**daf-2 modulates regeneration of mechanosensory neurons**

Zehra C Abay¹, Michelle Yu-Ying Wong¹, and Brent Neumann¹*

¹Neuroscience Program, Monash Biomedicine Discovery Institute and Department of Anatomy and Developmental Biology, Monash University, Melbourne VIC 3800, Australia

*Correspondence to: brent.neumann@monash.edu

**Description:**
The *daf-2* gene encodes an insulin-like growth factor/IGF-1 receptor that regulates *C. elegans* embryonic and larval development. It has previously been shown that DAF-2 inhibits neurite regeneration of the GABAergic motor neurons and PVD sensory neurons in an age-dependent fashion [1, 2]. Following injury, the posterior lateral microtubule (PLM) neurons are capable of regenerating through axonal fusion, a highly efficient regrowth mechanism in which separated fragments fuse back together [3-6]. We previously established that a critical event for axonal fusion to occur is the exposure of injury-induced phosphatidylserine (PS) ‘save-me’ signals [5]. The level of PS exposure increases with advancing age [3]. To determine if *daf-2* is involved in this age-dependent modulation of PS exposure, we visualised and quantified the level of PS exposed after PLM axotomy using a secreted, tagged version of Annexin V [5, 7]. Mutation of *daf-2* had no effect on PS exposure 1 h post-axotomy, with no significant differences observed on either the distal or proximal axon segments (Table 1).

**Table 1.** Quantification of the relative level of PS exposed 1 h post-axotomy.

<table>
<thead>
<tr>
<th>Genotype</th>
<th>PS exposed on distal axon (relative to pre-axotomy)</th>
<th>PS exposed on proximal axon (relative to pre-axotomy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>wild-type</td>
<td>1.53 ± 0.105</td>
<td>1.44 ± 0.0855</td>
</tr>
<tr>
<td><em>daf-2</em>(e1370)</td>
<td>1.51 ± 0.167</td>
<td>1.57 ± 0.166</td>
</tr>
</tbody>
</table>

**Reagents**
One-day-old adult hermaphrodites were used for all experiments, and were grown under standard conditions at 20°C. The BXN301 [*daf-2*(e1370); *smIs95(Phsps-16.2::sAnxV::mRFP); *zdIs5(Pmec-4::GFP)*] strain was used along with the CU4204 [*smIs95(Phsps-16.2::sAnxV::mRFP); *zdIs5(Pmec-4::GFP)*] control strain. The *daf-2*(e1370) allele has been considered temperature sensitive for the dauer phenotype, but not for the long-lived phenotype. At 20°C, *daf-2*(e1370) animals display a greater than 2-fold increase in lifespan compared to the wild-type [8]. Laser axotomy, microscopy and quantification of data was performed as previously described [3].

**References**


**Funding:**
This work was supported by National Health and Medical Research Council (NHMRC) Project Grant 1101974.

**Acknowledgements**
We thank Ding Xue for sharing strains.

**Reviewed by** Rachid El Bejjani  
**Received** 11/10/2017, **Accepted** 11/26/2017. **Available** starting WormBase release WS264, **Published Online** 12/01/2017.

**Copyright:** © 2017. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Citation:** Abay, ZC; Yu-Ying Wong, M; Neumann B. (2017): daf-2 modulates regeneration of mechanosensory neurons II. Micropublication: biology. Dataset. https://doi.org/10.17912/W2SM1T