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CGC #5137
Fay DS; Keenan S; Han M
fzr-1 and lin-35/Rb function redundantly to control cell proliferation in C. elegans as revealed by a nonbiased synthetic screen.
Genes & Development 16: 503-517 2002
ARTICLE

CGC #5138
Rugarli EI; Di Schiavi E; Hilliard MA; Arbucci S; Ghezzi C; Faciolli A; Coppola G; Ballabio A; Bazzicalupo P
The Kallmann syndrome gene homolog in C. elegans is involved in epidermal morphogenesis and neurite branching.
Development 129: 1283-1294 2002
ARTICLE

CGC #5139
Webb CT; Shabalina SA; Ogurtsov AY; Kondrashov AS
Analysis of similarity within 142 pairs of orthologous intergenic regions of Caenorhabditis elegans and Caenorhabditis briggsae.
Nucleic Acids Research 30: 1233-1239 2002
ARTICLE

CGC #5140
Otsuka AJ; Boontrakulpoontawee P; Rebeiz N; Domanus M; Otsuka D; Velamparampil N; Chan S; Wyngaerde MV; Campagna S; Cox A
Novel UNC-44 AO13 ankyrin is required for axonal guidance in C. elegans, contains six highly repetitive STEP blocks separated by seven potential transmembrane domains, and is localized to neuronal pro
Journal of Neurobiology 50: 333-349 2002
ARTICLE

CGC #5141
Masler EP
Aminopeptidases in Caenorhabditis elegans and Panagrellus redivivus: detection using peptide and non-peptide substrates.
Journal of Helminthology 76: 45-52 2002
ARTICLE

CGC #5142
Pettitt J; Crombie C; Schumperli D; Muller B
The Caenorhabditis elegans histone hairpin-binding protein is required for core histone gene expression and is essential for embryonic and postembryonic cell division.
ARTICLE
CGC #5143
Bailey S; Sedelnikova SE; Blackburn GM; Abdelghany HM; McLennan AG; Rafferty JB
Crystallization of a complex of Caenorhabditis elegans diadenosine tetraphosphate hydrolase and non-hydrolysable substrate analogue, AppCH(2)ppA. 
Acta Crystallographica Section D-Biological Crystallography 58: 526-528 2002
ARTICLE

CGC #5144
Yashin AI; Cypser JW; Johnson TE; Michalski AI; Boyko SI; Novoseltsev VN 
Heat shock changes the heterogeneity distribution in populations of Caenorhabditis elegans: Does it tell us anything about the biological mechanism of stress response? 
Journals of Gerontology Series A-Biological Sciences & Medical Sciences 57: B83-B92 2002
ARTICLE

CGC #5145
Cypser JW; Johnson TE 
Multiple stressors in Caenorhabditis elegans induce stress hormesis and extended longevity. 
Journals of Gerontology Series A-Biological Sciences & Medical Sciences 57: B109-B114 2002
ARTICLE

CGC #5146
Gu ZL; Cavalcanti A; Chen FC; Bouman P; Li WH 
Extent of gene duplication in the genomes of Drosophila, nematode, and yeast. 
Molecular Biology & Evolution 19: 256-262 2002
ARTICLE

CGC #5147
Nass R; Hall DH; Miller DM; Blakely RD
Neurotoxin-induced degeneration of dopamine neurons in Caenorhabditis elegans. 
Proceedings of the National Academy of Sciences USA 99: 3264-3269 2002
ARTICLE

CGC #5148
Kuhara A; Inada H; Katsura I; Mori I
Negative regulation and gain control of sensory neurons by the C. elegans calcineurin TAX-6. 
Neuron 33: 751-763 2002
ARTICLE

CGC #5150
Jansen G; Weinkove D; Plasterk RHA
The G protein gamma subunit gpc-1 of the nematode C. elegans is involved in taste adaptation. 
EMBO Journal 21: 986-994 2002
ARTICLE
CGC #5151
Halevi S; McKay J; Palfreyman M; Yassin L; Eshel M; Jorgensen E; Treinin M
The C. elegans ric-3 gene is required for maturation of nicotinic acetylcholine receptors.
EMBO Journal 21: 1012-1020 2002
ARTICLE

CGC #5152
Morita K; Flemming AJ; Sugihara Y; Mochii M; Suzuki Y; Yoshida S; Wood WB; Kohara Y; Leroi AM; Ueno N
A Caenorhabditis elegans TGF-B, DBL-1, controls the expression of LON-1, a PR-related protein, that regulates polyploidization and body length.
EMBO Journal 21: 1063-1073 2002
ARTICLE

CGC #5153
Esmaeili B; Ross JM; Neades C; Miller DM; Ahringer J
The C. elegans even-skipped homologue, vab-7, specifies DB motoneurone identity and axon trajectory.
Development 129: 853-862 2002
ARTICLE

CGC #5154
Dlakic M
A new family of putative insulin receptor-like proteins in C. elegans.
Current Biology 12: R155-R157 2002
REVIEW

CGC #5155
Ohmachi M; Rocheleau CE; Church D; Lambie E; Schedl T; Sundaram MV
C. elegans ksr-1 and ksr-2 have both unique and redundant functions and are required for MPK-1 ERK phosphorylation.
Current Biology 12: 427-433 2002
ARTICLE

CGC #5156
Ewbank JJ
Tackling both sides of the host-pathogen equation with Caenorhabditis elegans.
Microbes and Infection 4: 247-256 2002
REVIEW

CGC #5157
Wang Q; Wadsworth WG
The C domain of netrin UNC-6 silences calcium/calmodulin-dependent protein kinase- and diacylglycerol-dependent axon branching in Caenorhabditis elegans.
Journal of Neuroscience 22: 2274-2282 2002
ARTICLE

CGC #5158
Gruenbaum Y; Lee KK; Liu J; Cohen M; Wilson KL
The expression, lamin-dependent localization and RNAi depletion phenotype for emerin in C. elegans.
ARTICLE

CGC #5159
Seggerson K; Tang L; Moss EG
Two genetic circuits repress the Caenorhabditis elegans heterochronic gene lin-28 after translation initiation.

ARTICLE

CGC #5160
Huang NN; Mootz DE; Walhout AJM; Vidal M; Hunter CP
MEX-3 interacting proteins link cell polarity to asymmetric gene expression in Caenorhabditis elegans.
Development 129: 747-759 2002

ARTICLE

CGC #5161
Fedorov A; Saxonov S; Gilbert W
Regularities of context-dependent codon bias in eukaryotic genes.
Nucleic Acids Research 30: 1192-1197 2002

ARTICLE

CGC #5162
Partridge L; Gems D
Mechanisms of ageing: public or private?
Nature Reviews Genetics 3: 165-175 2002

REVIEW

CGC #5163
Tan MW; Ausubel FM
Alternative models in microbial pathogens.
Methods in Microbiology 31: 461-475 2002

ARTICLE

CGC #5164
Burglin TR; Cassata G
Loss and gain of domains during evolution of cut superclass homeobox genes.

ARTICLE

CGC #5165
Saito RM; van den Heuvel S
Malignant worms: What cancer research can learn from C. elegans.
Cancer Investigation 20: 264-275 2002

REVIEW

CGC #5166
Wu Y; Egerton G; Underwood AP; Sakuda S; Bianco AE
Expression and secretion of a larval-specific chitinase (family 18 glycosyl hydrolase) by the infective stages of the parasitic nematode, Onchocerca volvulus.
Journal of Biological Chemistry 276: 42557-42564 2002

ARTICLE
CGC #5167
Kuchenthal CA; Chen W; Okkema PG
Multiple enhancers contribute to expression of the NK-2 homeobox gene ceh-22
in C. elegans pharyngeal muscle.
Genesis 31: 156-166 2001
ARTICLE

CGC #5168
Ono S; Ono K
Tropomyosin inhibits ADF/cofilin-dependent actin filament dynamics.
Journal of Cell Biology 156: 1065-1076 2002
ARTICLE

CGC #5169
Zambrano N; Bimonte M; Arbucci S; Gianni D; Russo T; Bazzicalupo P
feh-1 and apl-1, the Caenorhabditis elegans orthologues of mammalian Fe65 and
beta-amyloid precursor protein genes, are involved in the same pathway that
controls nematode pharyngeal pumping.
Journal of Cell Science 115: 1411-1422 2002
ARTICLE

CGC #5170
Wolkow CA
Life span: getting the signal from the nervous system.
Trends in Neurosciences 25: 212-216 2002
REVIEW

CGC #5171
Winston WM; Molodowitch C; Hunter CP
Systemic RNAi in C. elegans requires the putative transmembrane protein SID-1.
Science 295: 2456-2459 2002
ARTICLE

CGC #5172
Lee KK; Starr D; Cohen M; Liu J; Han M; Wilson KL; Gruenbaum Y
Lamin-dependent localization of UNC-84, a protein required for nuclear
migration in Caenorhabditis elegans.
Molecular Biology of the Cell 13: 892-901 2002
ARTICLE

CGC #5173
Hagstrom KA; Holmes VF; Cozzarelli NR; Meyer BJ
C. elegans condensin promotes mitotic chromosome architecture, centromere
organization, and sister chromatid segregation during mitosis and meiosis.
Genes & Development 16: 729-742 2002
ARTICLE

CGC #5174
Knight CG; Patel MN; Azevedo RBR; Leroi AM
Evolution & Development 4: 16-27 2002
ARTICLE
Dystrobrevin requires a dystrophin-binding domain to function in Caenorhabditis elegans. 
European Journal of Biochemistry 269: 16007-1612 2002
ARTICLE

A heterochromatin protein 1 homologue in Caenorhabditis elegans acts in germline and vulval development. 
EMBO Reports 3: 235-241 2002
ARTICLE

A novel thioredoxin-like protein encoded by the C. elegans dpy-11 gene is required for body and sensory organ morphogenesis. 
Development 129: 1185-1194 2002
ARTICLE

The GTPase Ran regulates chromosome positioning and nuclear envelope assembly in vivo. 
Current Biology 12: 503-507 2002
ARTICLE

The worm in us - Caenorhabditis elegans as a model of human disease. 
REVIEW

Ionic basis of the resting membrane potential and action potential in the pharyngeal muscle of Caenorhabditis elegans. 
Journal of Neurophysiology 87: 954-961 2002
ARTICLE

Evidence for dynamic alteration in histone gene clusters of Caenorhabditis elegans: a topoisomerase II connection. 
Genetical Research 79: 11-22 2002
ARTICLE

Cytokinesis in the C. elegans embryo: Regulating contractile forces and a late role for the central spindle. 
Cell Structure & Function 26: 603-607 2001
REVIEW

CGC #5184
Uchida Y; Ogata M; Mori Y; Oh-hora M; Hatano N; Hamaoka T
Localization of PTP-FERM in Nerve Processes through its FERM domain.
Biochemical and Biophysical Research Communications 292: 13-19 2002
ARTICLE

CGC #5185
Warren CE; Krizus A; Partridge EA; Dennis JW
Caenorhabditis elegans gly-1, a core 2/I N-acetylglucosaminyltransferase homologue, is a glucosyltransferase.
Glycobiology 12: 8G-9G 2002
ADDEND

CGC #5186
Stewart AD; Phillips PC
Selection and maintenance of androdioecy in Caenorhabditis elegans.
Genetics 160: 975-982 2002
ARTICLE

CGC #5187
Chasnov JR; Chow KL
Why are there males in the hermaphroditic species Caenorhabditis elegans?
Genetics 160: 983-994 2002
ARTICLE

CGC #5188
Zhao X; Yang Y; Fitch DA; Herman MA
TLP-1 is an asymmetric cell fate determinant that responds to Wnt signals and controls male tail tip morphogenesis in C. elegans.
Development 129: 1497-1508 2002
ARTICLE

CGC #5189
Kuno K; Baba C; Asaka A; Matsushima C; Matsushima K; Hosono R
The Caenorhabditis elegans ADAMTS family gene adt-1 is necessary for morphogenesis of the male copulatory organs.
Journal of Biological Chemistry 277: 12228-12236 2002
ARTICLE

CGC #5190
Hersh BM; Hartwig E; Horvitz HR
The Caenorhabditis elegans mucolipin-like gene cup-5 is essential for viability and regulates lysosomes in multiple cell types.
Proceedings of the National Academy of Sciences USA 99: 4355-4360 2002
ARTICLE

CGC #5191
Hobert O
PCR fusion-based approach to create reporter gene constructs for expression analysis in transgenic C. elegans.
Biotechniques 32: 728-730 2002
ARTICLE

CGC #5192
Pasquinelli AE
MicroRNAs: deviants no longer.
Trends in Genetics 18: 171-173 2002

REVIEW

CGC #5193
Dudley NR; Labbe JC; Goldstein B
Using RNA interference to identify genes required for RNA interference.
Proceedings of the National Academy of Sciences USA 99: 4191-4196 2002

ARTICLE

CGC #5194
Tsuboi D; Qadota H; Kasuya K; Amano M; Kaibuchi K
Isolation of the interacting molecules with GEX-3 by a novel functional
screening.
Biochemical and Biophysical Research Communications 292: 697-701 2002

ARTICLE

CGC #5195
Kuwabara PE; Labouesse M
The sterol-sensing domain: multiple families, a unique role?
Trends in Genetics 18: 193-201 2002

REVIEW

CGC #5196
Su HP; Nakada-Tsukui K; Tosello-Trampont AC; Li Y; Bu G; Henson PM; Ravichandran KS
Interaction of CED-6/GULP, an adapter protein involved in engulfment of
apoptotic cells with CED-1 and CD91/low density kipoprotein receptor-related
protein (LRP).
Journal of Biological Chemistry 277: 11772-11779 2002

ARTICLE

CGC #5197
Beall MJ; Pearce EJ
Transforming growth factor-beta and insulin-like signalling pathways in
parasitic helminths.
International Journal for Parasitology 32: 399-404 2002

REVIEW

CGC #5198
Detwiler MR; Reuben M; Li X; Rogers E; Lin R
Two zinc finger proteins, OMA-1 and OMA-2, are redundantly required for oocyte
maturation in C. elegans.

ARTICLE

CGC #5199
Gonczy P; Bellanger JM; Kirkham M; Pozniakowski A; Baumer K; Phillips JB; Hyman AA
zyg-8, a gene required for spindle positioning in C. elegans, encodes a
Doublecortin-related kinase that promotes microtubule assembly.
The C. elegans PH domain protein CED-12 regulates cytoskeletal reorganization via a Rho/Rac GTPase signaling pathway.

Molecular mechanisms of developmental timing in C. elegans and Drosophila.

Isolation and characterization of pmk-(1-3): Three p38 homologs in Caenorhabditis elegans.

Mitochondrial electron transport is a key determinant of life span in Caenorhabditis elegans.

Caloric restriction and lifespan: a role for protein turnover?

Assaying metabolic activity in ageing Caenorhabditis elegans.

Model organisms as a guide to mammalian aging.
CGC #5208
Mishima M; Kaitna S; Glotzer M
Central spindle assembly and cytokinesis require a kinesin-like protein/RhoGAP complex with microtubule bundling activity.
Developmental Cell 2: 41-54 2002
ARTICLE

CGC #5209
Severson AF; Bowerman B
Cytokinesis: Closing in on the central spindle.
Developmental Cell 2: 4-6 2002
REVIEW

CGC #5210
Hodgkin J
What does a worm want with 20,000 genes?
REVIEW

CGC #5211
Gershon H; Gershon D
Caenorhabditis elegans - a paradigm for aging research: advantages and limitations.
REVIEW

CGC #5212
Bailey S; Sedelnikova SE; Blackburn GM; Abdelghany HM; Baker PJ; McLennan AG; Rafferty JB
The crystal structure of diadenosine tetraphosphate hydrolase from Caenorhabditis elegans in free and binary complex forms.
Structure 10: 589-600 2002
ARTICLE

CGC #5213
Hodgkin J
The worm - Caenorhabditis elegans.
Scientist 16: 20-21 2002
REVIEW

CGC #5214
Dufourcq P; Victor M; Gay F; Calvo D; Hodgkin J; Shi Y
Functional requirement for histone deacetylase 1 in Caenorhabditis elegans gonadogenesis.
Molecular and Cellular Biology 22: 3024-3034 2002
ARTICLE

CGC #5215
Chu DS; Dawes HE; Lieb JD; Chan RC; Kuo AF; Meyer BJ
A molecular link between gene-specific and chromosome-wide transcriptional repression.
Genes & Development 16: 796-805 2002
ARTICLE
Membrane transport in Caenorhabditis elegans: an essential role for VPS34 at the nuclear membrane. 
EMBO Journal 21: 1673-1683 2002
ARTICLE

Rothman JH
Aging: from radiant youth to an abrupt end.
Current Biology 12: R239-R241 2002
REVIEW

A conserved interaction between B1 integrin/PAT-3 and Nck-interacting kinase/MIG-15 that mediates commissural axon navigation in C. elegans.
Current Biology 12: 622-631 2002
ARTICLE

Stress response in Caenorhabditis elegans caused by optical tweezers: wavelengths, power, and time dependence.
Biophysical Journal 82: 2224-2231 2002
ARTICLE

Codon usage by transposable elements and their host genes in five species.
Journal of Molecular Evolution 54: 625-637 2002
ARTICLE

Getting the right dose of repression.
Genes & Development 16: 769-772 2002
REVIEW

The gift of Gab.
FEBS Letters 515: 1-7 2002
REVIEW

Novel alpha 7-like nicotinic acetylcholine receptor subunits in the nematode Caenorhabditis elegans.
Protein Science 11: 1162-1171 2002
ARTICLE
CGC #5224
Wallenfang MR;Seydoux G
cdk-7 is required for mRNA transcription and cell cycle progression in Caenorhabditis elegans embryos.
Proceedings of the National Academy of Sciences USA 99: 5527-5532 2002
ARTICLE

CGC #5225
Sumiyoshi E;Sugimoto A;Yamamoto M
Protein phosphatase 4 is required for centrosome maturation in mitosis and sperm meiosis in C. elegans.
ARTICLE

CGC #5226
Shaham S;Bargmann CI
Control of neuronal subtype identity by the C. elegans ARID protein CFI-1.
Genes & Development 16: 972-983 2002
ARTICLE

CGC #5227
Yokoyama K;Fukumoto K;Murakami T;Harada S;Hosono R;Wadhwa R;Mitsui Y;Ohkuma S
Extended longevity of Caenorhabditis elegans by knocking in extra copies of hsp70F, a homolog of mot-2 (mortalin)/mthsp70/Grp75.
FEBS Letters 516: 53-57 2002
ARTICLE

CGC #5228
Gorbunova V;Seluanov A
CLK-1 protein has DNA binding activity specific to O-L region of mitochondrial DNA.
ARTICLE

CGC #5229
Cameron S;Clark SG;McDermott JB;Aamodt E;Horvitz HR
PAG-3, a Zn-finger transcription factor, determines neuroblast fate in C. elegans.
Development 129: 1763-1774 2002
ARTICLE

CGC #5230
Agostoni E;Gobessi S;Petrini E;Monte M;Schneider C
Cloning and characterization of the C. elegans gas1 homolog: phas-1.
Biochemica et Biophysica Acta - Gene Structure & Expression 1574: 1-9 2002
ARTICLE

CGC #5231
Tosi S;Annovazzi L;Tosi I;Iadarola P;Caretta G
Collagenase production in an Antarctic strain of Arthrobotrys tortor Jarowaja.
ARTICLE
A novel cyclophilin from parasitic and free-living nematodes with a unique substrate- and drug-binding domain.
Journal of Biological Chemistry 277: 14925-14932 2002
ARTICLE

Genetic dissection of polyunsaturated fatty acid synthesis in Caenorhabditis elegans.
Proceedings of the National Academy of Sciences USA 99: 5854-5859 2002
ARTICLE

Protons at the gate: DEG/ENaC ion channels help us feel and remember.
Neuron 34: 337-340 2002
REVIEW

Regulated disruption of inositol 1,4,5-trisphosphate signaling in Caenorhabditis elegans reveals new functions in feeding and embryogenesis.
ARTICLE

Heparan sulfate proteoglycan-dependent induction of axon branching and axon misrouting by the Kallmann syndrome gene kal-1.
Proceedings of the National Academy of Sciences USA 99: 6346-6351 2002
ARTICLE

The art and design of genetic screens: Caenorhabditis elegans.
REVIEW

Caenorhabditis elegans - Plague bacteria biofilm blocks food intake.
Nature 417: 243-244 2002
ARTICLE

Phagocytosis of apoptotic cells in mammals, Caenorhabditis elegans and Drosophila melanogaster - molecular mechanisms and physiological consequences.
Frontiers in Bioscience 7: D1298-D1313 2002
REVIEW
CGC #5241
Reuben M; Lin R
Germline X chromosomes exhibit contrasting patterns of histone H3 methylation in Caenorhabditis elegans.
Developmental Biology 245: 71-82 2002
ARTICLE

CGC #5242
Hilliard M; Bargmann CI; Bazzicalupo P
C. elegans responds to chemical repellents by integrating sensory inputs from the head and the tail.
Current Biology 12: 730-734 2002
ARTICLE

CGC #5243
Ogurusu T; Shingai R
Enhancement of in situ hybridization signals in Caenorhabditis elegans by tyramide signal amplification.
Analytical Biochemistry 304: 133-135 2002
ARTICLE

CGC #5244
Sloboda RD
A healthy understanding of intraflagellar transport.
Cell Motility and the Cytoskeleton 52: 1-8 2002
REVIEW

CGC #5245
Szewczyk NJ; Peterson BK; Jacobson LA
Activation of Ras and the mitogen-activated protein kinase pathway promotes protein degradation in muscle cells of Caenorhabditis elegans.
Molecular and Cellular Biology 22: 4181-4188 2002
ARTICLE

CGC #5246
LaMunyon CW; Ward S
Evolution of larger sperm in response to experimentally increased sperm competition in Caenorhabditis elegans.
ARTICLE

CGC #5247
Roy F; Therrien M
MAP kinase module: the Ksr connection.
Current Biology 12: R325-R327 2002
REVIEW

CGC #5248
Puthalakath H; Strasser A
Keeping killers on a tight leash: transcriptional and posttranscriptional control of the pro-apoptotic activity of BH3-only proteins.
Cell Death & Differentiation 9: 505-512 2002
REVIEW
CGC #5249
Ge YL;Chen ZH;Kang ZB;Cluette-Brown J;Laposata M;Kang JX
Effects of adenoviral gene transfer of C. elegans n-3 fatty acid desaturase on
the lipid profile and growth of human breast cancer cells.
Anticancer Research 22: 537-542 2002
ARTICLE

CGC #5250
Rocheleau CE;Howard RM;Goldman AP;Volk ML;Girard LJ;Sundaram MV
A lin-45 raf enhancer screen identifies eor-1, eor-2 and unusual alleles of
Ras pathway genes in Caenorhabditis elegans.
Genetics 161: 121-131 2002
ARTICLE

CGC #5251
Huang X;Cheng HJ;Tessier-Lavigne M;Jin Y
MAX-1, a novel PH/MyTH4/ERM domain cytoplasmic protein implicated in
netrin-mediated axon repulsion.
Neuron 34: 563-576 2002
ARTICLE

CGC #5252
Castillo-Davis CI;Hartl DL
Genome evolution and developmental constraint in Caenorhabditis elegans.
Molecular Biology & Evolution 19: 728-735 2002
ARTICLE

CGC #5253
Riihimaa P;Nissi R;Page AP;Winter AD;Keskiaho K;Kivirikko KI;Myllyharju J
Egg shell collagen formation in Caenorhabditis elegans involves a novel prolyl
4-hydroxylase expressed in spermatheca and embryos and possessing many unique
properties.
Journal of Biological Chemistry 277: 18238-18243 2002
ARTICLE

CGC #5254
Scholey JM
Rafting along the axon on Unc104 motors.
Developmental Cell 2: 515-516 2002
REVIEW

CGC #5255
Bruinsma JJ;Jirakulaporn T;Muslin AJ;Kornfeld K
Zinc ions and cation diffusion facilitator proteins regulate Ras-mediated
signaling.
Developmental Cell 2: 567-578 2002
ARTICLE

CGC #5256
Antoshechkin I;Han M
The C. elegans evl-20 gene is a homolog of the small GTPase ARL2 and regulates
cytoskeleton dynamics during cytokinesis and morphogenesis.
Developmental Cell 2: 579-591 2002
ARTICLE
CGC #5257
Fujii T; Nakao F; Shibata Y; Shioi G; Kodama E; Fujisawa H; Takagi S
Caenorhabditis elegans plexinA, PLX-1, interacts with transmembrane
semaphorins and regulates epidermal morphogenesis.
Development 129: 2053-2063 2002
ARTICLE
CGC #5258
Ginzburg VE; Roy PJ; Culotti JG
Semaphorin 1a and semaphorin 1b are required for correct epidermal cell
positioning and adhesion during morphogenesis in C. elegans.
Development 129: 2065-2078 2002
ARTICLE
CGC #5259
Harrington RJ; Gutch MJ; Hengartner MO; Tonks NK; Chisholm AD
The C. elegans LAR-like receptor tyrosine phosphatase PTP-3 and the VAB-1 Eph
receptor tyrosine kinase have partly redundant functions in morphogenesis.
Development 129: 2141-2153 2002
ARTICLE
CGC #5260
Kostic I; Roy R
Organ-specific cell division abnormalities caused by mutation in a general
cell cycle regulator in C. elegans.
Development 129: 2155-2165 2002
ARTICLE
CGC #5261
Mackinnon AC; Qadota H; Norman KR; Moerman DG; Williams DB
C. elegans PAT-4/ILK functions as an adaptor protein within integrin adhesion
complexes.
Current Biology 12: 787-797 2002
ARTICLE
CGC #5262
Glotzer M; Dechant R
Cytokinesis: regulated by destruction.
Current Biology 12: R344-R346 2002
REVIEW
CGC #5263
Zervas CG; Brown NH
Integrin adhesion: when is a kinase a kinase?
Current Biology 12: R350-R351 2002
REVIEW
CGC #5264
Kaitna S; Pasierbek P; Jantsch M; Loidl J; Glotzer M
The aurora B kinase AIR-2 regulates kinetochores during mitosis and is
required for separation of homologous chromosomes during meiosis.
A conserved RNA-binding protein controls germline stem cells in Caenorhabditis elegans.
Nature 417: 660-663 2002

Characterization of Burkholderia pseudomallei infection and identification of novel virulence factors using a Caenorhabditis elegans host system.
Molecular Microbiology 44: 1185-1197 2002

Dephosphorylation of cell cycle-regulated proteins correlates with anoxia-induced suspended animation in Caenorhabditis elegans.

Caenorhabditis elegans inositol 5-phosphatase homolog negatively regulates inositol 1,4,5-triphosphate signaling in ovulation.
Molecular Biology of the Cell 13: 1641-1651 2002

Targeting of rough endoplasmic reticulum membrane proteins and ribosomes in invertebrate neurons.

Oxidative stress and life span determination in the nematode Caenorhabditis elegans.

Longevity genes in the nematode Caenorhabditis elegans also mediate increased resistance to stress and prevent disease.
Journal of Inherited Metabolic Disease 25: 197-206 2002
Increased or decreased levels of Caenorhabditis elegans lon-3, a gene encoding a collagen, cause reciprocal changes in body length.
Genetics 161: 83-97 2002

Levels of DNA polymorphism vary with mating system in the nematode genus Caenorhabditis.
Genetics 161: 99-107 2002

A Caenorhabditis elegans pheromone antagonizes volatile anesthetic action through a Go-coupled pathway.
Genetics 161: 109-119 2002

Functional characterization of the adenylyl cyclase gene sgs-1 by analysis of a mutational spectrum in Caenorhabditis elegans.
Genetics 161: 133-142 2002

Spermiogenesis initiation in Caenorhabditis elegans involves a casein kinase 1 encoded by the spe-6 gene.
Genetics 161: 143-155 2002

Activatin of Wnt signaling bypasses the requirement for RTK/Ras signaling during C. elegans vulval induction.
Genes & Development 16: 1281-1290 2002

The axin-like protein PRY-1 is a negative regulator of a canonical Wnt pathway in C. elegans.
Genes & Development 16: 1291-1302 2002

Understanding anesthesia: making genetic sense of the absence of senses.
Human Molecular Genetics 11: 1241-1249 2002
REVIEW

CGC #5280
GuhaThakurta D;Palomar L;Stormo GD;Tedesco P;Johnson TE;Walker DW;Lithgow G;Kim S;Link CD
Genome Research 12: 701-712 2002
ARTICLE

CGC #5281
Mounsey A;Bauer P;Hope IA
Evidence suggesting that a fifth of annotated Caenorhabditis elegans genes may be pseudogenes.
Genome Research 12: 770-775 2002
ARTICLE

CGC #5282
Iwahashi J;Kawasaki I;Kohara Y;Gengyo-Ando K;Mitani S;Ohshima Y;Hamada N;Hara K;Kashiwagi T;Toyoda T
Caenorhabditis elegans reticulon interacts with RME-1 during embryogenesis.
Biochemical & Biophysical Research Communications 293: 698-704 2002
ARTICLE

CGC #5283
Plasterk RHA
RNA silencing: the genome’s immune system.
Science 296: 1263-1265 2002
REVIEW

CGC #5284
Zamore PD
Ancient pathways programmed by small RNAs.
Science 296: 1265-1269 2002
REVIEW

CGC #5285
Ghenea S;Takeuchi M;Motoyama J;Sasamoto K;Kunau W-H;Kamiryo T;Bun-ya M
The cDNA sequence and expression of the AAA-family peroxin genes pex-1 and pex-6 from the nematode Caenorhabditis elegans.
Zoological Science 19: 249 2002
CORRECT

CGC #5286
Starich T;Sheehan M;Jadrich J;Shaw J
Innexins in C. elegans.
Cell Communication 8: 311-314 2001
REVIEW
CGC #5287
Choi KY; Ji YJ; Jee C; Kim DH; Ahnn J
Characterization of CeHDA-7, a class II histone deacetylase interacting with MEF-2 in Caenorhabditis elegans.
Biochemical and Biophysical Research Communications 293: 1295-1300 2002
ARTICLE

CGC #5288
Kohra S; Tominaga N; Takao Y; Nagae M; Ishibashi Y; Ueda K; Arizono K
A rapid respiratory toxicity test using Caenorhabditis elegans with an oxygen electrode system.
Journal of Health Science 48: 269-272 2002
ARTICLE

CGC #5289
MacColl G; Bouloux P; Quinton R
Kallmann syndrome: adhesion, afferents, and anosmia.
Neuron 34: 675-678 2002
REVIEW

CGC #5290
Gieseler K; Grisoni K; Mariol MC; Segalat L
Overexpression of dystrobrevin delays locomotion defects and muscle degeneration in a dystrophin-deficient Caenorhabditis elegans.
Neuromuscular Disorders 12: 371-377 2002
ARTICLE

CGC #5291
Conradt B
With a little help from your friends: cells don’t die alone.
Nature Cell Biology 4: E139-E143 2002
REVIEW

CGC #5292
Fujita M; Takasaki T; Nakajima N; Kawano T; Shimura Y; Sakamoto H
MRG-1, a mortality factor-related chromodomain protein, is required maternally for primordial germ cells to initiate mitotic proliferation in C. elegans.
ARTICLE

CGC #5293
Tabuchi K; Sudhof TC
Structure and evolution of neurexin genes: insight into the mechanisms of alternative splicing.
Genomics 79: 849-859 2002
ARTICLE

CGC #5294
Ashcroft N; Golden A
CDC-25.1 regulates germline proliferation in Caenorhabditis elegans.
Genesis 33: 1-7 2002
ARTICLE
CGC #5295
Maduro MF;Rothman JH
Developmental Biology 246: 68-85 2002
REVIEW

CGC #5296
Sengupta P
Chemosensation: tasting with the tail.
Current Biology 12: R386-R388 2002
REVIEW

CGC #5297
Labbe JC;Goldstein B
Embryonic development: a new SPN on cell fate specification.
Current Biology 12: R396-R398 2002
REVIEW

CGC #5298
Boxem M;van den Heuvel S
C. elegans class B synthetic multivulva genes act in G1 regulation.
Current Biology 12: 906-911 2002
ARTICLE

CGC #5299
Walker DS;Ly S;Lockwood KC;Baylis HA
A direct interaction between IP3 receptors and myosin II regulates IP3 signaling in C. elegans.
Current Biology 12: 951-956 2002
ARTICLE

CGC #5300
Ishihara T;Iino Y;Mohri A;Mori I;Gengyo-Ando K;Mitani S;Katsura I
HEN-1, a secretory protein with an LDL receptor motif, regulates sensory integration and learning in Caenorhabditis elegans.
ARTICLE

CGC #5301
Fong Y;Bender L;Wang W;Strome S
Regulation of the different chromatin states of autosomes and X chromosomes in the germ line of C. elegans.
Science 296: 2235-2238 2002
ARTICLE

CGC #5302
Morse DP;Aruscavage PJ;Bass BL
RNA hairpins in noncoding regions of human brain and Caenorhabditis elegans mRNA are edited by adenosine deaminases that act on RNA.
Proceedings of the National Academy of Sciences USA 99: 7906-7911 2002
ARTICLE
CGC #5303
Blumenthal T;Evans D;Link CL;Guffanti A;Lawson D;Thierry-Mieg J;Thierry-Mieg D;Chiu WL;Duke K;Kiraly M;Kim SK
A global analysis of Caenorhabditis elegans operons.
ARTICLE

CGC #5304
Goodman MB;Ernstrom GG;Chelur DS;O’Hagan R;Yao CA;Chalfie M
MEC-2 regulates C. elegans DEG/ENaC channels needed for mechanosensation.
Nature 417: 880 2002
ADDEND

CGC #5305
Baker AME;Roberts TM;Stewart M
2.6A resolution crystal structure of helices of the motile major sperm protein (MSP) of Caenorhabditis elegans.
Journal of Molecular Biology 319: 491-499 2002
ARTICLE

CGC #5306
Beeber C;Kieras FJ
Characterization of the chondroitin sulfates in wild type Caenorhabditis elegans.
Biochemical and Biophysical Research Communications 293: 1374-1376 2002
ARTICLE

CGC #5307
Heid PJ;Voos E;Soll DR
3D-DIASemb: a computer-assisted system for reconstructing and motion analyzing in 4D every cell and nucleus in a developing embryo.
Developmental Biology 245: 329-347 2002
ARTICLE

CGC #5308
Cheung I;Schertzer M;Rose A;Lansdorp PM
Disruption of dog-1 in Caenorhabditis elegans triggers deletions upstream of guanine-rich DNA.
Nature Genetics 31: 405-409 2002
ARTICLE

CGC #5309
Jinks-Robertson S
The genome’s best friend.
Nature Genetics 31: 331-332 2002
REVIEW

CGC #5310
Scott BA;Avidan MS;Crowder CM
Regulation of hypoxic death in C. elegans by the insulin/IGF receptor homolog DAF-2.
Science 296: 2388-2391 2002
ARTICLE
CGC #5311
Rogers E; Bishop JD; Waddle JA; Schumacher JM; Lin R
The aurora kinase AIR-2 functions in the release of chromosome cohesion in Caenorhabditis elegans meiosis.
ARTICLE

CGC #5312
Lithgow GJ; Walker GA
Stress resistance as a determinate of C. elegans lifespan.
REVIEW

CGC #5313
Vatamaniuk OK; Bucher EA; Ward JT; Rea PA
Worms take the "phyto" out of "phytochelatins".
Trends in Biotechnology 20: 61-64 2002
REVIEW

CGC #5314
Edgley M; D’Souza A; Moulder G; McKay S; Shen B; Gilchrist E; Moerman D; Barstead R
Improved detection of small deletions in complex polls of DNA.
Nucleic Acids Research 30: e52-e54 2002
ARTICLE

CGC #5315
Boontrakulpoontawee P; Otsuka AJ
Mutational analysis of the Caenorhabditis elegans ankyrin gene unc-44 demonstrates that the large spliceoform is critical for neural development.
Molecular Genetics & Genomics 267: 291-302 2002
ARTICLE

CGC #5316
Tzur YB; Hersh BM; Horvitz HR; Gruenbaum Y
Fate of the nuclear lamina during Caenorhabditis elegans apoptosis.
Journal of Structural Biology 137: 146-153 2002
ARTICLE

CGC #5317
Kaltschmidt JA; Brand AH
Asymmetric cell division: microtubule dynamics and spindle asymmetry.
REVIEW

CGC #5318
Piekny AJ; Mains PE
Rho-binding kinase (LET-502) and myosin phosphate (MEL-11) regulate cytokinesis in the early Caenorhabditis elegans embryo.
Journal of Cell Science 115: 2271-2282 2002
ARTICLE
A ubiquitin C-terminal hydrolase is required to maintain osmotic balance and execute actin-dependent processes in the early C. elegans embryo.
Journal of Cell Science 115: 2293-3002 2002
ARTICLE

The kinetically dominant assembly pathway for centrosomal asters in Caenorhabditis elegans is gamma-tubulin dependent.
ARTICLE

Alpha spectrin is essential for morphogenesis and body wall muscle formation in Caenorhabditis elegans.
ARTICLE

Characterization of HCP-6, a C. elegans protein required to prevent chromosome twisting and merotelic attachment.
Genes & Development 16: 1498-1508 2002
ARTICLE

A liquid-based method for the assessment of bacterial pathogenicity using the nematode Caenorhabditis elegans.
FEMS Microbiology Letters 210: 181-185 2002
ARTICLE

Characterization of a dominant negative C. elegans Twist mutant protein with implications for human Saethre-Chotzen syndrome.
Development 129: 2761-2772 2002
ARTICLE

lon-1 regulates Caenorhabditis elegans body size downstream of the dbl-1 TGFB signaling pathway.
Developmental Biology 246: 418-428 2002
ARTICLE
Boutla A; Kalantidis K; Tavernarakis N; Tsagris M; Tabler M
Induction of RNA interference in Caenorhabditis elegans by RNAs derived from plants exhibiting post-transcriptional gene silencing.
Nucleic Acids Research 20: 1688-1694 2002
ARTICLE

Schwarz EM; Stein LD; Sternberg PW
Caenorhabditis elegans databases.
Current Genomics 3: 111-119 2002
REVIEW

Reinke V
Defining development through gene expression profiling.
Current Genomics 3: 95-109 2002
REVIEW

Rual JF; Lamesch P; van den Haute J; Vidal M
The Caenorhabditis elegans interactome mapping project.
Current Genomics 3: 83-93 2002
REVIEW

Piano F; Gunsalus K
RNAi-based functional genomics in Caenorhabditis elegans.
Current Genomics 3: 69-81 2002
REVIEW

Jansen G
Gene inactivation in Caenorhabditis elegans.
Current Genomics 3: 59-67 2002
ARTICLE

Neri C
Preface: Caenorhabditis elegans postgenomic era and the biological practice.
Current Genomics 3: 55-57 2002
REVIEW

Ishii N; Kita K; Hartman PS
Mitochondrial contributions to aging in the nematode Caenorhabditis elegans.
Current Genomics 2: 349-355 2001
REVIEW

Segalat L
Genetic analysis of behavior in the nematode Caenorhabditis elegans.
CRC Methods in Cellular and Molecular Neuropathology Series. Neurobehavioral


The MEP-1 zinc-finger protein acts with MOG DEAH box proteins to control gene expression via the fem-3 3'-untranslated region in Caenorhabditis elegans. RNA 8: 725-739 2002


CGC #5342
Garigan D; Hsu AL; Fraser AG; Kamath RS; Ahringer J; Kenyon C
Genetic analysis of tissue aging in Caenorhabditis elegans: a role for
heat-shock factor and bacterial proliferation.
Genetics 161: 1101-1112 2002
ARTICLE

CGC #5343
Farrer T; Roller AB; Kent WJ; Zahler AM
Analysis of the role of Caenorhabditis elegans GC-AG introns in regulated
splicing.
Nucleic Acids Research 30: 3360-3367 2002
ARTICLE

CGC #5344
Howard RM; Sundaram MV
C. elegans EOR-1/PLZF and EOR-2 positively regulate Ras and Wnt signaling and
function redundantly with LIN-25 and the SUR-2 Mediator component.
Genes & Development 16: 1815-1827 2002
ARTICLE

CGC #5345
Kostrouchova M; Housa D; Kostrouch Z; Saudek V; Rall JE
SKIP is an indispensable factor for Caenorhabditis elegans development.
Proceedings of the National Academy of Sciences USA 99: 9254-9259 2002
ARTICLE

CGC #5346
Lee MH; Ahn B; Choi IS; Koo HS
The gene expression and deficiency phenotypes of Cockayne syndrome B protein
in Caenorhabditis elegans.
FEBS Letters 522: 47-51 2002
ARTICLE

CGC #5347
Gomes JE; Bowerman B
Caenorhabditis elegans par genes.
Current Biology 12: R444 2002
REVIEW

CGC #5348
Witze E; Rothman JE
Cell fusion: an EFFicient sculptor.
Current Biology 12: R467-R469 2002
REVIEW

CGC #5349
Burbea M; Dreier L; Dittman JS; Grunwald ME; Kaplan JM
Ubiquitin and AP180 regulate the abundance of GLR-1 glutamate receptors at
postsynaptic elements in C. elegans.
Neuron 35: 107-120 2002
ARTICLE
CGC #5350
Tobin DM;Madsen DM;Kahn-Kirby A;Peckol EL;Moulder G;Barstead R;Maricq AV;Bargmann CI
Combinatorial expression of TRPV channel proteins defines their sensory functions and subcellular localization in C. elegans neurons.
Neuron 35: 307-318 2002
ARTICLE

CGC #5351
Kruger O;Ladewig J;Koster K;Ragg H
Widespread occurrence of serpin genes with multiple reactive centre-containing exon cassettes in insects and nematodes.
Gene 293: 97-105 2002
ARTICLE

CGC #5352
Terranova R;Pujol N;Fasano L;Djabali M
Characterisation of set-1, a conserved PR/SET domain gene in Caenorhabditis elegans.
Gene 292: 33-41 2002
ARTICLE

CGC #5353
Stringham E;Pujol N;Vandekerckhove J;Bogaert T
unc-53 controls longitudinal migration in C. elegans.
Development 129: 3367-3379 2002
ARTICLE

CGC #5354
Sze JY;Zhang S;Li J;Ruvkun G
The C. elegans POU-domain transcription factor UNC-86 regulates the tph-1 tryptophan hydroxylase gene and neurite outgrowth in specific serotonergic neurons.
Development 129: 3901-3911 2002
ARTICLE

CGC #5355
Alper S;Kenyon C
The zinc finger protein REF-2 functions with the HOX genes to inhibit cell fusion in the ventral epidermis of C. elegans.
Development 129: 3335-3348 2002
ARTICLE

CGC #5356
Zhang Y;Ma C;Delohery T;Nasipak B;Foat BC;Bounoutas A;Bussemaker HJ;Kim SK;Chalfie M
Identification of genes expressed in C. elegans touch receptor neurons.
Nature 418: 331-335 2002
ARTICLE
CGC #5357
Gupta BP; Sternberg PW
Developmental Biology 247: 102-115 2002
ARTICLE

CGC #5358
Xu X; Sassa T; Kunoh K; Hosono R
A mutant exhibiting abnormal habituation behavior in Caenorhabditis elegans. 
Journal of Neurogenetics 16: 29-44 2002
ARTICLE

CGC #5359
Toms N; Cooper J; Patchen B; Aamodt E
High copy arrays containing a sequence upstream of mec-3 alter cell migration and axonal morphology in C. elegans. 
BMC Developmental Biology 1:2 2001
ARTICLE

CGC #5360
Samuel ADT; Murthy VN; Hengartner MO
Calcium dynamics during fertilization in C. elegans. 
BMC Developmental Biology 1:8 2001
ARTICLE

CGC #5361
Knight RD; Shimeld SM
BMC Developmental Biology 1:8 2001
ARTICLE

CGC #5362
Maglich JM; Sluder A; Guan X; Shi Y; McKee DD; Carrick K; Kamdar K; Willson TM; Moore JT
Comparison of complete nuclear receptor sets from the human, Caenorhabditis elegans and Drosophila genomes. 
Genome Biology 2(8): 29.1-29.7 2001
ARTICLE

CGC #5363
Bargmann CI
High throughput reverse genetics: RNAi screens in Caenorhabditis elegans. 
Genome Biology 2(2): - 2001
REVIEW

CGC #5364
Donohue BA; Michelotti EL; Reader JC; Reader V; Stirling M; Tice CM
Design, synthesis, and biological evaluation of a library of 1-(2-thiazolyl)-5-(trifluoromethyl)pyrazole-4-carboxamides. 
ARTICLE
CGC #5365
Ostashevsky J
A polymer model for large-scale chromatin organization in lower eukaryotes.
Molecular Biology of the Cell 13: 2157-2169 2002
ARTICLE

CGC #5366
Jedrusik MA; Vogt S; Claus P; Schulze E
A novel linker histone-like protein is associated with cytoplasmic filaments in Caenorhabditis elegans.
ARTICLE

CGC #5367
Ryu WS; Samuel ADT
Thermotaxis in Caenorhabditis elegans analyzed by measuring responses to defined thermal stimuli.
Journal of Neuroscience 22: 5727-5733 2002
ARTICLE

CGC #5368
Tabara H; Yigit E; Siomi H; Mello C
The dsRNA binding protein RDE-4 interacts with RDE-1, DCR-1, and a DExX-box helicase to direct RNAi in C. elegans.
Cell 109: 861-871 2002
ARTICLE

CGC #5369
Swan KA; Curtis DE; McKusick KB; Voinov AV; Mapa FA; Cancilla MR
High throughput gene mapping in Caenorhabditis elegans.
Genome Research 12: 1100-1105 2002
ARTICLE

CGC #5370
Kim DH; Feinbaum R; Alloing G; Emerson FE; Garsin DA; Inoue H; Tanaka-Hino M; Hisamoto N; Matsumoto K; Tan MW; Ausubel FM
A conserved p38 MAP kinase pathway in Caenorhabditis elegans innate immunity.
Science 297: 623-626 2002
ARTICLE

CGC #5371
Fonte V; Kapulkin V; Taft A; Fluet A; Friedman D; Link CD
Interaction of intracellular beta amyloid peptide with chaperone proteins.
Proceedings of the National Academy of Sciences USA 99: 9439-9444 2002
ARTICLE

CGC #5372
Knust E
Regulation of epithelial cell shape and polarity by cell-cell adhesion.
Molecular Membrane Biology 19: 113-120 2002
REVIEW
CGC #5373
Goutte C
Genetics leads the way to the accomplices of presenilins.
Developmental Cell 3: 6-7 2002
REVIEW

CGC #5374
Francis R; McGrath G; Zhang J; Ruddy DA; Sym M; Apfeld J; Nicoll M; Maxwell M; Hai B; Ellis MC; Parks AL; Xu W; Li J; Gurney M; Myers RL; Himes CS; Hiebsch R; Ruble C; Nye JS; Curtis D
aph-1 and pen-2 are required for Notch pathway signaling, gamma-secretase cleavage of BAPP, and presenilin protein accumulation.
Developmental Cell 3: 85-97 2002
ARTICLE

CGC #5375
Bei Y; Hogan J; Berkowitz LA; Soto M; Rocheleau CE; Pang KM; Collins J; Mello CC
SRC-1 and Wnt signaling act together to specify endoderm and to control cleavage orientation in early C. elegans embryos.
Developmental Cell 3: 113-125 2002
ARTICLE

CGC #5376
Romagnolo B; Jiang M; Kiraly M; Breton C; Begley R; Wang J; Lund J; Kim SK
Downstream targets of let-60 Ras in Caenorhabditis elegans.
Developmental Biology 247: 127-136 2002
ARTICLE

CGC #5377
Warren CE; Krizus A; Roy PJ; Culotti JG; Dennis JW
The Caenorhabditis elegans gene, gly-2, can rescue the N-acetylglucosaminyltransferase V mutation of Lec4 cells.
Journal of Biological Chemistry 277: 22829-22838 2002
ARTICLE

CGC #5378
Blair JE; Ikeo K; Gojobori T; Hedges SB
The evolutionary position of nematodes.
BMC Evolutionary Biology 2: 2002
ARTICLE

CGC #5379
Tatar M
Germ-line stem cells call the shots.
Trends in Ecology & Evolution 17: 297-298 2002
REVIEW

CGC #5380
Dellaire G; Makarov EM; Cowger JJM; Longman D; Sutherland HGE; Luhrmann R; Torchia J; Bickmore WA
Mammalian PRP4 kinase copurifies and interacts with components of both the U5 snRNP and the N-CoR deacetylase complexes.
Molecular and Cellular Biology 22: 5141-5156 2002
ARTICLE
CGC #5381
Couillault C;Ewbank JJ
Diverse bacteria are pathogens of Caenorhabditis elegans.
Infection and Immunity 70: 4705-4707 2002
ARTICLE
CGC #5382
Mallo GV;Kurz CL;Couillault C;Pujol N;Granjeaud S;Kohara Y;Ewbank JJ
Inducible antibacterial defense system in C. elegans.
Current Biology 12: 1209-1214 2002
ARTICLE
CGC #5383
Taylor S;Bagrodia S
Src and Wnt converge to seal cell’s fate.
Molecular Cell 10: 10-11 2002
REVIEW
CGC #5384
Hirabayashi J;Hayama K;Kaji H;Isobe T;Kasai K
Affinity capturing and gene assignment of soluble glycoproteins produced by
the nematode Caenorhabditis elegans.
ARTICLE
CGC #5385
Thompson FJ;Britton C;Wheatley I;Maitland K;Walker G;Anant S;Davidson
NO;Devaney E
Biochemical and molecular characterization of two cytidine deaminases in the
nematode Caenorhabditis elegans.
ARTICLE
CGC #5386
Wadsworth WG
Moving around in a worm: netrin UNC-6 and circumferential axon guidance in C.
elegans.
REVIEW
CGC #5387
Constans A
Small worms, small RNAs, big questions - Exploring small-RNA function and
biology in Caenorhabditis elegans.
Scientist 16: 32-34 2002
REVIEW
CGC #5388
Castillo-Davis CI;Mekhedov SL;Hartl DL;Koonin EV;Kondrashov FA
Selection for short introns in highly expressed genes.
Nature Genetics 31: 415-418 2002
ARTICLE

CGC #5389
Zhang Y; Herman B
Ageing and apoptosis.

REVIEW

CGC #5390
Bishop JD; Schumacher JM
Phosphorylation of the carboxyl terminus of inner centromere protein (INCENP) by the Aurora B kinase stimulates Aurora B kinase activity.
Journal of Biological Chemistry 277: 27577-27580 2002

ARTICLE

CGC #5391
Syntichaki P; Tavernarakis N
Death by necrosis - Uncontrollable catastrophe, or is there order behind the chaos?
EMBO Reports 3: 604-609 2002

REVIEW

CGC #5392
Irle T; Schierenberg E
Developmental potential of fused Caenorhabditis elegans oocytes: generation of giant and twin embryos.
Development Genes & Evolution 212: 257-266 2002

ARTICLE

CGC #5393
Shatilla A; Ramotar D
Embryonic extracts derived from the nematode Caenorhabditis elegans remove uracil from DNA by the sequential action of uracil-DNA glycosylase and AP (apurinic/apyrimidinic) endonuclease.
Biochemical Journal 365: 547-553 2002

ARTICLE

CGC #5394
Benard C; Hekimi S
Long-lived mutants, the rate of aging, telomeres and the germline in Caenorhabditis elegans.

REVIEW

CGC #5395
Kalb JM; Beaster-Jones L; Fernandez AP; Okkema PG; Goszczynski B; McGhee JD
Interference between the PHA-4 and PEB-1 transcription factors in formation of the Caenorhabditis elegans pharynx.
Journal of Molecular Biology 320: 697-704 2002

ARTICLE
CGC #5396
Baird SE
Haldane’s rule by sexual transformation in Caenorhabditis.
Genetics 161: 1349-1353 2002
ARTICLE

CGC #5397
Coghlan A; Wolfe K
Fourfold faster rate of genome rearrangement in nematodes than in Drosophila.
Genome Research 12: 857-867 2002
ARTICLE

CGC #5398
Rutledge E; Denton J; Strange K
Cell cycle- and swelling-induced activation of a Caenorhabditis elegans CIC channel is mediated by CeGLC-7alpha/beta phosphatases.
ARTICLE

CGC #5399
Grishok A; Mello CC
RNAi (Nematodes: Caenorhabditis elegans).
Advances in Genetics 46: 339-360 2002
REVIEW

CGC #5400
Ledent V; Paquet O; Vervoort M
Phylogenetic analysis of the human basic helix-loop-helix proteins.
Genome Biology 5400: 3: - 2002
ARTICLE

CGC #5401
AbdelRaheim SR; McLennan AG
The Caenorhabditis elegans Y87G2A.14 Nudix hydrolase is a peroxisomal coenzyme A diphosphatase.
BMC Biochemistry 3: - 2002
ARTICLE

CGC #5402
Hammond SM; Caudy AA; Hannon GJ
Post-transcriptional gene silencing by double-stranded RNA.
REVIEW

CGC #5403
Steinberg CEW; Bruggemann R
Ambiguous ecological control by dissolved humic matter (DHM) and natural organic matter (NOM): trade-offs between specific and non-specific effects.
Acta Hydrochimica et Hydrobiologica 29: 399-411 2002
ARTICLE
CGC #5404
Rose JK;Kaun KR;Rankin CH
A new group-training procedure for habituation demonstrates that presynaptic glutamate release contributes to long-term memory in Caenorhabditis elegans.
Learning & Memory 9: 130-137 2002
ARTICLE

CGC #5405
Gonczy P
Mechanisms of spindle positioning: focus on flies and worms.
REVIEW

CGC #5406
Wang C;Risteli M;Heikkinen J;Hussa AK;Uitto L;Myllyla R
Identification of amino acids important for the catalytic activity of the collagen glucosyltransferase associated with the multifunctional lysyl hydroxylase 3 (LH3).
Journal of Biological Chemistry 277: 18568-18573 2002
ARTICLE

CGC #5407
Onami S;Hamahashi S;Nagasaki M;Miyano S;Kitano H
Automatic acquisition of cell lineage through 4D microscopy and analysis of early C. elegans embryogenesis.
ARTICLE

CGC #5408
Schwientek T;Bennett EP;Flores C;Thacker J;Hollmann M;Reis CA;Behrens J;Mandel U;Keck B;Schafer MA;Haselmann K;Zubarev R;Roepstorff P;Burchell JM;Taylor-Papadimitriou J;Hollingsworth MA;Clausen H
Journal of Biological Chemistry 277: 22623-22638 2002
ARTICLE

CGC #5409
Letunic I;Copley RR;Bork P
Common exon duplication in animals and its role in alternative splicing.
Human Molecular Genetics 11: 1561-1567 2002
ARTICLE

CGC #5410
Yamasaki T;Sato M;Mori T;Mohamed ASA;Fujii K;Tsukioka J
Toxicity of tannins towards the free-living nematode Caenorhabditis elegans and the brine shrimp Artemia salina.
Journal of Natural Toxins 11: 165-171 2002
ARTICLE
CGC #5411
Shim EY;Walker AK;Shi Y;Blackwell TK
CDK-9/cyclin T (P-TEFb) is required in two postinitiation pathways for transcription in the C. elegans embryo.
Genes & Development 16: 2135-2146 2002
ARTICLE

CGC #5412
Howard RM;Sundaram MV
C. elegans EOR-1/PLZF and EOR-2 positively regulate Ras and Wnt signaling and function redundantly with LIN-25 and the SUR-2 Mediator component.
Genes & Development 16: 2169 2002
CORRECT

CGC #5413
Wang X;Chamberlin HM
Multiple regulatory changes contribute to the evolution of the Caenorhabditis lin-48 ovo gene.
Genes & Development 16: 2345-2349 2002
ARTICLE

CGC #5414
Watts DJ;Strogatz SH
Collective dynamics of 'small-world' networks.
Nature 393: 440-442 2002
ARTICLE

CGC #5415
Ahmed H;Bianchet MA;Amzel LM;Hirabayashi J;Kasai K;Giga-Hama Y;Tohda H;Vasta GR
Novel carbohydrate specificity of the 16-kDa galectin from Caenorhabditis elegans: binding to blood group precursor oligosaccharides (type1, type 2, Ta, and TB) and gangliosides.
Glycobiology 12: 451-461 2002
ARTICLE

CGC #5416
Jansen WTM;Bolm M;Ballng R;Chhatwal GS;Schnabel R
Hydrogen peroxide-mediated killing of Caenorhabditis elegans by Streptococcus pyogenes.
Infection and Immunity 70: 5202-5207 2002
ARTICLE

CGC #5417
Lim YS;Wadsworth WG
Identification of domains of netrin UNC-6 that mediate attractive and repulsive guidance and responses from cells and growth cones.
Journal of Neuroscience 22: 7080-7087 2002
ARTICLE
CGC #5418
Petriv OI; Pilgrim DB; Rachubinski RA; Titorenko VI
Physiological Genomics 10: 79-91 2002
ARTICLE

CGC #5419
Hobert O; Johnston RJ; Chang S
Left-right asymmetry in the nervous system: the Caenorhabditis elegans model.
REVIEW

CGC #5420
Lyczak R; Gomes JE; Bowerman B
Heads or tails - cell polarity and axis formation in the early Caenorhabditis elegans embryo.
Developmental Cell 3: 157-166 2002
REVIEW

CGC #5421
Nehrke K; Melvin JE
The NHX family of Na+ - H+ exchangers in Caenorhabditis elegans.
Journal of Biological Chemistry 277: 29036-29044 2002
ARTICLE

CGC #5422
Myllyharju J; Kukkola L; Winter AD; Page AP
The exoskeleton collagens in Caenorhabditis elegans are modified by prolyl 4-hydroxylases with unique combinations of subunits.
Journal of Biological Chemistry 277: 29187-29196 2002
ARTICLE

CGC #5423
Simmer F; Tijsterman M; Parrish S; Koushika SP; Nonet ML; Fire A; Ahringer J; Plasterk RHA
Loss of the putative RNA-directed RNA polymerase RRF-3 makes C. elegans hypersensitive to RNAi.
Current Biology 12: 1317-1319 2002
ARTICLE

CGC #5424
Morley JF; Brignull HR; Weyers JJ; Morimoto RI
The threshold for polyglutamine expansion protein aggregation and cellular toxicity is dynamic and influenced by aging in Caenorhabditis elegans.
Proceedings of the National Academy of Sciences USA 99: 10417-10422 2002
ARTICLE

CGC #5425
Hajnal A; Berset T
The Caenorhabditis elegans MAPK phosphatase LIP-1 is required for the G(2)/M meiotic arrest of developing oocytes.
EMBO Journal 21: 4317-4326 2002
CGC #5426
Rankin CH
>From gene to identified neuron to behavior in Caenorhabditis elegans.
Nature Reviews Genetics 3: 622-630 2002

CGC #5427
Sattelle DB;Culetto E;Grauso M;Raymond V;Franks C J;Towers P
Functional genomics of ionotropic acetylcholine receptors in Caenorhabditis elegans and Drosophila melanogaster.
Novartis Foundation 245: 240-257 2002

CGC #5428
Roy PJ;Stuart JM;Lund J;Kim SK
Chromosomal clustering of muscle-expressed genes in Caenorhabditis elegans.
Nature 418: 975-979 2002

CGC #5429
GuhaThakurta D;Palomar L;Stormo GD;Tedesco P;Johnson TE;Walker DW;Lithgow G;Link CD
Genome Research 12: 1301 2002

CGC #5430
Popovici C;Isnardon D;Birnbaum D;Roubin R
Caenorhabditis elegans receptors related to mammalian vascular endothelial growth factor receptors are expressed in neural cells.
Neuroscience Letters 329: 116-120 2002

CGC #5431
Ohtsuki T;Sato A;Watanabe Y;Watanabe K
A unique serine-specific elongation factor Tu found in nematode mitochondria.
Nature Structural Biology 9: 669-673 2002

CGC #5432
Urano F;Calfon M;Yoneda T;Yun C;Kiraly M;Clark SG;Ron D
A survival pathway for Caenorhabditis elegans with a blocked unfolded protein response.
CGC #5433
Shim EY;Walker AK;Blackwell TK
Broad requirement for the Mediator subunit RGR-1 for transcription in the Caenorhabditis elegans embryo.
Journal of Biological Chemistry 277: 30413-30416 2002
ARTICLE

CGC #5434
Britton C;Murray L
A cathespin L protease essential for Caenorhabditis elegans embryogenesis is functionally conserved in parasitic nematodes.
Molecular & Biochemical Parasitology 122: 21-33 2002
ARTICLE

CGC #5435
Cort JR;Chiang Y;Zheng D;Montelione G;Kennedy MA
NMR structure of conserved eukaryotic protein ZK652.3 from C. elegans: a ubiquitin-like fold.
ARTICLE

CGC #5436
Park HK;Yook JS;Koo HS;Choi IS;Ahn B
The Caenorhabditis elegans XPA homolog of human XPA.
Molecules & Cells 14: 50-55 2002
ARTICLE

CGC #5437
Wang L;Eckmann CR;Kadyk LC;Wickens M;Kimble J
A regulatory cytoplasmic poly(A) polymerase in Caenorhabditis elegans.
Nature 419: 312-316 2002
ARTICLE

CGC #5438
Baek JH;Cosman P;Feng Z;Silver J;Schafer WR
Using machine vision to analyze and classify Caenorhabditis elegans behavioral phenotypes quantitatively.
Journal of Neuroscience Methods 118: 9-21 2002
ARTICLE

CGC #5439
Rex E;Komuniecki RW
Characterization of a tyramine receptor from Caenorhabditis elegans.
Journal of Neurochemistry 82: 1352-1359 2002
ARTICLE

CGC #5440
Ge Y;Wang X;Chen Z;Landman N;Lo EH;Kang JX
Gene transfer of the Caenorhabditis elegans n-3 fatty acid desaturase inhibits neuronal apoptosis.
Journal of Neurochemistry 82: 1360-1366 2002
ARTICLE
CGC #5441
Yamada S;Okada Y;Ueno M;Iwata S;Deepa SS;Nishimura S;Fujita M;Van Die I;Hirabayashi Y;Sugahara K
Determination of the glycosaminoglycan-protein linkage region oligosaccharide structures of proteoglycans from Drosophila melanogaster and Caenorhabditis elegans.
Journal of Biological Chemistry 35: 31877-31886 2002
ARTICLE

CGC #5442
Van Voorhies WA
Metabolism and aging in the nematode Caenorhabditis elegans.
Free Radical Biology & Medicine 33: 587-596 2002
REVIEW

CGC #5443
Rudel D;Kimble J
Evolution of discrete Notch-like receptors from a distant gene duplication in Caenorhabditis.
Evolution & Development 4: 319-333 2002
ARTICLE

CGC #5444
Miyoshi H;Dwyer DS;Keiper BD;Jankowska-Anyszka M;Darzynkiewicz E;Rhoads RE
Discrimination between mono- and trimethylated cap structures by two isoforms of Caenorhabditis elegans.
EMBO Journal 21: 4680-4690 2002
ARTICLE

CGC #5445
Korswagen HC
Canonical and non-canonical Wnt signaling pathways in Caenorhabditis elegans: variations on a common signaling theme.
BioEssays 24: 801-810 2002
REVIEW

CGC #5446
Slimko EM;McKinney S;Anderson DJ;Davidson N;Lester HA
Selective electrical silencing of mammalian neurons in vitro by the use of invertebrate ligand-gated chloride channels.
Journal of Neuroscience 22: 7373-7379 2002
ARTICLE

CGC #5447
Mears JA;Cannone JJ;Stag SM;Gutell RR;Agrawal RK;Harvey SC
Modeling a minimal ribosome based on comparative sequence analysis.
ARTICLE

CGC #5448
Lespinet O;Wolf YI;Koonin EV;Aravind L
The role of lineage-specific gene family expansion in the evolution of eukaryotes.
Genome Research 12: 1048-1059 2002
ARTICLE

CGC #5449
Honda Y;Honda S
Life span extensions associated with upregulation of gene expression of antioxidant enzymes in Caenorhabditis elegans: studies of mutation in the age-1, PI3 kinase homologue and short-term exposure to
ARTICLE

CGC #5450
Driver C
An hypothesis concerning control networks and aging in Drosophila melanogaster and Caenorhabditis elegans.
ARTICLE

CGC #5451
Herman MA
Control of cell polarity by noncanonical Wnt signaling in C. elegans.
REVIEW

CGC #5452
O’Connell KF
The ZYG-1 kinase, a mitotic and meiotic regulator of centriole replication.
Oncogene 21: 6201-6208 2002
REVIEW

CGC #5453
Gruneberg U;Glotzer M;Gartner A;Nigg EA
The CeCDC-14 phosphatase is required for cytokinesis in the Caenorhabditis elegans embryo.
Journal of Cell Biology 158: 901-914 2002
ARTICLE

CGC #5454
Shimada M;Kawahara H;Doi H
Novel family of CCCH-type zinc-finger proteins, MOE-1, -2, and -3, participates in C. elegans oocyte maturation.
Genes to Cells 7: 933-947 2002
ARTICLE

CGC #5455
Thor S;Thomas JB
Motor neuron specification in worms, flies and mice: conserved and "lost" mechanisms.
Current Opinion in Genetics & Development 12: 558-564 2002
REVIEW
TOR deficiency in C. elegans causes developmental arrest and intestinal atrophy by inhibition of mRNA translation.
Current Biology 12: 1448-1461 2002
ARTICLE

A novel function for the Sm proteins in germ granule localization during C. elegans embryogenesis.
Current Biology 12: 1502-1506 2002
ARTICLE

PPW-1, a PAZ/PIWI protein required for efficient germline RNAi, is defective in a natural isolate of C. elegans.
Current Biology 12: 1535-1540 2002
ARTICLE

Hill-Robertson interference is a minor determinant of variations in codon bias across Drosophila melanogaster and Caenorhabditis elegans genomes.
Molecular Biology & Evolution 19: 1399-1406 2002
ARTICLE

Affinity capturing and gene assignment of soluble glycoproteins produced by the nematode Caenorhabditis elegans.
ARTICLE

Conservation of gene co-regulation in prokaryotes and eukaryotes.
REVIEW

Synapsis-dependent and -independent mechanisms stabilize homolog pairing during meiotic prophase in C. elegans.
Genes & Development 16: 2428-2442 2002
ARTICLE

Regulation of sex-specific differentiation and mating behavior in C. elegans by a new member of the DM domain transcription factor family.
Genes & Development 16: 2390-2402 2002
ARTICLE
CGC #5464
Hodgkin J
The remarkable ubiquity of DM domain factors as regulators of sexual phenotype: ancestry or aptitude?
Genes & Development 16: 2322-2326 2002
REVIEW
CGC #5465
Fitch DHA; Sudhaus W
One small step for worms, one giant leap for "Bauplan?"
Evolution & Development 4: 243-246 2002
REVIEW
CGC #5466
Trappe R; Schulze E; Rzymski T; Frode S; Engel W
The Caenorhabditis elegans ortholog of human PHF5a shows a muscle-specific expression domain and is essential for C. elegans morphogenetic development.
Biochemical and Biophysical Research Communications 297: 1049-1057 2002
ARTICLE
CGC #5467
Sudhaus W; Fitch D
Comparative studies on the phylogeny and systematics of the Rhabditidae (Nematoda).
Journal of Nematology 33: 1-70 2002
ARTICLE
CGC #5468
Starr DA; Han M
Role of ANC-1 in tethering nuclei to the actin cytoskeleton.
ARTICLE
CGC #5469
Nuttley WM; Atkinson-Leadbeater KP; van der Kooy D
Serotonin mediates food-odor associative learning in the nematode Caenorhabditis elegans.
Proceedings of the National Academy of Sciences 99: 12449-12454 2002
ARTICLE
CGC #5470
Nickell WT; Pun RYK; Bargmann CI; Kleene SJ
Single ionic channels of two Caenorhabditis elegans chemosensory neurons in native membrane.
ARTICLE
CGC #5471
Kawar ZS; Van Die I; Cummings RD
Molecular cloning and enzymatic characterization of a UDP-GalNAc:GlcNAcB-R B1,4-N-acetylgalactosaminytransferase from Caenorhabditis elegans.
Coordinated folding and association of the LIN-2, -7 (L27) domain.

Journal of Biological Chemistry 277: 34902-34908 2002

Virulence effect of Enterococcus faecalis protease genes and the quorum-sensing locus fsr in Caenorhabditis elegans.

Infection and Immunity 70: 5647-5650 2002

Ageing is reversed, and metabolism is reset to young levels in recovering dauer larvae of C. elegans.

Experimental Gerontology 37: 1015-1021 2002

Transcriptional profile of aging in C. elegans.

Current Biology 12: 1566-1573 2002

Integrins in development: moving on, responding to, and sticking to the extracellular matrix.

Developmental Cell 3: 311-321 2002

Differential display analysis of gene expression in invertebrates.

Cellular and Molecular Life Sciences 59: 1256-1263 2002

Genetic approaches to programmed cell death: achievements and questions.

M S-Medecine Sciences 18: 831-840 2002
CGC #5479
de Chadarevian S
Mapping development or how molecular is molecular biology?
Pubblicazioni della Stazione Zoologica de Napoli:Secion II:History &
Philosophy of the Life Sciences 22: 381-396 2002
REVIEW

CGC #5480
Guhathakurta D;Schriefer LA;Hresko MC;Waterston RH;Stormo GD
Identifying muscle regulatory elements and genes in the nematode
Caenorhabditis elegans.
Pacific Symposium on Biocomputing : 425-436 2002
ARTICLE

CGC #5481
Kjeldgaard M
Another worm in translation.
Structure 10: 1154-1155 2002
REVIEW

CGC #5482
Picken NC;Eschenlauer S;Taylor P;Page AP;Walkinshaw MD
Structural and biological characterisation of the gut-associated cyclophilin B
isoforms from Caenorhabditis elegans.
Journal of Molecular Biology 322: 15-25 2002
ARTICLE

CGC #5483
Bandyopadhyay J;Lee J;Lee J;Lee JI;Yu JR;Jee C;Cho JH;Jung S;Lee MH;Zannoni
S;Singson A;Kim DH;Koo HS;Ahnn J
Calcineurin, a calcium/calmodulin-dependent protein phosphatase, is involved
in movement, fertility, egg laying, and growth in Caenorhabditis elegans.
Molecular Biology of the Cell 13: 3281-3293 2002
ARTICLE

CGC #5484
Geles KG;Johnson JJ;Jong S;Adam SA
A role for Caenorhabditis elegans importin IMA-2 in germ line and embryonic
mitosis.
Molecular Biology of the Cell 13: 3138-3147 2002
ARTICLE

CGC #5485
Buechner M
Tubes and the single C. elegans excretory cell.
Trends in Cell Biology 12: 479-484 2002
REVIEW

CGC #5486
Colaiacovo MP;Stanfield GM;Reddy KC;Reinke V;Kim SK;Villeneuve AM
A targeted RNAi screen for genes involved in chromosome morphogenesis and
nuclear organization in the Caenorhabditis elegans germline.
Genetics 162: 113-128 2002
ARTICLE
CGC #5487
Martin E; Laloux H; Couette G; Alvarez T; Bessou C; Hauser O; Sokhareea S; Labouesse M; Segalat L
Identification of 1088 new transposon insertions of Caenorhabditis elegans: a pilot study toward large-scale screens.
Genetics 162: 521-524 2002

ARTICLE
CGC #5488
Dillin A; Crawford DK; Kenyon C
Timing requirements for insulin/IGF-1 signaling in C. elegans.
Science 298: 830-834 2002

ARTICLE
CGC #5489
Kirkwood TBL; Finch CE
The old worm turns more slowly.
Nature 419: 794-795 2002

REVIEW
CGC #5490
Herndon LA; Schmeissner PJ; Dudaronek JM; Brown PA; Listner KM; Sakano Y; Paupard MC; Hall DH; Driscoll M
Stochastic and genetic factors influence tissue-specific decline in ageing C. elegans.
Nature 419: 808-814 2002

ARTICLE
CGC #5491
Vargas JD; Culetto E; Ponting CP; Miguel-Aliaga I; Davies KE; Sattelle DB
Cloning and developmental expression analysis of ltd-1, the Caenorhabditis elegans homologue of the mouse kyphoscoliosis (ky) gene.

ARTICLE
CGC #5492
Karabinos A; Schulze E; Klisch T; Wang J; Weber K
Expression profiles of the essential intermediate filament (IF) protein A2 and the IF protein C2 in the nematode Caenorhabditis elegans.

ARTICLE
CGC #5493
Tabuse Y
Protein kinase C isotypes in C. elegans.

REVIEW
CGC #5494
Li P; Slimko EM; Lester HA
Selective elimination of glutamate activation and introduction of fluorescent proteins into a Caenorhabditis elegans chloride channel.
FEBS Letters 528: 77-82 2002
ARTICLE

CGC #5495
Wu YC; Cheng TW; Lee MC; Weng NY
Distinct Rac activation pathways control Caenorhabditis elegans cell migration and axon outgrowth.
Developmental Biology 250: 145-155 2002
ARTICLE

CGC #5496
Chu KW; Chow KL
Synergistic toxicity of multiple heavy metals is revealed by a biological assay using a nematode and its transgenic derivative.
Aquatic Toxicology 61: 53-64 2002
ARTICLE

CGC #5497
Stachelska A; Wieczorek Z; Ruszczynska K; Stolarski R; Pietrzak M; Lamphear BJ; Rhoads RE; Darzynkiewicz E; Jankowska-Anyszka M
Interaction of three Caenorhabditis elegan isoforms of translation initiation factor eIF4E with mono- and trimethylated mRNA 5’ cap analogues.
Acta Biochimica Polonica 49: 671-682 2002
ARTICLE

CGC #5498
Pirrotta V
Silence in the germ.
Cell 110: 661-664 2002
REVIEW

CGC #5499
Lagos-Quintana M; Rauhut R; Lendeckel W; Tuschi T
Identification of novel genes coding for small expressed RNAs.
Science 294: 853-858 2002
ARTICLE

CGC #5500
Driscoll M; Tavernarakis N
Worm cast in starring role for Nobel prize.
Nature 419: 548-549 2002
REVIEW

CGC #5501
Hatten ME
New directions in neuronal migration.
Science 297: 1660-1663 2002
REVIEW
CGC #5502
Marx J
Nobel’s run the gamut from cells to the cosmos.
Science 298: 526 2002
REVIEW

CGC #5503
von Mering C; Bork P
Teamed up for transcription.
Nature 417: 797-798 2002
REVIEW

CGC #5504
Lamitina ST; L’Hernault SW
Dominant mutations in the Caenorhabditis elegans Myt1 ortholog wee-1.3 reveal a novel domain that controls M-phase entry during spermatogenesis.
Development 129: 5009-5018 2002
ARTICLE

CGC #5505
Tsang WY; Lemire BD
Stable heteroplasmy but differential inheritance of large mitochondrial DNA deletion in nematodes.
ARTICLE

CGC #5506
Caruana G
Genetic studies define MAGUK proteins as regulators of epithelial cell polarity.
REVIEW

CGC #5507
Driscoll M; Tavernarakis N
Closing in on a mammalian touch receptor.
Nature Neuroscience 3: 1232-1234 2002
REVIEW

CGC #5508
Dedhar S; Williams B; Hannigan G
Integrin-linked kinase (ILK): a regulator of integrin and growth-factor signalling.
REVIEW
Use of eat-5 as a selection marker for transgenics
Boris Shtonda, Leon Avery

Department of Molecular Biology, University of Texas Southwestern Medical Center, 6000 Harry Hines Blvd, Dallas, TX 75390-9148, USA

eat-5 encodes a Caenorhabditis elegans innexin, a component of gap junctions between the muscle cells in the pharynx. The eat-5 null worms grow normally on an easy-to-eat strain of E. coli, HB101, but arrest as L1s on a harder-to-eat strain, DA837, a derivative of OP50. This difference in growth on two E. coli strains makes eat-5 a convenient co-transformation marker. This is particularly useful for situations when rol-6 is not good because the movement phenotype is studied. The gene of interest is co-injected into the eat-5(ad1402) null strain DA1402 with the genomic fragment containing the eat-5 gene, and the injected worms are transferred on the DA837 E. coli. Only transgenic F1s will grow. (It is important to use the null allele ad1402--mutants carrying the weak allele ad464 can grow on DA837.) Once the transgenic strains are isolated, they can be maintained on DA837, so a population of adult transgenic worms is easily obtained. If non-transgenic sibs are needed for controls, a transgenic worm can be transferred on HB101, so that non-transgenics can grow. In this case, however, a second marker, such as GFP, is needed to identify transgenics.

We tested this idea by co-injecting three constructs into DA1402: a constitutively active glr-1 receptor under its own promoter, glr1::glr1(Ala->Thr), which is known to cause an increased reversal frequency phenotype, myo2::GFP (pPD118.33), to have an additional label for the transgenics, and a genomic eat5::eat5 fragment generated by PCR. Several dozens transgenic lines were established on DA837. Because all adult worms on DA837 are transgenics, it was very easy to see the increased reversal frequency phenotype by looking at the population of worms.
A method of growing large synchronous population of C.elegans using chicken eggs.
Takao Ishidate, Craig Mello

Biotech II Suite217, Univ. of Massachusetts Med School, Worcester, MA 01605

It is sometimes required to prepare a large synchronously growing population of worms for various biochemical or genetic assays. Use of chicken eggs to grow gram quantity of worms has been described (D.Baillie and R.Rosenbluth; WBG2(1)). We have found that by adding E.coli to blended chicken egg it is possible to grow a large population of worms synchronously on plates. In this method, freshly hatched L1 larvae are suspended in blended chicken egg solution supplemented with concentrated E.coli, and seeded onto standard NGM plates. Typically, 1 million worms can be grown synchronously on five, 150mm NGM plates. 1) Take one egg and break into 25ml of boiling water placed on magnetic stirrer. 2) Stir several minutes until yolk breaks. 3) Put the egg solution into Waring blender and blend for two minutes. 4) Transfer the homogenized egg solution to sterile tubes. (They can be frozen and stored at -80C.) 5) Mix egg solution and concentrated E.coli solution (OP-50 grown in Terrific Broth for one day is pelleted and then resuspended in equal volume of sterile M9). Usually we use the ratio of 1:9 = concentrated E.coli : egg solution. 6) Suspend 200,000 freshly hatched L1 larvae in 1~1.5ml of egg/E.coli mixture and inoculate onto 150mm NGM plates.
In previous investigations of male fertility in different wild isolates of *C. elegans*, it was found that males from the Stanford race CB4855 are substantially more fertile than males from the standard Bristol race N2 (Hodgkin and Doniach (1997), Genetics 146: 149-164). More recently, several investigators have observed that the Hawaiian race CB4856 also exhibits high male fertility, so that male plates can be maintained indefinitely, simply by chunking rather than by setting up new crosses periodically (Hammarlund & Jorgensen (2001), wbg17.1p38).

We were curious as to whether high male fertility occurred in any other wild isolates. We therefore tested 6 - 12 individual males from a set of 11 geographically assorted races for the ability to sire progeny after more than three days of adult growth at 20 degrees C. Males were tested by daily transfer to fresh plates containing six young adult fem-1(hc17) females, as described (Hodgkin and Doniach, 1997). The races examined were: N2 (Bri), CB4855 (Sta), CB4856 (Haw), AB1 (Ado), AB3 (Adt), RC301 (Fre), CB4932 (Tau), CB4857 (Cla), CB4854 (Gan), CB4853 (Gat), DH424 (Epc).

The table below reports the fractions of males capable of siring progeny on days 3 - 10 of adulthood. We confirmed long-term fertility for CB4855 (Sta) and CB4856 (Haw). The only other race in this set that exhibited comparable endurance was the Adelelaide race AB1 (Ado).

Rough estimates of total progeny sired at late time points suggest that CB4855 (Sta) has the highest male fertility of these three races, and AB1 (Ado) the lowest.

Other races appear similar to or slightly more fertile than N2 in this survey, which is admittedly superficial. The Californian Epc (DH424) race appears less fertile, perhaps because this strain carries a high Tc1 transposon load. Very high Tc1 loads, as in the Bergerac strains CB4851 and RW7000, are associated with effectively complete male infertility. The Vancouver race KR314 also exhibits male infertility, as a result of homozygosity for a *mab-23* mutation. Overall, we tentatively conclude that high male fertility is the exception rather than the rule, among different wild populations of *C. elegans*.

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Biased asymmetry of the RID motor axon
Oliver Hobert, Adam S. Wenick, Hannes Buelow

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The nervous system of *C. elegans* displays significant patterns of bilateral symmetry (Hobert et al., 2002). Deviations from this symmetry are usually highly stereotyped. For example, the unilateral RIS neuron is always located on the left side of the animal, but never on the right side (White et al., 1986; this observation, based on a limited number of EM-reconstructed animals, has now been confirmed with *gfp* reporters). One major exception to this stereotyped laterality is represented by the expression of the putative odorant receptor gene *str-2*, which occurs stochastically in either the left or right AWC neuron (the distribution is about 50:50; Troemel, et al., 1999). Are there other examples of stochastic laterality in the nervous system? In their EM reconstruction work, White et al. (1986) noted that the unilateral RID motor neuron (see Fig.), whose cell body is located on the dorsal midline, sends its axon along the right side of the nerve ring in one reconstructed animal, but along the left side in another reconstructed animal. Could this observation reflect a stochastic choice of the growth cone when encountering the dorsal side of the nerve ring? The sample size of two obviously did not allow one to derive such a statement, but the advent of *gfp* reporter technology allows us to address this question. Several previously described *gfp* reporter strains show RID expression, yet the presence of GFP in the axons of many other neurons precluded the tracing of the RID axon. A promoter fragment from a putative serotonin-like receptor gene that we study in the lab drives expression of *gfp* in RID and only one additional pair of neurons, allowing us to trace the axon of RID. Taking advantage of this, we found that in 56 out of 58 animals, the axon traveled along the left side of the nerve ring, while in 2/58 animals, the axon migrated on the right side. In another genetic background in which a *gfp* marker is ectopically expressed in RID (*Is[unc-119::txt-3; ttx-3::gfp]*), we found a similar distribution; namely 46 out of 48 animals have their RID axon on the left side.

Another case of strongly biased, though not 100% stereotyped left/right asymmetry can be found in the ventral nerve cord. The total set of D-type motorneurons sends 2 circumferential commissures around the left side of the animal; the remaining commissures are around the right side of the animal. However, this choice is not entirely stereotyped. In 25% (n=80) of wild type animals there are one or two additional commissures that run on the left side of the animal rather than on the right side.

Taken together, the nervous system of *C. elegans* shows several examples of non-stereotyped, biased anatomic asymmetries. It will be interesting to investigate the mechanistic basis for this left/right asymmetry.
**Figure:** Morphology of the RID motorneuron.

**References:**


Troemel et al. (1999), Cell 99, 387-98

White et al. (1986) Phil. Royal Soc. of London B. Biological Sciences 314, 1-340
Array formation and integration after injection of DNA into oocyte nuclei.
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University of Utah, Department of Biology, 257 South 1400 East, Salt Lake City, UT 84112-0840

We are exploring methods for gene targeting. Such methods require the introduction of linear DNA fragments which can then be integrated into chromosomal DNA by means of homologous recombination. However, injection of linear fragments into the gonadal syncytium does not result in homologous recombination of the gene fragment and the chromosome. Rather, such DNA is assembled into extrachromosomal arrays. These arrays are most likely formed using the nonhomologous end joining pathway. We think that it is likely that the nonhomologous end joining happens in the cytoplasm, before the DNA has access to recombine with the chromosome. Thus, this pathway is in direct competition with the homologous recombination pathway that we hope to use in gene targeting. In order to achieve gene targeting we have been working to both increase the frequency of homologous recombination and decrease the frequency of nonhomologous end joining. In all cases, we injected a rescuing fragment from the *unc-18* gene into the *unc-18(e234)* strain and scored for rescued animals. DNA was injected directly into the nucleus of 5-10 oocytes per worm at a concentration of ~100ng/ul. The DNA could be incorporated in one of three ways: end joining into semi-stable arrays, integrating randomly into chromosomal DNA, or homologous recombination into the *unc-18* locus. Transformed animals were tested for integration by isolating true-breeding rescued lines. Homologous integrations were tested by outcrossing and testing for linkage.

First, it is possible that DNA injected into the gonadal syncytium does not enter the nucleus efficiently or perhaps it does not enter at all until after nuclear envelope breakdown. By contrast, injection of circular DNA into the nucleus has resulted in frequent nonhomologous integrations and rare homologous integrations (Broverman, MacMorris, and Blumenthal PNAS 90: 4359-4363 1993). We injected circular DNA into the nucleus but did not identify homologous integrants (see Table); however our methods were unable to generate nonhomologous integrants at high frequencies.

Second, linear DNA with 3’ overhangs may inhibit nonhomologous end-joining as well act as a substrate for RAD-51 binding to initiate strand invasion with homologous sequences. Digestion of 5’ ends was performed by 15 minute treatment with lambda exonuclease at 1unit/ug DNA at 15°C, leaving 3’ overhangs that were estimated to be 500 nucleotides on each end. DNA treated in this way did not generate homologous integrations.

Third, it is possible that strand invasion by 3’ single stranded overhanging ends can be promoted by prebinding the DNA with RecA protein. RecA is a bacterial homolog of Rad51, which is the protein that binds to 3’ overhangs and catalyzes the integration of single stranded DNA into homologous double-stranded DNA. It was also thought that RecA bound to the free ends of the injected DNA would help protect the DNA from end joining. We did not identify any homologous events. The numbers of arrays and random integrants are proportionally similar with or without RecA.

Although none of our events is a homologous targeting event, our nonhomologous integrations suggest that it is true that a major barrier to homologous integration is access to the nucleus. It has been observed in a number of systems that the majority of integration events are nonhomologous, suggesting that homologous targeting in worms will require a method that generates a large number of integration events.
<table>
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<tr>
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<th>transformants</th>
<th>integrations</th>
<th>homologous recombinants</th>
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<tr>
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A Method for the Cryo-Preservation of *Acrobeloides* (Cephalobidae)

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Introduction:

Preservation of nematode strains at low temperature is widely used. There is a general understanding that the methods hitherto developed are more applicable to Rhabditida, but less to Cephalobida. Consequently cephalobids have to be maintained in culture for future use. Maintaining cultures is time consuming and labour intensive.

We have over 100 culture isolates of *Acrobeloides* which we have been maintaining for the last three years. The objective of this experiment on methodology was, therefore, to be able cryo-preserve these culture isolates. All strains were maintained on *E. coli* (strain OP50) seeded MYOB plates. The standard freezing protocol for *C. elegans* was first tested (Sulston and Hodgkin, 1988), but the method did not work for our isolates. On the other hand culture isolates of a different genus, *Panagrolaimus*, were frozen successfully following the *C. elegans* protocol. Recovery was high (80-90%) for *Panagrolaimus*. We subsequently developed a method of freezing *Acrobeloides* sp which may be of utility for other nematode zoo-keepers.

Description of the method for the freezing of *Acrobeloides*:

Solutions needed for cryo-preservation are *M9 buffer* and *Freezing solution*, as described for *C. elegans* in Sulston and Hodgkin (1988).

1. Transfer adults to newly seeded plates and maintain cultures at room temperature for ten days until growth is high and peak density is reached. Make sure the density of adults in the culture is high, as they survive freezing better than juveniles (unlike the *C. elegans* protocol that works mainly for larvae).

2. Keep cultures at 15°C for about 15 days. This slows down their metabolism and may starve them to a certain extent.

3. Wash nematodes with *M9 Buffer* from plates into 15ml plastic centrifuge tube and keep them at 4°C for three to four days. This starves them further.

4. Centrifuge at 2000RPM for three minutes. If the culture is dominated by adults, they tend to settle fast and a shorter centrifugation time can be used.

5. Pipette off supernatant leaving about 0.5ml (with nematodes) at the bottom.

6. Heat-shock them by leaving them at 37°C for 45 minutes.

7. Add 1ml freezing solution, mix gently but well and transfer into 1.5ml freezing vials, close and immediately keep them cool in ice. These nematodes seem not to like the freezing solution; therefore the speed of cooling and freezing are critical. The longer one leaves nematodes in the freezing solution, the fewer nematodes will recover from freezing.

8. Put them in a Styrofoam (closed on the bottom but open at the top) and freeze them (at -75°C). Fast thawing is best for survival of nematodes. Keep vials at room temperature but hold them by hand to facilitate thawing. Shake them and pour out into a petri dish half-filled with *M9 Buffer* before they defrost completely in the vial. Slow thawing (first keeping frozen vials at 4°C until they defrost) decreases the recovery of *Acrobeloides* strains we tested.
Normally some nematodes start to show signs of movement about three hours from thawing, but noticeable body movement can be seen much later, usually 24 hours after thawing. Nematodes can be transferred to seeded plates after washing them in buffer. Recovered nematodes transferred to seeded plates reproduced well in culture.

Additional observations:

1. Fast growing cultures of *Acrobeloides* do not survive freezing as well as aged ones.

2. Survival of larvae is much lower than adults. In most cases larvae die while adults survive.

3. The "Slow-Freezing" protocol described for *C. elegans* (Carmel L., web-published) does not work for *Acrobeloides*. Slow freezing according to the *C. elegans*-protocol requires keeping nematodes in *Freezing Solution* and *Buffer* at low temperature before freezing, but this results in the death of all stages of *Acrobeloides*.

4. Exposure of nematodes to heat (37°C) for longer than 45 minutes decreased recovery. But we did not investigate the effect of different levels of temperature on recovery.

5. Total density is not an indicator of degree of recovery, the number of starved adults is.

6. In all cases nematodes were frozen for 24hrs only. The effect of long term freezing was not investigated.

Reference:

Carmel, L. The Effect of Freezing and Thawing Rates on Cryonic Treatment of *Caenorhabditis elegans*. Website address: [http://share3.esd105.wednet.edu/mcmillend/00/carmell/carmell.htm](http://share3.esd105.wednet.edu/mcmillend/00/carmell/carmell.htm)


Acknowledgement:

The study was part of a project funded by the Natural Environmental Research Council (UK).
Evolution of sex differences in lifespan in nematodes
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N2 males live ~20% longer than hermaphrodites when maintained in isolation to prevent deleterious interactions with other worms (1). We have found that this is also true of 9/12 other C. elegans wild isolates tested. Increased male lifespan is therefore typical of C. elegans as a species, and not unique to N2. Why might this male longevity bias have evolved? One possibility is that it is a consequence of protandrous hermaphroditism, which is likely to lead to a skew in the male reproductive probability distribution to later ages. The evolutionary theory of aging suggests that this would result in the evolution of greater longevity in males. To test this idea, we measured the lifespans of both sexes of four dioecious and three more hermaphroditic terrestrial nematode species. However, males proved to be significantly longer-lived than hermaphrodites/females in all other nematode species tested, bar one. This disproved our hypothesis, and suggested that a male longevity bias is typical of free-living nematodes. The exception was C. briggsae, since hermaphrodites were significantly longer-lived than males in the three isolates tested, G16, HK104 and VT847. This could be an evolutionary consequence of the fact that following mating in this species, oocytes are preferentially fertilised by X-bearing sperm, so that outcross progeny are initially mainly hermaphrodites (2). Given that the frequency of males among progeny of selfing hermaphrodites is comparable to that in C. elegans (3), it seems likely that C. briggsae males are exceptionally rare in the wild. Potentially, this rarity results in reduced selection against deleterious mutations with male-specific effects, and the evolution of reduced male longevity. Interestingly, lifespans of males of dioecious species as a whole were greater than those of males of hermaphroditic species (p < 0.001); females were not longer-lived overall than hermaphrodites. Thus, the rarity of males in hermaphroditic species may lead to the evolution of reduced male lifespan.

Male C. elegans are also more likely to form dauer larvae than hermaphrodites (4). We have found that insulin/IGF-like signalling plays a role in both increased male dauer formation and lifespan in this species. Possibly increased male lifespan evolved due to selection for increased dauer formation. Yet in other species tested we saw increased dauer formation in hermaphrodites/females, arguing against this idea. However, since this included C. briggsae, where hermaphrodites are the longer-lived sex, it is possible that common mechanisms underlie the evolution of sex differences in dauer formation and lifespan in the genus Caenorhabditis.

Why might male free-living nematodes of both hermaphroditic and dioecious species be longer-lived than the feminine sex? Within a species, the sex experiencing greater extrinsic mortality is expected to become the one with more rapid aging (5). One cause of early mortality in C. elegans hermaphrodites is internal hatching of eggs (bagging). If bagging occurs at significant rates in terrestrial nematodes, the resulting bias in sex-specific survival could account for the evolution of the male longevity bias. Using a simple starvation test, we observed varying levels of bagging in six other terrestrial nematodes tested. In conclusion, a male longevity bias is common among dioecious and hermaphroditic terrestrial nematode species, and may have evolved as a consequence of bagging, while reduced male longevity in hermaphroditic relative to dioecious species may have evolved as a consequence of male rarity.
The CAST and RIM/UNC-10 system in C. elegans
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The cytomatrix at the active zone (CAZ) has been implicated in defining the site of Ca2+-dependent exocytosis of neurotransmitter. Recently, we have identified a novel CAZ protein of ~120 kDa from rat brain and named it CAST (CAZ-associated structural protein) (1). CAST has no transmembrane segment, but has four coiled-coil domains and a C-terminal consensus motif for binding to PDZ domains (2). CAST is localized at the CAZ of conventional synapses of mouse brain. CAST binds directly RIM1 and indirectly Munc13-1 presumably through RIM1, forming a ternary complex. Our cell biological analyses in primary cultured rat hippocampal neurons demonstrate that CAST plays a role at least partly in the localization of RIM1 at the CAZ.

In C. elegans, UNC-10 has been identified and characterized as an orthologue of RIM1 (3). In the mutant animals, vesicle priming was impaired, but the organization of the active zone was intact. With GenBank database search, we then identified a putative orthologue of CAST (CeCAST) (F42A6.9: GenBank accession no. AF038613) in C. elegans. CeCAST consists of 836 amino acids (aa) with several coiled-coil regions. CeCAST shows a relatively low homology to CAST over the entire sequence (~20% aa identity), but the C-terminal consensus motif of CAST was also conserved in CeCAST. Because this motif was essential for CAST binding to RIM1 in the mammalian system (1), we examined whether CeCAST binds RIM/UNC10. We constructed two CeCAST mutants, pCMV-Myc-CeCAST-1 (residues 581-836) and pCMV-Myc-CeCAST-1deltaC (residues 581-833). The extract of HEK293 cells expressing each mutant was incubated with glutathione Sepharose beads containing a GST fusion protein of RIM/UNC10 PDZ domain. Myc-CeCAST-1 bound to the beads, but Myc-CeCAST-1deltaC did not. This result suggests that CeCAST directly binds RIM/UNC10 and that the CAST and RIM/UNC10 system is also conserved in C. elegans. Cell biological and genetic analyses of CeCAST are currently under way.

References


Plague? Bah! Mutants resistant to the bubonic plague biofilm
Creg Darby

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Bubonic plague is spread by the bites of fleas infected with *Yersinia pestis* bacteria. When worms are exposed to *Y. pestis*, sticky biofilms appear on their heads. The biofilms cover mouths and impair feeding, which in the case of larvae delays or arrests growth. Bacterial genes required for flea infection are also required to form worm biofilms, suggesting that the plague-flea interaction can be modeled with *C. elegans* (1).

N2 worms were mutagenized with ENU and the F2 eggs were deposited on lawns of *Y. pseudotuberculosis*, a close relative of the plague bacillus that also produces biofilms. We screened for animals that had no biofilm and grew normally in the continuous presence of *Yersinia*, a phenotype we call Bah: Biofilm Absent on Head. We obtained 11 independent Bah mutants from 7,000 mutagenized genomes, a frequency that suggests mutations in multiple genes. There are no obvious secondary phenotypes in the mutants.

Biofilms appear on the exterior of worms, and *Yersinia* does not colonize interior tissues, suggesting that some Bah mutants will have altered surface characteristics. Furthermore, three mutations affecting the worm surface -- *srf-2*, *srf-3*, and *srf-5* -- have been shown to confer resistance to adherent infection by the nematode pathogen *Microbacterium nematophilum* (2). We found that animals with the same three *srf* mutations are Bah. Because the bacterial genera *Microbacterium* and *Yersinia* are not closely related, this commonality suggests that *srf-2*, *srf-3* and *srf-5* are important in a variety of interactions between nematodes and bacteria.

**C. elegans as a model to study human diseases linked to the mitochondrial respiratory chain complex II**

Karine Gouget, You-Fang Zhou, Moïse Pinto, Monique Bolotin-Fukuhara, Emmanuel Culetto

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The mitochondria play a critical role in the cellular energy supply and perform other essential roles in a variety of metabolic functions. The mitochondria electron transport respiratory chain (MRC) is typically composed of four multi-subunit enzymes (complexes I to IV) and the ATP synthase (complex V). Complex II is involved in both the tricarboxylic acid (TCA) cycle and the aerobic respiratory chains of mitochondria. It consists of 4 nuclear-encoded polypeptides: the flavoprotein (Fp/ SDHA), an iron-sulphur protein (Ip/ SDHB) and two integral membrane proteins (SDHC and SDHD). Clinically, complex II deficiency associated with SDHA gene mutations can result in myopathy, encephalopathy and isolated cardiomyopathy. Recently, the analysis of the susceptibility gene for familial paraganglioma syndrome revealed germ line mutations in the SDHB, SDHC and SDHD genes. Those genes are therefore considered to be tumor-suppressor genes. One can speculate that oxidative damage or ROS recycling dysfunction from impaired complex II could be important in explaining the damage to muscle and nerve cells. The molecular basis of such MRC enzyme deficiencies in humans remains largely unknown (1).

We aim to generate *C. elegans* models of these pathologies to identify the underlying mechanisms associated with such deficiencies. We identified by sequence comparison *C. elegans* homologues of complex II polypeptides (C03G5.1 and C34B2.7 are homologous to SDHA, F42A8.2 is homologue to SDHB, F33A8.5 is SDHD and *mev-1* is the structural gene for SDHC (2)). We sequenced several ESTs (thanks to Yuji Kohara) to determine the exon-intron structures of each gene. We used RNAi feeding experiments to study the worm phenotype associated with loss-of-function of worm homologues to the complex II subunits. Our preliminary RNAi experiments, for the anchorage subunits, show a decrease of the progeny numbers that seems to be due to an early arrest of embryo development. The single RNAi experiment for C03G5.1 and C34B2.7 gave no phenotype, whereas the simultaneous RNAi for both genes led to embryonic arrest of development. Thus, the SDHA encoding genes show some functional redundancy. We would like to isolate stable mutants in the genes of interest. Those mutants will be used for complementation experiments with human cDNAs (Wild type and mutants identified in human pathologies). The *mel-9* and *mel-13* mutants mapped very near the physical localization of SDHB and SDHD respectively. We have started to sequence those genes in the respective genetic background to identify any molecular alteration. We also recently received a SDHA mutant harbouring a 1.7 kb deletion in the C03G5.1 gene (thanks to OMRF KO group). We think that the *C. elegans* strains expressing Human complex II subunits we will generate, could be used for future drug screening. We also want to identify genes that are functionally linked to complex II activity. As a first approach we are looking for mutants resistant to complex II inhibitors : theonyltrifluoroacetone (TTFA) and 3-nitropropionic acid (3-NP). We already checked the sensitivity of L1 stage worms for the two drugs, and we found lethal doses of 2.2 mM (for TTFA) and 15 mM (for 3-NP). We also tested TTFA effect on L4 worms and found that they are just as sensitive as the L1. We have recently commenced a genetic screen to select mutants resistant to both inhibitors. (1)Rustin P et al. (2002) Eur J Hum Genet., 10, 10289-10291, (2)Ishii N et al. (1998) Nature 394, 694-697
ABC transporters constitute one of the biggest gene families in *C. elegans*. They are mostly involved in transmembrane delivery of substrates such as amino acids, peptides and toxins. In order to understand how big gene families are organized and how they evolve, comparative analysis of the ABC transporters has been done on a genome scale between *C. elegans* and *C. briggsae* now that both of genome sequences are available. 59 ABC genes have been identified and classified into 8 different subfamilies in *C. elegans* by a combination of database search and phylogenetic analysis. Two genes, C56E6.5 and C56E6.1, in *C. elegans*, cannot be assigned into established human subfamilies and has been assigned to a new subfamily H. Each subfamily shows similar structure to the equivalent human one. Annotation of *C. briggsae* ABC transporters has been done by database search, *ab initio* gene prediction, and the use of syntenic relationships. It turns out that ABC transporters are well conserved between the two morphologically similar worms. 57 putative orthologous ABC transporters in *C. briggsae* have been identified which can also be grouped into 8 subfamilies, and only 3 of *C. elegans* ABC genes do not have an obvious ortholog in *C. briggsae*. Most of the *C. briggsae* ABC transporters are of comparable size to their orthologs in *C. elegans*. 6 inversions and 5 deletions/insertions were found among the nearest neighbours of the 57 orthologous pairs. 45 of the 57 *C. briggsae* orthologous ABC genes were confirmed both by syntenic and phylogenetic analysis. 6 putative *C. briggsae* ABC orthologs assigned by BLAST score don’t have any syntenic support, but 4 of them are clustered well with their *C. elegans* orthologues when ABC transporters from both species are used to generate a phylogenetic tree. 14 *C. briggsae* ABC genes are not supported by the tree data, suggesting possible mis-prediction or sequence error. The transposase or reverse transcriptase insertion were found within two gene clusters in *C. briggsae*, suggesting the role of transposition in the formation of local gene clusters. Two *C. briggsae* ABC genes are assigned only by sequence similarity and have no tree or syntenic support, suggesting transposition or misprediction. No significant ortholog can be found for one of the *C. elegans* ABC transporters, Y57G11C.1. However, as there is no EST match for this gene in the database, it is possible that the gene is a pseudogene, which has therefore undergone a great deal of mutation. Also, local duplication occurs more frequently for ABCs on the sex chromosome than on autosomes. We are investigating the expression pattern of all the ABC transporters in *C. elegans* using GFP as markers, those having the same tissue expression will be used to map transcriptional elements. The orthology information will facilitate the identification of some cis-elements shared between the two species.
An attempt to slow aging in *C. elegans*. 26. A slight positive effect of streptomycin sulphate in concentrations 1.0 and 0.1 mg/ml

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The purpose of this study was to investigate the effect of streptomycin sulphate in water solutions on the nematode life span. In this experiment streptomycin sulphate was used in following dilutions: 1.0 and 0.1 mg/ml. Three adult animals (3 - 5 days old) were kept in microtitre wells containing 0.5 ml of liquid medium (with *E. coli* and without streptomycin sulphate) during 4 hours, then they were discarded and newborn larvae were transferred in next wells (without streptomycin sulphate in medium) every day (one worm in one well) beginning from third day. Then, beginning from 3th day, these worms were transferred every day in next wells containing medium with streptomycin sulphate in any concentration. This investigation was carried out in temperature +21°C and in the darkness.

The obtained results are presented in the following table.

<table>
<thead>
<tr>
<th>Concentration of streptomycin sulphate (mg/ml)</th>
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<th>Longevity (days)</th>
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<tr>
<td></td>
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<td>Mean±S.E. Maximal</td>
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<tr>
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</table>

Conclusion: If streptomycin sulphate solution was applied to *C. elegans*, it was able to increase not significantly (P>0.05) their mean longevity in comparison with control to 6.6 and 15.7 percent, respectively.

Acknowledgment: The author wishes to express his thanks to CGC for providing *C. elegans* (Bristol, N2) and *E. coli* OP50.
An attempt to slow aging in *C. elegans*. 27. A positive effect of acetylsalicylic acid

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The purpose of this study was to investigate the effect of acetylsalicylic acid in water solutions on the nematode life span. In this experiment acetylsalicylic acid was used in following dilutions: 1000, 100, 10, 1.0 and 0.1 mg/L. Three adult animals (3 - 5 days old) were kept in microtitre wells containing 0.5 ml of liquid medium (with *E. coli* and without acetylsalicylic acid) during 4 hours, then they were discarded and newborn larvae were transferred in next wells (without acetylsalicylic acid in medium) every day (one worm in one well) beginning from third day. Then, beginning from 3\(^{rd}\) day, these worms were transferred every day in next wells containing medium with acetylsalicylic acid in any concentration. This investigation was carried out in temperature +21°C and in the darkness. The obtained results are presented in the following table.

<table>
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<tr>
<th>Concentration of acetylsalicylic acid (mg/L)</th>
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<th>Longevity (days)</th>
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</table>

Conclusion: If acetylsalicylic acid solution was applied to *C. elegans* in concentration of 10 mg/L, it was able to increase significantly (P>0.05) their mean longevity in comparison with control to 83.96 percent.

Acknowledgment: The authors wish to express their thanks to CGC for providing *C. elegans* (Bristol, N2) and *E. coli* OP50.
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