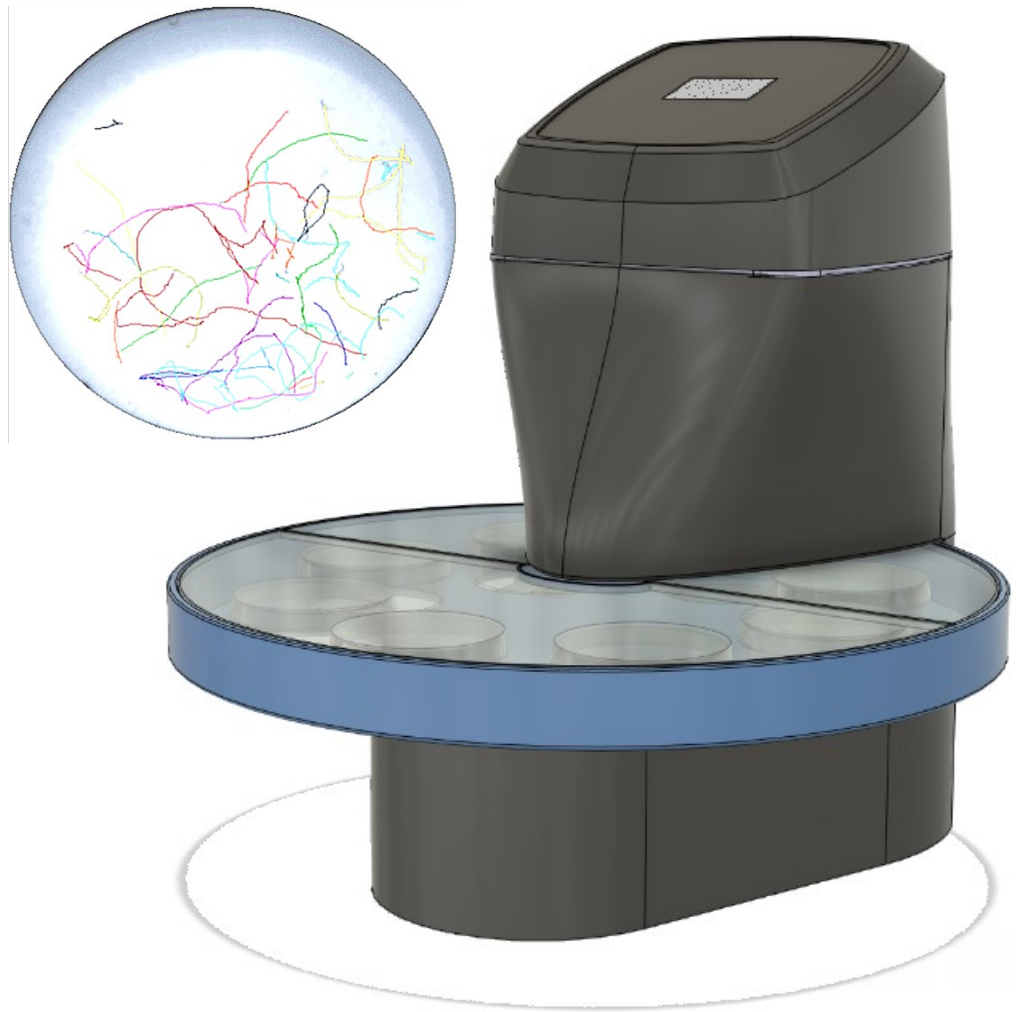


W microtracker SMART

8x Carousel version



WMicrotracker® SMART is our new technology with which you can obtain real-time information on the behavior of small animal populations based on time and space. The "Equipment + Software" system is optimized to quantify the speed and trajectory of small organisms cultured in 35 mm Petri dishes. Its integration with the 8x carousel allows to perform automated kinetics of multiple plates, as well as fully automated lifespan and healthspan experiments using *C.elegans*.



How it works?

The system has the ability to work in 2 different modes:

1) Infrared images, plate upside down: This arrangement allows tracking of the path of multiple adult *C. elegans* (or worms of similar size) using NGM-type solid medium cultures. The method is based on an optical phenomenon of Amplification of Silhouettes by Infrared Refraction. The infrared light waves refract at the worm-agar interface generating an amplified image that will be captured by a sensitive optical/HD camera system. The digital processing of the image is carried out using software specially designed for real-time data acquisition.

2) Infrared microbeam grid, with face-up plate: allows the quantification of the behavior of multiple organisms of size > 0.1 mm using solid, liquid or air cultures. It also allows to define the area of activity in the plate for its use in chemotaxis experiments. This patented method is based on detecting movement through the scattering of light caused by a grid of infrared microbeams.

SOFTWARE



3. Calculation of Parameters



2. Path tracking



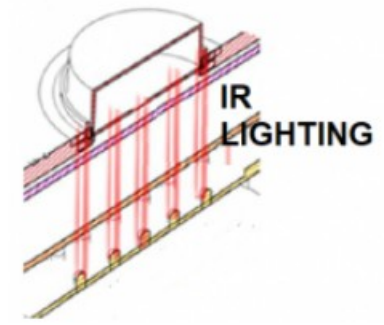
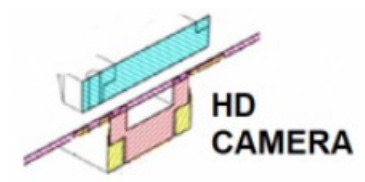
1. Organism Detection

- # Worms into the plate
- Average speed [mm/s]
- Travel distance [mm/worm]
- Motility Score
- Rotation index
- Full list of single particle parameters.

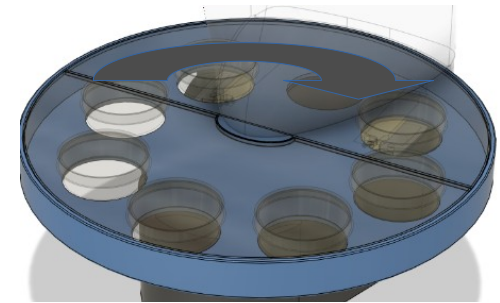
Infrared amplification optics



Full plate imaging

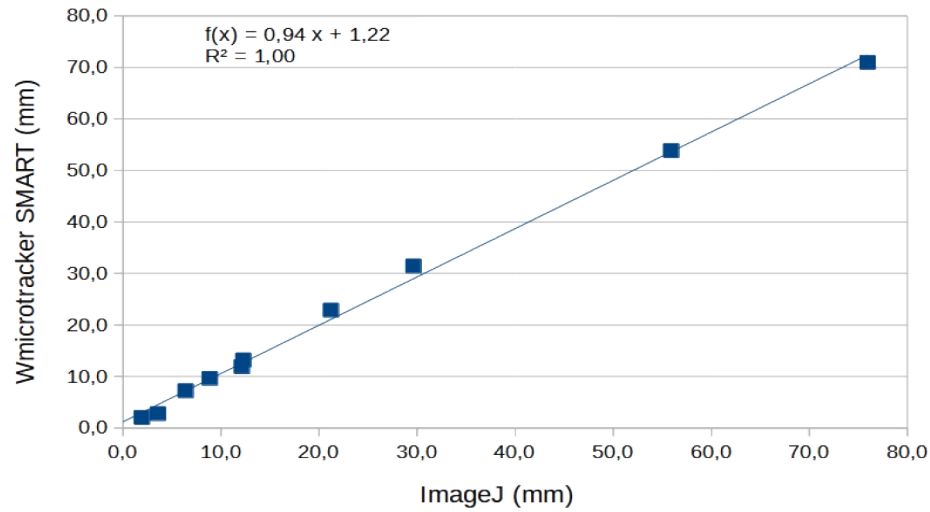


8 Plates Rotatory wheel



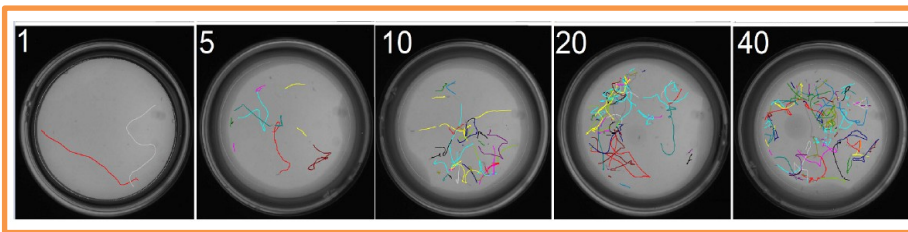


The calculated distances correlate very well with manual processing

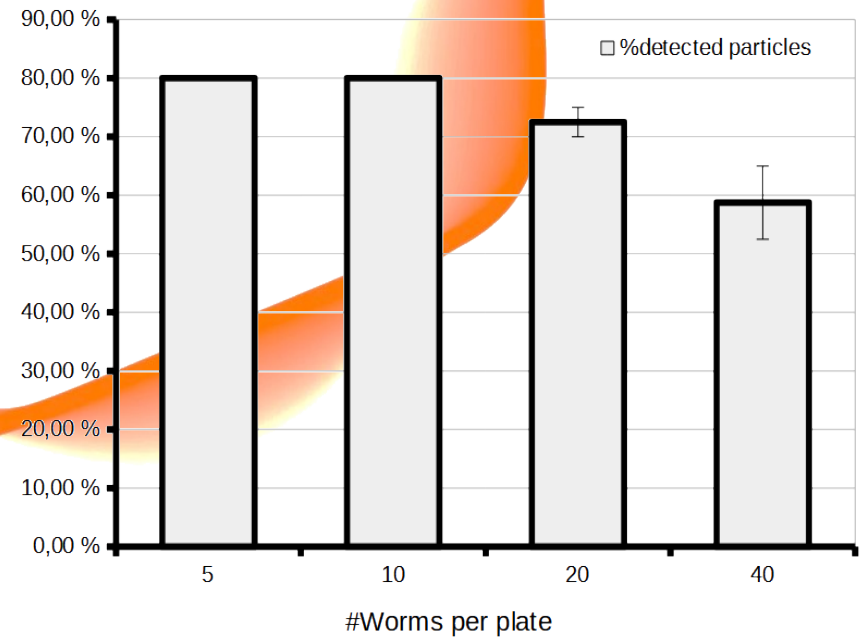


Worm Travel Distance [mm]

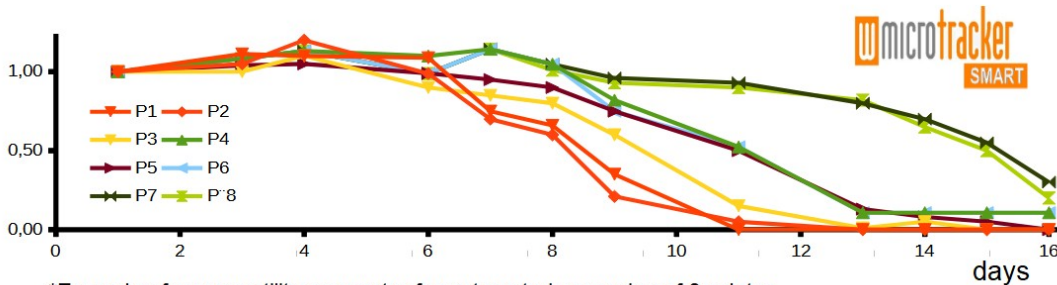
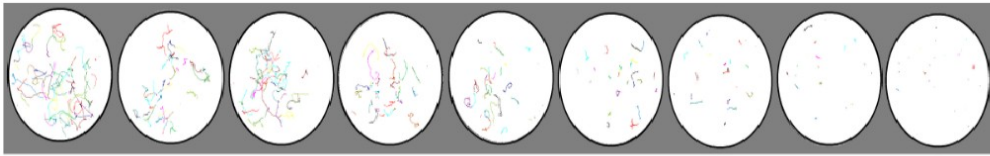
ImageJ	SMART
1,9	2,1
3,6	2,8
6,4	7,2
8,9	9,6
12,1	11,9
12,3	13,2
21,2	22,9
29,6	31,4
55,9	53,8
76,0	71,0



Current Algorithm is able to detect and track >80% of worms simultaneously.



Fully automated Lifespan+Healthspan with 8 plates capabilities



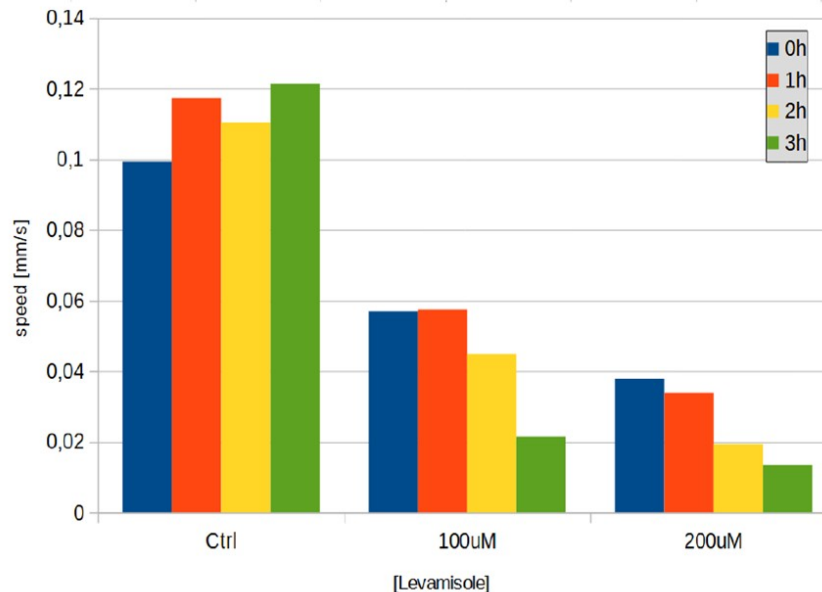
*Example of worm motility parameter for automated screening of 8x plates

FULLY AUTOMATED LONGEVITY TEST

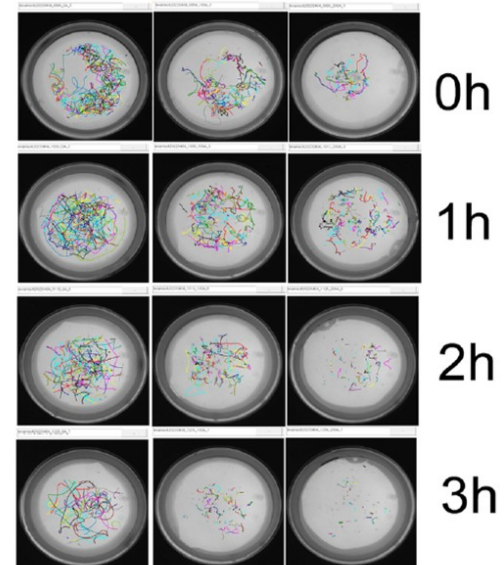
The graph shows the traces of individual worms on the plate and their reduction with age. 20 adult C.elegans were grown at 25°C in a 35mm Petri dish with 80 uM NGM+FuDR. Data acquisition was performed once a day, using an acquisition period of 5 minutes.

TOXICITY

Example of kinetics for treatment with levamisole. 25 worms were cultured in 35mm Petri dishes containing NGM and increasing concentrations Levamisole [0 to 200 uM]. The plates were recorded for 5 minutes every 1 hour. The graphs show the slowing down of the movement speed of the worms.



Ctrl 100uM 200uM



The system Includes:

	<p>Wmicrotracker SMART acquisition hardware with 8x carousel for 35mm Petri dish</p>
	<p>Plate mode adapter: Microbeam grid side-up Tracking mode Side-up Tracking mode, side down</p>
	<p>WIFI Mini Router Access point configured to provide "phylumtech.com" network connection</p>
	<p>5V DC, 1 or 2 Amp Power Supply MicroUSB*</p> <p>*In some countries might not include it due to customs restrictions</p>

Product Dimensions and Manufacturing

LWH: 24cm x 22cm x 22cm [9.5"x8.6"x 8.6"]
Manufacturing technology: 3D printing

PC requirements:

- IBM PC compatible with the following minimum requirements:
 - Pentium Core i3 processor or above
 - 2Gb of RAM memory
 - 1 USB port available to power WiFi access point.
 - MSWindows 7 (or higher) operating system
 - > 1Gb of free HD space for experiment images storage.