**Supplementary Tables**

**Contents:**

**Table S1. Lifespan of wild-type nematode (N2) treated with DnAE in different concentrations.**

| **Figure 1A** Concentration | | Control (0μM) | 200μg/ml DnAE | 500μg/ml DnAE | 1000μg/ml DnAE |
|---|---|---|---|---|---|
| strain | | **N2(WT)** | **N2(WT)** | **N2(WT)** | **N2(WT)** |
| Treatments | | 20℃/OP50 (dead) | 20℃/OP50 (dead) | 20℃/OP50 (dead) | 20℃/OP50 (dead) |
| Mean±SEM | EXP.1 | 18.933±0.926 | 20.233±0.998 | 21.939±0.990 | 22.979±1.005 |
| | EXP.2 | 18.663±0.728 | 20.374±0.972 | 21.243±0.961 | 22.270±0.938 |
| | EXP.3 | 19.487±0.824 | 20.455±0.983 | 21.232±0.825 | 22.837±0.988 |
| *P* value VS control | EXP.1 | | 0.1594 | 0.0069 | 0.0013 |
| | EXP.2 | | 0.1325 | 0.0038 | 0.0009 |
| | EXP.3 | | 0.1932 | 0.0098 | 0.0023 |
| N | EXP.1 | 63 | 62 | 65 | 68 |
| | EXP.2 | 73 | 72 | 75 | 74 |
| | EXP.3 | 73 | 73 | 77 | 77 |
| change in mean lifespan | EXP.1 | | 6.87% | 15.88% | 21.37% |
| | EXP.2 | | 9.34% | 14.01% | 19.51% |
| | EXP.3 | | 4.97% | 8.95% | 17.19% |

**Table S2. Lifespan of wild-type nematode (N2) treated with 214 μmol/ml EtOH (consistent with the concentration of alcohol contained in 1 mg/ml DnAE)**

| Figure | Strain | Treatment | Mean lifespan ±SEM (days) | P value VS control | change in mean lifespan | N |
|---|---|---|---|---|---|---|
| | **N2（WT）** | **20℃** | Days | | | |
| **1B** | EXP.1 | control | 18.643±0.672 | 0.4754 | # | 61 |
| | EXP.1 | 214 μmol/ml EtOH | 18.827±0.726 | | | 61 |
| | EXP.2 | control | 19.224±0.526 | 0.2637 | # | 65 |
| | EXP.2 | 214 μmol/ml EtOH | 18.824±0.982 | | | 75 |
| | EXP.3 | control | 19.453±0.530 | 0.6283 | # | 60 |
| | EXP.3 | 214 μmol/ml EtOH | 19.295±0.612 | | | 66 |

S1-S2: *p*-value was analyzed by log-rank (Mantel-Cox) test.
N: number of dead worms.
*P* <0.05 indicated that the experiment was statistically significant, while *P* >0.05 indicated that the experiment was not statistically significant.

**Table S3 Effect of DnAE on oviposition rate of N2 worm.**

| | Days | Strains | Treatments | Mean offspring ±SEM | P value VS control | N |
|---|---|---|---|---|---|---|
| | | **N2(WT)** | **OP50(dead) 20℃** | | | |
| | 1 | EXP.1 | control | 53.00±1.566 | 0.943 | 3 |
| | | EXP.1 | 1mg/ml DnAE | 53.33±2.053 | | |
| | 2 | EXP.1 | control | 152.3±6.467 | 0.377 | 3 |
| | | EXP.1 | 1mg/ml DnAE | 146.7±5.974 | | |
| | 3 | EXP.1 | control | 47.33±2.940 | 0.696 | 3 |
| | | EXP.1 | 1mg/ml DnAE | 49.00±3.105 | | |
| | 4 | EXP.1 | control | 26.67±1.394 | 0.768 | 3 |
| | | EXP.1 | 1mg/ml DnAE | 27.00±1.293 | | |
| | 5 | EXP.1 | control | 12.00±1.283 | 0.629 | 3 |
| | | EXP.1 | 1mg/ml DnAE | 10.00±0.838 | | |
| | Total | EXP.1 | control | 291.3±6.323 | 0.169 | 3 |
| | | EXP.1 | 1mg/ml DnAE | 282.7±6.923 | | |
| | | **N2（WT）** | **OP50(dead) 20℃** | | | |
| | 1 | EXP.2 | control | 48.67±1.384 | 0.165 | 3 |
| | | EXP.2 | 1mg/ml DnAE | 54.33±1.345 | | |
| | 2 | EXP.2 | control | 156.7±4.389 | 0.126 | 3 |
| | | EXP.2 | 1mg/ml DnAE | 146.3±5.228 | | |
| | 3 | EXP.2 | control | 50.67±2.993 | 0.294 | 3 |
| | | EXP.2 | 1mg/ml DnAE | 53.33±3.232 | | |
| | 4 | EXP.2 | control | 30.00±1.323 | 0.439 | 3 |
| | | EXP.2 | 1mg/ml DnAE | 28.33±1.394 | | |
| | 5 | EXP.2 | control | 16.67±1.339 | 0.341 | 3 |
| | | EXP.2 | 1mg/ml DnAE | 14.00±1.832 | | |
| | Total | EXP.2 | control | 302.7±6.822 | 0.578 | 3 |
| **Figure1C** | | EXP.2 | 1mg/ml DnAE | 296.3±7.360 | | |
| | | **N2（WT）** | **OP50(dead) 20℃** | | | |
| | 1 | EXP.3 | control | 49.33±2.283 | 0.493 | 3 |
| | | EXP.3 | 1mg/ml DnAE | 46.33±1.92 | | |
| | 2 | EXP.3 | control | 142.3±4.263 | 0.916 | 3 |
| | | EXP.3 | 1mg/ml DnAE | 142.7±3.911 | | |
| | 3 | EXP.3 | control | 49.00±1.293 | 0.922 | 3 |

| | | | | | |
|---|---|---|---|---|---|
| 4 | EXP.3 | 1mg/ml DnAE | 49.33±1.178 | 0.613 | 3 |
| | EXP.3 | control | 30.00±1.134 | | |
| 5 | EXP.3 | 1mg/ml DnAE | 29.00±1.384 | 0.402 | 3 |
| | EXP.3 | control | 12.67±0.490 | | |
| Total | EXP.3 | 1mg/ml DnAE | 10.33±0.379 | 0.346 | 3 |
| | EXP.3 | control | 283.3±6.915 | | |
| | EXP.3 | 1mg/ml DnAE | 277.7±6.559 | | |

**Table S4. Effect of DnAE on pharyngeal pumping in wild-type nematode (N2).**

| Figure | Strain | Treatment | Mean Pigment ±SEM | P value VS control | N |
|---|---|---|---|---|---|
| **1D** | **N2(WT)** | OP50(dead) | 3 days of adult | | |
| | EXP.1 | 20℃/control | 29.30±0.6549 | 0.2326 | 20 |
| | EXP.1 | 20℃/1mg/ml DnAE | 29.65±0.6832 | | 20 |
| | EXP.2 | 20℃/control | 31.37±0.6982 | 0.1937 | 20 |
| | EXP.2 | 20℃/1mg/ml DnAE | 30.63±0.6039 | | 20 |
| | EXP.3 | 20℃/control | 31.16±0.6121 | 0.2142 | 20 |
| | EXP.3 | 20℃/1mg/ml DnAE | 30.43±0.5893 | | 20 |

The pharyngeal pumping count time was 10 seconds per nematode. N was the experimental sample size, and P value was calculated by two-tailed t-test. $P < 0.05$ indicated that the experiment was statistically significant

**Table S5. Effect of DnAE on body movement in wild-type nematode (N2).**

| Figure | Strain | Treatment | Mean Pigment ±SEM | P value VS control | N |
|---|---|---|---|---|---|
| **1E** | **N2(WT)** | OP50(dead) | 3 days of adult | | |
| | EXP.1 | 20℃/control | 34.70±0.7749 | 0.2888 | 20 |
| | EXP.1 | 20℃/1mg/ml DnAE | 35.65±0.6893 | | 20 |
| | EXP.2 | 20℃/control | 32.46±0.5452 | 0.1733 | 20 |
| | EXP.2 | 20℃/1mg/ml DnAE | 34.13±0.5029 | | 20 |
| | EXP.3 | 20℃/control | 31.16±0.4832 | 0.364 | 20 |
| | EXP.3 | 20℃/1mg/ml DnAE | 32.17±0.5923 | | 20 |

The body movement count time was 20 seconds per nematode. N was the experimental sample size, and P value was calculated by two-tailed t-test. P <0.05 indicated that the experiment was statistically significant

**Table S6. Effect of DnAE on lipofuscin in wild-type nematode (N2).**

| Figure | Strain | Treatments | Mean Pigment ±SEM | *P* value VS control | N |
|---|---|---|---|---|---|
| **1F** | **N2(WT)** | **20℃ 5 days** | | | |
| | EXP.1 | control | 18.06±0.921 | <0.00001 | 29 |
| | EXP.1 | 1mg/ml DnAE | 8.635±0.448 | | 30 |
| | EXP.2 | control | 16.31±0.954 | <0.00001 | 30 |
| | EXP.2 | 1mg/ml DnAE | 7.41±0.351 | | 30 |
| | EXP.3 | control | 18.39±0.720 | <0.00001 | 25 |
| | EXP.3 | 1mg/ml DnAE | 10.02±0.322 | | 29 |
| **1F** | **N2(WT)** | **20℃ 10 days** | | | |
| | EXP.1 | control | 36.54±1.293 | 0.0011 | 29 |
| | | 1mg/ml DnAE | 33.44±1.048 | | 30 |
| | EXP.2 | control | 34.31±0.954 | 0.0008 | 30 |
| | | 1mg/ml DnAE | 30.41±1.151 | | 30 |
| | EXP.3 | control | 29.89±0.820 | 0.0015 | 25 |
| | | 1mg/ml DnAE | 27.02±0.769 | | 29 |

On the 5 and 10 day of the adult worm, the accumulation of lipofuscin in intestinal tissues of the treated and untreated nematodes was photographed and counted. Fluorescence intensity was analyzed by Image J, and *p* value was calculated by two-tailed t-test, where $P < 0.05$ indicated that the experiment was statistically significant

**Table S7. Effect of DnAE on resistance to high temperature and oxidation in wild-type nematode (N2).**

| Figure | Strain | Treatment | Mean lifespan ±SEM | P value VS control | change in mean lifespan | N |
|---|---|---|---|---|---|---|
| | **N2** | **Paraquat** | Days | | | |
| | EXP.1 | 20℃/control | 9.436±0.493 | | | 80 |
| | EXP.1 | 20℃/1mg/ml DnAE | 11.500±0.611 | 0.010 | 21.87% | 82 |
| **4B** | EXP.2 | 20℃/control | 8.581±0.343 | | | 70 |
| | EXP.2 | 20℃/1mg/ml DnAE | 10.232±0.549 | 0.031 | 19.24% | 76 |
| | EXP.3 | 20℃/control | 9.059±0.603 | | | 80 |
| | EXP.3 | 20℃/1mg/ml DnAE | 10.858±0.307 | 0.018 | 19.87% | 85 |
| | **N2** | **$H_2O_2$** | Hours | | | |
| | EXP.1 | 20℃/control | 4.750±0.234 | | | 74 |
| | EXP.1 | 20℃/1mg/ml DnAE | 5.850±0.311 | 0.007 | 23.16% | 78 |
| **4A** | EXP.2 | 20℃/control | 4.612±0.243 | | | 84 |
| | EXP.2 | 20℃/1mg/ml DnAE | 5.506±0.303 | 0.002 | 19.39% | 80 |
| | EXP.3 | 20℃/control | 4.085±0.206 | | | 85 |
| | EXP.3 | 20℃/1mg/ml DnAE | 4.917±0.278 | 0.011 | 20.38% | 81 |
| | **N2** | **37℃** | Hours | | | |
| | EXP.1 | control | 3.256±0.200 | 0.0007 | 34.09% | 65 |
| | EXP.1 | 1mg/ml DnAE | 4.366±0.254 | | | 78 |
| **3A** | EXP.2 | control | 3.612±0.173 | 0.0011 | 28.39% | 88 |
| | EXP.2 | 1mg/ml DnAE | 4.637±0.209 | | | 81 |
| | EXP.3 | control | 3.485±0.201 | 0.0021 | 30.78% | 80 |
| | EXP.3 | 1mg/ml DnAE | 4.558±0.208 | | | 81 |

*p*-value was analyzed by log-rank (Mantel-Cox) test.
N: number of dead worms.
$P$ <0.05 indicated that the experiment was statistically significant, while $P$ >0.05 indicated that the experiment was not statistically significant.

**Table S8. Effect of DnAE on ROS level of N2 nematode.**

| Figure | Strain | Treatment | Mean ± SEM | P value VS Control | N |
|---|---|---|---|---|---|
| **4D** | **N2(WT)** | 20℃ OP50(dead) | | | |
| | EXP.1 | Control | 10.24±0.1531 | | 22 |
| | EXP.1 | 1mg/ml DnAE | 7.889±0.2475 | <0.0001 | 23 |
| | EXP.1 | 4mM Paraquat | 18.23±0.2392 | <0.0001 | 20 |
| | EXP.1 | 4mM Paraquat 1mg/ml DnAE | 16.40±0..4523 | <0.0001 | 21 |
| | EXP.2 | Control | 14.318±0.521 | | 33 |
| | EXP.2 | 1mg/ml DnAE | 10.964±0.391 | <0.0001 | 29 |
| | EXP.2 | 4mM Paraquat | 20.140±0.620 | <0.0001 | 33 |
| | EXP.2 | 4mM Paraquat 1mg/ml DnAE | 18.172±0.667 | <0.0001 | 35 |
| | EXP.3 | Control | 18.283±0.226 | | 30 |
| | EXP.3 | 1mg/ml DnAE | 15.293±0.469 | <0.0001 | 27 |
| | EXP.3 | 4mM Paraquat | 27.394±0.392 | <0.0001 | 30 |
| | EXP.3 | 4mM Paraquat 1mg/ml DnAE | 22.312±0.683 | <0.0001 | 33 |

ROS levels were quantified using the cell membrane-permeable reactive oxygen species (ROS) detection probe H2DCFH-DA.the accumulation of ROS was photographed and counted. Fluorescence intensity was analyzed by Image J, and *p* value was calculated by two-tailed t-test, where $P < 0.05$ indicated that the experiment was statistically significant.

**Table S9. Effect of DnAE on SOD level of N2 nematode.**

| Figure | Strain | Treatment | SOD activity | P value VS control |
|---|---|---|---|---|
| | **N2（WT）** | **20℃** | | |
| **4C** | EXP.1 | control | 7.3321±0.122 | 0.0050 |
| | EXP.1 | 1mg/ml DnAE | 9.7259±0.096 | |
| | EXP.2 | control | 6.224±0.106 | 0.0037 |
| | EXP.2 | 1mg/ml DnAE | 10.824±0.192 | |
| | EXP.3 | control | 12.453±0.249 | 0.0183 |
| | EXP.3 | 1mg/ml DnAE | 14.295±0.212 | |

*p* value was calculated by two-tailed t-test

N: number of dead worms. N≥1000.

*P* <0.05 indicated that the experiment was statistically significant.

**Table S10. Effect of DnAE on expression of HSP-12.6, SOD-3, GST-4, DAF-16 in mutant nematode.**

| Figure | Strain | Treatment | Fluorescence intensity Mean ± SEM | P valuel | N |
|---|---|---|---|---|---|
| 3C | **TJ375 *gpIs1 (hsp-16.2p::GFP)*** | OP50(dead) | | | |
| | EXP.1 | 20℃/control | 4.614±0.2891 | 0.0021 | 31 |
| | EXP.1 | 20℃/1mg/ml DnAE | 6.457±0.6876 | | 31 |
| | EXP.1 | 35℃ 1h | 26.44±3.199 | 0.0249 | 25 |
| | EXP.1 | 35℃1h/1mg/ml DnAE | 28.02±2.548 | | 27 |
| | EXP.2 | 20℃/control | 5.233±0.158 | 0.0036 | 36 |
| | EXP.2 | 20℃/1mg/ml DnAE | 7.526±0.152 | | 34 |
| | EXP.2 | 35℃ 1h | 22.26±2.293 | 0.0162 | 34 |
| | EXP.2 | 35℃1h/1mg/ml DnAE | 24.02±2.521 | | 27 |
| | EXP.3 | 20℃/control | 4.238±0.1928 | 0.0022 | 28 |
| | EXP.3 | 20℃/1mg/ml DnAE | 6.263±0.5278 | | 32 |
| | EXP.3 | 35℃ 1h | 25.27±2.349 | 0.0527 | 22 |
| | EXP.3 | 35℃1h/1mg/ml DnAE | 28.32±2.364 | | 25 |
| 5B | **CL2166 *dvIs19* (gst-4p::GFP)** | 20℃ OP50(dead) | | | |
| | EXP.1 | control | 14.50±0.4102 | <0.0001 | 38 |
| | EXP.1 | 1mg/ml DnAE | 19.11±0.4200 | | 36 |
| | EXP.1 | 4mM Paraquat | 9.581±0.3027 | <0.0001 | 43 |
| | EXP.1 | 1mg/ml DnAE 4mM Paraquat | 12.22±0.3090 | | 39 |
| | EXP.2 | control | 11.26±0.3760 | <0.0001 | 34 |
| | EXP.2 | 1mg/ml DnAE | 14.77±0.3224 | | 36 |
| | EXP.2 | 4mM Paraquat | 8.283±0.3983 | <0.0001 | 35 |
| | EXP.2 | 1mg/ml DnAE 4mM Paraquat | 10.27±0.3451 | | 33 |
| | EXP.3 | control | 9.553±0.3964 | <0.0001 | 31 |
| | EXP.3 | 1mg/ml DnAE | 13.28±0.4340 | | 36 |
| | EXP.3 | 4mM Paraquat | 8.391±0.3237 | <0.0001 | 40 |
| | EXP.3 | 1mg/ml DnAE 4mM Paraquat | 10.25±0.3543 | | 38 |
| 5C | **CF1553 *zcIs13* (sod-3p::GFP)** | OP50(dead) | | | |

| | | | | | |
|---|---|---|---|---|---|
| EXP.1 | control | 11.00±0.2183 | <0.0001 | | 21 |
| EXP.1 | 1mg/ml DnAE | 13.21±0.2854 | | | 24 |
| EXP.1 | 4mM Paraquat | 8.163±0.2220 | 0.0003 | | 32 |
| EXP.1 | 1mg/ml DnAE 4mM Paraquat | 9.577±0.2282 | | | 23 |
| EXP.2 | control | 12.37±0.2233 | <0.0001 | | 32 |
| EXP.2 | 1mg/ml DnAE | 14.22±0.2804 | | | 25 |
| EXP.2 | 4mM Paraquat | 8.273±0.2660 | 0.0023 | | 32 |
| EXP.2 | 1mg/ml DnAE 4mM Paraquat | 9.746±0.2228 | | | 27 |
| EXP.3 | control | 10.88±0.2142 | 0.0003 | | 33 |
| EXP.3 | 1mg/ml DnAE | 12.54±0.2464 | | | 34 |
| EXP.3 | 4mM Paraquat | 8.453±0.2022 | 0.0010 | | 32 |
| EXP.3 | 1mg/ml DnAE 4mM Paraquat | 9.863±0.3100 | | | 32 |

| Figure | Strain | Treatment | Cytosolic | Intermediate | Nuclear | N |
|---|---|---|---|---|---|---|
| **5A** | **TJ356 zIs356(daf-16p::daf-16a/b::GFP )** | 20℃ OP50(dead) | | | | |
| | EXP.1 | control | 35 | | | 35 |
| | EXP.1 | 1mg/ml DnAE | 29 | | | 29 |
| | EXP.1 | 4mM Paraquat | 3 | 18 | 12 | 33 |
| | EXP.1 | 4mM Paraquat 1mg/ml DnAE | 2 | 11 | 14 | 27 |
| | EXP.1 | control | 30 | | | 30 |
| | EXP.1 | 1mg/ml DnAE | 26 | | | 26 |
| | EXP.1 | 4mM Paraquat | 3 | 20 | 7 | 30 |
| | EXP.1 | 4mM Paraquat 1mg/ml DnAE | 3 | 12 | 16 | 31 |
| | EXP.1 | control | 25 | | | 25 |
| | EXP.1 | 1mg/ml DnAE | 26 | | | 26 |
| | EXP.1 | 4mM Paraquat | 3 | 15 | 6 | 24 |
| | EXP.1 | 4mM Paraquat 1mg/ml DnAE | 2 | 10 | 12 | 24 |

Fluorescence intensity was analyzed by Image J, and p value was calculated by two-tailed t-test, where $P < 0.05$ indicated that the experiment was statistically significant.

**Table S11. Effect of DnAE on lifespan of mutant nematode.**

| Figure | Strain | Treatment | Mean lifespan ±SEM (days) | P value VS control | change in mean lifespan | N |
|---|---|---|---|---|---|---|
| **3D** | **PS3551** ***hsf-1 (sy441).*** | 20℃ OP50(dead) | Days | | | |
| | EXP.1 | control | 15.172±0.926 | 0.2559 | # | 60 |
| | EXP.1 | 1mg/ml DnAE | 15.688±1.298 | | | 77 |
| | EXP.2 | control | 15.224±0.689 | 0.2862 | # | 77 |
| | EXP.2 | 1mg/ml DnAE | 14.824±0.982 | | | 85 |
| | EXP.3 | control | 14.453±0.536 | 0.6161 | # | 66 |
| | EXP.3 | 1mg/ml DnAE | 14.075±0.619 | | | 68 |
| **6B** | **CF1038** ***daf-16 (mu86).*** | 20℃ OP50(dead) | | | | |
| | EXP.1 | control | 12.361±0.564 | 0.1651 | # | 79 |
| | EXP.1 | 1mg/ml DnAE | 12.727±0.588 | | | 78 |
| | EXP.2 | control | 13.158±0.511 | 0.2112 | # | 70 |
| | EXP.2 | 1mg/ml DnAE | 12.215±0.405 | | | 80 |
| | EXP.3 | control | 11.832±0.505 | 0.2938 | # | 61 |
| | EXP.3 | 1mg/ml DnAE | 12.292±0.650 | | | 64 |
| **6C** | **CB1370** ***daf-2 (e1370).*** | 20℃ OP50(dead) | | | | |
| | EXP.1 | control | 43.410±1.886 | 0.1373 | # | 77 |
| | EXP.1 | 1mg/ml DnAE | 42.788±2.620 | | | 73 |
| | EXP.2 | control | 42.767±1.458 | 0.110 | # | 88 |
| | EXP.2 | 1mg/ml DnAE | 43.157±1.520 | | | 78 |
| | EXP.3 | control | 39.284±1.592 | 0.716 | # | 67 |
| | EXP.3 | 1mg/ml DnAE | 40.032±1.532 | | | 76 |

***p***-value was analyzed by log-rank (Mantel-Cox) test.

N: number of dead worms.

$P$ <0.05 indicated that the experiment was statistically significant, while $P$ >0.05 indicated that the experiment was not statistically significant.

**Table S12. Effects of DnAE on Parkinson**

| PD | | | | | |
|---|---|---|---|---|---|
| Figure | Strain | Treatment | Mean±SEM Days | P value | N |
| 7B | **BZ555 *egIs1*(DAT-1::GFP)** | 20℃ OP50(dead) | | | |
| | EXP.1 | 50mM 6-OHDA | 16.10±0.7446 | | 22 |
| | EXP.1 | 50mM 6-OHDA +1mg/ml DnAE | 20.20±0.7072 | <0.0001 | 20 |
| | EXP.1 | 50mM 6-OHDA +2mM L-DA | 21.09±0.5886 | <0.0001 | 20 |
| | EXP.1 | Control | 22.04±0.5842 | <0.0001 | 20 |
| | EXP.2 | 50mM 6-OHDA | 15.04±0.4292 | | 23 |
| | EXP.2 | 50mM 6-OHDA +1mg/ml DnAE | 18.31±0.8639 | 0.0036 | 22 |
| | EXP.2 | 50mM 6-OHDA +2mM L-DA | 20.12±0.5639 | <0.0001 | 22 |
| | EXP.2 | Control | 20.93±0.9378 | <0.0001 | 21 |
| | EXP.3 | 50mM 6-OHDA | 16.32±0.5386 | | 25 |
| | EXP.3 | 50mM 6-OHDA +1mg/ml DnAE | 18.54±0.7210 | 0.0004 | 24 |
| | EXP.3 | 50mM 6-OHDA +2mM L-DA | 19.38±0.5248 | <0.0001 | 29 |
| | EXP.3 | Control | 21.22±0.9218 | <0.0001 | 21 |
| 7A | **N5901 Punc-54::α-syn::YFP** | **5 days of adult** | | | |
| | EXP.1 | control | 11.230±1.073 | <0.0001 | 35 |
| | EXP.1 | 1mg/ml DnAE | 9.188±1.534 | | 27 |
| | EXP.1 | DR | 8.347±1.069 | <0.0001 | 29 |
| | EXP.1 | DR+1mg/ml DnAE | 6.420±1.070 | | 32 |
| | EXP.2 | control | 14.678±1.580 | 0.0008 | 30 |
| | EXP.2 | 1mg/ml DnAE | 11.391±1.447 | | 31 |
| | EXP.2 | DR | 9.347±1.273 | 0.0002 | 26 |
| | EXP.2 | DR+1mg/ml DnAE | 7.620±1.270 | | 34 |
| | EXP.3 | control | 13.348±1.720 | 0.0021 | 27 |
| | EXP.3 | 1mg/ml DnAE | 11.321±1.441 | | 27 |
| | EXP.3 | DR | 10.233±1.772 | <0.0001 | 28 |
| | EXP.3 | DR+1mg/ml DnAE | 8.273±1.491 | | 30 |

Fluorescence intensity was analyzed by Image J, and p value was calculated by two-tailed t-test, where P <0.05 indicated that the experiment was statistically significant.

**Table S13. Effects of DnAE on Alzheimer**

| Figure | Strain | Treatment | Mean hours ±SEM | P value VS control | change in mean time | N |
|---|---|---|---|---|---|---|
| **7C** | **CL4176 dvIs27 [myo-3p::A-Beta (1-42)::let-851 3'UTR)]** | **25℃** | Hours | | | |
| | EXP.1 | control | 32.967±0.283 | | | 61 |
| | EXP.1 | DnAE | 34.328±0.344 | 0.0023 | 4.13% | 61 |
| | EXP.2 | DR | 34.355±0.367 | 0.0019 | 4.21% | 65 |
| | EXP.2 | DR + DnAE | 35.123±0.345 | <0.0001 | 6.53% | 73 |
| | EXP.2 | control | 30.453±0.330 | | | 60 |
| | EXP.2 | DnAE | 32.495±0.322 | 0.0033 | 6.70% | 66 |
| | EXP.2 | DR | 32.667±0.427 | 0.0024 | 7.27% | 67 |
| | EXP.2 | DR + DnAE | 33.371±0.571 | 0.0002 | 9.66% | 77 |
| | EXP.3 | control | 32.189±0.327 | | | 70 |
| | EXP.3 | DnAE | 34.501±0.401 | 0.0043 | 7.18% | 71 |
| | EXP.3 | DR | 34.428±0.390 | 0.0053 | 7.01% | 68 |
| | EXP.3 | DR + DnAE | 35.652±0.326 | 0.0004 | 10.76% | 71 |

p-value was analyzed by log-rank (Mantel-Cox) test.

N: number of dead worms.

P <0.05 indicated that the experiment was statistically significant, while P >0.05 indicated that the experiment was not statistically significant.

**Table S14. Effect of DnAE on gene expression at mRNA level in nematode.**

| Gene | EXP.1 | EXP.2 | EXP.3 | Mean | SEM |
|---|---|---|---|---|---|
| Control | 1 | 1 | 1 | 1 | 0 |
| *daf-16* | 2.329 | 3.577 | 2.345 | 2.884 | 0.366 |
| *skn-1* | 0.763 | 0.969 | 1.063 | 0.932 | 0.088 |
| *daf-2* | 0.491 | 0.680 | 0.562 | 0.578 | 0.055 |
| *gst-4* | 1.507 | 1.780 | 2.275 | 1.854 | 0.224 |
| *sod-3* | 2.175 | 2.051 | 1.931 | 2.053 | 0.070 |
| *ctl-1* | 1.259 | 1.456 | 1.672 | 1.462 | 0.119 |
| *hsf-1* | 4.665 | 3.164 | 3.498 | 3.775 | 0.454 |
| *hsp-16.1* | 1.886 | 1.411 | 1.567 | 1.621 | 0.139 |
| *hsp-16.2* | 1.264 | 1.453 | 1.483 | 1.400 | 0.068 |
| *hsp-6* | 1.820 | 1.759 | 1.881 | 1.820 | 0.035 |
| *hsp-60* | 1.417 | 1.133 | 1.283 | 1.278 | 0.081 |
| *hsp-12.6* | 2.965 | 3.132 | 2.893 | 2.997 | 0.070 |

**Table S14. Primers used for the analysis of mRNA expression levels in nematode.**

| Gene | Forward primer | Reverse primer |
|---|---|---|
| *cdc-42* | CTGCTGGACAGGAAGATTACG | CTCGGACATTCTCGAATGAAG |
| *hsp-16.2* | CTGCAGAATCTCTCCATCTGAGTC | AGATTCGAAGCAACTGCACC |
| *hsp-60* | AGGAGAAGCTTAATGAGCG | ACACGGTCCTTCTTCTCT |
| *hsp-6* | AGGAACAACAGAGTAAGATTTTC | TCGATTTGGTCCTTGGAAAG |
| *sod-3* | AGCATCATGCCACCTACGTGA | CACCACCATTGAATTTCAGCG |
| *ctl-1* | GAATGTGAAGAATTATTTCGCTGA | GAATGTGAAGAATTATTTCGCTGA |
| *daf-2* | CGGTGCGAAGAGAGGATATT | TACAGAGGTCGCCGTTACTG |
| *gst-4* | TCCGTCAATTCACTTCTTCCG | AAGAAATCATCACGGGCTGG |
| *hsf-1* | TTGACGACGACAAGCTTCCAGT | AAAGCTTGCACCAGAATCATCCC |
| *daf-16* | TTTCCG TCC CCG AACTCA | ATTCGCCAACCCATGATGG |
| *hsp-12.6* | GTG ATG GCTGACGAAGGAAC | GGGAGGAAGTTATGGGCTTC |
| *skn-1* | AGTGTCGGCGTTCCAGATTTC | GTCGACGAATCTTGCGAATCA |
| *hsp-16.1* | GTCACTTTACCACTATTTCCGTCCAGC TCAACGTTC | CAACGGGCGCTTGCTGAATTGGAATA GATCTTCC |