

# MaggotTracker

## *Drosophila melanogaster* larval locomotion

### Parameter Definitions

Measurement	Parameter	Unit	Definition of parameter
Animal shape	Body Length	mm	The length of the midline of the larva measured using all frames.
	Body Length Contracted	mm	Body length measured using a subset of frames when the larval length reaches the local minimum during a stride.
	Body Length Extended	mm	Body length measured using a subset of frames where the larval length reaches the local maximum during a stride.
	Time Head Bending	%	Percentage of time when the larva has a head angle of over 45 degrees. <sup>1, 2</sup>
	Time Body Bending	%	Percentage of time when the larva has a body angle of over 45 degrees. <sup>1, 2</sup>
	Time Bending	%	Percentage of time when the larva has either its head or body angle over 45 degrees. <sup>1, 2</sup>
Peristalsis movement	Speed	mm/sec	The positional change of the center point over time. <sup>1, 3</sup>
	Time Striding	%	Percentage of time when the larva is striding. <sup>1, 2</sup>
	Speed Striding	mm/sec	Speed measured using a subset of frames when the animal is striding. <sup>1, 3</sup>
	Stride Duration	sec	Time duration of one stride. <sup>1</sup>
	Stride Distance	mm	Distance traveled by the center point during one stride. <sup>1, 3</sup>
	Contraction rate	mm/sec	The rate of body length change during the contraction phase of a stride. <sup>1</sup>
	Extension rate	mm/sec	The rate of body length change during the extension phase of a stride. <sup>1</sup>
Stamina	Stride Count	counts/min	Total number of strides over the video length. <sup>2</sup>
	Run Distance	mm	Average distance traveled in a run. A run is defined as a period when the animal is striding continuously. <sup>2</sup>
	Run Duration	sec	
	Run Stride Count	counts/min	Average number of strides of a run. <sup>2</sup>
	Run Count	counts/min	Total number of runs over the video length. <sup>2</sup>
Track	Distance	mm/min	Total distance traveled by the center point over the video length. <sup>2</sup>
	Direction Change	%	Percentage points on the track where the animal is changing its direction. <sup>2</sup>
	Time Inside	%	Percentage of time the animal is away from the plastic ring. <sup>2</sup>

<sup>1</sup> These parameters are measured in three ways: overall, inside, and outside. Overall values evaluate the whole video. Inside values evaluate the animal when it is away from the plastic. Outside values evaluate the animal when it is close to or on the plastic ring. Overall values were used by default unless otherwise specified.

<sup>2</sup> These parameters are measured over the entire video. They have one value data point from each video. The other parameters are measured for each frame. The mean value was used for each video.

<sup>3</sup> These parameters are measured for each of the 13 points along the midline. Values for the center point, Point 7, were used by default unless otherwise specified.