

SUPPLEMENTARY FILE

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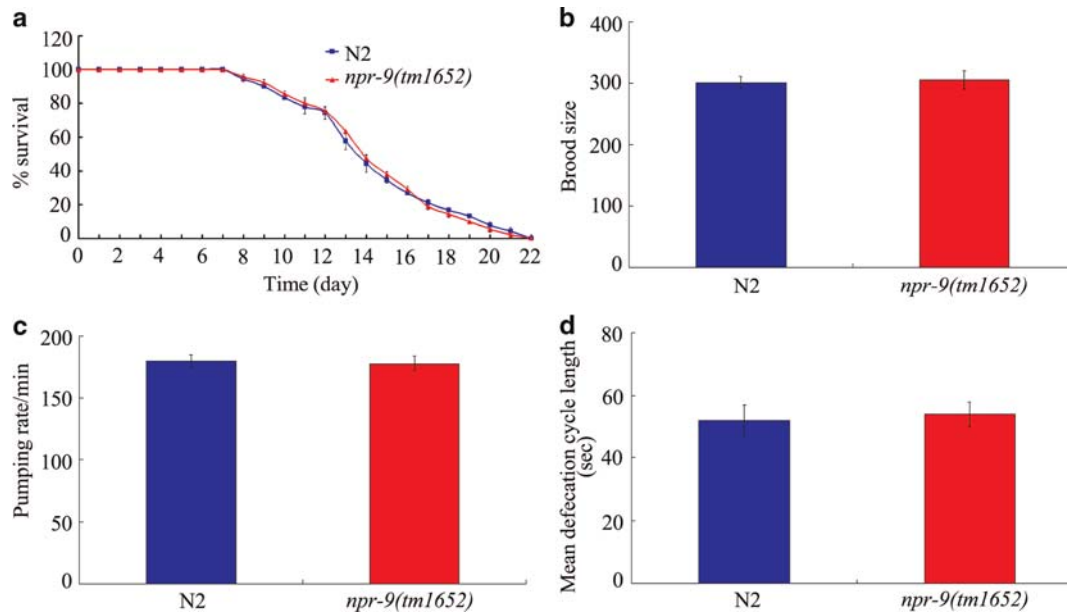


Figure 1 Phenotypic analysis in *npr-9* mutant nematodes. (a) Lifespan comparison between wild-type and *npr-9* mutant nematodes. A statistical comparison of the survival plots indicates that survival of the mutant animals was not significantly different from the wild-type N2 strain ($P=0.915$). (b) Brood size comparison between wild-type and *npr-9* mutant nematodes. (c) Pumping rate comparison between wild-type and *npr-9* mutant nematodes. (d) Mean defecation cycle length comparison between wild-type and *npr-9* mutant nematodes. Bars represent mean \pm SD.

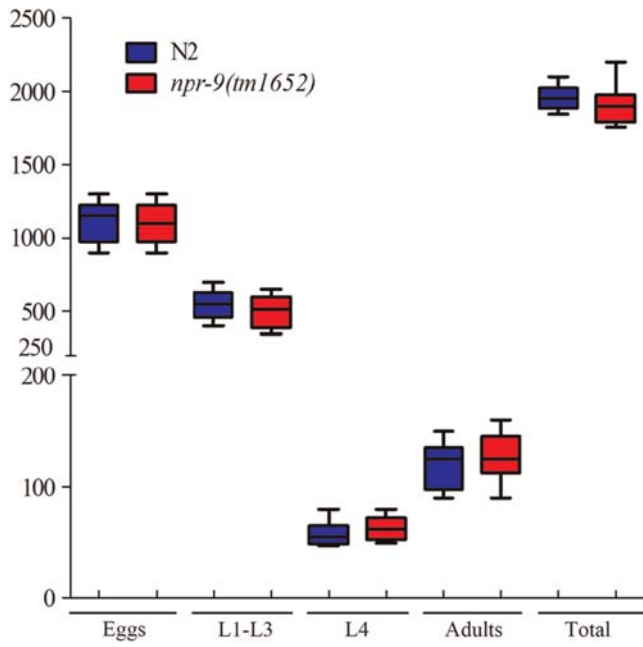


Figure 2 Effect of *npr-9* mutation on population growth. Bars represent mean \pm SD.

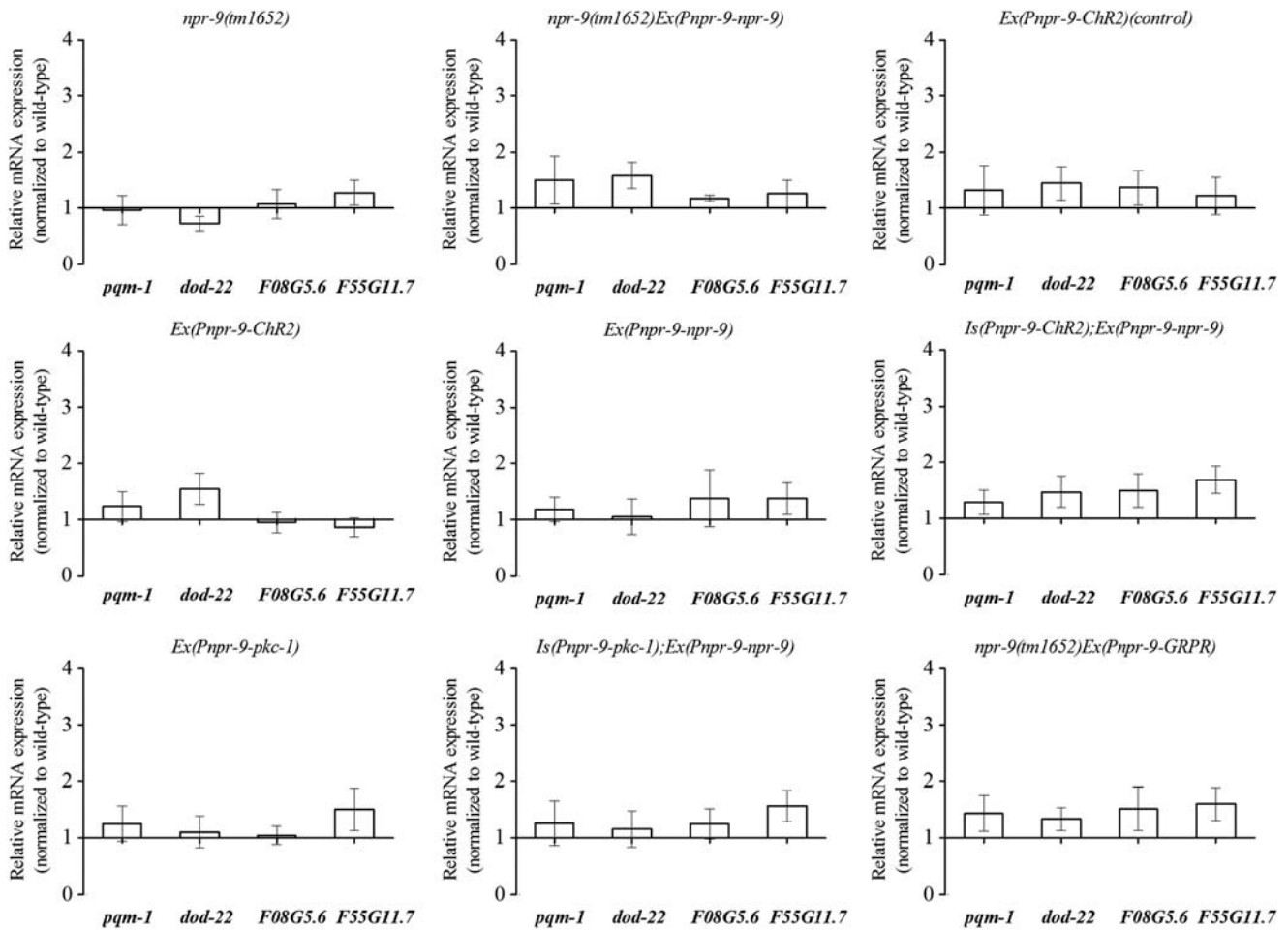


Figure 3 Quantitative real-time PCR analysis of expression patterns of some immunity-related genes in nematodes on plates fed with OP50. Normalized expression is presented relative to wild-type expression. Bars represent mean \pm SD.

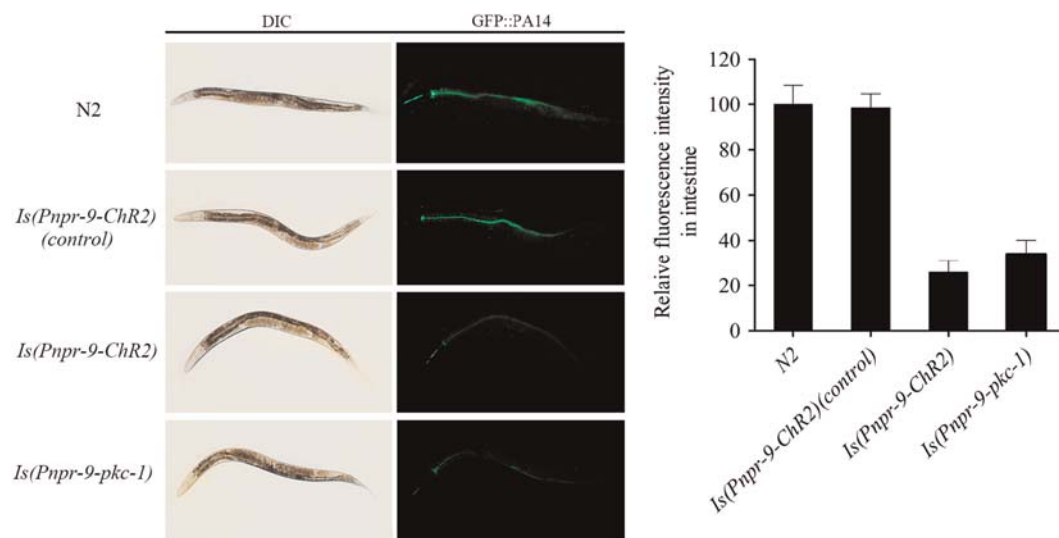


Figure 4 Effects of *ChR2*-mediated activation of AIB interneurons or overexpression of *pkc-1* in AIB interneurons on PA14::GFP expression in intestine in nematodes. Bars represent mean \pm SD. ** $P < 0.01$ vs N2.

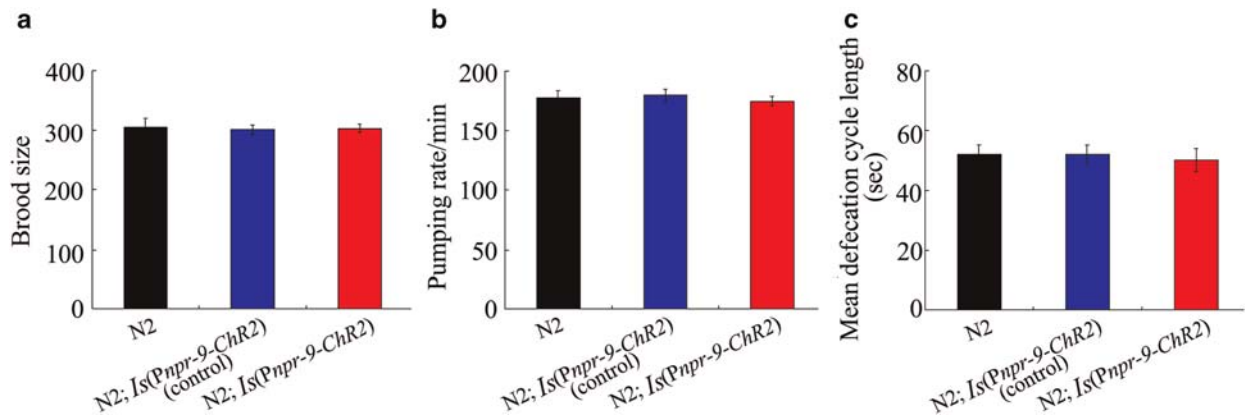


Figure 5 Phenotypic analysis in nematodes with *ChR2*-mediated activation of AIB interneurons. (a) Brood size comparison between wild-type and nematodes with *ChR2*-mediated activation of AIB interneurons. (b) Pumping rate comparison between wild-type and nematodes with *ChR2*-mediated activation of AIB interneurons. (c) Mean defecation cycle length comparison between wild-type and nematodes with *ChR2*-mediated activation of AIB interneurons. Bars represent mean \pm SD.

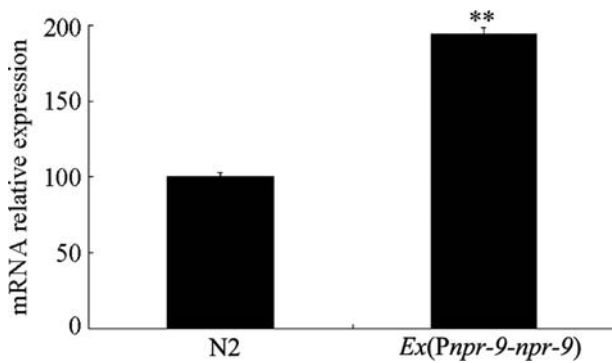


Figure 6 *npr-9* expression in wild-type and nematodes overexpressing *npr-9*. Bars represent mean \pm SD. ** $P < 0.01$ vs N2.

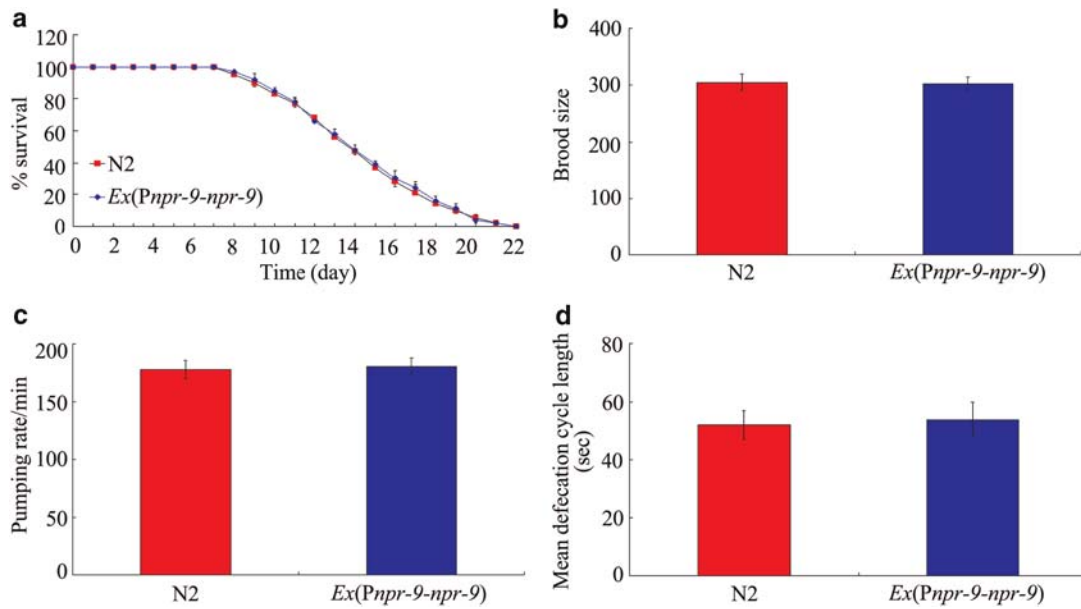


Figure 7 Phenotypic analysis in nematodes overexpressing *npr-9* gene. (a) Lifespan comparison between wild-type and nematodes overexpressing *npr-9* gene. A statistical comparison of the survival plots indicates that survival of nematodes overexpressing *npr-9* gene was not significantly different from the wild-type N2 strain ($P=0.936$). (b) Brood size comparison between wild-type and nematodes overexpressing *npr-9* gene. (c) Pumping rate comparison between wild-type and nematodes overexpressing *npr-9* gene. (d) Mean defecation cycle length comparison between wild-type and nematodes overexpressing *npr-9* gene. Bars represent mean \pm SD.

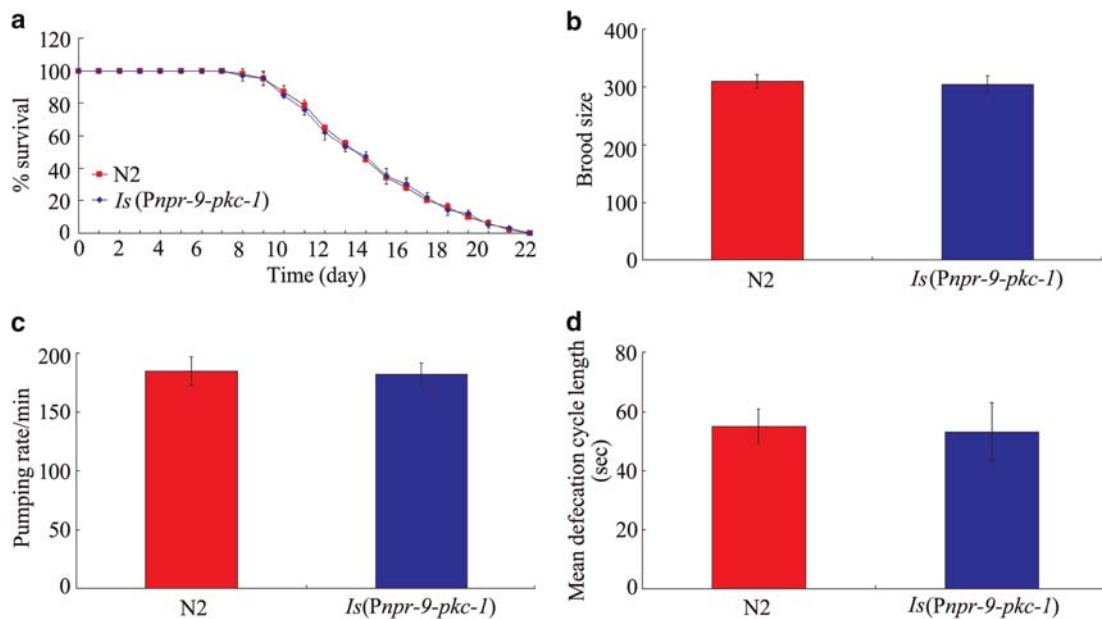


Figure 8 Phenotypic analysis in nematodes overexpressing *pkc-1* gene in AIB interneurons. (a) Lifespan comparison between wild-type and nematodes overexpressing *pkc-1* gene in AIB interneurons. A statistical comparison of the survival plots indicates that survival of nematodes overexpressing *pkc-1* gene in AIB interneurons was not significantly different from the wild-type N2 strain ($P=0.927$). (b) Brood size comparison between wild-type and nematodes overexpressing *pkc-1* gene in AIB interneurons. (c) Pumping rate comparison between wild-type and nematodes overexpressing *pkc-1* gene in AIB interneurons. (d) Mean defecation cycle length comparison between wild-type and nematodes overexpressing *pkc-1* gene in AIB interneurons. Bars represent mean \pm SD.

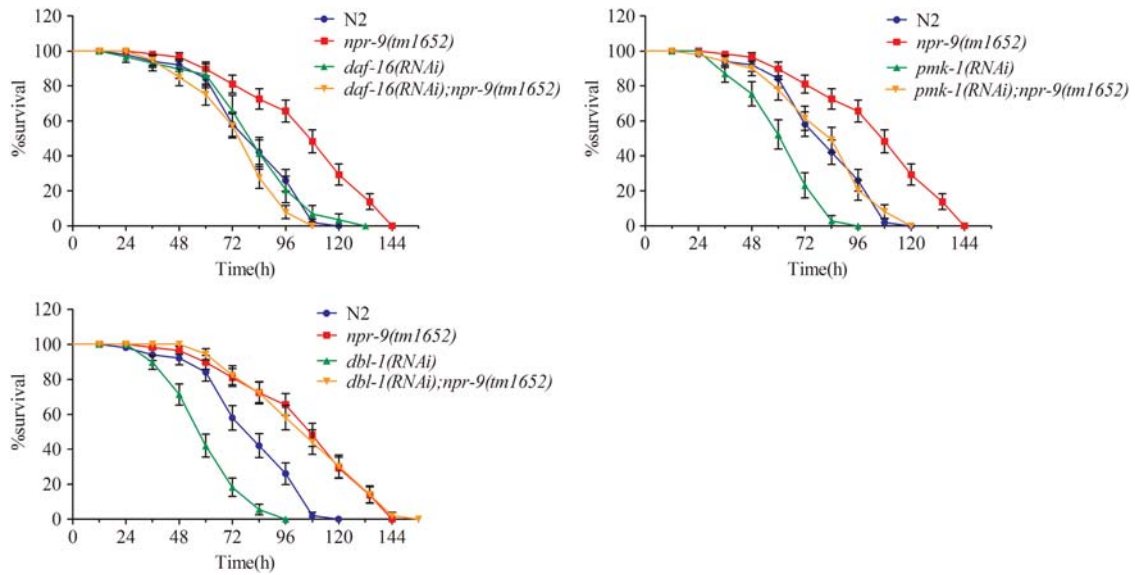


Figure 9 Genetic interaction of *npr-9* with *daf-16*, *pmk-1*, or *dbl-1* in regulating innate immunity. A statistical comparison of the survival plots indicates that survival of *daf-16(RNAi);npr-9(tm1652)* or *pmk-1(RNAi);npr-9(tm1652)* was significantly different from that in *npr-9(tm1652)* ($P < 0.0001$), whereas the survival plots indicates that the survival of *dbl-1(RNAi);npr-9(tm1652)* was not significantly different from that in *npr-9(tm1652)* ($P = 0.9123$). Bars represent mean \pm SD.

Table 1 Primers used for quantitative real-time polymerase chain reaction (PCR)

Gene	Forward primer (5'-3')	Reverse primer (5'-3')
<i>tba-1</i>	TCAACACTGCCATCGCCGCC	TCCAAGCGAGACCAGGCTTCAG
<i>lys-1</i>	TTCGGATCTTTCAAGAAGGC	TGGGATTCCAACAACGTAAA
<i>lys-2</i>	CCTTTCCAACAAATGTCCAAGTA	GGTATCCTTGGCAGCTTGAT
<i>pqm-1</i>	TCAAATGCAACGTTCCCAAC	CTCTGGAAGTGGAAATCCG
<i>dod-22</i>	CCAGGATACAGAATACGTACAAGACATTGCTC	CCAGAGATGACTTCAGTTTTCCGCCG
<i>F08G5.6</i>	ACTGCACTCAAATTCGGCTGGTGG	GTTTCCATTCAATCCGTTTTCCAGAAC
<i>F55G11.7</i>	CACCCTCAGGCCAACTCAATC	CTGTGACTGTAGCGTCACTTTCCATC
<i>npr-9</i>	TACGCTTTGATGTCGCAG	CTGGATGTGCTGGAGTTT

Table 2 Effects of *npr-9* expression in AIB interneurons on lifespan of *npr-9(tm1652)* mutants exposed to *P. aeruginosa* PA14

Strain	Mean lifespan (h)	Significance (compared with WT)
WT	69 \pm 4	
<i>npr-9(tm1652)</i>	101 \pm 3.6	$P < 0.01$
<i>npr-9(tm1652)</i>	67 \pm 2.5	NS
<i>Ex(Pnpr-9-npr-9)#1</i>		
<i>npr-9(tm1652)</i>	69 \pm 3.3	NS
<i>Ex(Pnpr-9-npr-9)#2</i>		

NS, no significance.

Table 3 Effects of *npr-9* overexpression on lifespan of nematodes exposed to *P. aeruginosa* PA14

Strain	Mean lifespan (h)	Significance (compared with WT)
WT	69 \pm 3.3	
<i>Ex(Pnpr-9-npr-9)#1</i>	55 \pm 4.6	$P < 0.01$
<i>Ex(Pnpr-9-npr-9)#2</i>	56 \pm 3.5	$P < 0.01$

Table 4 Effects of *npr-9* gene on lifespan of nematodes expressing *pkc-1* gene in AIB interneurons exposed to *P. aeruginosa* PA14

Strain	Mean lifespan (h)	Significance (compared with WT)
WT	68 ± 3.4	
<i>Is(Pnpr-9-pkc-1)#1</i>	102 ± 3.4	<i>P</i> < 0.01
<i>Is(Pnpr-9-pkc-1)#2</i>	105 ± 2.1	<i>P</i> < 0.01
<i>Is(Pnpr-9-pkc-1);Ex(Pnpr-9-npr-9)#1</i>	71 ± 3.1	NS
<i>Is(Pnpr-9-pkc-1);Ex(Pnpr-9-npr-9)#2</i>	69 ± 4.9	NS

NS, no significance.

Table 5 Effects of expressing human *GRPR* on nematodes exposed to *P. aeruginosa* PA14

Strain	Mean lifespan (h)	Significance (compared with WT)
WT	71 ± 2.5	
<i>npr-9(tm1652)</i>	103 ± 4.6	<i>P</i> < 0.01
<i>npr-9(tm1652)Ex(Pnpr-9-GRPR)#1</i>	72 ± 2.5	NS
<i>npr-9(tm1652)Ex(Pnpr-9-GRPR)#2</i>	73 ± 2.7	NS

NS, no significance.