryotoxic effects. Major pharmaceutical companies maintain libraries with millions of substances, and screening them for embryotoxicity with animal tests is controversial. Zebrafish embryos serve as an alternative model for large-scale screening, but they must first be freed from their chorion (egg envelope) without damage. Mechanical removal remains a time-consuming manual process, while chemical removal using enzymatic solutions tends to be harmful. Obtaining sufficient quantities of undamaged zebrafish embryos is thus an unresolved technical problem, which has so far prevented the development of a standardized toxicity bioassay.

Innovation

- Modified spreading tweezers are designed so that, when opening the chorion, instead of a slit (risk of crushing damage), a triangular opening is created through which the zebrafish embryo can fall out.
- Example for time savings: previously 20–30 embryos per hour could be processed with conventional tweezers; now, 10 embryos per minute with the modified tweezer (up to 600 per hour).
- Automation of this step is possible, enabling high-throughput toxicity screenings for the first time.

Application

- Toxicological studies for chemical substances.
- Drug discovery research using zebrafish embryos as alternative model organisms.
- Automated, high-throughput toxicity assays for substance libraries.

Development Status

- Prototype available.

Responsible Scientist

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Toxicity bioassays, toxicity bioassay, active substance identification

Patent Status

DE pending, EP intended for granting

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