MICROFLUIDIC-BASED ROBOTIC DEVICE FOR FULLY AUTOMATED HIGH-CONTENT SCREENING ON C. ELEGANS AS A NOVEL NAMs PLATFORM FOR CHEMICAL TOXICITY ASSESSMENT

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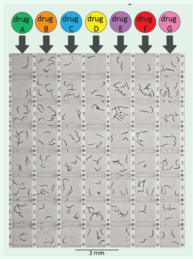
SYDLAB™ ONE: FULLY AUTOMATED COMPOUNDS' TESTING AND MULTI-PHENOTYPIC ANALYSIS ON C. ELEGANS

Nagi™ Microfluidic Organism-on-Chip



- Patented microfluidic design, relying on passive hydrodynamics.
- 64 fluidic lines = 64 independent experimental conditions.
- +1000 organisms analyzed simultaneously.

SydLab™ One Robotic Platform

Automated worms' culture, treatment, and imaging of up to 64 independent conditions in parallel.

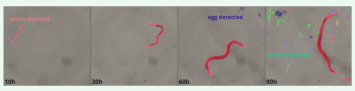
- Programmable acquisitions of bright-field and fluorescence images and videos.
- Active temperature control in the 15-38°C range for automated culture.

SYDLAB™ ANALYZER SUITE: REAL-TIME DATA EXTRACTION, ANALYSIS & INTERPRETATION

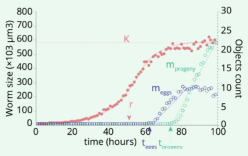
Real-time AI-based analysis of +25 data-points/hour/organism

- Time-resolved high-content data extracted using AI.
- Integrated statistical analysis and data interpretation algorithms.

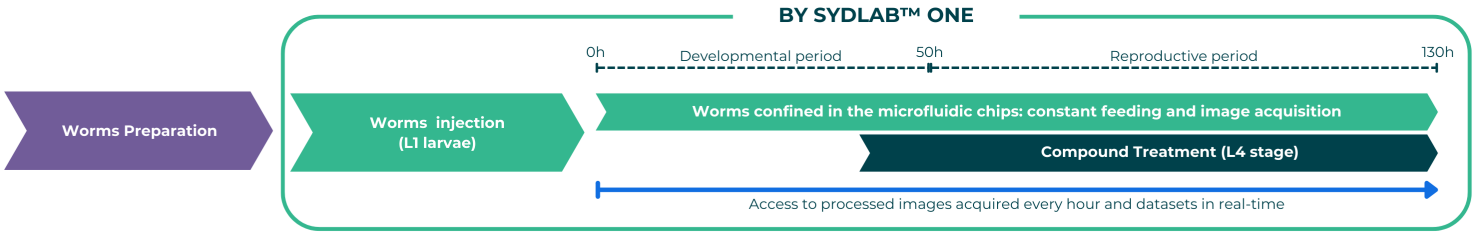
AI-based object detection



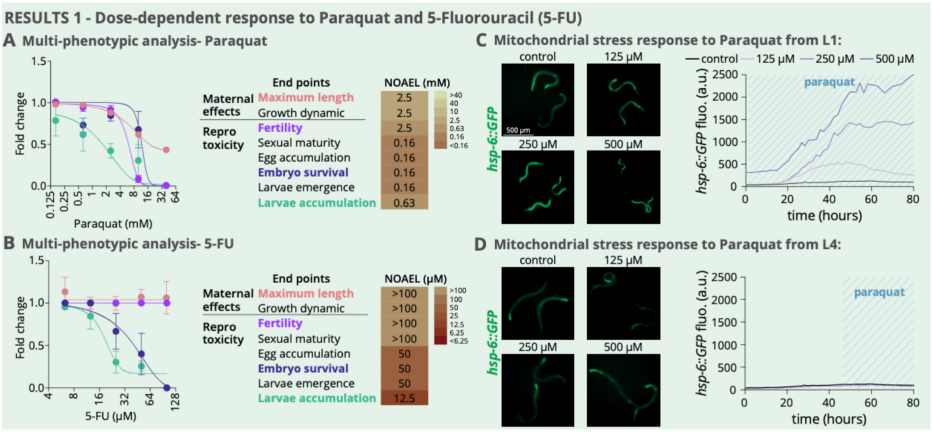
Automated, real-time and robust anlysis



VALIDATION OF THE REPRODUCTIVE & DEVELOPMENTAL TOXICITY (DART) ASSAY ON THE SYDLAB™ ONE PLATFORM



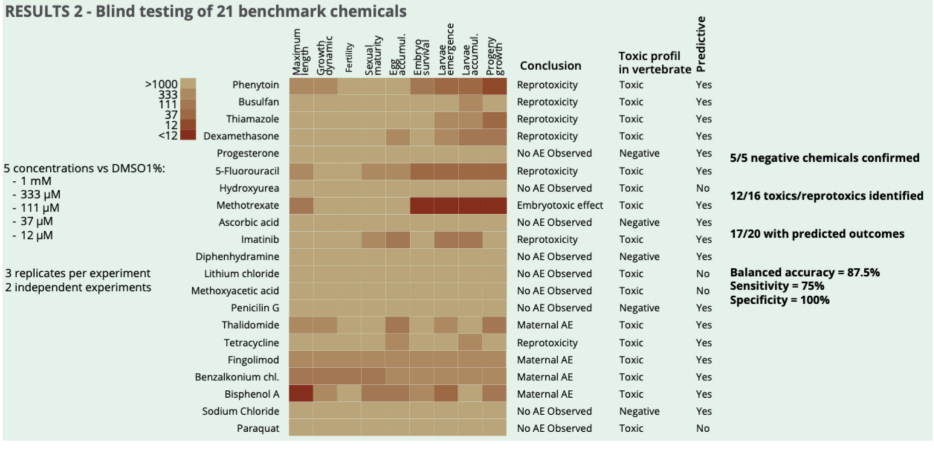
RESULTS 1 - Dose-dependent response to Paraquat and 5-Fluorouracil (5-FU)



CONCLUSIONS OF RESULTS 1:

- Paraquat induces **major maternal adverse effect (AE)** at high doses (NOAEL: 2.5mM) and **significant reprotoxic effect** at lower doses (NOAEL: 0.16mM).
- Expression of the mitochondrial stress reporter (hsp-6::GFP) is increased by paraquat treatment at L1 stage but not by the treatment at L4 stage.
- Therefore, Paraquat induced AE is not correlated with mitochondrial stress response.
- As reported, 5-FU has no maternal AE at the doses tested but a **strong reprotoxic impact** at mid doses (NOAEL: 50µM).

RESULTS 2 - Blind testing of 21 benchmark chemicals



CONCLUSIONS OF RESULTS 2:

This study highlights the strong advantages of our innovative technology which yield

1. Reproducible and accurate results thanks to standardized protocols;
2. An automated dosing of chemicals with low liquid consumption;
3. Multi-phenotypic readouts in real-time.

SydLab™ One represents the first «all-in-one» *C. elegans* lab-in-a-device that contributes to the rapid identification of toxic compounds in the early stages of drug discovery pipelines. Hence, making *C. elegans* now accessible for large safety and efficacy screenings as part of the NAMs toolkit.