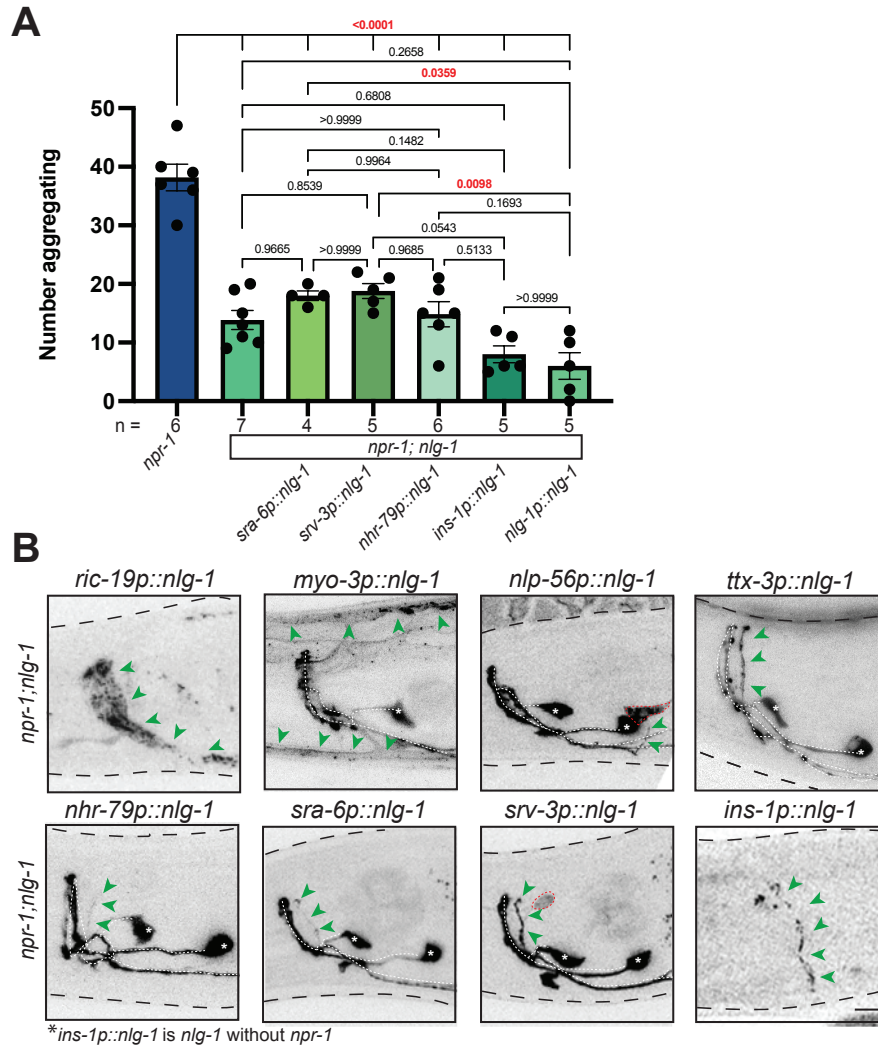


SUPPLEMENTAL FIGURE 1

Supplemental Fig. 1. Confirming role for, expression, and localization, of NRX-1 in aggregation behavior

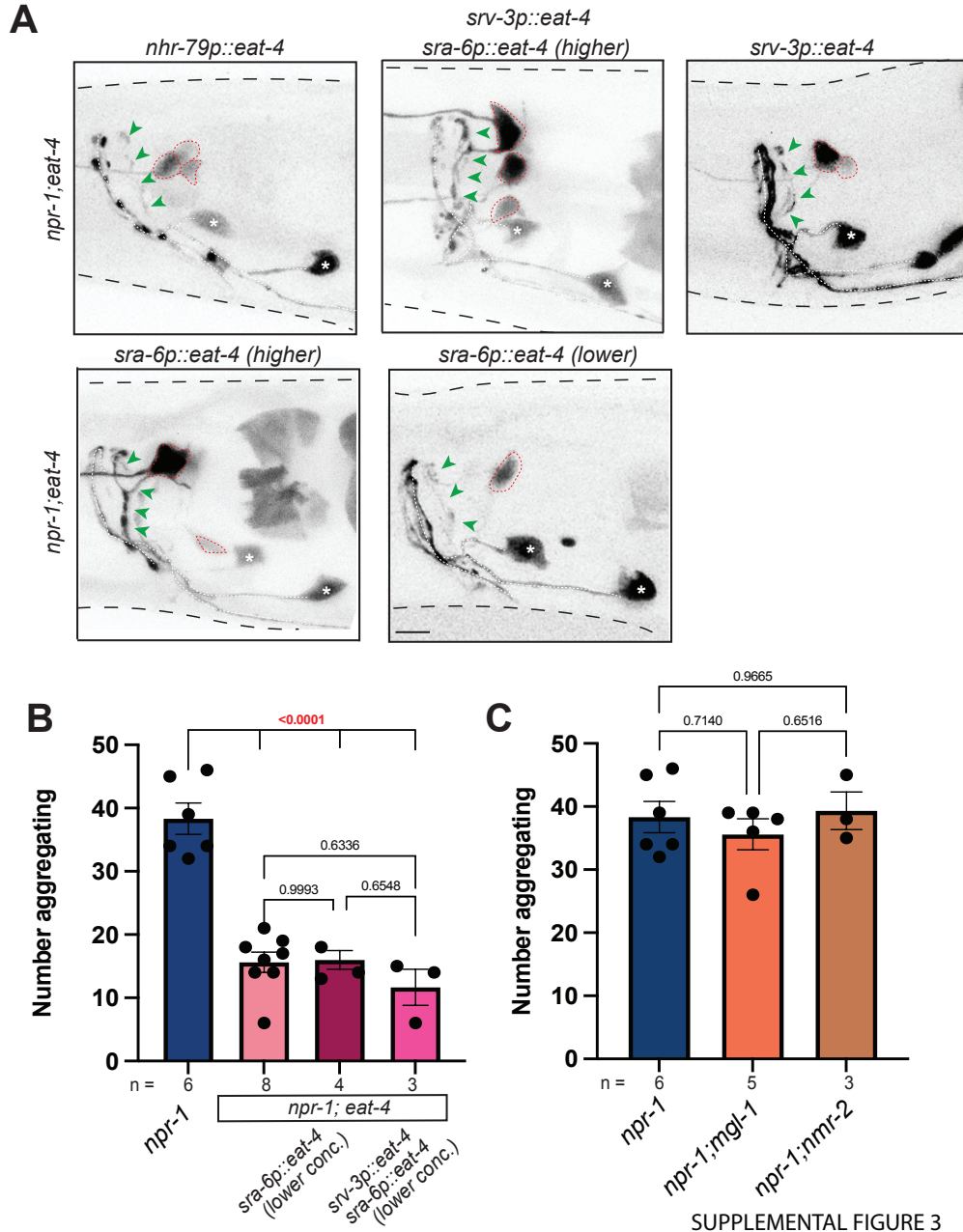
A) Graph showing aggregation behavior levels in *npr-1(ad609)* animals compared to *npr-1(ad609); otIs525;him-8* animals and N2 compared to *otIs525;him-8*. Aggregation behavior was not changed by the presence of *otIs525* or *him-8*. Graph showing number of aggregating animals **(B)** and representative images (Scale bar = 10 μ m) **(C)** of QG1 (*qgIR1*) strain compared to *qgIR1;nrx-1(wy778);otIs525;him-8* mutants and representative images of aggregation behavior in *flp-21p::pkc-1(gf)* and *flp-21p::pkc-1(gf);nrx-1(wy778)* animals (Scale bar = 1mm). **D)** Graph showing number of aggregating animals in *npr-1(ad609)*, *npr-1(ad609);nrx-1(wy778)*, and *npr-1(ad609);nrx-1(wy778)* animals with NRX-1(γ) driven under the *ric-19* promoter and NRX-1(α) driven under promoters indicated. **E)** Graph showing number of aggregating animals in solitary controls with NRX-1(α) driven under the *ric-19* promoter and *npr-1(ad609)* animals. **F)** Expression of NRX-1 tagged with sfGFP driven under various promoters. Green arrows indicate NRX-1 axonal expression. Red dashed lines show cell bodies. White dashed line indicates *lim-6^{int4}::gfp* which drives expression in RIS and AVL axons. White asterisks indicate RIS and AVL cell bodies. Yellow box in *nlp-56p::nrx-1(α)* indicates area where RMG should be located. Expression of *nrx-1* under this promoter is not seen. *osm-6p::nrx-1(α)* imaging performed in *nrx-1(wy778)*. Data shown in Supplemental Fig. 1E expand on that shown in Fig. 2 B and E. Number of biological replicates (n) are displayed in figure, bars show the mean number of aggregating *C. elegans*, error bars indicate SEM. One-way ANOVA with Tukey's post-hoc test was used for comparisons (t-test for panels B & E), exact p-values are shown on graphs (red indicates significance, black indicates non-significance). Source data are provided in the Source Data file.



SUPPLEMENTAL FIGURE 2

Supplemental Fig. 2. Expression and localization of NLG-1 in aggregation behavior

A) Graph showing number of aggregating animals in *npr-1(ad609)*, *npr-1(ad609);nlg-1(ok259)*, and *npr-1(ad609);nlg-1(ok259)* with NLG-1 driven under *sra-6*, *srv-3*, *nhr-79*, *ins-1*, and *nlg-1* promoters. **B)** Expression of NLG-1 tagged with sfGFP (or GFP for *nlg-1p*) driven under various promoters. Green arrows indicate NLG-1 axonal or muscle expression. Red dashed lines show cell bodies. White dashed line indicates *lim-6^{int4}::gfp* which drives expression in RIS and AVL axons. White asterisks indicate RIS and AVL cell bodies (Scale bar = 10 μ m). Data for *npr-1* and *npr-1;nlg-1* are replotted in Supplemental Fig. 2A from Figure 3. Number of biological replicates (n) are displayed in figure, bars show the mean number of aggregating *C. elegans*, error bars indicate SEM. One-way ANOVA with Tukey's post-hoc test was used for comparisons, exact p-values are shown on graphs (red indicates significance, black indicates non-significance). Source data are provided in the Source Data file.

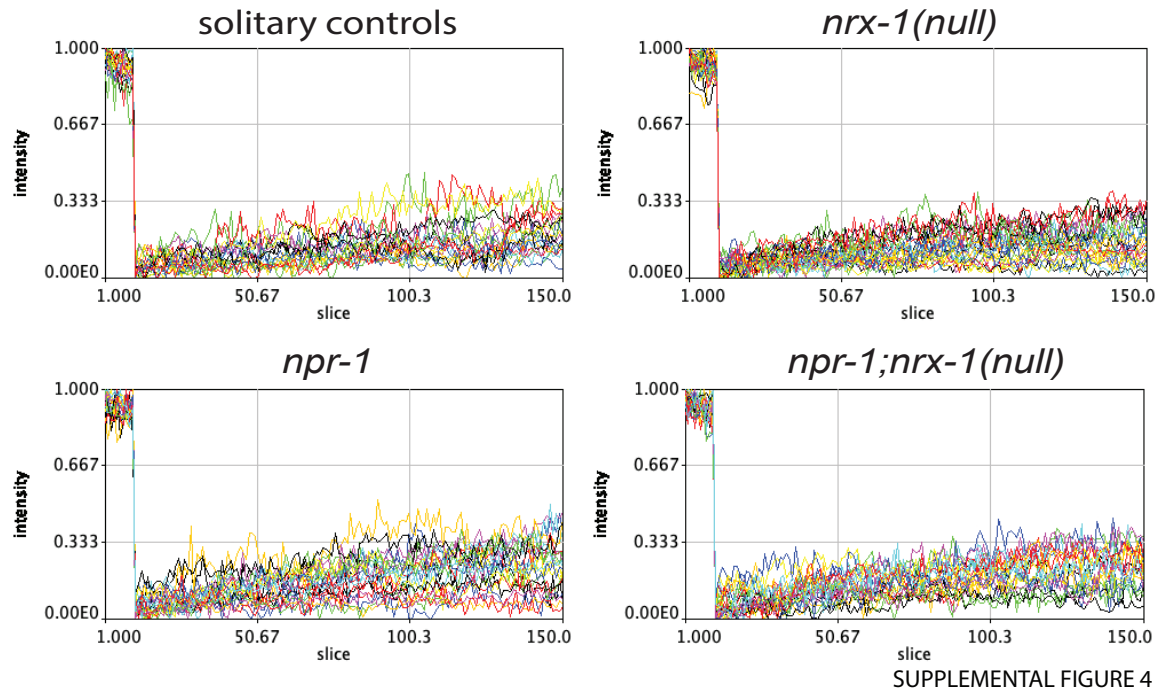


SUPPLEMENTAL FIGURE 3

Supplemental Fig. 3. Expression of EAT-4 and analysis of glutamate receptors in aggregation behavior

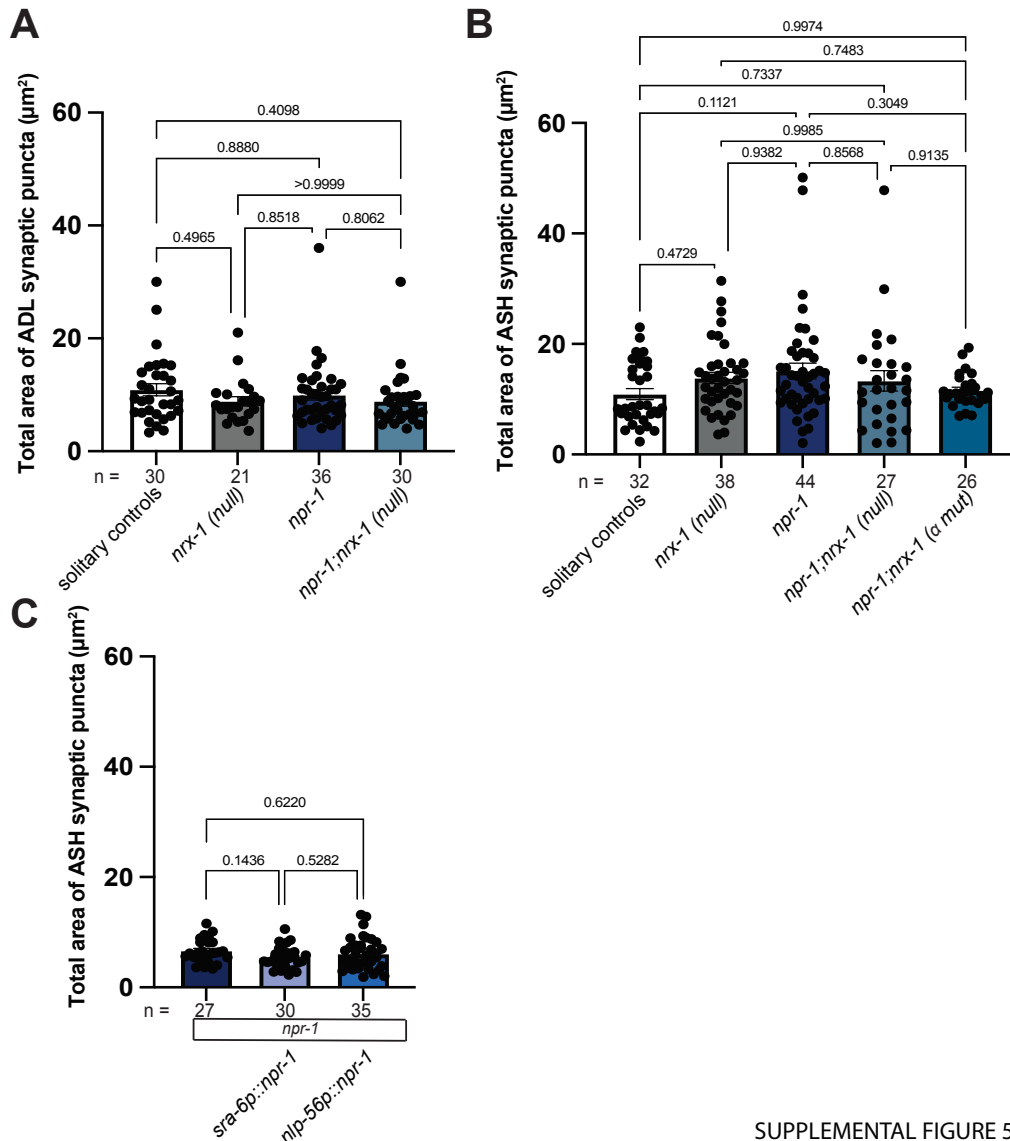
A) Expression of EAT-4 tagged with sfGFP driven under *nhr-79p*, *srv-3p*, *sra-6p(higher)*(injected at 40 ng μl^{-1}), *sra-6p(lower)*(injected at 20 ng μl^{-1}), and *srv-3p/sra-6p higher combined*. Green arrows indicate NRX-1 axonal expression. Red dashed lines show cell bodies. White dashed line indicates *lim-6^{int4}::gfp* which drives expression in RIS and AVL axons. White asterisks indicate RIS and AVL cell bodies (Scale bar = 10 μm). **B)** Graph showing number of aggregating animals in *npr-1(ad609)*, *npr-1(ad609);eat-4(ky5)*, *npr-1(ad609);eat-4(ky5);sra-6p(lower)::eat-4*, *npr-1(ad609);eat-4(ky5);srv-3p::eat-4;sra-6p(lower)::eat-4*. **C)** Graph showing number of aggregating animals in *npr-1(ad609)*, *npr-1(ad609);mgl-1(tm1811)* and *npr-1(ad609);nmr-*

2(ok3324). Data for *npr-1* and *npr-1;eat-4* in Supplemental Fig. 3B and C are replotted from Figure 4. Number of biological replicates (n) are displayed in figure, bars show the mean number of aggregating *C. elegans*, error bars indicate SEM. One-way ANOVA with Tukey's post-hoc test was used for comparisons, exact p-values are shown on graphs (red indicates significance, black indicates non-significance). Source data are provided in the Source Data file.



Supplemental Fig. 4. Individual slopes for FRAP of ASH::eat-4::phluorin.

Graphs of ASH::eat-4::phluorin tracings for all animals included in analysis showing pre-bleach post-bleach and recovery with minimum and maximum set to 0 and 1 respectively in solitary controls, *nrx-1(wy778)*, *npr-1(ad609)*, and *nrx-1(wy778);npr-1(ad609)*.



SUPPLEMENTAL FIGURE 5

Supplemental Fig. 5. Areas of ADL and ASH pre-synaptic puncta.

A) Graphs showing area of *srv-3p::cla-1::gfp* puncta in ADL in solitary controls, *nrx-1(wy778)*, *npr-1(ad609)*, and *npr-1(ad609);nrx-1(wy778)* mutants. **B)** Graph showing area of *sra-6p::cla-1::gfp* puncta in ASH in solitary controls, *nrx-1(wy778)*, *npr-1(ad609)*, *npr-1(ad609);nrx-1(wy778)* mutants, and *npr-1(ad609);nrx-1(gk246237)* mutants. **C)** Graph showing area of *sra-6p::cla-1::gfp* puncta in ASH in *npr-1(ad609)*, *npr-1(ad609); sra-6p::npr-1* (ASH), and *npr-1(ad609); nlp-56p::npr-1* (RMG). Number of biological replicates (n) are displayed in figure, bars show the mean number of aggregating *C. elegans*, error bars indicate SEM. One-way ANOVA with Tukey's post-hoc test was used for comparisons, exact p-values are shown on graphs (red indicates significance, black indicates non-significance). Source data are provided in the Source Data file.

Supplementary table 1. Conservation of *C. elegans* genes with human autism-associated genes

<i>C. elegans</i> gene	Human gene	SFARI rank	EAGLE score	~identity (%)
<i>nrx-1</i>	<i>NRXN1</i>	1	143.75	27
	<i>NRXN2</i>	1	7	24
	<i>NRXN3</i>	1	11.1	24
<i>nlg-1</i>	<i>NLGN3</i>	1	6.5	29
	<i>NLGN4X</i>	1	12	29
	<i>NLGN2</i>	1	3	27
	<i>NLGN4Y</i>	2	/	28
<i>glr-1</i>	<i>NLGN1</i>	2	/	28
	<i>GRIA2</i>	1	12	37
	<i>GRIA3</i>	S	/	37
<i>glr-2</i>	<i>GRIA1</i>	2	/	37
	<i>GRIA2</i>	1	12	37
	<i>GRIA3</i>	S	/	35
<i>avr-15</i>	<i>GRIA1</i>	2	/	37
	<i>GLRA2</i>	2	/	39
	<i>GABRA3</i>	S	/	32
	<i>GABRB2</i>	1	0.3	31
	<i>GABRB3</i>	1	/	32
	<i>GABRA4</i>	2	/	30

Note: Conservation identified from homology searches on flybase, ortholist2, and previous publications. SFARI rank and EAGLE score from SFARI gene. % identity from DIOPT alignments of amino acid sequences

Supplementary Table 2. *C. elegans* strains by Figure

Figure	Figure reference	Strain identifier	Genotype	Source	injection concentration
1	<i>npr-1</i>	MPH39	<i>him-8(e1489) IV; npr-1(ad609) X; otIs525[lim-6int4::gfp]</i>	Hart Lab	
	<i>npr-1</i>	DA609	<i>npr-1(ad609) X</i>	CGC	
	<i>nrx-1(null); npr-1</i>	MPH40	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]</i>	Hart Lab	
	<i>nrx-1(null); npr-1</i>	MPH49	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X</i>	this study	
	<i>nrx-1(α mut); npr-1</i>	MPH50	<i>him-8(e1489) IV; nrx-1(gk246237) V; npr-1(ad609) X; otIs525[lim-6int4::gfp]</i>	this study	
	<i>nrx-1(α del); npr-1</i>	MPH51	<i>nrx-1(nu485) V; npr-1(ad609) X</i>	this study	
	solitary controls	OH15098	<i>him-8(e1489) IV; otIs525[lim-6int4::gfp]</i>	Hart & Hobert 2018	
	<i>nrx-1(null)</i>	TV13570	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V</i>	CGC	
	<i>nrx-1(α mut)</i>	OH15116	<i>him-8(e1489) IV; nrx-1(gk246237) V; otIs525[lim-6int4::gfp]</i>	Hart & Hobert 2018	
	<i>nrx-1(α del)</i>	TV22997	<i>nrx-1(nu485) V</i>	Tong et al. 2017	
	<i>flp-21p::pkc-1(gf)</i>	CX10252	<i>kyEx2385[flp-21p::pkc-1(gf)::sl2::gfp; ofm-1p::dsred]</i>	Bargmann lab	
	<i>nrx-1(null); flp-21p::pkc-1(gf)</i>	MPH98	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; kyEx2385[flp-21p::pkc-1(gf)::sl2::gfp; ofm-1p::dsred]</i>	this study	
2	<i>npr-1; nrx-1(null); ric-19p::nrx-1(γ)</i>	MPH52	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; hpmEx3[ric-19p::sfGFP::nrx-1(γ); ttx-3p::mCherry]</i>	this study	
	<i>npr-1; nrx-1(null); ric-19p::nrx-1(α)</i>	IV870	<i>unc-119(ed3) III, him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; ueEx601[ric-19p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); flp-21p::nrx-1(α)</i>	IV874	<i>unc-119(ed3) III, him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; ueEx605[flp-21p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); nhr-79p::nrx-1(α)</i>	IV878	<i>unc-119(ed3) III, him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; ueEx609[nhr-79p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); ric-19p::nrx-1(α)</i>	MPH53	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; ueEx611[ric-19p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	

	<i>npr-1; nrx-1(null); nhr-79p::nrx-1(α)</i>	MPH54	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; ueEx609[nhr-79p::sfGFP::nrx-1(α); unc-122::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); srv-3p::nrx-1(α)</i>	MPH55	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X, hpmEx9[srv-3p::sfGFP::nrx-1(α); lin-44p::gfp]</i>	this study	
	<i>npr-1; nrx-1(null); srv-3p::nrx-1(α); sra-6p::nrx-1(α)</i>	MPH56	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; hpmEx9[srv-3p::sfGFP::nrx-1(α); lin-44p::gfp]</i>	this study	45 ng/ μ l
	<i>npr-1; nrx-1(null); sra-6p::nrx-1(α)</i>	MPH57	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; him-8(e1489) IV; otls525[lim-6int4::gfp]; hpmEx10[sra-6p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	45 ng/ μ l
3	<i>npr-1; nlg-1</i>	MPH43	<i>him-8(e1489) IV; npr-1(ad609) X; nlg-1(ok259) X; otls525[lim-6int4::gfp]</i>	Hart Lab	
	solitary controls	N2	Bristol lab control strain	CGC	
	<i>nlg-1</i>	VC228	<i>nlg-1(ok259) X</i>	CGC	
	<i>npr-1; nlg-1; ric-19p::nlg-1</i>	IV930	<i>npr-1(ad609) X; nlg-1(ok259) X; ueEx645[ric-19p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nlg-1; myo-3p::nlg-1</i>	MPH159	<i>npr-1(ad609) X; nlg-1(ok259) X; hpmEx29[myo-3p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nlg-1; nlp-56p::nlg-1</i>	MPH59	<i>him-8(e1489) IV; npr-1(ad609) X; nlg-1(ok259) X; otls525[lim-6int4::gfp]; hpmEx12[nlp-56p::sfGFP::nlg-1; ttx-3p::mCherry]</i>	this study	40 ng/ μ l
	<i>npr-1; nlg-1; ttx-3p::nlg-1</i>	MPH160	<i>npr-1(ad609) X; nlg-1(ok259) X; hpmEx30[ttx-3p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nrx-1; nlg-1</i>	MPH44	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609); nlg-1(ok259) X; otls525[lim-6int4::gfp]</i>	this study	
4	<i>npr-1; eat-4</i>	MPH60	<i>eat-4(ky5) III; npr-1(ad609) X; otls525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; eat-4; nhr-79p::eat-4</i>	MPH61	<i>eat-4(ky5) III; npr-1(ad609) X; otls525[lim-6int4::gfp]; hpmEx13[nhr-79p::eat-4::SL2::gfp; ttx-3p::mCherry]</i>	this study	
	<i>npr-1; eat-4; srv-3p::eat-4</i>	MPH62	<i>eat-4(ky5) III; npr-1(ad609) X; otls525[lim-6int4::gfp]; hpmEx14[srv-3p::eat-4::SL2::gfp; ttx-3p::mCherry]</i>	this study	
	<i>npr-1; eat-4; sra-6p::eat-4</i>	MPH161	<i>eat-4(ky5) III; npr-1(ad609) X; otls525[lim-6int4::gfp]; hpmEx31[sra-6p::eat-4::SL2::gfp; lin-44p::gfp]</i>	this study	40 ng/ μ l

	<i>npr-1; eat-4; srv-3p::eat-4; sra-6p::eat-4</i>	MPH162	<i>eat-4(ky5) III; npr-1(ad609) X; otls525[lim-6int4::gfp]; hpmEx14[srv-3p::eat-4::SL2::gfp; ttx-3p::mCherry]; hpmEx32[sra-6p::eat-4::SL2::gfp; lin-44p::gfp]</i>	this study	
	<i>npr-1; nrx-1; eat-4</i>	MPH64	<i>eat-4(ky5) III; unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otls525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; nrx-1; eat-4; nhr-79p::eat-4</i>	MPH65	<i>eat-4(ky5) III; unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otls525[lim-6int4::gfp]; hpmEx13[nhr-79p::eat-4::SL2::gfp; ttx-3p::mCherry]</i>	this study	
	<i>npr-1; nrx-1; eat-4; nhr-79p::nrx-1(α)</i>	MPH66	<i>eat-4(ky5) III; unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; ueEx609[nhr-79p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>eat-4</i>	MT6308	<i>eat-4(ky5) III</i>	CGC	
	<i>npr-1; nlg-1; eat-4</i>	MPH67	<i>eat-4(ky5) III; npr-1(ad609); nlg-1(ok259) X; otls525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; glr-1</i>	MPH68	<i>glr-1(n2461) III; npr-1(ad609) X</i>	this study	
	<i>npr-1; glr-2</i>	MPH69	<i>glr-2(ok2342) III; npr-1(ad609) X</i>	this study	
	<i>npr-1; nlg-1; glr-2</i>	MPH163	<i>glr-2(ok2342) III; unc-119(ed3) III; npr-1(ad609) X; nlg-1(ok259) X; otls525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; avr-15</i>	MPH70	<i>avr-15(ad1051) V; npr-1(ad609) X</i>	this study	
	<i>npr-1; nrx-1; glr-1</i>	MPH71	<i>glr-1(n2461) III; unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otls525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; nrx-1; glr-2</i>	MPH72	<i>glr-2(ok2342) III; unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otls525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; nrx-1; avr-15</i>	MPH73	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] avr-15(ad1051) V; npr-1(ad609) X; otls525[lim-6int4::gfp]</i>	this study	
5	solitary controls	CX16921	<i>kyls673[sra-6:eat-4::pHluorin; unc-122p:dsRed]</i>	Bargmann lab	-
	<i>nrx-1(null)</i>	MPH74	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; kyls673[sra-6p:eat-4::pHluorin; unc-122p:dsRed]</i>	this study	
	<i>npr-1</i>	MPH75	<i>npr-1(ad609) X; kyls673[sra-6:eat-4::pHluorin; unc-122p:dsRed]</i>	this study	
	<i>npr-1; nrx-1(null)</i>	MPH76	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; kyls673[sra-6p:eat-4::pHluorin; unc-122p:dsRed]</i>	this study	
6	solitary controls	MPH77	<i>hpmEx16[srv-3p::gfp::cla-1; lin-44p::gfp]</i>	this study	
	<i>nrx-1(null)</i>	MPH78	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; hpmEx16[srv-3p::gfp::cla-1; lin-44::gfp]</i>	this study	

	<i>npr-1</i>	MPH79	<i>npr-1(ad609) X; hpmEx16[srv-3p::gfp::cla-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nrx-1(null)</i>	MPH80	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; hpmEx16[srv-3p::gfp::cla-1; lin-44::gfp]</i>	this study	
	solitary controls	MPH81	<i>hpmEx17[sra-6:gfp::cla-1; lin-44p::gfp]</i>	this study	
	<i>nrx-1(null)</i>	MPH82	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; hpmEx17[sra-6:gfp::cla-1; lin-44::gfp]</i>	this study	
	<i>npr-1</i>	MPH83	<i>npr-1(ad609) X; hpmEx17[sra-6:gfp::cla-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nrx-1(null)</i>	MPH84	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; hpmEx17[sra-6p:gfp::cla-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nrx-1(α mut)</i>	MPH85	<i>nrx-1(gk246237) V; npr-1(ad609) X; hpmEx17[sra-6p:gfp::cla-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; ASH::npr-1</i>	MPH164	<i>npr-1(ad609) X; hpmEx17[sra-6:gfp::cla-1; lin-44::gfp]; hpmEx33[sra-6p::npr-1::sl2::mCherry; unc-122p::dsRed]</i>	this study	
	<i>npr-1; RMG::npr-1</i>	MPH165	<i>npr-1(ad609) X; hpmEx17[sra-6:gfp::cla-1; lin-44::gfp]; hpmEx34[nlp-56p::npr-1::sl2::mCherry; unc-122p::dsRed]</i>	this study	
Supp 1	<i>qglR1</i>	QG1	<i>qglR1 (X, CB4856>N2, npr-1) X</i>	this study	
	<i>qglR1; nrx-1(null)</i>	MPH86	<i>unc-119(ed3) III, him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; qglR1 (X, CB4856>N2, npr-1) X; otIs525[lim-6int4::gfp]</i>	this study	
	<i>npr-1; ric-19p::nrx-1(α)</i>	MPH166	<i>npr-1(ad609) X; ueEx601[ric-19p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); osm-6p::nrx-1(α)</i>	MPH87	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; ueEx603[osm-6p::sfGFP::nrx-1(α); unc-122p::dsred]</i>	this study	
	<i>npr-1; nrx-1(null); sre-1p::nrx-1(α)</i>	MPH88	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; hpmEx18[sre-1p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); gcy-36p::nrx-1(α)</i>	MPH89	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; hpmEx19[gcy-36p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>	this study	
	<i>npr-1; nrx-1(null); flp-8::nrx-1(α)</i>	MPH90	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; hpmEx20[flp-</i>	this study	

			<i>8p::sfGFP::nrx-1(α); unc-122p::dsRed]</i>		
	<i>npr-1; nrx-1(null); nlp-56p::nrx-1(α)</i>	MPH91	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; hpmEx21[nlp-56p::sfGFP::nrx-1(α); ttx-3p::mCherry]</i>	this study	40 ng/μl
	<i>npr-1; nrx-1(null); osm-6p::nrx-1(α)</i>	MPH20	<i>unc-119(ed3) III; nrx-1(wy778[unc-119(+)] V; ueEx603[osm-6p::sfGFP::nrx-1(α); unc-122p::dsred]</i>	this study	
	<i>npr-1; nrx-1(null); srv-3p::nrx-1(α)</i>	MPH97	<i>unc-119(ed3) III; him-8(e1489) IV; nrx-1(wy778[unc-119(+)] V; npr-1(ad609) X; otIs525[lim-6int4::gfp]; hpmEx24[srv-3p::sfGFP::nrx-1(α); lin-44::gfp]</i>	this study	
Supp 2	<i>npr-1; nlg-1; sra-6p::nlg-1</i>	MPH93	<i>him-8(e1489) IV; npr-1(ad609); nlg-1(ok259) X; otIs525[lim-6int4::gfp]; hpmEx22[sra-6p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	40 ng/μl
	<i>npr-1; nlg-1; srv-3p::nlg-1</i>	MPH94	<i>him-8(e1489) IV; npr-1(ad609); nlg-1(ok259) X; otIs525[lim-6int4::gfp]; hpmEx23[srv-3p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	40 ng/μl
	<i>npr-1; nlg-1; nhr-79p::nlg-1</i>	MPH58	<i>him-8(e1489)IV; npr-1(ad609) X; nlg-1(ok259) X; otIs525[lim-6int4::gfp]; hpmEx11[nhr-79p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nlg-1; ins-1p::nlg-1</i>	MPH92	<i>npr-1(ad609); nlg-1(ok259) X; ueEx651[ins-1p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	
	<i>nlg-1; sra-6p::nlg-1</i>	IV937	<i>nlg-1(ok259) X; ueEx651[ins-1p::sfGFP::nlg-1; lin-44p::gfp]</i>	this study	
	<i>npr-1; nlg-1; nlg-1p::nlg-1</i>	MPH167	<i>npr-1(ad609) X; nlg-1(ok259) X; vjls105[nlg-1p::GFP::nlg-1; ttx-3p::mCherry]</i>	this study	
Supp 3	<i>npr-1; eat-4; sra-6p::eat-4(lower)</i>	MPH63	<i>eat-4(ky5) III; npr-1(ad609) X; otIs525[lim-6int4::gfp]; hpmEx15[sra-6p::eat-4::SL2::gfp; ttx-3p::mCherry]</i>	this study	
	<i>npr-1; eat-4; srv-3::eat-4; sra-6p::eat-4(lower)</i>	MPH168	<i>eat-4(ky5) III; npr-1(ad609) X; otIs525[lim-6int4::gfp]; hpmEx14[srv-3p::eat-4::SL2::gfp; ttx-3p::mCherry]; hpmEx15[sra-6p::eat-4::SL2::gfp; ttx-3p::mCherry]</i>	this study	
	<i>npr-1; nmr-2</i>	MPH95	<i>nmr-2(ok3324) V; npr-1(ad609) X</i>	this study	
	<i>npr-1; mgl-1</i>	MPH96	<i>mgl-1(tm1811) X; npr-1(ad609) X</i>	this study	

* 20 ng/μl if not noted

Supplementary Table 3. Plasmids and promoters

Identifier	Construct	promoter forward primer	promoter reverse primer	promoter size	from
pMPH34	<i>ric-19p::sfGF</i> <i>P::nrx-1(a)</i>	CATTAAAGAGTGTGCTC CACGAGCC	GTTCAAAGTGAAGAGCT CTCTCGAC	147	Hart Lab
pMPH35	<i>ric-19p::sfGF</i> <i>P::nrx-1(y)</i>	CATTAAAGAGTGTGCTC CACGAGCC	GTTCAAAGTGAAGAGCT CTCTCGAC	147	Hart Lab
pMPH38	<i>osm-6p::sfGFP</i> <i>::nrx-1(a)</i>	TCCATACGGCATCTGTT GCATTC	TGAAGGTAATAGCTTGA AAGAGA	2082	Hart Lab
pMPH41	<i>flp-21p::sfGF</i> <i>P::nrx-1(a)</i>	TGAGGTCACGCAACTTG ATGATCATTTTAT	GAAAATGACTTTTTGGAT TTTGGAGCAATG	4099	this study
pMPH42	<i>nhr-79p::sfGF</i> <i>P::nrx-1(a)</i>	CACGATCATTTTAAGCC AAGTTGTGGCCGT	TTTTATGCTAAAAATCGA TAAATCAAGGAA	3000	this study
pMPH43	<i>srv-3p::sfGFP</i> <i>::nrx-1(a)</i>	TCACATTTGCCACCAAA TTGCCGGTTGCCA	TTTTGGAGGAGAAAGTT GAGCAAATAGTAG	770	this study
pMPH44	<i>sra-6p::sfGFP</i> <i>::nrx-1(a)</i>	CTGAGGTGCATTTGCGA GGGGCACTTCAGA	GGCAAAATCTGAAATAAT AAATATTAAATT	2408	this study
pMPH45	<i>ric-19p::sfGF</i> <i>P::nlg-1</i>	CATTAAAGAGTGTGCTC CACGAGCC	GTTCAAAGTGAAGAGCT CTCTCGAC	147	this study
pMPH46	<i>nhr-79p::sfGF</i> <i>P::nlg-1</i>	CACGATCATTTTAAGCC AAGTTGTGGCCGT	TTTTATGCTAAAAATCGA TAAATCAAGGAA	3000	this study
pMPH47	<i>nlp-56p::sfGF</i> <i>P::nlg-1</i>	TTCCAAATCCGAACTTC CAGCTCAAATGAC	CTGGAAGAGTTGAATCA TATGTTTAGAAG	721	this study
pMPH48	<i>nhr-79p::eat-4::SL2::gf p</i>	CACGATCATTTTAAGCC AAGTTGTGGCCGT	TTTTATGCTAAAAATCGA TAAATCAAGGAA	3000	this study
pMPH49	<i>srv-3p::eat-4::SL2::gf p</i>	TCACATTTGCCACCAAA TTGCCGGTTGCCA	TTTTGGAGGAGAAAGTT GAGCAAATAGTAG	770	this study
pMPH50	<i>sra-6p::eat-4::SL2::gf p</i>	CTGAGGTGCATTTGCGA GGGGCACTTCAGA	GGCAAAATCTGAAATAAT AAATATTAAATT	2408	this study
pMPH51	<i>srv-3p::gfp::cla-1</i>	TCACATTTGCCACCAAA TTGCCGGTTGCCA	TTTTGGAGGAGAAAGTT GAGCAAATAGTAG	770	this study
pMPH52	<i>sra-6::gfp::cla-1</i>	CTGAGGTGCATTTGCGA GGGGCACTTCAGA	GGCAAAATCTGAAATAAT AAATATTAAATT	2408	this study
pMPH53	<i>sre-1p::sfGFP</i> <i>::nrx-1(a)</i>	GGGCGGGGCTATCTGC AAACAATGCAATGC	GAGGACATTTAAAAACC GGCGAGTATTGTA	1100	this study

pMPH54	<i>gcy-36p::sfGF P::nrx-1(α)</i>	ATGATGTTGGTAGATGG GGTTTGGATTCAT	TGTTGGGTAGCCCTTGT TTGAATTTACCAC	1087	this study
pMPH55	<i>flp-8p::sfGFP ::nrx-1(α)</i>	AGTGCTCAAATGGAGTC TGCATGAAAATGA	TTTCTACTTGAAAAGTGT GGACTGAGCACT	3165	this study
pMPH56	<i>nlp-56p::sfGF P::nrx-1(α)</i>	TTCCAAATCCGAACTTC CAGCTCAAATGAC	CTGGAAGAGTTGAATCA TATGGTTTAGAAG	721	this study
pMPH57	<i>sra-6p::sfGFP ::nlg-1</i>	CTGAGGTGCATTTGCGA GGGGCACTTCAGA	GGCAAAATCTGAAATAAT AAATATTAAATT	2408	this study
pMPH58	<i>srv-3p::sfGFP ::nlg-1</i>	TCACATTTGCCACCAAA TTGCCGGTTGCCA	TTTTGGAGGAGAAAAGTT GAGCAAATAGTAG	770	this study
pMPH59	<i>ins-1p::sfGFP ::nlg-1</i>	CTTCCTGTTTCCTGTCC GTTTAAGGATTTA	ACAACGGGCCACACGC TACGACAGTACGCA	314	this study
pMPH64	<i>sra-6p::npr-1::sl2::mC herry</i>	CTGAGGTGCATTTGCGA GGGGCACTTCAGA	GGCAAAATCTGAAATAAT AAATATTAAATT	2408	this study
pMPH65	<i>nlp-56p::npr-1::sl2::mC herry</i>	TTCCAAATCCGAACTTC CAGCTCAAATGAC	CTGGAAGAGTTGAATCA TATGGTTTAGAAG	721	this study
pMPH66	<i>myo-3p::sfGFP ::nlg-1</i>	GTAATTTATTTAACCTGT ACTCTATCACT	TTCTAGATGGATCTAGTG GTCGTGGGTTTG	2418	this study
pMPH67	<i>tx-3p::sfGFP ::nlg-1</i>	TCTCATTTAAATTTTCAGA GCTTAAAAATG	ATTTGACACCGAAGACA ATTATTATGATAA	912	this study