Supplementary Table S1. *C. elegans* mutant strains assayed for sensitivity to ectopic sperm migration after mating with males of *C. elegans* or *C. nigoni*.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Gene | Strain genotype | Strain | Phenotype group | Protein | Localization | Phenotype notes [REFERENCES] |
| wt | wildtype | N2 | wildtype | n/a | n/a | n/a |
| *ceh-18* | *ceh-18(mg57) X* | GR1034 | attraction + ovulation | homeodomain transcription factor | broadly expressed | required for normal sheath cell development and contractions, ovulation, sperm sensing; loss induces endomitosis [1, 2] |
| *ceh-18; fog-2* | *ceh-18(mg57) X; fog-2(q71) V* | DG1604 | attraction + ovulation | homeodomain transcription factor | broadly expressed | required for normal sheath cell development and contractions, ovulation, sperm sensing; loss induces endomitosis [1-4] |
| *daf-2* | *daf-2(e1370) III* | CB1370 | attraction + ovulation | insulin/IGF receptor tyrosine kinase | broadly expressed | required for normal sperm migration toward oocytes, spermathecal valve constriction [5-7] |
| *dpl-1* | *dpl-1(n3316) unc-4(e120)/mnC1 [dpy-10(e128) unc-52(e444) II]* | MT9940 | ovulation | DP transcriptional regulator | broadly expressed | required for normal oogenesis, ovulation; loss induces endomitosis [8-10] |
| *efl-1* | *efl-1(n3639) V /+ ; lin-15A(n767) X* | MT11691 | ovulation | E2F transcription factor | gonad | required for normal oogenesis, ovulation; loss induces endomitosis [9] |
| *egg-1* | *egg-1(tm1071) III* | AD186 | attraction + fertilization + ovulation | LDL-receptor | oocyte membrane | required for normal gamete interaction and fertilization, sperm attraction/retention, ovulation [11] |
| *fat-1* | *fat-1(wa9) IV* | BX24 | attraction | omega-3 fatty acyl desaturase | broadly expressed | PUFA synthesis [6, 12] |
| *fat-1,4* | *fat-4(wa14) fat-1(wa9) IV* | BX52 | attraction | omega-3 and delta-5 desaturases | broadly expressed | [6, 12] |
| *fat-2* | *fat-2(wa17) IV* | BX26 | attraction + ovulation | delta-12 fatty acyl desaturase | broadly expressed | C18/C20 PUFA synthesis; required for normal sperm migration toward oocytes, spermathecal valve constriction [5-7, 12] |
| *fat-3* | *fat-3(wa22) IV* | BX30 | attraction | delta-6 fatty acid desaturase | broadly expressed | delta-6/C20 fatty acid synthesis [6, 12] |
| *fat-4* | *fat-4(wa14) IV* | BX17 | attraction | delta-5 fatty acid desaturase | broadly expressed | PUFA precursor synthesis [6, 12] |
| *gst-4* | *gst-4&msp-38(ok2358) IV* | RB1823 | attraction + ovulation | GSH-dependent prostaglandin D synthase | broadly expressed | required for normal sperm migration toward oocytes [5, 7] |
| *inx-14* | *inx-14(ag17) I* | AU98 | attraction + ovulation | innexin gap junction channel | broadly expressed | required for normal sperm migration toward oocytes, oocyte maturation [13] |
| *ipp-5* | *ipp-5(sy605) X* | PS3653 | ovulation | inositol 5-phosphatase | distal spermatheca, proximal sheath cells | required for normal spermathecal contractions [14] |
| *itr-1(sa73)* | *itr-1(sa73) IV* | JT73 | ovulation | inositol (1,4,5) triphosphate receptor | broadly expressed | required for normal ovulation, spermatheca and sheath cell contractions [14-16] |
| *itr-1(sy327)* | *itr-1(sy327) unc-24(e138) IV* | PS2368 | ovulation | inositol (1,4,5) triphosphate receptor | broadly expressed | required for normal ovulation, spermatheca and sheath cell contractions [16, 17] |
| *oma-1,2* | *oma-1(zu405te33)/nT1 [unc-?(n754) let-?] IV; oma-2(te51)/nT1 V* | TX183 | ovulation | TIS11 zinc finger protein | broadly expressed | required for normal oocyte maturation, ovulation; no obvious single-mutant phenotypes [18, 19] |
| *plc-1* | *plc-1(rx1) X; kfEx2* | PS4112 | ovulation | phospholipase C | broadly expressed | required for normal ovulation, spermathecal contractions; loss induces endomitosis [14, 16, 20] |
| *rme-2* | *rme-2(b1008)IV* | DH1390 | attraction + ovulation | LDL-receptor | near oocyte membrane | required for normal yolk uptake in oogenesis, sperm movement, ovulation, spermathecal valve constriction; loss induces endomitosis [6, 7, 10] |
| *spe-41* | *spe-41(sy693) III; him-5(e1490) V* | PS4330 | fertilization | Ca+ TRPC channel | sperm membrane | required for fertilization upon gamete contact [21, 22] |
| *spe-42* | *spe-42(tn1231) V/nT1 [unc-?(n754) let-? qIs50] (IV;V)* | SL1138 | fertilization | novel 7-pass transmembrane protein | sperm membrane | required for fertilization upon gamete contact [22] |
| *spe-9* | *spe-9(hc88) I* | BA671 | fertilization | EGF repeat-containing protein | near sperm membrane | required for fertilization upon gamete contact [19, 23, 24] |
| *spv-1* | *spv-1(ok1498) II* | RB1353 | ovulation | F-BAR/RhoGAP protein | membranes of neurons, spermatheca, hypodermis | required for normal spermathecal contractions [25, 26] |
| *vab-1* | *vab-1(dx31) II* | CZ337 | ovulation | ephrin receptor | neurons, oocytes, sheath cells | required for normal sheath cell contractions; receptor for MSP [3] |
| *vab-1; fog-2* | *vab-1(dx31)/mIn1 [dpy-10(e128) mIs14] II; fog-2(q71) V* | DG1612 | ovulation | ephrin receptor | neurons, oocytes, sheath cells | required for normal sheath cell contractions; receptor for MSP [3, 4, 27] |

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