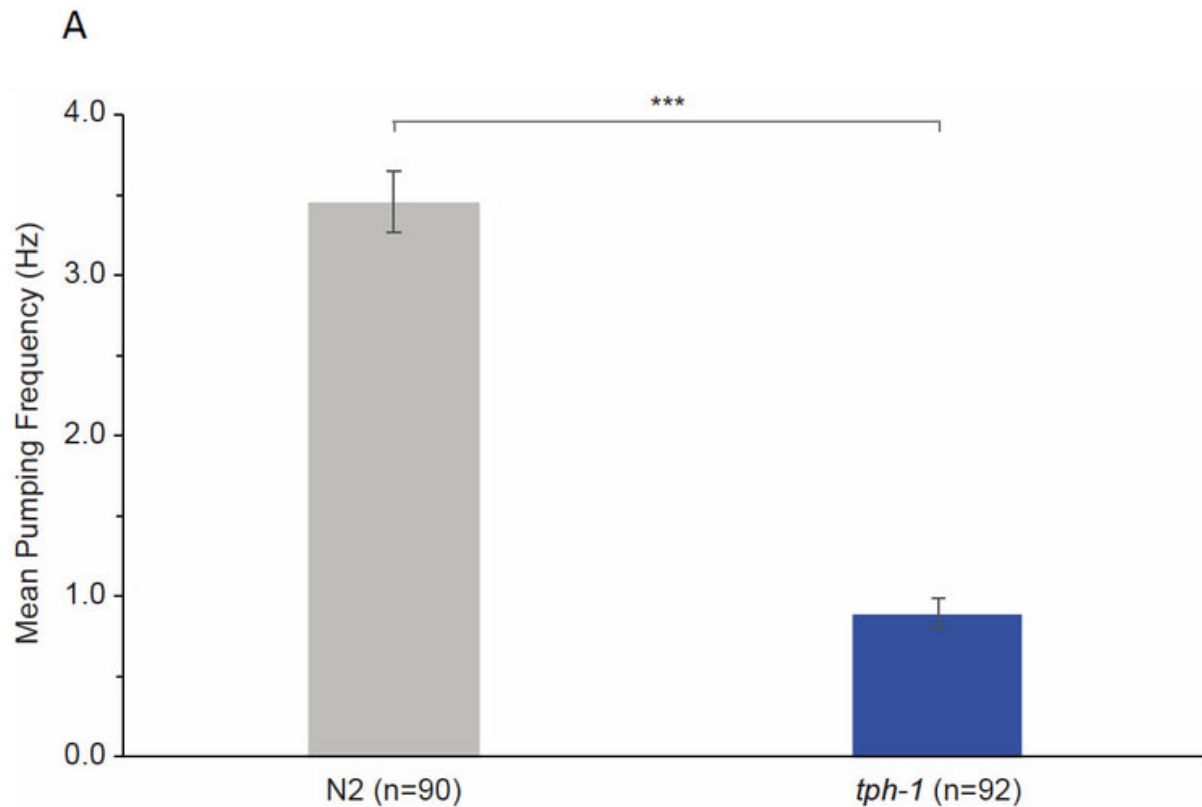


Reduced pharyngeal pumping rates observed in *tph-1* mutants using microfluidic electropharyngeogram (EPG) recordings

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B

Trial #	N2	<i>tph-1</i>
1	3.99 ± 0.28 Hz; n=30	0.79 ± 0.18 Hz; n=30
2	3.00 ± 0.32 Hz; n=30	0.77 ± 0.17 Hz; n=30
3	3.38 ± 0.36 Hz; n=30	1.11 ± 0.15 Hz; n=32

Description

In *Caenorhabditis elegans*, [serotonin \(5-HT\)](#) activates and controls pharyngeal pumping in response to food (Horvitz et al., 1982; Sze et al., 2000; Song and Avery 2012). Tryptophan hydroxylase, the enzyme required for [serotonin](#) biosynthesis, is encoded by the gene [tph-1](#). Worms with a [tph-1](#) deletion mutation exhibit phenotypes associated with a lack of serotonin-signaling, including reduced pharyngeal pumping (Sze et al., 2000; Avery and Horvitz 1990; Song and Avery 2012). We used a microfluidic electropharyngeogram (EPG) recording platform ([NemaMetrix](#)) and associated software ([NemAnalysis](#)) to

measure pharyngeal pumping in *C. elegans* *tph-1* mutants in the presence of bacterial food (100 mg/ml *E. coli* OP50 in M9 buffer), following a 2-hr fasting period. Prior research has shown that a fasting period (e.g., 2-4-hr) induces elevated feeding rates for worms upon re-introduction to bacterial food (Lemieux and Ashrafi 2015). We chose to measure pharyngeal pumping during this elevated feeding phase due to our hypothesis that *tph-1* animals would exhibit lower pumping rates than control worms. Pumping was recorded for 2-minute durations over three independent trials (total [N2](#) n = 90; *tph-1* n = 92). *C. elegans* *tph-1* mutants exhibited significantly lower pharyngeal pumping rates than [N2](#) control animals (A, [N2](#) = 3.46 ± 0.19 Hz; *tph-1* = 0.89 ± 0.10 Hz; mean \pm SEM; *** p < 0.0001, 2-tailed students t-test). Pumping frequency data were pooled in A; see B for a comparison of each experimental trial.

Reagents

Strains: MT15434 *tph-1* ([mg280](#)) II, kindly provided by the [Prahlad](#) lab.

Control Strain: [N2](#)

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