ωmicrotracker arena

Wmicrotracker® ARENA is our new technology that allows you to obtain detailed information on the behavior of small animal populations over time and space. The "Equipment + Software" system is optimized to quantify the locomotor activity of small organisms in 6- and 24-well microplates, as well as in 35 mm plates

Many biological assays are complex to perform, requiring great manipulation skills and analysis time. This makes the work tedious and limits experiments based on their level of difficulty. Therefore, at Phylumtech, **our vision is to provide unique, agile, and real-time solutions that enable immediate, reliable, and reproducible results.** Founded in 2009 as a joint venture between the public and private sectors, we combine the latest advances in science and research with cutting-edge technologies.

After years of experience, we are committed to the development of an **image processing system with temperature control.** The **Wmicrotracker® ARENA**, based on non-invasive technology of infrared microbeams and camera detection, developed with CONICET and protected by international patents. ARENA allows the quantification of locomotor activity of small organisms in liquid or agar medium, in a 35 mm Petri dish and in 6- and 24-well microplates. The detection system is compatible with tiny animals such as C.elegans and related species, zebrafish larvae, and artemia salina, among others.
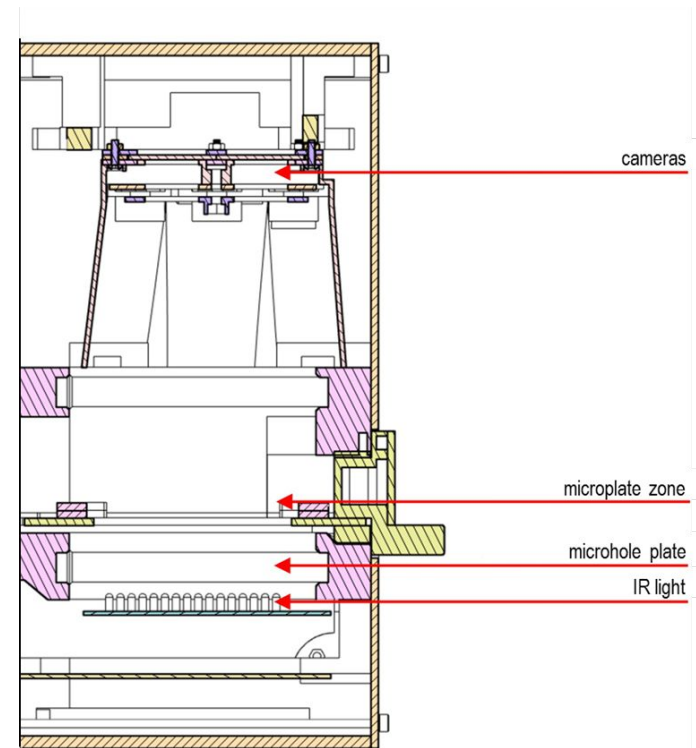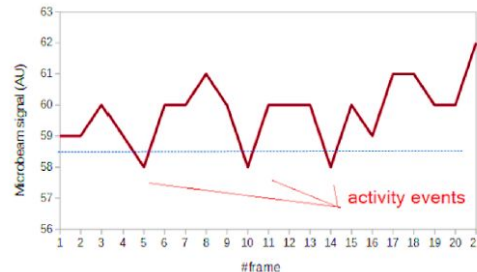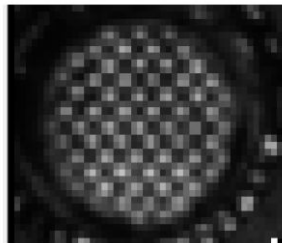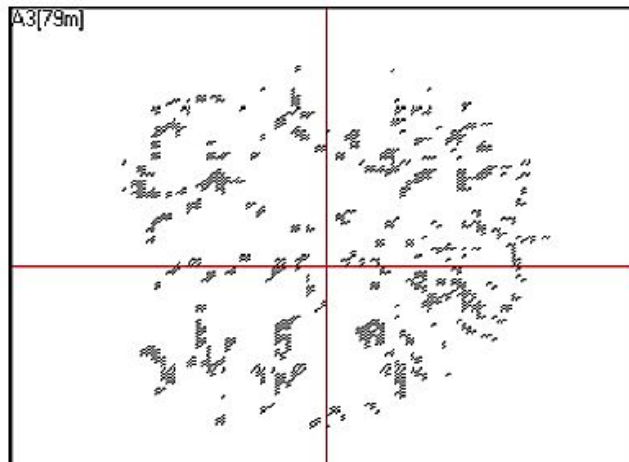
HOW IT WORKS?
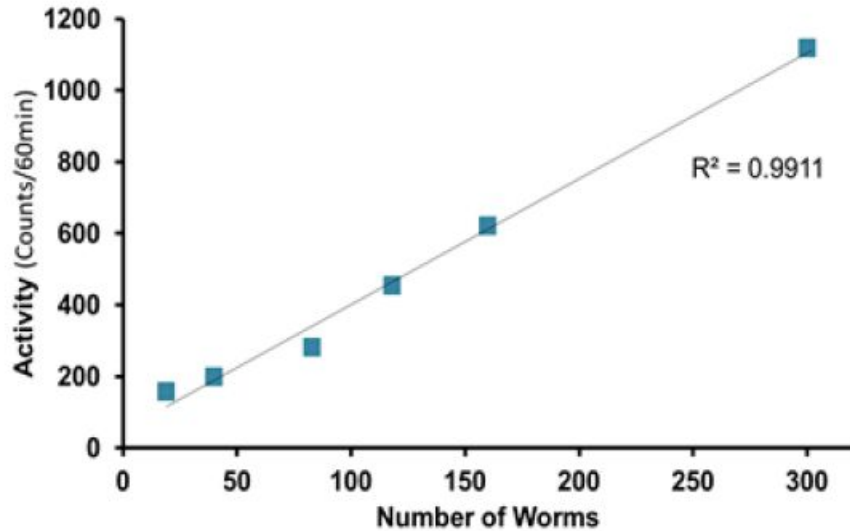
"The ARENA equipment with Peltier system allows controlling the working temperature range between 20 to 37ºC (±1ºC). Its design is intended for conducting experiments that require controlled conditions.

 The system is based on the detection of the movement of worms through the infrared light scattering effect. This system has a detection area composed of more than 20,000 infrared microbeams, each of 100 µm in width. This array of beams illuminates the microplate from the bottom, while a 6-camera video optical system (1M-pixel each) captures the light beams that pass through the sample. The software processes the analog signal, and the detection algorithm acquires the signal from each microbeam and processes it mathematically to detect the light scattering caused by the animals' movement. When the system detects movement, the activity counter is incremented. The total calculated activity will be the integration of activity events in a time frame defined by the user."
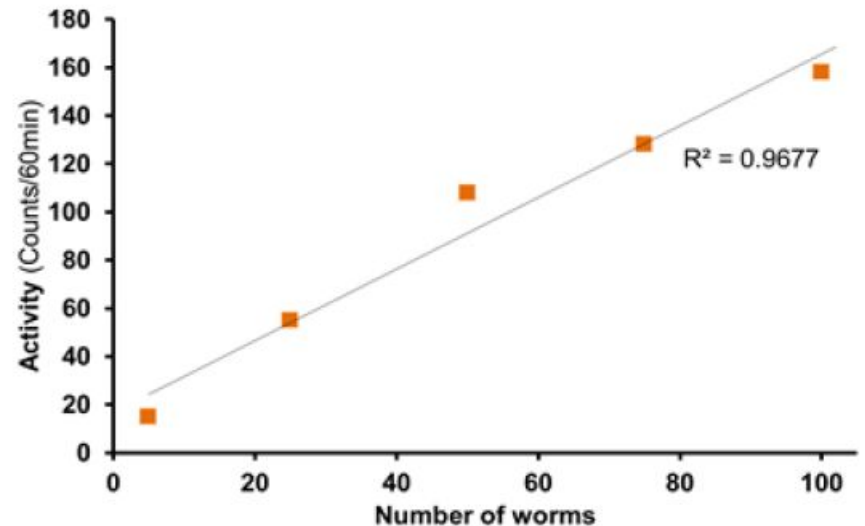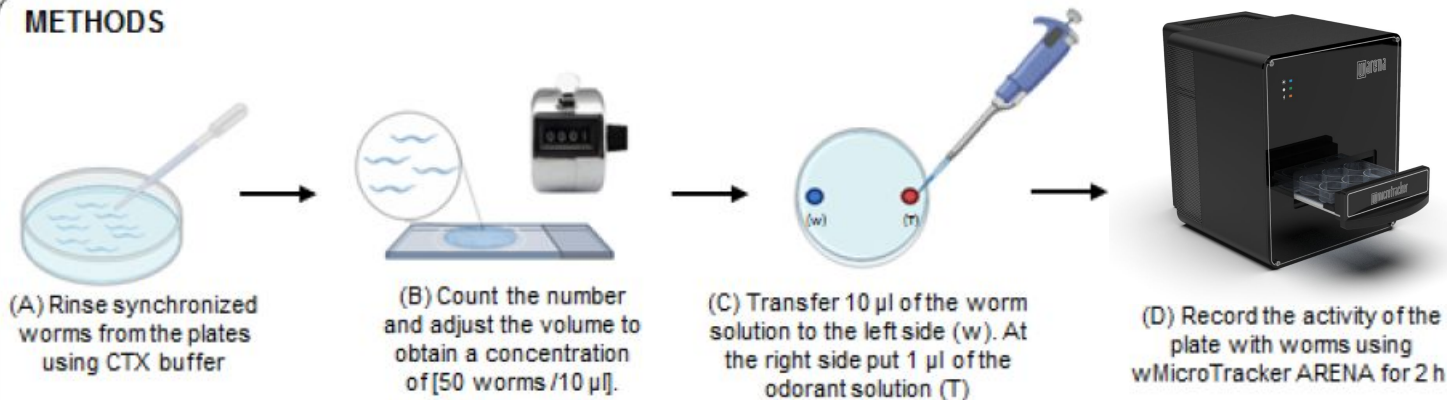

Capture of a camera

A3[79m]

Microbeam signal (A.U.)
activity events
#frame

cameras

microplate zone

microhole plate

IR light

Equipment detection range

Curve in 24-well plate: N2 young adults_NGM.
The system presents good detection linearity between 5 and 100 nematodes (R2=0.96).

Curve in 6-well plate: N2 young adults_NGM.
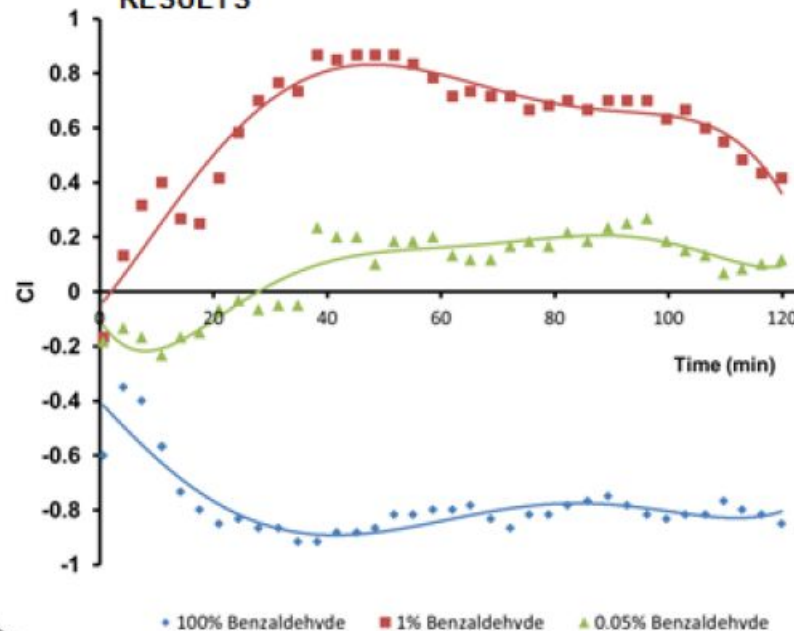The system presents good detection linearity between 10 and 300 nematodes (R2=0.99).

METHODS

CHEMOTAXIS

(A) Rinse synchronized worms from the plates using CTX buffer

(B) Count the number and adjust the volume to obtain a concentration of [50 worms /10 µl].

(C) Transfer 10 µl of the worm solution to the left side (w). At the right side put 1 µl of the odorant solution (T)

(D) Record the activity of the plate with worms using wMicroTracker ARENA for 2 h

RESULTS

(E) Generate the data report using ARENA software and plot

A different chemotactic response is observed when worms are tested against benzaldehyde 0.05%, 1% (attractive) or 100% (repellent). Fifty young-adults N2 worms were transfer on the left side of a 35-mm plate, on the opposite side was spotted the odorant diluted at each concentration. The locomotor activity was evaluated at 23°C during 2 hours. Three independent experiments were performed in duplicate (Data represents the mean).
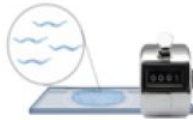
• 100% Benzaldehvde   ■ 1% Benzaldehvde   ▲ 0.05% Benzaldehvde

TOXICITY

METHODS
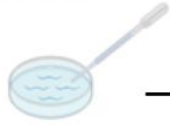
(A) Rinse synchronized worms from the plates using buffer solution.

(B) Count the number and adjust the volume to obtain a concentration of [35 worms /10 µl].
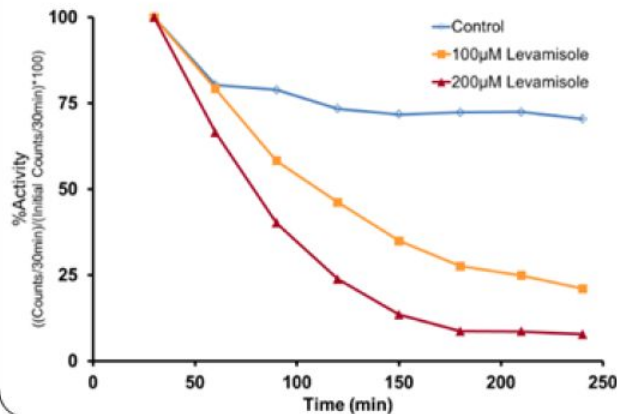
(C) Transfer 10 µl of the worm solution to a 6 well plate containing NGM+levamisole without bacteria.

(D) Record the activity of the plate with worms using wMicroTracker ARENA for 4 h
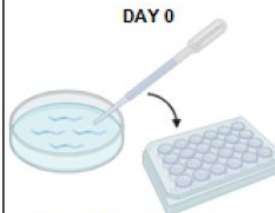
RESULTS

(E) Generate the data report using ARENA software and plot

Dose-inhibition response curve of levamisole on N2 locomotor activity. The effect of different concentration of levamisole (0µM (control),100µM and 200µM) was evaluated. Thirty-five young adult N2 were transferred per well in a 6-well plate. The locomotor activity was recorded at 23°C during 4 hours. Data represents the mean of four independent experiments conducted in duplicate.
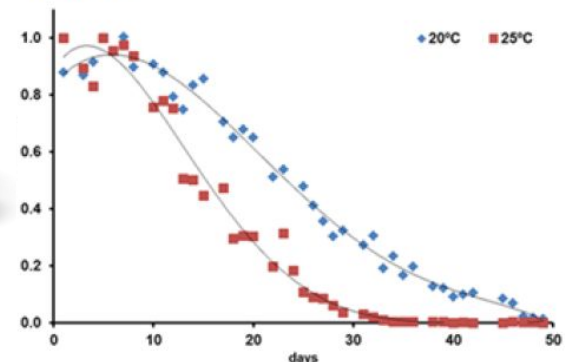
LIFESPAN

METHODS

DAY 0

DAY 1 to 50

Transfer 50 L4 worms in 500 µl to 24-well plate

Register worm activity using wMicroTracker ARENA

RESULTS

Locomotion-based healthspan assay
Locomotion activity of N2 was evaluated during 50 days. On day 0, L4 larvae stage N2 worms were transferred to S Complete Medium with 50 µM FudR in a 24-well plate. The worms were allowed to grow at 20°C or 25°C. Locomotor activity was recorded at 20°C/25°C during 30 min.
Data represents the mean activity recorded each day (n=9 per group, 2 independent experiments)
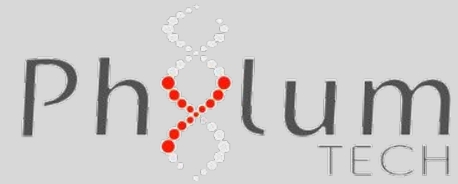
	Microplate Reader System.
	USB-B Cable.
	Plastic Adapter for 35 mm Petri Dish.
	12V DC, 6 Amp Switching * Power Source (5.5 x 2.1 mm plug. Center +).

Measurements

Product Dimensions and Manufacturing

- W: 24cm x H: 29cm x D: 31.5cm
  W: 9.5in x H: 11.5in x D: 12.4in

Requirements

- IBM PC compatible with the following minimum requirements:
  - Pentium Core i3 processor or above
  - 2Gb of RAM memory
  - 1 USB port 2.0 available
  - Windows 7 32-bit (or higher) operating system
  - At least 200Mb of free HD space
  - Automatic shutdown/sleep/hibernate mode must be disabled.