



wMicroTracker Frequently Asked Questions

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WHAT CAN I MEASURE?

Is the wMicroTracker compatible with all worm strains?

The system is compatible with most worm strains including wild nematode isolates and parasitic nematodes. Non motile/non-good swimming strains (such as roll or severe unc mutants) are not recommended.

Can I perform worm development assays with a wMicroTracker?

Yes, the MicroTracker can measure worm activity from L1 to older adult for weeks. Be sure to validate your liquid culture protocol before using it in the WMicroTracker.

Can I measure the worm's curvature/body bends with the wMicroTracker?

Although the wMicroTracker does not have a camera, it is possible to correlate the wMicroTracker's data (number of beam breaks) to the number of body bends per minute (see figure [here](#)).

Can I measure movement in *C. elegans* larvae?

You can measure movement in populations of larvae as early as L1.

Is it possible to measure individual worms?

It is not recommended. However, it is possible to perform experiments with as few as 1 worm. See graphs in this [Tech Note](#) for more details.

HOW LONG CAN I MEASURE?

Can I use bacteria in the well and still get accurate measurements of movement?

Yes. Worms can be measured in the wMicroTracker for multiple days when placed in bacteria. We recommend that you use fresh bacteria at an OD600 of 0.5 (up to 1). Under these conditions, adult worms usually have enough food for 3-5 days. Another option is to cultivate your worms in axenic media (CeMM) instead of using bacteria.

How long can I keep and measure my worms in the wMicroTracker?

The wMicroTracker can acquire data on your worms for weeks without interruption. The limiting factor for longitudinal studies will be determined by your worm culture protocol and requirements. For long term data acquisition in the wMicroTracker, we recommend that you place your worms in axenic media. We recommend that you conduct measurements for at least 100 minutes to reduce standard error. See [protocol for healthspan assays](#).

Do the beams maintain the same properties overtime?

We observed no degradation of the LEDs over time. The LEDs in the wMicroTrackers have a lifetime of 36,000 hours. Since they flash every 1/384 sec, this is equivalent of 10 years of use. The wMicroTracker was engineered to auto-compensate and auto-calibrate the beams to maintain signal linearity over time.

Do worms develop an aversion to the beam over time?

The infra-red beams in the wMicroTracker are generated by low-power LEDs and have been shown to be non-invasive for *C. elegans* ([Simonetta and Golombek 2007](#)).

DATA ACQUISITION

Is the software free?

Yes, you can download the wMicroTracker software [here](#).

What data do I get from the wMicroTracker?

The LED beams pulse every 1/384 sec and the software records every interruptions of the beams. This data is pooled and analyzed when the data report is generated by the software and presented as “average activity count by data interval”. You can always change the analysis bin (data interval) size after the data is collected. The minimum bin size recommended for analysis is 5 minutes. Choosing smaller bins may increase variability of your data.

What is the beam size relative to the worms?

The LED beams have a diameter of 150 μm , which is larger than the diameter of an adult *C. elegans* worm (100 μm on average).

What are the beam specs?

- Wavelength: Infrared, 880nm
- Temperature: no heat generated
- Pulse frequency: 1/384 sec
- Number of beams per well for the wMicroTracker.
 - 96-well plate: 2 beams per well
 - 384-well plate: 1 beam per well

These properties cannot be modified.

COMPUTER REQUIREMENTS

What are the computer requirements to use the wMicroTracker?

Computer minimum requirements:

- Pentium II processor or above (>1GHz clock)
- 512Mb of RAM memory
- 1 USB port
- Windows XP 32 bits (or higher) operating system
- 200Mb of free HD space (>10Gb free HD space recommended for real time data saving)

What is the size of the wMicroTracker files:

The wMicroTracker creates a folder for each experiment. The raw data for a 2-hour experiment is about 20 Kb. The Excel export file for such an experiment is about 15 Kb.

TEMPERATURE CONTROL

Can I control/change the temperature of my samples with the wMicroTracker?

The temperature in the wMicroTracker cannot be pre-set and will depend on the room temperature. However, it is very compact and can easily fit in your incubator if needed. The wMicroTracker does measure and report the temperature inside of the platform for the duration of the experiment. **Note: The wMicroTrackers power source does not generate heat.**

Can I put the wMicroTracker inside an incubator?

The instrument is permeable to gas, so you can use a CO₂ incubator when appropriate.

Be sure to reduce humidity in the incubator. When using humid chambers for very short experiments, use a maximum experimental timeline of 12 hours.

EXPERIMENTAL CONDITIONS

What type of liquid media can I use? Can I use bacteria?

96-wells experiments work with: liquid culture of *E. coli* OP50, CeMM, CeHR (with or without 10% skim milk). Which one to use will depend on your preference and your experimental requirements. **Note for lifespan experiments:** it has been reported that liquid culture extend lifespan compared to NGM.

How many worms should I put in each well to get accurate measurements?

Larvae: For L1 to L3: use round-bottom 96-well plates - 100-150 larvae

Older worms: For L4 and older worms in a flat bottom 96-well plates - 30-70 worms

For more information on this matter please check out [this Tech Note](#).

Do I need to count the worms in each well? How do I get good results if I can't pipet a precise number of worms in each well?

Pipetting worms is not as precise as dispensing same number of worms with a cell sorter or even manually. However, you can easily reduce the variability of your data by relativizing mathematically each group of wells to time 0 (referred to as "BASAL measure" [in Simonetta et al.; 2007](#)).

What brands of plates can I use with the wMicroTracker?

The wMicroTracker was designed to fit multiwell plates from Greiner. Plates from other brands may not fit in the proper plate adapters.

For 384-well plates, you can use:

- 384w COSTAR square shape,
- 384w Microtiter round shape by Thermo Scientific

Should I use flat-bottom or round bottom multi-well plates?

The swimming activity of worms in U-bottom wells is generally higher than in flat bottom wells since the shape of the well causes the worms to accumulate exactly in the path of the laser beam which detects activity. In flat bottom wells, the nematodes are more spread out and interfere less often with the laser beam. For more information, download [this Tech Note](#).