Supplemental Materials

Molecular Biology of the Cell

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Supplemental Figures

Supplemental Figure 1: A screen of 102 genes that encode actin binding and regulatory proteins reveals the importance of the actin cytoskeleton in *C. elegans* reproduction and somatic gonad function. Spermathecae in live animals were visualized on a dissection scope using a line that expresses GFP::ACT-1 under a spermatheca specific promoter. This line allows for easy visualization of the spermatheca to distinguish spermathecae undergoing ovulation that are occupied by an oocyte and appear distended, "occupied," from spermathecae between ovulations that contain only sperm and appear compact, "empty." Animals with occupied spermathecae but no embryos in the uterus were scored as, "occupied on first," and animals with empty spermathecae and no embryos in the uterus were scored as, "no entry." At least 100 animals were scored for each condition. For the number of animals screened for each gene and for a description of the known gene functions and orthologs see Supplemental Table 1. Genes that result in a 2 to 4-fold increase in the percent of animals with occupied spermathecae are classified as resulting in a mild contractility defect. Genes that result in a greater than 4-fold increase are classified as resulting in a severe contractility defect. Genes that result in a "no entry," phenotype were classified as producing in a mild entry defect if fewer than 50% of animals had the "no entry" phenotype and a severe entry defect if 50% or more did.

Supplemental Figure 2: The screening method used to identify contractility defects is highly reproducible. Animals treated with control RNAi were scored on 11 different days over 2 years. Spermathecae in live animals were visualized on a dissection scope using a line that expresses GFP::ACT-1 under a spermatheca specific promoter. This line allows for easy visualization of the spermatheca to distinguish spermathecae undergoing ovulation that are occupied by an oocyte and appear distended, "occupied," from spermathecae between ovulations that contain only sperm and appear compact, "empty." The number of animals scored on each day is indicated (n). The average percent of animals with each phenotype and the SD across experiments is indicated.

Supplemental Figure 3: The *unc-70* gene has 4 predicted splice variants and only isoform c is detected in the spermathecae. (A) Schematic of the different splice variants for the *unc-70* locus, K11C4.3. The sequence used to generate the RNAi construct is indicated and is common to all for transcripts. (B) Schematic of the expression constructs used to determine unc-70 expression pattern. The top constructs reports the expression of all isoforms except c and is not detect in the spermatheca (Krieg *et al.*, 2014). The bottom construct is expressed in the spermatheca and SP-UT valve (this work). (C) Protein alignment for the predicted amino acid sequence of each isoform. Alternative splicing results in a unique N-terminal extension in isoform c. Unique residues are highlighted in red. Yellow indicates two unstructured regions predicted using the online Simple Modular Architecture Research Tool (SMART) and blue shows the start of the calponin homology (CH) domain conserved across all isoforms.

Supplemental Figure 4: Labeled SPC-1/α is functional in the somatic gonad. (A) Scoring of ovulation defects in WT unlabeled animals and animals expressing SPC-1::mKate2 using a widefield microscope. Expression of labeled SPC-1/α does not significantly alter the percentages of gonad arms with empty spermathecae, occupied spermathecae, and spermathecae occupied by a pinched oocyte. (B) Scoring of contractility defects in animals expressing GFP labeled actin in the spermatheca with unlabeled SPC-1/α and SPC-1::mKate2 using a dissection microscope. Expression of labeled mKate2 in the background of this

potentially sensitized line does not result in significant changes in the percent of animals with empty and occupied spermathecae. In (A) n = the number of gonad arms scored and in (B) n = the number of animals scored. Chi-square test, P value: ns P > 0.05.

Supplemental Figure 5: SPC-1/α is faintly expressed in the sheath cells but is not required for F-actin organization in the sheath. (A) A confocal maximum intensity projection of an excised gonad of an animal expressing SPC-1::mKate2 labeled at the endogenous locus. The image is colored to highlight differences in fluorescence intensity. SPC-1::mKate2 is prominently expressed in the spermatheca and faint expression is also present in the sheath (white arrowheads). (B) Confocal maximum intensity projections of excised and fixed gonads from WT, N2, animals stained with phalloidin to label F-actin. Animals were treated with control RNAi or RNAi against *spc-1* and *unc-70* to disrupt the SBMS. Knock down of SPC-1/α or UNC-70/β does not result in notable alterations to sheath F-actin morphology.

Supplemental Figure 6: Spectrin is not required for myosin association with actomyosin bundles.(A) Confocal maximum intensity projections of spermathecal cells in intact animals expressing moeABD::mCherry, to label F-actin, and GFP::NMY-1, to label myosin. (B) Central sagittal cross sections of the spermathecae shown in (A). Note, actin and myosin are both enriched at the basal cell surface. In cross section images, basal is at the bottom and apical is at the top. (C) Fluorescence intensity across the dashed line on the WT cell shown in (A). (D) Fluorescence intensity across the dashed line on the *unc-70(RNAi)* cell shown in (A). Line scan analysis shows that peaks of actin fluorescence coincide with peaks of myosin fluorescence in both WT and *unc-70(RNAi)* cells. Scale bar 5 μm.

Supplemental Table 1: This table contains a list of the genes screened in this paper, the known orthologs, and gene functions in *C. elegans*. Rows one and two contain the *C. elegans* gene name and the number of animals screened for spermathecal contractility defects with RNAi of the indicated gene. Row three lists known orthologs or related protein families based on conserved protein domains. Row four includes a list of the biological function gene ontology terms associated with that gene in *C. elegans*. Information for the 3rd and 4th rows is from WormBase. For details on the spermathecal contractility phenotypes associated with each gene see Supplemental Figure 1. Genes listed in this table are in the same order as the genes in Supplemental Figure 1.

***C. elegans* Gene**	**Animals Scored**	**Orthologs and Related Protein Families**	***C. elegans* Biological Function Gene Ontology (GO)**
Empty vector	628		
vps-16	200	S. cerevisiae Vps16p (vacuolar sorting protein)	intracellular protein transport, vacuole organization, embryo development ending in birth or egg hatching, protein transport, endosomal transport, regulation of vacuole fusion, (non-autophagic), regulation of SNARE complex assembly, and digestive tract development
tth-1	170	Thymosin-beta	actin filament organization, and nervous system development
Y65B4A.4	141	Human CAP2 (CAP, adenylate cyclase-associated protein, 2 (yeast))	cell morphogenesis, cytoskeleton organization, establishment or maintenance of cell polarity, signal transduction, actin polymerization or depolymerization, and regulation of adenylate cyclase activity
ttn-1	203	Titin	protein phosphorylation, striated muscle contraction, actin filament organization, phosphorylation, sarcomere organization, and striated muscle myosin thick filament assembly
ced-12	126	ELMO (Engulfment and Cell Motility)	establishment of mitotic spindle orientation, phagocytosis, engulfment, apoptotic process, actin filament organization, cell migration, regulation of cell migration, actin cytoskeleton reorganization, gonad morphogenesis, engulfment of apoptotic cell, cytoskeletal rearrangement involved in phagocytosis and engulfment, left/right axis specification, positive regulation of engulfment of apoptotic cell, apoptotic process involved in development, and positive regulation of distal tip cell migration
arx-7	185	p16Arc (subunit of the actin related protein of the conserved Arp2/3 complex)	epithelial cell migration, morphogenesis of embryonic epithelium, regulation of actin filament polymerization, and Arp2/3 complex-mediated actin nucleation
tmd-2	169	Human LMOD1-3 (leiomodin 1-3) and members of the TMOD (Tropomodulins) family	actin filament organization, myofibril assembly, and pointed-end actin filament capping

dys-1	395	Human DMD (Duchenne muscular dystrophy)	drug transmembrane transport, synaptic transmission (cholinergic), locomotory behavior, acetylcholine transport, positive regulation of synaptic transmission (cholinergic), positive regulation of locomotion, forward locomotion, sarcomere organization, muscle cell cellular homeostasis, and ammonium transmembrane transport
daam-1	236	Drosophila DAAM and human DAAM1 (Disheveled-Associated Activator of Morphogenesis)	cellular component organization and actin cytoskeleton organization
atn-1	174	Alpha-actinin	striated muscle thin filament and striated muscle dense body
arx-5	216	p21Arc (subunit of the actin related protein of the conserved Arp2/3 complex)	epithelial cell migration, morphogenesis of embryonic epithelium, regulation of actin filament polymerization, and Arp2/3 complex-mediated actin nucleation
pfn-3	191	Profilin	sequestering of actin monomers and muscle thin filament assembly
myo-6	132	Human myosin-13, straited muscle conventional myosin heavy chain	microtubule-based movement
mig-2	196	RhoG family GTP-binding proteins; homologous to Human RAC1	neuron migration, regulation of protein phosphorylation, actin filament organization
C46H11.3	163	Human Arpc5 (actin related protein 2/3 complex subunit 5) and ARPC5L (actin related protein 2/3 complex subunit 5 like)	cell migration, regulation of actin filament polymerization, and Arp2/3 complex-mediated actin nucleation
pxl-1	284	Paxillin	nematode larval development, pharyngeal pumping, and muscle structure development
frm-1	302	Human EPB41L1 and 3 (erythrocyte membrane protein band 4.1 like 1 and 3)	actomyosin structure organization,

tnt-4	120	Troponin	nematode larval development, muscle contraction, regulation of muscle contraction, pharynx development, and pharyngeal gland morphogenesis
eps-8	237	Cell signaling adaptor protein containing PTB, SH3, and actin-binding domains; homologous to Drosophila CG8907 and human BAG65598	nematode larval development, intermediate filament organization, maintenance of protein location, and digestive tract morphogenesis
Y50D7A.10	254	Human GMFG and B (glia maturation factor gamma and beta)	negative regulation of Arp2/3 complex-mediated actin nucleation
tni-4	112	Troponin	muscle contraction, pharyngeal pumping, and embryo development ending in birth or egg hatching
samp-1	138	Mammalian NET5/Samp1 (spindle associated membrane protein)	embryo development ending in birth or egg hatching and nuclear migration along microtubule
myo-2	165	Human myosin-3, conventional myosin heavy chain	microtubule-based movement
unc-53	330	Human NAV1-3 (Neuron Navigator 1-3)	signal transduction, multicellular organism development, axon guidance, mating behavior, motor neuron axon guidance, mesodermal cell migration, determination of muscle attachment site, oviposition, actin cytoskeleton organization, positive regulation of cell migration, positive regulation of multicellular organism growth, backward locomotion, positive regulation of axon extension, positive regulation of axon extension involved in axon guidance, and cell projection morphogenesis
pfn-1	207	Profilin	sequestering of actin monomers
cap-1	250	Human F-actin-capping protein subunit alpha-1	barbed-end actin filament capping

feh-1	325	Fe65 protein family homologous to human Isoform 2 of Amyloid beta A4 precursor protein-binding family B member 2	nematode larval development, transcription (DNA-templated), regulation of transcription (DNA-templated), feeding behavior, and embryo development ending in birth or egg hatching
aipl-1	196	AIP1 (Actin Interacting Protein 1) cooperates with ADF/cofilin	actin filament organization, actin filament depolymerization, positive regulation of actin filament depolymerization, regulation of protein localization, locomotion, and sarcomere organization
zoo-1	195	Zonula occludens (ZO) subfamily of membrane-associated guanylate kinases (MAGUKs)	actin filament organization, embryo development ending in birth or egg hatching, and embryonic morphogenesis
gsnl-1	145	Gelsolin	actin filament depolymerization, actin filament severing, barbed-end actin filament capping, actin filament capping, and positive regulation of synapse disassembly
cor-1	333	Coronin	actin cytoskeleton organization
frl-1	280	Human formin FMNL1	cellular component organization and actin cytoskeleton organization
spe-15	210	Human unconventional myosin VI heavy chain	microtubule-based movement, spermatogenesis, spermatid development, and organelle localization
hipr-1	535	Mammalian Huntingtin-interacting protein 1-related (Hip1r)	endocytosis, neurotransmitter secretion, ultradian rhythm, protein localization, defecation, and developmental process
cas-2	342	Human CAP1-2 (adenylate cyclase associated protein 1-2)	cell morphogenesis, cytoskeleton organization, establishment or maintenance of cell polarity, signal transduction, actin polymerization or depolymerization, and regulation of adenylate cyclase activity
plst-1	182	Human PLS1 and 3 (plastin 1 and 3) and LCP1 (lymphocyte cytosolic protein 1 (L-plastin))	actin filament bundle assembly, actin filament network formation, and actin crosslink formation,

hum-5	182	Human unconventional myosin-Ib heavy chain	microtubule-based movement
viln-1	177	Human SVIL (supervillin)	cytoskeleton organization
pfn-2	175	Profilin	sequestering of actin monomers and muscle thin filament assembly
spe-26	239	Kelch motif-containing protein related to Drosophila proteins kelch and diablo	protein ubiquitination
cas-1	239	Human CAP1 (adenylyl cyclase-associated protein 1)	cell morphogenesis, cytoskeleton organization, establishment or maintenance of cell polarity, signal transduction, actin polymerization or depolymerization, and regulation of adenylate cyclase activity
M04F3.5	230	I-BAR domain-containing protein related to human MTSS1L (MTSS1-like protein)	plasma membrane organization, cell projection assembly, and membrane organization
Y73B3B.1	183	Human PLS1 and 3 (plastin 1 and 3) and LCP1 (lymphocyte cytosolic protein 1 (L-plastin))	actin filament bundle assembly, actin filament network formation, and actin crosslink formation,
ketn-1	282	Kettin, invertebrate paralog of titin	No biological process GO available; Cellular component GO term: I band
anc-1	242	Mammalian SYNE1-2 (Spectrin repeat-containing nuclear envelope protein 1-2)	nucleus organization, cytoskeleton organization, and pronuclear migration
add-1	160	Human ADD1 (alpha-adducin)	memory, short-term memory, long-term memory, barbed-end actin filament capping, receptor localization to synapse, and regulation of actin cytoskeleton reorganization
hum-8	154	Human unconventional myosin VI	microtubule-based movement

add-2	246	Contains an alpha-adducin-like domain related to human ADD1 (alpha-adducin)	No biological process GO available; cellular compartment GO term predicts ADD-2 is associated with the cytoskeleton and cellular membrane
myo-5	151	Human myosin-3, conventional myosin heavy chain	microtubule-based movement and Golgi vesicle transport
hum-2	150	Human Myosin-5B, unconventional myosin heavy chain type V	microtubule-based movement
syg-1	163	Immunoglobulin superfamily with homology to human KIRREL2 (Kin of IRRE-like protein 2)	cell adhesion, cell-cell signaling, nervous system development, synapse assembly, synaptic target recognition, collateral sprouting, branching morphogenesis of a nerve, synapse organization, and actin filament bundle assembly
tni-3	348	Troponin	muscle contraction, oviposition, and post-embryonic body morphogenesis
Mild exit defect (13 genes)			
ehbp-1	176	Human EH domain-binding protein 1 (EHBP1)	receptor recycling, protein secretion, and endocytic recycling
exc-6	201	Human FHDC1 (FH2 domain containing 1)	epithelial cell development, regulation of microtubule polymerization, regulation of tube size, regulation of tube size, epithelial tube morphogenesis, and positive regulation of actin filament binding
nab-1	256	Mammalian Neurabin/Spinophilin proteins	synapse assembly
frg-1	236	Vertebrate facioscapulohumeral muscular dystrophy (FSHD) region gene 1 (FRG1)	rRNA processing, muscle organ development, ribosome biogenesis, and actin filament bundle assembly,

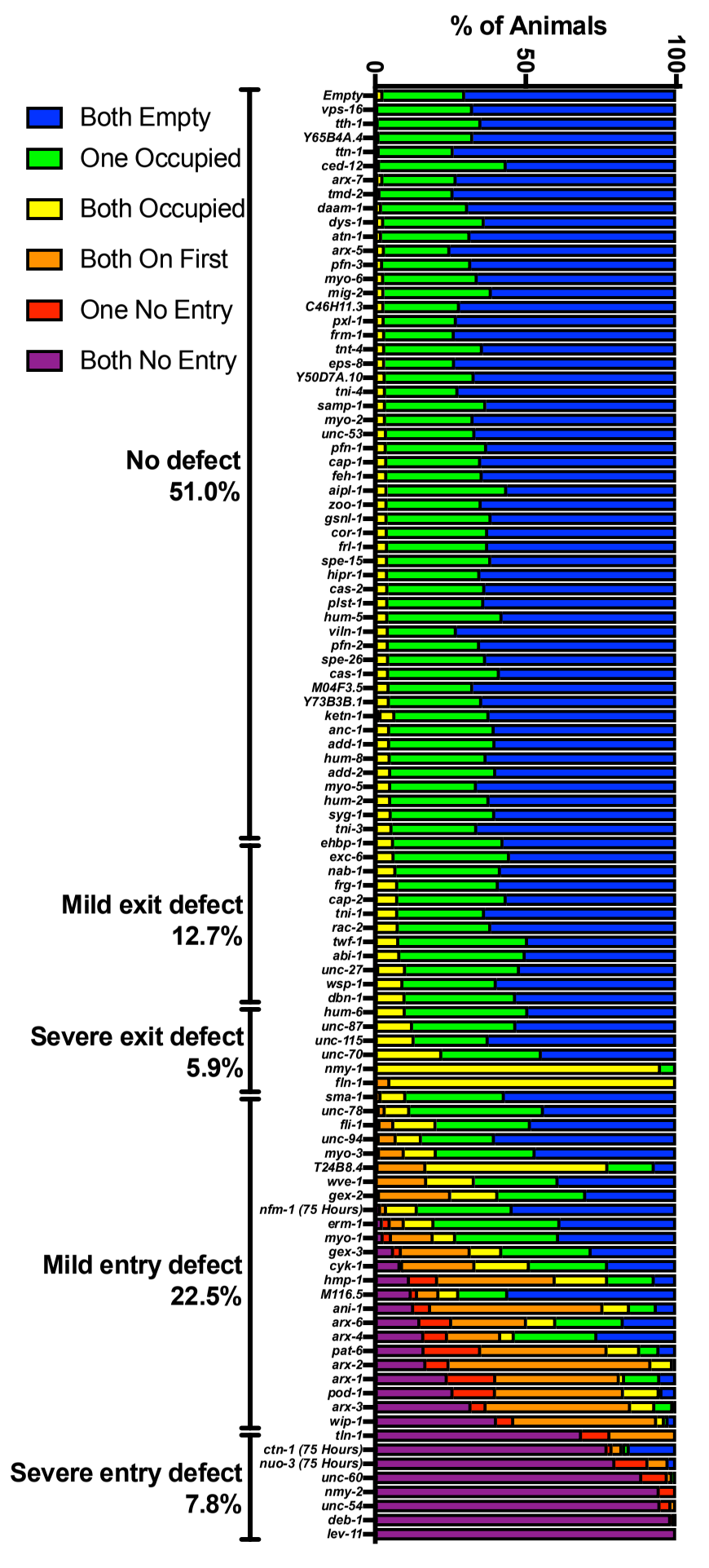
cap-2	236	Human F-actin-capping protein subunit beta	embryonic axis specification, cell morphogenesis, regulation of lamellipodium assembly, actin cytoskeleton organization, barbed-end actin filament capping, negative regulation of filopodium assembly, and actin filament capping
tni-1	104	Troponin	muscle contraction, backward locomotion
rac-2	179	RhoG family GTP-binding proteins; homologous to Human RAC1	neuron migration, actin filament organization, motor neuron axon guidance, dorsal/ventral axon guidance, neuron projection morphogenesis, and axon extension involved in axon guidance
twf-1	250	Human TWF1 (twinfilin actin binding protein 1)	negative regulation of actin filament polymerization
abi-1	123	Human Abl interactor 1 (ABI1)	neuron migration, actin polymerization or depolymerization, cell migration, cell projection morphogenesis, positive regulation of engulfment of apoptotic cell, positive regulation of clathrin-dependent endocytosis
unc-27	185	Troponin	muscle contraction, locomotion, and sarcomere organization
wsp-1	235	Human WASP (Wiskott-Aldrich syndrome protein)	epithelial cell migration, morphogenesis of embryonic epithelium, regulation of protein stability, microvillus organization, regulation of Arp2/3 complex-mediated actin nucleation, embryonic ectodermal digestive tract morphogenesis, positive regulation of oviposition, and positive regulation of clathrin-dependent endocytosis
dbn-1	188	Human DBNL (drebrin like) and DBN1 (drebrin 1)	No biological process GO available; cellular component GO term indicates actin binding
hum-6	118	Human Unconventional myosin-VIIa heavy chain	microtubule-based movement and signal transduction
Strong exit defect (6 genes)			
unc-87	254	Similar structure to calponin but with no obvious orthologs outside of nematodes	actomyosin structure organization, myosin filament assembly, actin filament bundle assembly, negative regulation of plus-end directed microfilament motor activity, and negative regulation of muscle filament sliding
unc-115	175	Human ABLIM1 (Actin-binding LIM protein 1)	cytoskeleton organization, regulation of lamellipodium assembly, neuron projection morphogenesis, and regulation of filopodium assembly

unc-70	103	beta-spectrin	nematode larval development, cytoskeleton organization, embryonic body morphogenesis, dendrite development, regulation of locomotion, muscle cell cellular homeostasis, neuron development, and actin filament capping
nmy-1	178	Drosophila zipper (type II non-muscle myosin heavy chain)	nematode larval development, microtubule-based movement, protein localization, regulation of embryonic cell shape, and locomotion
fln-1	198	Human FLNA (filamin A)	actin filament organization, axon guidance, axonal fasciculation, uterus morphogenesis, and semaphorin-plexin signaling pathway
sma-1	232	beta-H spectrin	epithelial cell development, nematode larval development, body morphogenesis, embryonic body morphogenesis, regulation of tube size, regulation of locomotion, positive regulation of multicellular organism growth, positive regulation of cell size, positive regulation of organ growth, pharynx development, and pharyngeal gland morphogenesis
Mild entry defect (23 genes)			
unc-78	198	AIP1 (Actin Interacting Protein 1) cooperates with ADF/cofilin	skeletal muscle thin filament assembly, positive regulation of actin filament depolymerization, and negative regulation of actin filament polymerization
fli-1	172	Drosophila and human Flightless I	multicellular organism development, actin cytoskeleton organization, and actin filament severing
unc-94	334	Tropomodulin	nematode larval development, embryo development ending in birth or egg hatching, and negative regulation of actin filament depolymerization
myo-3	122	Human myosin-13, straited muscle conventional myosin heavy chain	microtubule-based movement, locomotory behavior, and positive regulation of ovulation
T24B8.4	324	Contains two tandem WH2 domains with no obvious orthologs outside of nematodes	No biological process GO; molecular GO predicts actin binding
wve-1	133	SCAR/WAVE	neuron migration, actin filament organization, motor neuron axon guidance, actin cytoskeleton organization, embryonic morphogenesis, embryonic ectodermal digestive tract morphogenesis, collateral sprouting, positive regulation of oviposition, positive regulation of protein localization to synapse, and positive regulation of clathrin-dependent endocytosis

gex-2	281	Mammalian p140/Sra-1 (specifically Rac1-associated protein)	multicellular organism development, embryonic body morphogenesis, cell migration, positive regulation of oviposition, and positive regulation of clathrin-dependent endocytosis,
nfm-1	254	Human merlin/schwannomin (NF2)	negative regulation of cell proliferation
erm-1	234	ERM (Ezrin, Radixin, Moesin) family of cytoskeletal linkers	morphogenesis of an epithelium, nematode larval development, actin filament organization, tube formation, and protein localization to basolateral plasma membrane
myo-1	108	Human myosin-3, conventional myosin heavy chain	muscle contraction, microtubule-based movement, pharyngeal pumping, and inositol lipid-mediated signaling
gex-3	192	Mammalian NAP1/NCKAP1 (NCK Associated Protein 1)	actin filament organization, multicellular organism development, embryonic body morphogenesis, cell migration, oviposition, embryonic ectodermal digestive tract morphogenesis, collateral sprouting, positive regulation of oviposition, positive regulation of protein localization to synapse, and positive regulation of clathrin-dependent endocytosis
cyk-1	177	Formin Homology protein homologous to Drosophila diaphanous and human DIAPH1	actin filament organization, cell cycle, cellular component organization, actin cytoskeleton organization, and pronuclear migration
hmp-1	225	alpha-catenin	cytoskeletal anchoring at plasma membrane, cell adhesion, multicellular organism development, embryonic body morphogenesis, cell migration, regulation of protein localization, regulation of actin cytoskeleton organization, and cell migration involved in gastrulation
M116.5	197	Human plectin	No biological process GO available; molecular function GO terms indicate actin and microtubule binding activity
ani-1	124	Anillin	cell cycle, multicellular organism development, protein localization, embryo development ending in birth or egg hatching, first cell cycle pseudocleavage, cortical cytoskeleton organization, septin ring organization, collagen and cuticulin-based cuticle development, locomotion, hermaphrodite genitalia development, polar body extrusion after meiotic divisions, nematode male tail tip morphogenesis, actin filament bundle assembly, cell division, and meiotic cell cycle

arx-6	246	p20/Arc subunit of the actin related protein of the conserved Arp2/3 complex	epithelial cell migration, morphogenesis of embryonic epithelium, regulation of actin filament polymerization, and Arp2/3 complex-mediated actin nucleation
arx-4	153	p34/Arc subunit of the actin related protein of the conserved Arp2/3 complex	epithelial cell migration, morphogenesis of embryonic epithelium, regulation of actin filament polymerization, and Arp2/3 complex-mediated actin nucleation
pat-6	250	alpha-parvin	cell adhesion, actin cytoskeleton reorganization, striated muscle cell development, and positive regulation of sarcomere organization
arx-2	194	Arp-2 subunit of the actin related protein of the conserved Arp2/3 complex	actin filament organization, gastrulation, epithelial cell migration, morphogenesis of embryonic epithelium, and Arp2/3 complex-mediated actin nucleation
arx-1	112	Arp-3 subunit of the actin related protein of the conserved Arp2/3 complex	actin filament organization, gastrulation, epithelial cell migration, morphogenesis of embryonic epithelium, and Arp2/3 complex-mediated actin nucleation
pod-1	127	Coronin-like protein similar to human Coronin-7	No biological process GO available; molecular function GO terms indicate association with the Golgi, cell cortex, and cleavage furrow
arx-3	100	p41/Arc subunit of the actin related protein of the conserved Arp2/3 complex	regulation of actin filament polymerization and Arp2/3 complex-mediated actin nucleation
wip-1	158	WIP (Wiskott-Aldrich syndrome protein (WASP)-Interacting Protein)	embryonic body morphogenesis, regulation of cell migration, and regulation of protein stability
Strong entry defect (8 genes)			
tln-1	288	Human TLN1-2 (talin 1-2)	cytoskeletal anchoring at plasma membrane, cell adhesion, integrin-mediated signaling pathway, regulation of vulval development, negative regulation of epidermal growth factor receptor signaling pathway, and vulval cell fate specification
ctn-1	123	alpha-catulin family of catenin-like proteins	cell adhesion, Rho protein signal transduction, and regulation of locomotion

nuo-3	119	encodes two non-overlapping proteins; on is homologous to human C3orf10/BRICK1 (WAVE1 complex component) the other to human NDUFA6 (NADH-ubiquinone oxidoreductase alpha subunit)	mitochondrial electron transport, NADH to ubiquinone and response to oxidative stress
unc-60	177	Actin depolymerizing factor(ADF)/cofilin	embryo development ending in birth or egg hatching, actin filament depolymerization, skeletal muscle thin filament assembly, positive regulation of actin filament polymerization, locomotion, actin filament severing, and muscle thin filament assembly
nmy-2	145	Drosophila Mhc (type II non-muscle myosin heavy chain)	mitotic cytokinesis, nematode larval development, microtubule-based movement, embryo development ending in birth or egg hatching, polarity specification of anterior/posterior axis, regulation of embryonic cell shape, asymmetric protein localization involved in cell fate determination, and asymmetric neuroblast division
unc-54	192	Human myosin-13, straited muscle conventional myosin heavy chain	muscle contraction, microtubule-based movement, oviposition, skeletal muscle myosin thick filament assembly, locomotion, pharyngeal pumping, and inositol lipid-mediated signaling
deb-1	242	Vinculin	cytoskeletal anchoring at plasma membrane, cell adhesion, and. positive regulation of ovulation
lev-11	239	Tropomyosin	muscle contraction, actin filament organization, embryo development ending in birth or egg hatching, regulation of actin filament polymerization, negative regulation of actin filament depolymerization, spicule insertion, locomotion, and regulation of protein binding


% of Animals
0
50
100
Both Empty
One Occupied
Both Occupied
Both On First
One No Entry
Both No Entry
No defect
51.0%
Mild exit defect
12.7%
Severe exit defect
5.9%
Mild entry defect
22.5%
Severe entry defect
7.8%
Empty
vps-16
tth-1
Y65B4A.4
ttn-1
ced-12
arx-7
tmd-2
daam-1
dys-1
atn-1
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pfn-3
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mig-2
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pxl-1
frm-1
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samp-1
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hum-8
add-2
myo-5
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syg-1
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nab-1
frg-1
cap-2
tni-1
rac-2
twf-1
abi-1
unc-27
wsp-1
dbn-1
hum-6
unc-87
unc-115
unc-70
nmy-1
fln-1
sma-1
unc-78
fli-1
unc-94
myo-3
T24B8.4
wve-1
gex-2
nfm-1 (75 Hours)
erm-1
myo-1
gex-3
cyk-1
hmp-1
M116.5
ani-1
arx-6
arx-4
pat-6
arx-2
arx-1
pod-1
arx-3
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nmy-2
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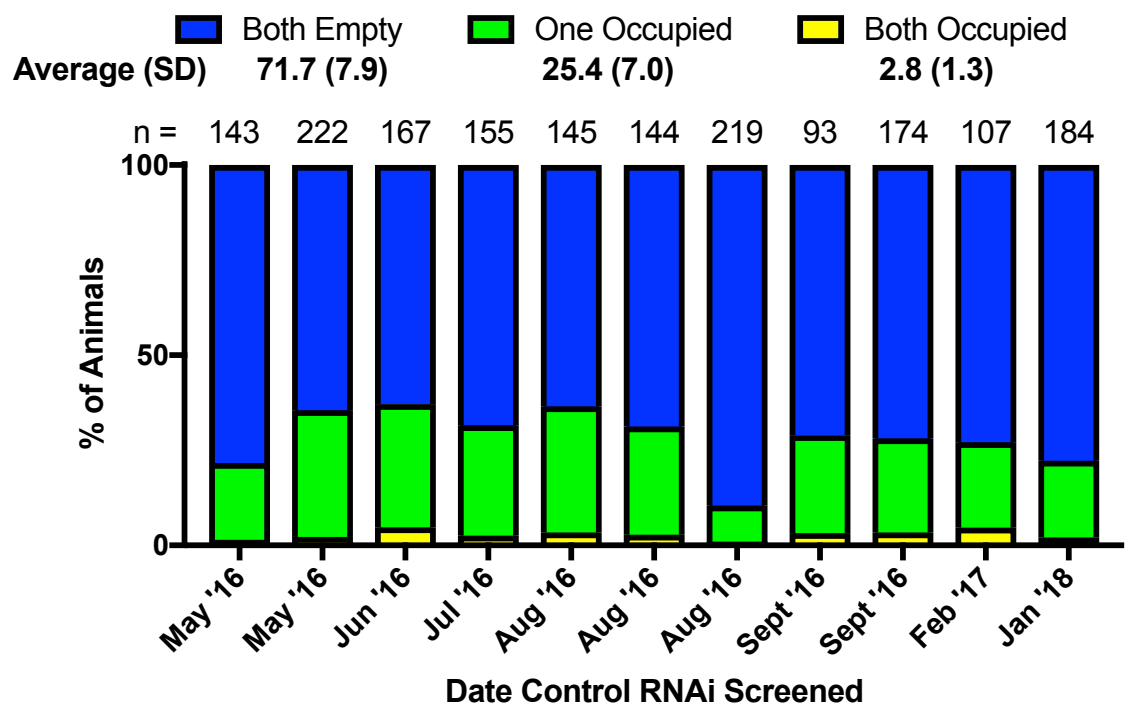
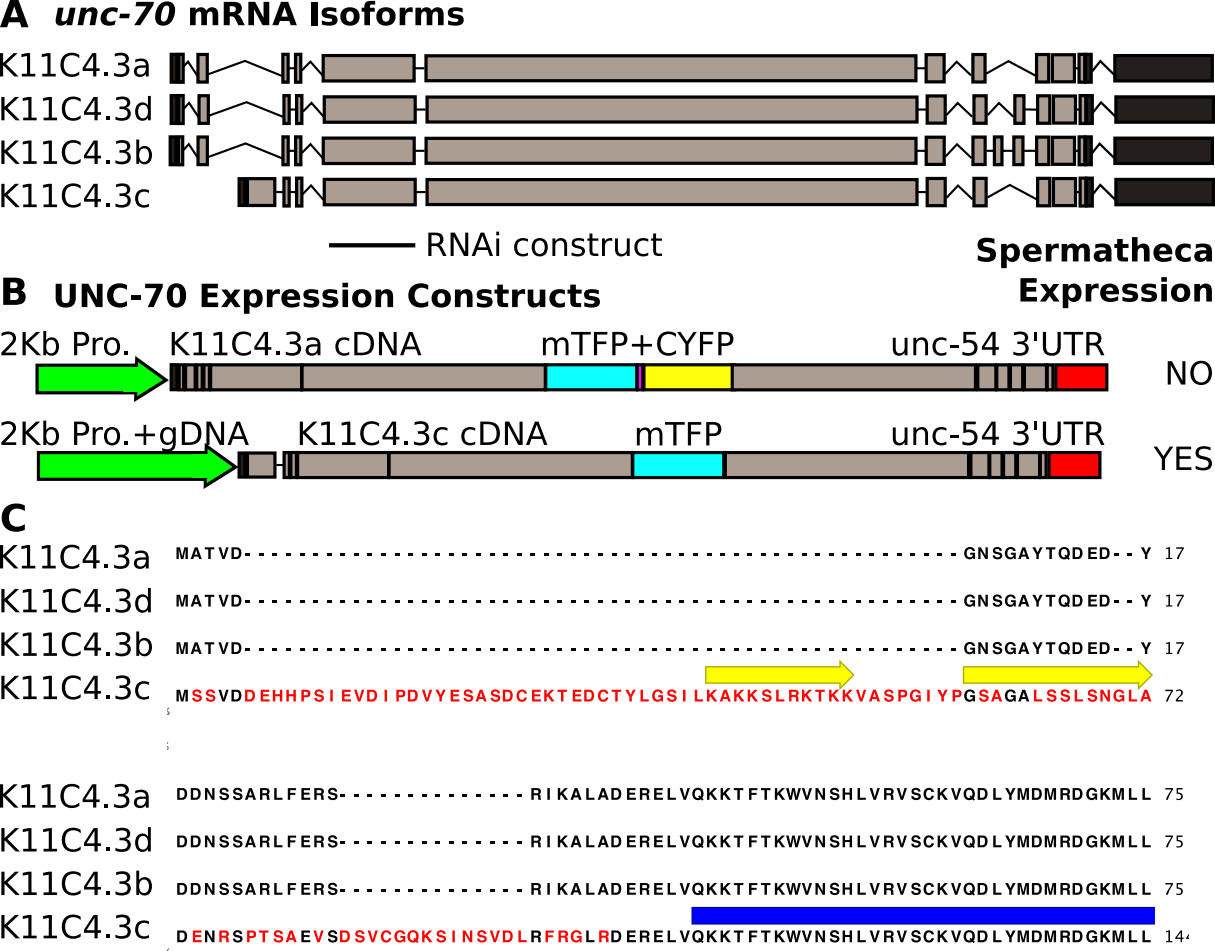
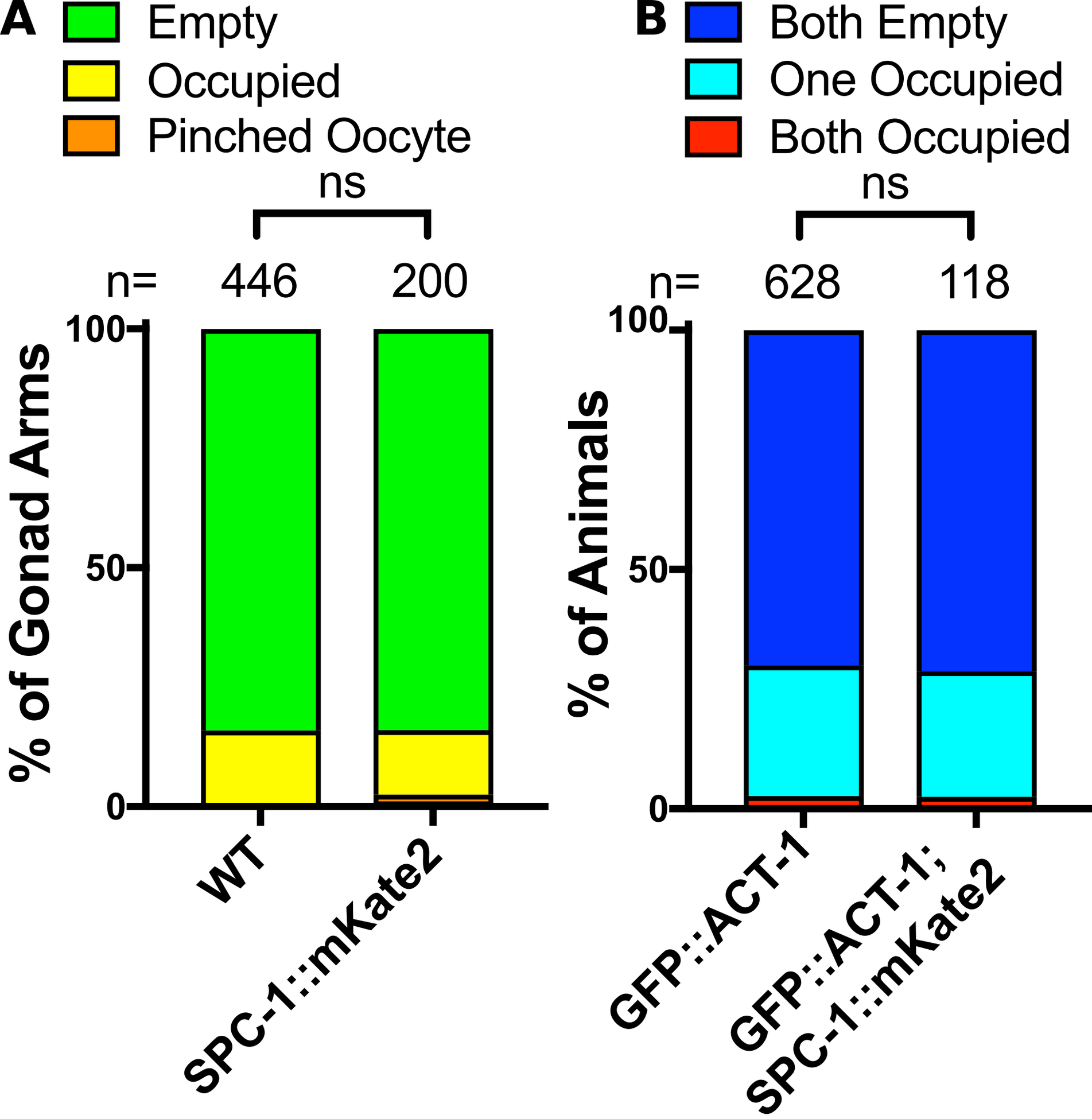
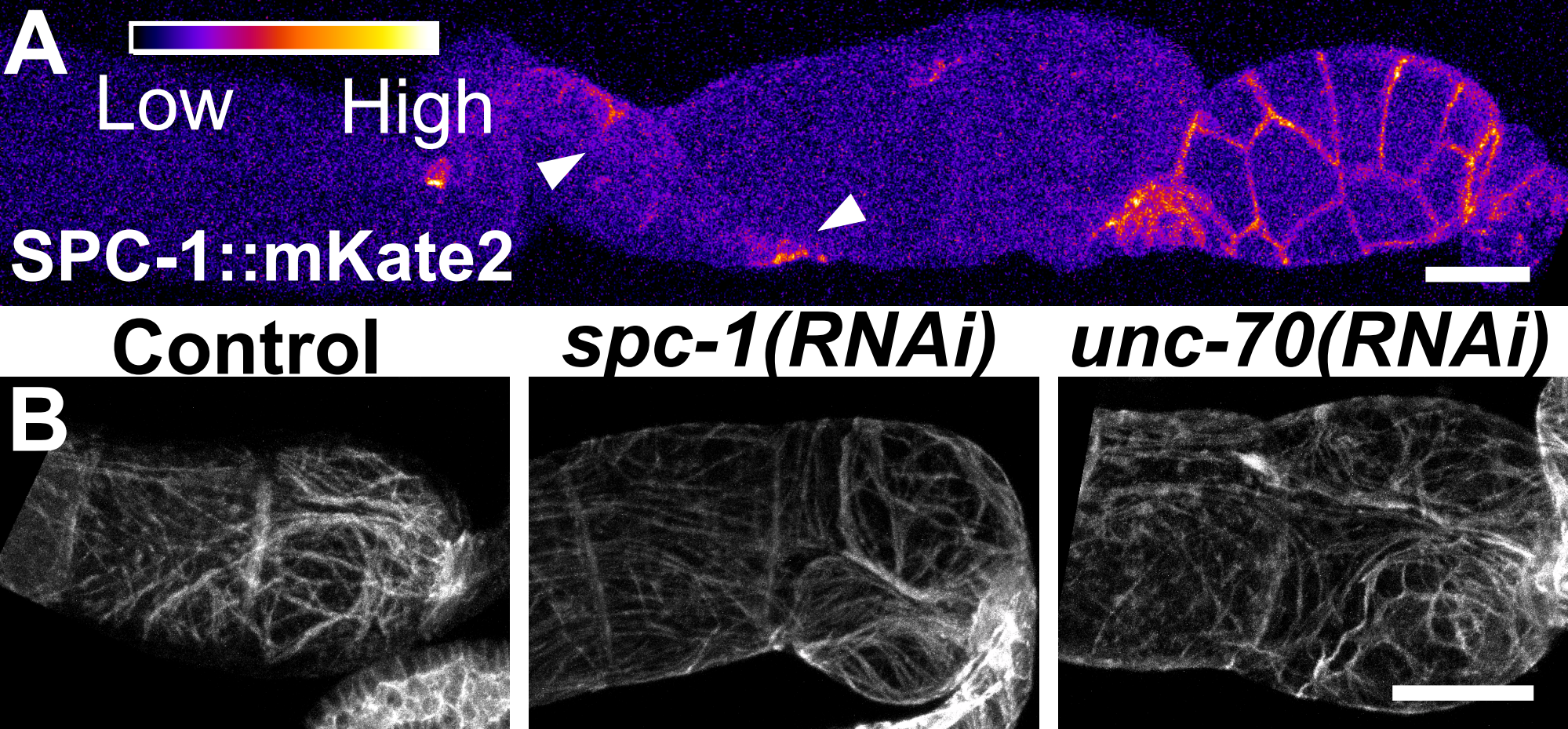
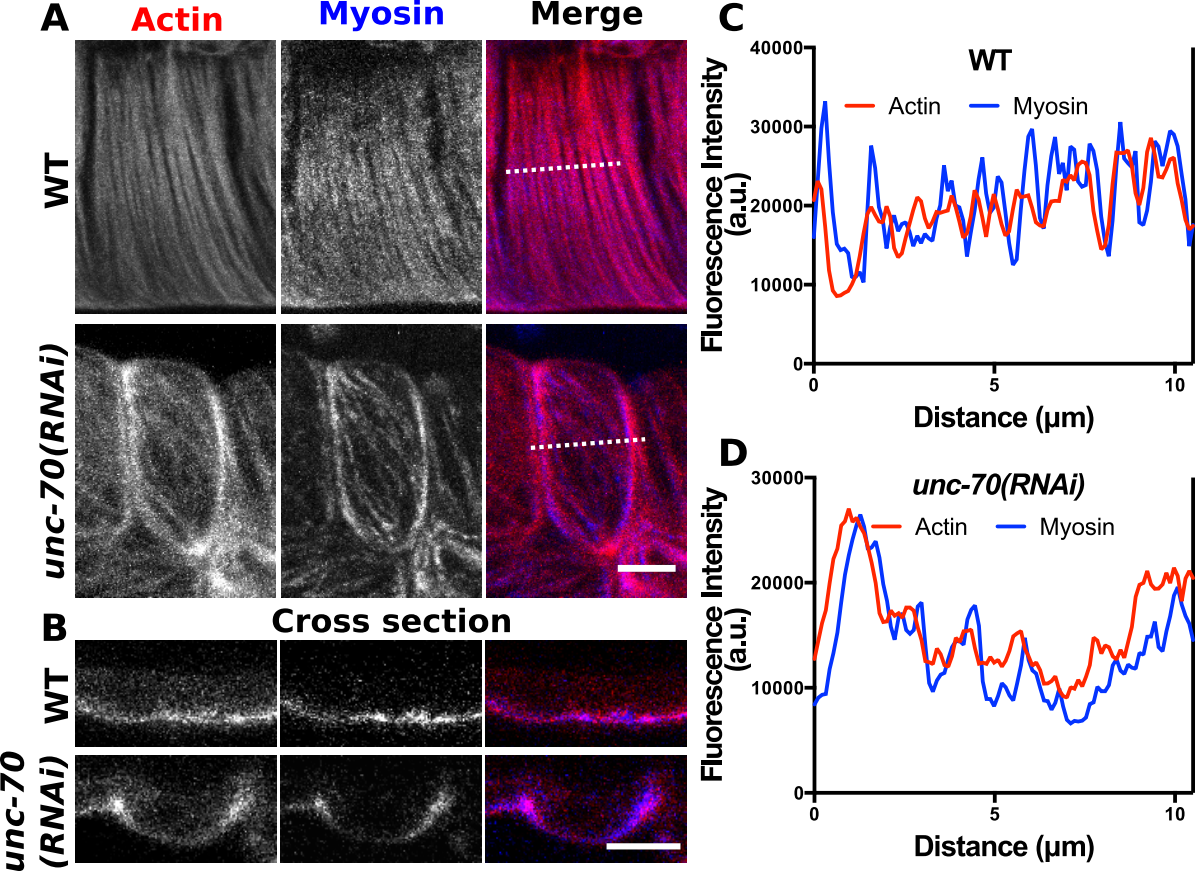
lev-11


Both Empty
One Occupied
Both Occupied
Average (SD)
71.7 (7.9)
25.4 (7.0)
2.8 (1.3)
n =
143
222
167
155
145
144
219
93
174
107
184
100
50
0
% of Animals
May '16
May '16
Jun '16
Jul '16
Aug '16
Aug '16
Aug '16
Sept '16
Sept '16
Feb '17
Jan '18
Date Control RNAi Screened


A unc-70 mRNA Isoforms
K11C4.3a
K11C4.3d
K11C4.3b
K11C4.3c
RNAi construct
Spermatheca Expression
B UNC-70 Expression Constructs
2Kb Pro.
K11C4.3a cDNA
mTFP+CYFP
unc-54 3'UTR
NO
2Kb Pro.+gDNA
K11C4.3c cDNA
mTFP
unc-54 3'UTR
YES
C
K11C4.3a MATVD----------GNSGAYTQDED--Y 17
K11C4.3d MATVD----------GNSGAYTQDED--Y 17
K11C4.3b MATVD----------GNSGAYTQDED--Y 17
K11C4.3c MSSVDDEHHPSIEVDIPDVYESASDCEKTEDCTYLGSILKAKKSLRKTKKVASPGIYPGSAGALSSLSNGLA 72
K11C4.3a DDNSSARLFERS----------RIKALADERELVQKKTFTKWVNSHLVRVSCKVQDLYMDMRDGKMLL 75
K11C4.3d DDNSSARLFERS----------RIKALADERELVQKKTFTKWVNSHLVRVSCKVQDLYMDMRDGKMLL 75
K11C4.3b DDNSSARLFERS----------RIKALADERELVQKKTFTKWVNSHLVRVSCKVQDLYMDMRDGKMLL 75
K11C4.3c DENRSPTSAEVSDSVCGQKSINSVDLRFRGLRDERELVQKKTFTKWVNSHLVRVSCKVQDLYMDMRDGKMLL 14


A
Empty
Occupied
Pinched Oocyte
ns
n=
446
200
100
50
0
% of Gonad Arms
WT
SPC-1::mKate2
B
Both Empty
One Occupied
Both Occupied
ns
n=
628
118
100
50
0
% of Animals
GFP::ACT-1
GFP::ACT-1;
SPC-1::mKate2


A
Low
High
SPC-1::mKate2
Control
spc-1(RNAi)
unc-70(RNAi)
B


A
Actin
Myosin
Merge
WT
unc-70(RNAi)
B
Cross section
WT
unc-70 (RNAi)
C
WT
Actin
Myosin
Fluorescence Intensity (a.u.)
40000
30000
20000
10000
0
0
5
10
Distance (μm)
D
unc-70(RNAi)
Actin
Myosin
Fluorescence Intensity (a.u.)
30000
20000
10000
0
0
5
10
Distance (μm)