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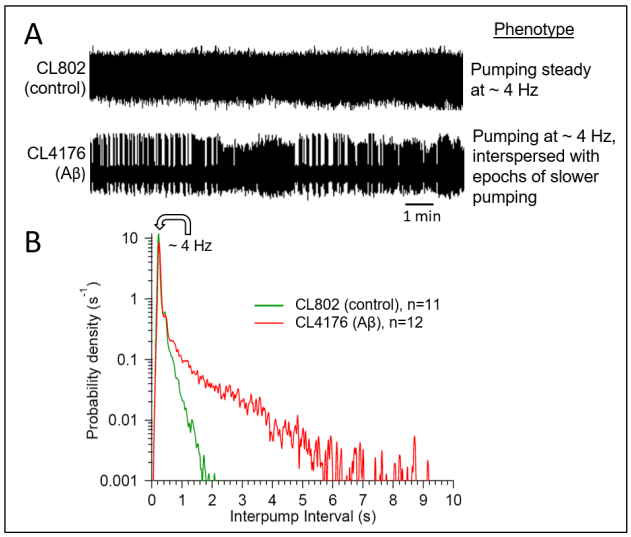
Microfluidic EPG Recordings Show Striking Pharyngeal Pumping Phenotype in a *C. elegans* Alzheimer's Disease Model

Janis C. Weeks[1,2], Kristin J. Robinson[1], Benedicta Wanjeri[1], Philip F. Copenhaver[3], William M. Roberts[1,2]
[1]Institute of Neuroscience, University of Oregon, Eugene OR 97403, USA. jweeks@uoregon.edu
[2]NemaMetrix, Inc,. 44 W 7th Ave., Eugene, OR 97401 USA. www.nemametrix.com
[3]Dept. of Cell, Developmental and Cancer Biology, Oregon Health & Science University, Portland, OR, 97239. USA.



Description:

Strain CL4176 accumulates amyloid-β_{1-42} in body wall muscles after being shifted from 15 to 25ºC during L4 (Link et al. 2003). Forty-eight hours after a temperature shift, control CL802 worms showed normal pumping activity (**A**) during microfluidic electropharyngeogram (EPG) recordings in M9 buffer containing 10 mM serotonin (Lockery et al. 2012). In contrast, mean pump frequency in CL4176 worms was reduced significantly by ~42% (**A**. CL802, 3.70 ± 0.15 Hz; CL4176, 2.16 ± 0.23 Hz; S.E.M.; $P < 10^{-4}$; 2-tailed Student's t-test), due to a marked increase in the probability of longer inter-pump intervals (the time between successive pumps **B**).

References:

Link CD, Taft A, Kapulkin V, Duke K, Kim S, Fei Q, Wood DE, Sahagan BG (2003) Gene Expression analysis in a transgenic *Caenorhabditis elegans* Alzheimer's disease model. Neurobiology of Aging 24(3):397-413

Lockery SR, RE Hulme, WM Roberts, KJ Robinson, A Laromaine, TH Lindsay, GM Whitesides, JC Weeks (2012) A microfluidic device for whole-animal drug screening using electrophysiological measures in the nematode *C. elegans*. *Lab Chip*, 12:2211-20.

Reagents:

Molecule: Serotonin
Strains: **CL4176**: *smg-1*(*cc546*) I; *dvIs27* X.
Control Strain: **CL802**: *smg-1*(*cc546*) I; *rol-6*(*su1006*) II
Transgenes: ***dvIs27***[pAF29(*myo-3*p::human Aβ1-42::*let* 3'UTR)+pRF4(*rol-6*(*su1006*))]

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