

Table S1**Name and Accession Numbers of Proteins Used for Phylogenetic Analysis**

Protein Name	Accession Number	Protein Length
Protein CBG25184	CAS00939	1573 aa
CBR-GDI-1 protein	XP_002632610	444
CBR-SRI-18 protein	XP_002637071	331
CBR-PQN-68 protein	XP_002637004	150
CBR-PRS-1 protein	XP_002643184	579
Hypothetical protein CBG16343	XP_002643609	519
CBR-EPS-8 protein	XP_002632592	918
Hypothetical protein CBG03002	XP_002631206	361
CBR-ENOL-1 protein	XP_002631372	434
CBR-GTA-1 protein	XP_002633716	483
Hypothetical protein CBG04561	XP_002637778	326
CBR-LFE-2 protein	XP_002639970	393
CBR-OBR-1 protein	XP_002641357	762
Hypothetical protein CBG18198	XP_002642224	314
CBR-VPS-41 protein	XP_002644672	898
CBR-RPL-13 protein	XP_002646297	207
CBR-UNC-73 protein	XP_002646360	1618

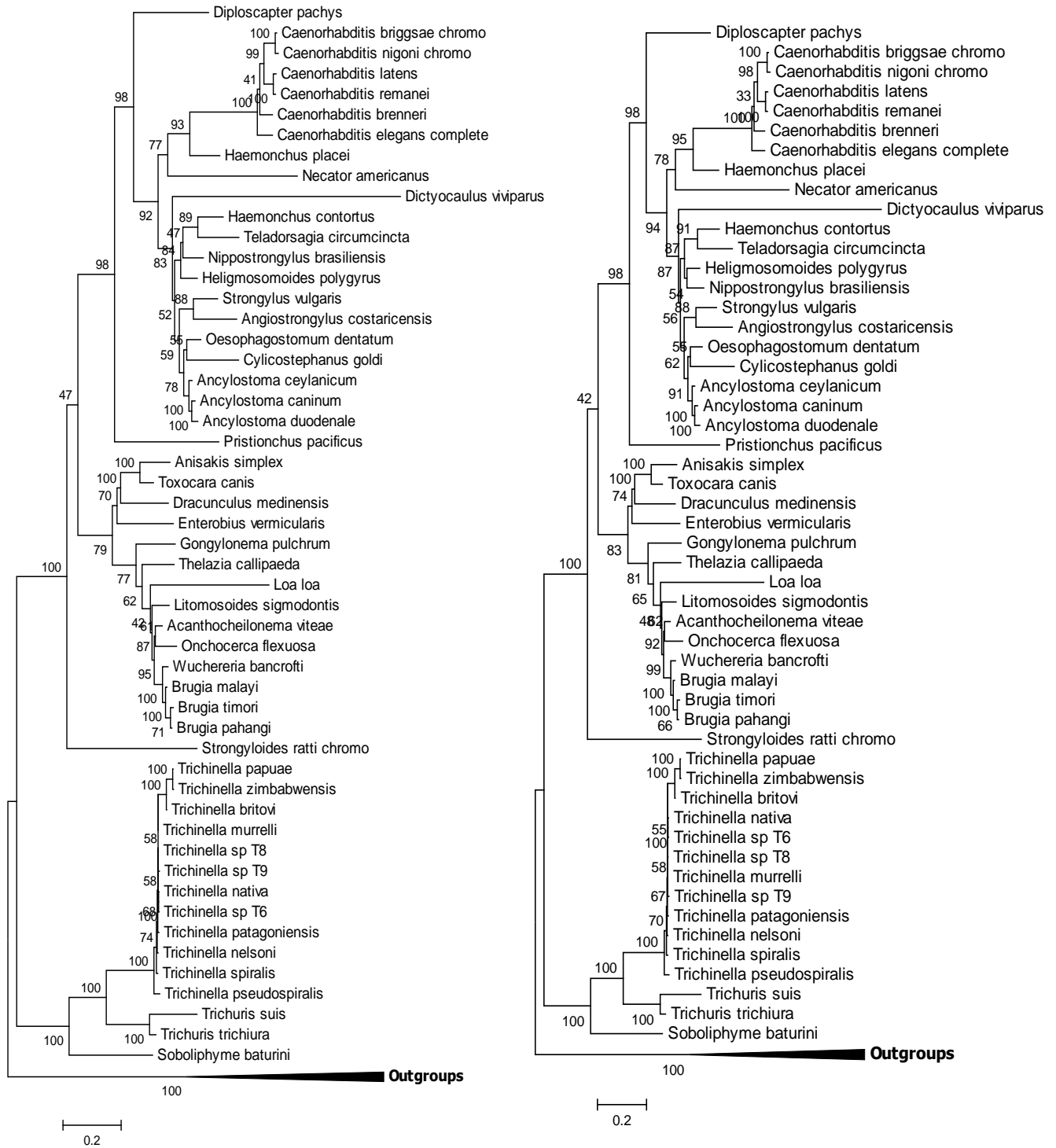


Figure S1. Maximum Likelihood phylogenetic trees of the genome sequenced nematode species based on concatenated sequences of 17 conserved proteins. The trees were constructed in MEGA6 using (A) Whelan and Goldman + Freq. and (B) JTT matrix-based models. Trees are based on 100 bootstrap replicates and rooted using sequences for Apicomplexa species as in Figure 1.

			233	263			
Caenorhabditis (6/6)	{	<i>Caenorhabditis elegans</i>	AFP33163	TIGVDFTVKTMKIP	P	NRAIAMQLWDTAGQER	
		<i>Caenorhabditis brenneri</i>	EGT41967	-----	-	-----	
		<i>Caenorhabditis remanei</i>	OZF92029	-----	-	-----	
		<i>Caenorhabditis latens</i>	OZF87495	-----	-	-----	
		<i>Caenorhabditis briggsae</i>	CAP21883	-----	A	-----	
		<i>Caenorhabditis nigoni</i>	PIC31209	-----	A	-----	
Other Nematodes (0/48)	{	<i>Toxocara canis</i>	KHN75949	-----	IRLQ	--VV-V-----	
		<i>Nippostrongylus brasiliensis</i>	VDL82832	-----	MI--V-VD	-DK-KL-I-----	
		<i>Gongylonema pulchrum</i>	VDN36140	-----	MI--V-VN	DDK-KL-I-----	
		<i>Oesophagostomum dentatum</i>	KHJ84531	-----	I-VG	--VV-L-----	
		<i>Wuchereria bancrofti</i>	EJW79243	-----	IRLC	--VV-I-----	
		<i>Ancylostoma duodenale</i>	KIH53884	-----	I-VG	S-VV-L-----	
		<i>Brugia pahangi</i>	VDN91210	-----	IRLC	--VV-V-----	
		<i>Strongylus vulgaris</i>	VDM82877	-----	I-VG	S-VV-L-----	
		<i>Brugia malayi</i>	CRZ23819	-----	IRLC	--VV-V-----	
		<i>Brugia timori</i>	VDO25812	-----	IRLC	--VV-V-----	
		<i>Necator americanus</i>	XP_013308986	-----	I-VG	S-VV-L-----	
		<i>Dictyocaulus viviparus</i>	KJH46195	-----	TVG	D-VV-L-----	
		<i>Enterobius vermicularis</i>	VDD95818	-----	I-VK	DKFV-V-----	
		<i>Ancylostoma caninum</i>	RCN39681	-----	I-VG	S-VV-L-----	
		<i>Dracunculus medinensis</i>	VDN57676	-----	NIRLG	--TV-V-----	
		<i>Heligmosomoides polygyrus</i>	VDO22485	-----	ITVG	D-VV-L-----	
		<i>Ancylostoma ceylanicum</i>	EYC11435	-----	I-VG	S-IV-L-----	
		<i>Angiostrongylus costaricensis</i>	VDM58536	-----	ICVG	--VV-L-----	
		<i>Heterodera cruciferae</i>	AMD33341	-----	LLVR	E-MV-L-----	
		<i>Haemonchus placei</i>	VD062950	-----	ITVG	E-VV-L-----	
		<i>Acanthocheilonema viteae</i>	VBB25686	-----	I--IRLC	D-IV-V-----	
		<i>Onchocerca flexuosa</i>	OZC09065	---	I--I--IHLY	--VV-V-----	
		<i>Diploscapter pachys</i>	PAV91080	-----	VQLK	G-F--L-----	
		<i>Haemonchus contortus</i>	CDJ88358	-----	ITVG	E-VV-L-----	
		<i>Onchocerca ochengi</i>	VDM94142	-----	I--IRLY	D-VV-V-----	
		<i>Strongyloides ratti</i>	XP_024499704	-----	IN-N	DKKVTI-----	
		<i>Pristionchus pacificus</i>	PDM64254	-----	VQLR	D-LL-V-----	
		<i>Cylicostephanus goldi</i>	VDK82117	---	I--LS--YLE	D-TVRL-----	
		<i>Loa loa</i>	XP_003145161	-----	MI--V-VN	DDK-KL-I-----	
		<i>Anisakis simplex</i>	VDK63524	-----	MI--V-VG	DDK-KL-I-----	
		<i>Soboliphyme baturini</i>	VDP03528	-----	M--LI-D	SKRVKL-I--G---	
		<i>Litomosoides sigmodontis</i>	VDK79798	-----	MI--V-VN	EDK-KL-I-----	
		<i>Teladorsagia circumcincta</i>	PIO59286	-----	KIR-VD-D	GQRVKL-I-----	
		<i>Thelazia callipaeda</i>	VDM96437	-----	Y--FHLD	HCVV-L-----	
		<i>Trichinella nelsoni</i>	KRX14869	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella nativa</i>	KRZ52102	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella sp. T6</i>	KRX81729	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella pseudospiralis</i>	KRY72075	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella spiralis</i>	KRY29793	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella papuae</i>	KRZ80298	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella britovi</i>	KRY53573	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella zimbabwensis</i>	KRZ14659	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichinella patagoniensis</i>	KRY13850	---	I--HM-IL-VE	DQL--L-----	
		<i>Trichuris suis</i>	KHJ43420	---	I--HLRVL-VE	DQL--L-----	
		<i>Trichuris trichiura</i>	CDW52341	---	I--LS--YLE	D-TVRL-----	
		Outgroups (0/>100)	{	<i>Homo sapiens</i>	NP_001138430	-V-I-YR--LNVD	-SQV-L-----
				<i>Mus musculus</i>	XP_006506407	-V-I-YR--VTVD	-AQV-L-----
				<i>Babesia bovis</i>	BAN65758	-----	KI--V--D
<i>Hydra vulgaris</i>	XP_012556792			-----	Q--LE-C	-NW--L-----	

Supplementary Figure 2A. Partial sequence alignments of the protein Rab-44 with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. *T. canis*, *G. pulchrum* and *N. brasiliensis* contains second homologs which contain this CSI.

		411	454
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001023137	FSSYTG YGHTLKWAE LQPNHS RQNTN EFRDRFGR LRVETIAIDA
	<i>Caenorhabditis remanei</i>	XP_003093608	Y---D---KS---KP---EDA D--DS SL--KY---P-----
	<i>Caenorhabditis brenneri</i>	EGT38432	---D---TST---RP-K-K-A ---EP SN--KY-----
	<i>Caenorhabditis briggsae</i>	XP_002647141	Y-G---ANK---RP-SGRYA ---DA RL--KY-----V----
	<i>Caenorhabditis nigoni</i>	PIC17744	Y-G---ARD---HP-T-RYA ---DT RL--KY-----T----
	<i>Caenorhabditis latens</i>	OZG17769	PKPKPAPRK---KA---EDA D--DT SL--KY---P-----
Other Nematodes (0/21)	<i>Diploscapter pachys</i>	PAV64174	---S-----N-KQYDNFGK E KT-NE---INNIM-----
	<i>Gongylonema pulchrum</i>	VDK27510	-----P-FR-QRMEHED- TP-----LC-LV----
	<i>Haemonchus contortus</i>	CDJ80847	Y---F---GS-Q--PFEDFDR -P--K---V-C-LV-M--
	<i>Onchocerca ochengi</i>	VDK68310	--D-D---SSFR-RPMKMM-- FP----N--CC-LV----
	<i>Onchocerca flexuosa</i>	OZC09105	--D-D---SSFR-RPMKMM-- FP----N--CC-LV----
	<i>Dictyocaulus viviparus</i>	KJH49243	H--I---E--Q--PYEEYG- -S--K-C-VKC-VV-M--
	<i>Toxocara canis</i>	VDM38707	Y-D-E---DSFQ-YP-HSPDP LS----E---C-MV----
	<i>Brugia timori</i>	VDO13221	--D-N---SSFR-RPMEKMD- FP----N--CC-LV----
	<i>Brugia malayi</i>	XP_001897754	--D-N---SSFR-RPMEKMD- FP----N--CC-LV----
	<i>Anisakis simplex</i>	VDK26367	Y-D-A---NSFQ-YP-HAPEA LS----E---HC-LV----
	<i>Brugia pahangi</i>	VDN90162	--D-N---SSFR-RPMEKMD- FP----N--CC-LV----
	<i>Oesophagostomum dentatum</i>	KHJ76834	Y-D-I---E--E-SP-ENYGD -P--E-R-VIC-VV-M--
	<i>Ancylostoma duodenale</i>	KIH62945	Y-D-----E--E--R-ENYGF -P--C-R-VIC-VV-M--
	<i>Ancylostoma ceylanicum</i>	EPB77283	Y-D-----E--E--R-ENYGF -P--C-R-VIC-VV-M--
	<i>Wuchereria bancrofti</i>	EJW76497	--D-N---PSFR-RPMEKVD- FP----N--CC-LV----
	<i>Ancylostoma caninum</i>	RCN39092	Y--S---K----LPFEGYG- -P--E-R-VICNVV-M--
	<i>Thelazia callipaeda</i>	VDN02538	--N-V---SSFR-CPMEIKNP LP----R--CC-LV-M--
	<i>Necator americanus</i>	XP_013299999	Y-D-F---E--E-NQ-EDYG- -P--E-L-VIS-VV-M--
	<i>Loa loa</i>	XP_020303580	--G-D---SSFR-RPMEKMD- FP----H--CC-LV----
	<i>Litomosoides sigmodontis</i>	VDK84342	--D-S---SSFR-RPRRKVD- FP----N--CC-LV----
	<i>Acanthocheilonema viteae</i>	VBB29553	--D-S---SSFC-RPMVKAD- FP----N--CC-LV----
Outgroups (0/>200)	<i>Homo sapiens</i>	NP_001290415	Y-E---AE-YR-SRSHEDG- E--DWQ-RCT-IV----
	<i>Mus musculus</i>	NP_001346844	Y-E---AE-YR--RSHEDG- EK-DWQ-RCT-IV----
	<i>Pocillopora damicornis</i>	RMX52245	Y-D---A--FR--GNHSDRT T--SW--RHSKIV----
	<i>Exaoptasia pallida</i>	XP_020892460	Y-D---A--F--GNHDDQT P--SW--RHCQVV----
	<i>Stylophora pistillata</i>	PFX34124	Y-D---A--FR--GNHSDRT T--SW--RHSKIV----
	<i>Acropora millepora</i>	XP_029187629	--D-E--A--FR--GNHVDQV T--SW--RCCSIV----
	<i>Seriola dumerili</i>	XP_022625279	--V-S-F-DSFE--GPHQDRL D--EW--KRQIL----
	<i>Cyprinodon variegatus</i>	XP_015238624	Y-K---SQ-Y--GSHQDTT P--DW--RCT-IV----
	<i>Seriola lalandi dorsalis</i>	XP_023268207	--V-S-F-DSF--GPHRD-L D--GW--KRQIL----
	<i>Danaus plexippus plexippus</i>	OWR43927	Y-T-S---SFS-GSNYNDIT P--SS--K-TAVL----
	<i>Notothenia coriiceps</i>	XP_010772468	--N-S-F-D-FQ-KGPHEERL N--EWA--QRQIV----
	<i>Xenopus tropicalis</i>	XP_017950760	Y-E---SE-Y--RVHEDE- P--EWQ-RTT-IV----
	<i>Bicyclus anynana</i>	XP_023940579	--T-----SFQ--GDFADET PY--SS--R-CAVL----
	<i>Perca flavescens</i>	XP_028456875	--L-S---E-FE--GPYEDRL D--EWA--KRQIL----
	<i>Blyttiomycetes helicus</i>	RK090865	--D-E---D-F--KGPHEDLA P--ALC--KT-I--V--
	<i>Vanessa tameamea</i>	XP_026483100	Y-K-S---SFQ--GEHVDAT P--SS--R-CAVL----
	<i>Myotis lucifugus</i>	XP_023617070	Y-E---AE-YR--RSHEDGN E--DWQ-RST-IV----
	<i>Myotis brandtii</i>	XP_014386202	Y-E---AE-YR--RSHEDGN E--DWQ-RST-IV----
	<i>Mizuhopecten yessoensis</i>	XP_021376375	--D-D--AR-FR-K-NYEDKT P--NW--CTDVV----
	<i>Acanthochromis polyacanthus</i>	XP_022064719	--C-S-F-DSFE--GPHEE-L K--AWA--KRQIL----
	<i>Orbicella faveolata</i>	XP_020608915	Y-D-I--A--FR--GDHVDET T--SW--RHSKIV----
<i>Xenopus laevis</i>	NP_001089602	Y-E---SE-Y--CVHEDE- P--EWQ-RTT-IV----	

Supplementary Figure 2B. Partial sequence alignments of a Poly ADP-ribose Glycohydrolase protein with a CSI consisting of a 5 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		389	420
Caenorhabditis (5/5)	Caenorhabditis elegans	NP_001022057	RVTNVFSILMNGL
	Caenorhabditis briggsae	XP_002629728	-----
	Caenorhabditis nigoni	PIC43332	-----
	Caenorhabditis brenneri	EGT38253	-----
	Caenorhabditis remanei	XP_003097265	-----
Other Nematodes (0/26)	Loa loa	XP_003143505	-L--W---SQ-- RI AP-EAPTT-Y---K-I---
	Onchocerca ochengi	VDN00454	-L--WY---SQ-- RI AP-EAPVS-Y---K-I---
	Wuchereria bancrofti	VDM21799	-L--WY---SQ-- RI AP-EAPAT-Y---K-I---
	Pristionchus pacificus	PDM64980	-LS-F-G--SQ-- RI AP-EAPST-Y---K----
	Diploscapter pachys	PAV91078	-LA-W---TQ-- RI AP-EAPMT-Y---K-I---
	Enterobius vermicularis	VDD85971	-I--WYG--SQ-- RV AP-EAPST-F---K-I---
	Anisakis simplex	VDK59352	-L--WYG--SQ-- RI AP-EAPST-Y---K----
	Heligmosomoides polygyrus	VDO67729	--S-FYN--SH-- RI AP-EVPLT-F---K----
	Trichoplax adhaerens	XP_002109067	----FVG--SQ-- RI AP-EAPVT-Y---K----
	Soboliphyme baturini	VDP00762	-LV-WY---CS-- KI AP-EAPST-Y---K-I---
	Brugia pahangi	VDN89517	-L--WY---SQ-- RI APLEAPKT-Y---K-I---
	Brugia timori	VDO24680	-L--WY---SQ-- RI APLEAPKT-Y---K-I---
	Brugia malayi	XP_001893054	-L--WY---SQ-- RI APLEAPKT-Y---K-I---
	Schistosoma margrebowiei	VDO49046	-L--WVG--GR-- QI AP-EAPSS-Y---K----
	Schistosoma mattheei	VDP63272	-L--WVG--GR-- QI AP-EAPSS-Y---K----
	Nippostrongylus brasiliensis	VDL70778	--S-FYN--SH-- RI AP-EVPLT-Y---K----
	Trichuris suis	KHJ46115	-NS-YAG--CQ-- RI AP-EAPVT-Y---K-I---
	Trichinella nelsoni	KRX19541	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella patagoniensis	KRY16608	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella murrelli	KRX42668	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella spiralis	KRY39132	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella sp. T8	KRZ84918	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella britovi	KRY54119	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella sp. T6	KRX77647	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella nativa	OUC43219	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
	Trichinella zimbabwensis	KRZ17851	-LS-FVG-ISQ-- RI AP-ESLTS-H---K-I---
Outgroups (0/>100)	Homo sapiens	1UK0_A	T--FAG--SQ-- RI AP-EAPVT-Y---K-I---
	Mus musculus	AAF61293	T--FAG--SQ-- RI AP-EAPVT-Y---K-I---

Supplementary Figure 3. Partial sequence alignments of a Poly (ADP-ribose) polymerase 2 protein with a CSI consisting of a 2 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. The sequence alignment of the species *Caenorhabditis latens* was not observed in the BLASTP search.

		186	207
Caenorhabditis (6/6)	<i>Caenorhabditis remanei</i>	OZF80352	GVAIICKSS SSKFKLVLFDKEG
	<i>Caenorhabditis nigoni</i>	PIC39710	-----
	<i>Caenorhabditis brenneri</i>	EGT45655	-----
	<i>Caenorhabditis latens</i>	OZG18293	-----
	<i>Caenorhabditis elegans</i>	NP_001254891	-----
	<i>Caenorhabditis briggsae</i>	XP_002642541	-----
Other Nematodes (0/40)	<i>Diploscapter pachys</i>	PAV60060	-ISV--R-T S F-----RD-
	<i>Teladorsagia circumcincta</i>	PIO53971	-IC-V---A S -----
	<i>Dictyocaulus viviparus</i>	KJH48665	-IC-V---P S -----
	<i>Angiostrongylus costaricensis</i>	VDM62769	-IC-V---P S -----
	<i>Brugia timori</i>	VDO44364	-LMV--R-A Q M-----
	<i>Wuchereria bancrofti</i>	EJW80584	-LMV--R-A Q M-----
	<i>Brugia malayi</i>	XP_001900908	-LMV--R-A Q M-----
	<i>Pristionchus pacificus</i>	PDM62666	--S-V---P S M-----RD-
	<i>Anisakis simplex</i>	VDK63706	-LM-----A Q M-----
	<i>Dracunculus medinensis</i>	VDN52079	-LM-M---P Q M-----
	<i>Soboliphyme baturini</i>	VDO93050	-IVLV-R-H S E----II-----
	<i>Onchocerca flexuosa</i>	OZC07009	-LM--R-M Q M-----
	<i>Onchocerca ochengi</i>	VDK87080	-LM--R-M Q M-----
	<i>Acanthocheilonema viteae</i>	VBB26716	-LM--R-M Q M-----
	<i>Enterobius vermicularis</i>	VDD88357	-IM-----I Q M-----
	<i>Loa loa</i>	XP_020303998	-LMV--R-M Q M-----
	<i>Litomosoides sigmodontis</i>	VDK80743	-LMV--R-M Q M-----
	<i>Thelazia callipaeda</i>	VDN08491	-LM--R-F Q M-----F----
	<i>Strongyloides ratti</i>	XP_024507239	-IIVRVS-A S M-----II---D-
	<i>Oesophagostomum dentatum</i>	KHJ79345	-IC-V--- S -----
	<i>Haemonchus placei</i>	VDO41032	-IC-V--- S -----
	<i>Haemonchus contortus</i>	CDJ87271	-IC-V--- S -----
	<i>Heligmosomoides polygyrus</i>	VDO90444	-IC-V--- S -----
	<i>Necator americanus</i>	XP_013300303	-IC-V--- S -----
	<i>Nippostrongylus brasiliensis</i>	VDL82817	-IC-V--- S -----
	<i>Gongylonema pulchrum</i>	VDN22375	-LM--R-M Q M-----EMSKF
	<i>Toxocara canis</i>	VDM47619	-LM--R-A Q M-----D----
	<i>Trichuris suis</i>	KFD58118	-II-S-R-- S M-----RD-
	<i>Trichinella nelsoni</i>	KRX21170	-II-S-R-T D M-----I-----
	<i>Trichinella nativa</i>	OUC45935	-II-S-R-T D M-----I-----
	<i>Trichinella pseudospiralis</i>	KRY85173	-II-S-R-T D M-----I-----
	<i>Trichinella papuae</i>	95459948	-II-S-R-T D M-----I-----
	<i>Trichinella zimbabwensis</i>	KRZ11165	-II-S-R-T D M-----I-----
	<i>Trichinella patagoniensis</i>	KRY22341	-II-S-R-T D M-----I-----
	<i>Trichinella sp. T6</i>	KRX75581	-II-S-R-T D M-----I-----
	<i>Trichinella sp. T8</i>	KRZ86851	-II-S-R-T D M-----I-----
	<i>Trichinella britovi</i>	KRY49360	-II-S-R-T D M-----I-----
	<i>Trichinella spiralis</i>	KRY33941	-II-S-R-T D M-----I-----
	<i>Trichinella murrelli</i>	KRX41356	-II-S-R-T D M-----I-----
	<i>Trichuris trichiura</i>	CDW57381	-II-S-R-- S M-----RD-

Supplementary Figure 4. Partial sequence alignments of a DnaJ-domain containing chaperone protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for non-nematode organisms in BLASTP search.

		456	487
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001254914	GELK IADLGLARLW EKESRLYTNRVITLWYRP
	<i>Caenorhabditis remanei</i>	POM37359	----- Q-----
	<i>Caenorhabditis latens</i>	OZG10685	----- Q-----
	<i>Caenorhabditis brenneri</i>	EGT52238	----- Q-----
	<i>Caenorhabditis nigoni</i>	PIC37815	----- Q-----N-----
	<i>Caenorhabditis briggsae</i>	XP_002642141	----- Q-----N-----
Other Nematodes (0/43)	<i>Diploscapter pachys</i>	PAV78157	-----F----RF Y ADQQ-P-----
	<i>Strongyloides ratti</i>	XP_024506005	--I-L-F----FY N --QK-----
	<i>Necator americanus</i>	XP_013295973	-----F----YY S SDQE-----
	<i>Haemonchus contortus</i>	CDJ82163	-----F----YY S SDQE-----
	<i>Oesophagostomum dentatum</i>	KHJ92341	-----F----YY S SDQE-----
	<i>Toxocara canis</i>	KHN86651	--I-L-F----Y D -EQD-P-----
	<i>Nippostrongylus brasiliensis</i>	VDL74284	-----F----YY S SDQE-----
	<i>Loa loa</i>	XP_003140552	-----L-----FY D -DQD-P-----
	<i>Enterobius vermicularis</i>	VDD93079	--I-L-F----Y D -DQN-P-----
	<i>Teladorsagia circumcincta</i>	PI063993	-----F----YY S SDQE-----
	<i>Strongylus vulgaris</i>	VDM71588	-----F----YY S SDQE-----
	<i>Haemonchus placei</i>	VDO22610	-----F----YY S SDQE-----
	<i>Dictyocaulus viviparus</i>	KJH46797	--I----F----YY S SDQE-----
	<i>Brugia malayi</i>	XP_001900704	----L-F----FY D -DQD-P-----
	<i>Brugia pahangi</i>	VDN89696	----L-F----FY D -DQD-P-----
	<i>Litomosoides sigmodontis</i>	VDK80595	----L-F----FY D -DQD-P-----
	<i>Angiostrongylus costaricensis</i>	VDM58212	--I----F----YY S SDQE-----
	<i>Onchocerca flexuosa</i>	VDP12968	----L-F----FY D -DQD-P-----
	<i>Dracunculus medinensis</i>	VDN54878	--I-L-F----Y D -ELD-P-----
	<i>Acanthocheilonema viteae</i>	VBB30047	----L-F----FY D -DQD-P-----
	<i>Wuchereria bancrofti</i>	EJW84954	----L-F----FY D -DQD-P-----
	<i>Ancylostoma duodenale</i>	KIH59324	-----F----YY S SDQE-----
	<i>Ancylostoma caninum</i>	RCN31189	-----F----YY S SDQE-----
	<i>Thelazia callipaeda</i>	VDN02201	----L-F----FY N -DQD-P-----
	<i>Anisakis simplex</i>	VDK58077	--I-L-F----Y D -DQD-P-----
	<i>Gongylonema pulchrum</i>	VDN21708	----L-F----FY D -EQD-P-----
	<i>Brugia timori</i>	VDO13135	----L-F----FY D -DQD-P-----
	<i>Trichuris suis</i>	KFD49469	-DI-L-----Y Q RGQQ-P---K-----
	<i>Cylicostephanus goldi</i>	VDK59804	--I----F----YY S SDQE-----
	<i>Trichuris trichiura</i>	CDW56806	-DI-L-----Y Q RGQQ-P---K-----
	<i>Soboliphyme baturini</i>	VDP09343	--I-L-F----Y Q HDKE-P---K-----
	<i>Trichinella pseudospiralis</i>	KRX94481	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella patagoniensis</i>	KRY21320	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella nelsoni</i>	KRX27294	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella sp. T6</i>	KRX76053	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella sp. T8</i>	KRZ86089	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella sp. T9</i>	KRX58564	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella spiralis</i>	KRY35454	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella murrelli</i>	KRX38536	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella britovi</i>	KRY55180	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella nativa</i>	KRZ58235	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella zimbabwensis</i>	KRZ16106	--I-L-F----Y Q RDKV-P---K-----
	<i>Trichinella papuae</i>	KRZ69043	--I-L-F----Y Q RDKV-P---K-----
Outgroups (0/>100)	<i>Homo sapiens</i>	AAD54514	-QI-L-F----Y S SE---P---K-----
	<i>Mus musculus</i>	BAC29077	-QI-L-F----Y S SE---P---K-----

Supplementary Figure 5. Partial sequence alignments of a Cyclin dependent kinase 12 protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		448	GG	487
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001040875	SPFIDEKTRKKFMVSGGS	DLKEELRKHIEEKFI PDFL
	<i>Caenorhabditis briggsae</i>	XP_002641795	-----	-----D-----
	<i>Caenorhabditis nigoni</i>	PIC39092	-----	-----D-----
	<i>Caenorhabditis brenneri</i>	EGT33558	-----	-----Y-----
	<i>Caenorhabditis remanei</i>	POM40570	-----	-----D-----
	<i>Caenorhabditis latens</i>	OZG18173	-----	-----D-----
Other Nematodes (0/42)	<i>Oesophagostomum dentatum</i>	KHJ77459	----DN--N---IN--E	LV---IS-Y-D-QY----
	<i>Brugia timori</i>	VD035878	----N-----INA-E	PVIS---Y---QY--E--
	<i>Ancylostoma caninum</i>	RCN37277	----DN--N---IN--E	LV---IS-Y-DDQY----
	<i>Necator americanus</i>	XP_013291223	----DN--N---IN--E	TV---IS-Y-DDQY----
	<i>Strongylus vulgaris</i>	VDM75523	----DN--N---IN--E	LV---IS-Y-D-QY----
	<i>Brugia malayi</i>	XP_001899466	----N-----INA-E	PVIS---Y---QY--E--
	<i>Wuchereria bancrofti</i>	EJW86413	----N-----INA-E	PVIS---Y---QY--E--
	<i>Loa loa</i>	XP_020306009	----N-----INA-E	PVIS---Y---QY--E--
	<i>Brugia pahangi</i>	VDN83279	----N-----INA-E	PVIS---Y---QY--E--
	<i>Onchocerca ochengi</i>	VDK61168	----N-----INA-E	SVIS---Y--QQY--E--
	<i>Ancylostoma ceylanicum</i>	EYC32960	----DN--N---IN--E	LV---IS-Y-DDQY----
	<i>Heligmosomoides polygyrus</i>	VDP04674	----N--N---INS-E	VV-D-IS-YVD-QY----
	<i>Nippostrongylus brasiliensis</i>	VDL74672	----N--N---INS-E	VV-D-IS-YVD-QY----
	<i>Litomosoides sigmodontis</i>	VDK72923	----N-----INA-E	PVIS--K-Y---QY--E--
	<i>Acanthocheilonema viteae</i>	VBB31712	----N-----INA-E	PVIC---Y---QY--E--
	<i>Teladorsagia circumcincta</i>	PI077325	----N--N---INS-E	IV-D-IS-Y-DDQY----
	<i>Onchocerca flexuosa</i>	OZC09224	----N-----INA-E	PVIS---Y--QQY--E--
	<i>Haemonchus placei</i>	VDO25093	----DN--N---INS-E	LV-D-IS-Y-D-QY----
	<i>Haemonchus contortus</i>	CDJ85549	----DN--N---INS-E	LV-D-IS-Y-D-QY----
	<i>Dracunculus medinensis</i>	VDN57909	----N-----NASE	S-PA--A-Y-D--YV----
	<i>Thelazia callipaeda</i>	VDN04664	----N-----INS-Q	PVVN--K-Y-S-E---A--
	<i>Enterobius vermicularis</i>	VDD87376	----N-----INA-E	SVIS--K-YMD-QY--E--
	<i>Anisakis simplex</i>	VDK47223	----N-----INSSE	SVFN--S-Y-D-QYL----
	<i>Cylicostephanus goldi</i>	VDK62164	----DN--S--KIN--D	FV-G-IS-Y-D-QY----
	<i>Angiostrongylus costaricensis</i>	VDM52935	----N--N---INS-E	IS-G-IS-Y-DDQY----
	<i>Dictyocaulus viviparus</i>	KJH42177	----T--N---INS-E	LV-G-IS-YVDDQY----
	<i>Strongyloides ratti</i>	XP_024498558	----N-----NSNE	HIIDD-K-Y-D-NYL-T--
	<i>Toxocara canis</i>	KHN86630	----N-----INS-E	AVLV--S-Y-DQQYL-E--
	<i>Trichuris suis</i>	KFD57671	----N--AN--IY---	-YANC-CQYM-Q-W----
	<i>Trichinella sp. T9</i>	KRX61898	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella nativa</i>	KRZ51817	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella sp. T6</i>	KRX77867	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella spiralis</i>	KRY33248	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella zimbabwensis</i>	KRZ14091	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella papuae</i>	KRZ78546	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella britovi</i>	KRY45589	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella patagoniensis</i>	KRY15637	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella sp. T8</i>	KRZ85865	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella murrelli</i>	KRX35808	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella nelsoni</i>	KRX21447	----N-R-A---IYS-N	-YVDC-KHYMD-EW----
	<i>Trichinella pseudospiralis</i>	KRY73116	----N-R-A---IYS-N	-YVDC-KHYMD-EW--E-
	<i>Trichuris trichiura</i>	CDW51999	----N--AN--IY---	-YANC-CQYM-Q-W----
Outgroups (0/>100)	<i>Homo sapiens</i>	BAG56746	----DN--R--LIYA-N	-YQGPGLLDY-DKEI---
	<i>Mus musculus</i>	EDL34613	----DN--R--LIYA-N	-YQGPGLLDY-DKEI---

Supplementary Figure 6. Partial sequence alignments of an CRAL-TRIO domain-containing Sec14 protein with a CSI consisting of a 2 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

			80	109
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001254942	HKNIIQFYGICKAT	G NDFIVTEYAEKGSL
	<i>Caenorhabditis remanei</i>	XP_003113095	-----	- --Y-----
	<i>Caenorhabditis latens</i>	OZG12911	-----	- --Y-----
	<i>Caenorhabditis brenneri</i>	EGT52079	-----	-----R---
	<i>Caenorhabditis briggsae</i>	CAP34484	-----	- --Y-----R---
	<i>Caenorhabditis nigoni</i>	PIC38130	-----	- --Y-----R---
Other Nematodes (0/17)	<i>Diploscapter pachys</i>	PAV57043	-----H---TG	T--Y-I--F-PN---
	<i>Ancylostoma duodenale</i>	KIH62964	-R---H-----SM	S-----D---N---
	<i>Ancylostoma caninum</i>	RCN31590	-R---H-----SM	S-----D---N---
	<i>Oesophagostomum dentatum</i>	KHJ88987	-R---H---V--TM	S-----D---N---
	<i>Ancylostoma ceylanicum</i>	EPB70831	-R---H-----SL	S-----D---N---
	<i>Anisakis simplex</i>	VDK48365	-R-----VS-TD	P-----F--G---
	<i>Enterobius vermicularis</i>	VDD89857	-R-----F-VSHTN	P-----F--N---
	<i>Toxocara canis</i>	KHN72927	-R-----F-VSQTN	P-----F-DG---
	<i>Strongyloides ratti</i>	XP_024505381	-R---K---VSL-K	P-YY----F-AN---
	<i>Onchocerca ochengi</i>	VDK65711	----LRYF-AEVHG	---WLI--FHDN---
	<i>Onchocerca flexuosa</i>	OZC05979	----LRYF-SEVHG	---WLI--FHDN---
	<i>Gongylonema pulchrum</i>	VDN19314	-E-V--LF-VVTES	EPVM-----M-N---
	<i>Brugia pahangi</i>	VDN94600	-P---K---VATLK	DPIM--M-F-SG---
	<i>Loa loa</i>	XP_003139070	-P---K---VATLK	DPIM--M-F-SG---
<i>Acanthocheilonema viteae</i>	VBB30169	-P---K---VATLK	DPIM--M-F-SG---	
<i>Brugia timori</i>	VDO38867	----LRYL-AEVHG	---WLI--FHDN---	
<i>Brugia malayi</i>	CDQ03802	----LRYL-AEVHG	---WLI--FHDN---	
Outgroups (0/>100)	<i>Homo sapiens</i>	NP_057737	-R-----VILEP	PNYG--- --SL-
	<i>Mus musculus</i>	BAC32371	-R-----VILEP	PNYG--- --SL-

Supplementary Figure 7. Partial sequence alignments of a Mammalian ZAK kinase homolog protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

	<i>Caenorhabditis elegans</i>	NP_001022706	DHRGTTNSFQMQS	LQ	KTPLSVLYSTEGSVLE
Caenorhabditis (6/6)	<i>Caenorhabditis nigoni</i>	PIC13845	-----	--	-----I-----
	<i>Caenorhabditis briggsae</i>	XP_002642442	-----	--	-----I-----
	<i>Caenorhabditis brenneri</i>	EGT56754	-----A	--	-----
	<i>Caenorhabditis remanei</i>	POM39899	-----	--	-----V-----
	<i>Caenorhabditis latens</i>	OZF89246	-----	--	-----V-----
		<i>Diploscapter pachys</i>	PAV86338	-----L--	--
Other Nematodes (0/40)	<i>Nippostrongylus brasiliensis</i>	VDL76464	-----A--L--	--	R---AL---S-----
	<i>Dictyocaulus viviparus</i>	KJH43544	-----A--L--	--	---AQ---S-----
	<i>Ancylostoma caninum</i>	RCN25685	-----A--L--	--	---AQ---S-----
	<i>Haemonchus placei</i>	VDO28866	-----A--L--	--	---AQ---S-----
	<i>Ancylostoma duodenale</i>	KIH62265	-----A--L--	--	---AQ---S-----
	<i>Ancylostoma ceylanicum</i>	EPB72032	-----A--L--	--	---AQ---S-----
	<i>Haemonchus contortus</i>	CDJ82671	-----A--L--	--	---AQ---S-----
	<i>Anisakis simplex</i>	VDK54203	-----A--L--	--	---AQ---S-----
	<i>Necator americanus</i>	XP_013299661	-----A--L--	--	---AQ---S-----
	<i>Toxocara canis</i>	KHN78341	-----A--L--	--	---AQ---S-----
	<i>Brugia malayi</i>	CRZ26330	-----A--V--	--	R---AQ---S-----
	<i>Heligmosomoides polygyrus</i>	VDP09895	-----A--L--	--	---AQ---S-----
	<i>Oesophagostomum dentatum</i>	KHJ90379	-----T--L--	--	R---AQ---S-----
	<i>Brugia pahangi</i>	VDN89372	-----A--V--	--	R---AQ---S-----
	<i>Loa loa</i>	XP_020303296	-----A--V--	--	R---AQ---S-----
	<i>Wuchereria bancrofti</i>	EJW83303	-----A--V--	--	R---AQ---S-----
	<i>Litomosoides sigmodontis</i>	VDK68074	-----A--V--	--	R---AQ---S-----
	<i>Thelazia callipaeda</i>	VDN06480	-----A--V--	--	R---AQ---S-----
	<i>Onchocerca ochengi</i>	VDK64108	-----A--V--	--	R---AQ---S-----
	<i>Onchocerca flexuosa</i>	OZC09660	-----A--V--	--	R---AQ---S-----
	<i>Strongyloides ratti</i>	XP_024507051	-----A--L--	--	---AQ---S-----
	<i>Brugia timori</i>	VDO21918	-----A--V--	--	R---AQ---S-----
	<i>Acanthocheilonema viteae</i>	VBB26691	-----A--V--	--	R---AQ---S-----
	<i>Pristionchus pacificus</i>	PDM84936	-----K-A	--	R---AQ---S-----
	<i>Trichinella spiralis</i>	XP_003378646	-----V--	--	--A-AQ---S-----
	<i>Trichinella nativa</i>	OUC49818	-----V--	--	--A-AQ---S-----
	<i>Trichinella papuae</i>	KRZ78135	-----V--	--	--A-AQ---S-----
	<i>Trichinella murrelli</i>	KRX50328	-----V--	--	--A-AQ---S-----
	<i>Trichinella britovi</i>	KRY57231	-----V--	--	--A-AQ---S-----
	<i>Trichinella sp. T8</i>	KRZ92979	-----V--	--	--A-AQ---S-----
	<i>Trichinella pseudospiralis</i>	KRZ31736	-----V--	--	--A-AQ---S-----
	<i>Trichinella nelsoni</i>	KRX28020	-----V--	--	--A-AQ---S-----
	<i>Trichuris trichiura</i>	CDW57862	-----V--	--	--A-AQ---S-----
	<i>Trichinella patagoniensis</i>	KRY19114	-----V--	--	--A-AQ---S-----
	<i>Trichinella sp. T6</i>	KRX82861	-----V--	--	--A-AQ---S-----
	<i>Trichinella sp. T9</i>	KRX64000	-----V--	--	--A-AQ---S-----
<i>Trichinella zimbabwensis</i>	KRZ13685	-----V--	--	--A-AQ---S-----	
<i>Trichuris suis</i>	KFD50868	-----V--	--	--A-AQ---S-----	
Outgroups (0/>100)	<i>Homo sapiens</i>	4HTX_A	----N----	VA-	-SV-AA ---S---M
	<i>Mus musculus</i>	AAH06845	----N----	VA-	-SV-AA ---S---M

Supplementary Figure 8. Partial sequence alignments of a probable 3',5'-cyclic phosphodiesterase pde-2 protein with a CSI consisting of a 2 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		7	35
Caenorhabditis (7/7)	<i>Caenorhabditis elegans</i>	NP_001256335	EFAAFKAITFLNPDA
	<i>Caenorhabditis remanei</i>	OZF78699	-----
	<i>Caenorhabditis latens</i>	OZG09782	-----
	<i>Caenorhabditis nigoni</i>	PIC26490	-----
	<i>Caenorhabditis briggsae</i>	XP_002636614	-----
	<i>Caenorhabditis brenneri</i>	EGT48686	-----
	Other Nematodes (0/16)	<i>Diploscapter pachys</i>	PAV80213
<i>Necator americanus</i>		XP_013293410	-----F-----
<i>Ancylostoma ceylanicum</i>		EPB78040	-----T-F-----
<i>Teladorsagia circumcincta</i>		PI066922	-----T-F-----
<i>Ancylostoma caninum</i>		RCN37032	-----T-F-----
<i>Haemonchus placei</i>		VD026611	-----T-F-----
<i>Dictyocaulus viviparus</i>		KJH43863	---T---AL-F---
<i>Angiostrongylus costaricensis</i>		VDM58595	---T---AL-F---
<i>Pristionchus pacificus</i>		PDM77897	--S-----F-----
<i>Heligmosomoides polygyrus</i>		VD079280	-----T-F-----
<i>Haemonchus contortus</i>		CDJ92296	---T---AL-F---
<i>Nippostrongylus brasiliensis</i>		VDL82945	-----T-F-----
<i>Anisakis simplex</i>		VDK50975	--S-----F-----
<i>Strongylus vulgaris</i>		VDM85120	-----T-F-----
<i>Toxocara canis</i>		KHN81931	-----F-----
<i>Ancylostoma duodenale</i>		KIH69436	---T---AL-F---

DISLESKHAINEER
 -V---A--E--T--
 -V---A--E--T--
 -V---A--E--L--
 -V---A--E--L--
 -V---A--E--L--
 -V--DA-A-----

Supplementary Figure 9. Partial sequence alignments of a Nuclear Hormone Receptor protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

		1353	1393
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001256383	RREADEVVGMWYKAKL VM SGDDSSALAPSAIPHRLLKHEAF
	<i>Caenorhabditis nigoni</i>	PIC26477	-----M--H----- -A-----A-----
	<i>Caenorhabditis briggsae</i>	CAP39687	-----M--H----- -A-----A-----
	<i>Caenorhabditis remanei</i>	XP_003114094	-----M--H----- -A-----T--T-----
	<i>Caenorhabditis latens</i>	OZG15081	-----M--H----- -A-----T--T-----
	<i>Caenorhabditis brenneri</i>	EGT60238	-----M--H----- -A-----AT--A-----
Other Nematodes (0/27)	<i>Ancylostoma ceylanicum</i>	EYB93290	K-D-E-MIS-IH-K-- AN--HRDLTS-ANK-----
	<i>Ancylostoma duodenale</i>	KIH45166	K-D-E-MIS-I--K-- AN--HRDLTS-ANK-----
	<i>Brugia malayi</i>	CDP98888	--NIQ-LSQ-IA--R-I AN--YRD TAS-TMK----K--
	<i>Dictyocaulus viviparus</i>	KJH48207	K-D-E-MIA-IHD-K-- AN--HKDL-S-ANK-----
	<i>Diploscapter pachys</i>	PAV55545	K-DG-MI--IA--K-T AC--HRDLTS-ANK--R----
	<i>Haemonchus contortus</i>	CDJ92175	K-D-E-MIT-IH--K-- AN--HRDLTS-ANK-----
	<i>Loa loa</i>	XP_020307521	--NIQ-LSQ-IA--E-I AN--YRDAAS-TMK----K--
	<i>Necator americanus</i>	XP_013296416	K-D-E-MIS-IH--K-- AN--HRDLTS-ANK-----
	<i>Oesophagostomum dentatum</i>	KHJ79216	--D-E-MIA-IHD-K-- AN--HRDLTS-ANK-----
	<i>Onchocerca flexuosa</i>	OZC12060	--NIQ-LTQ-IA--KRI AN-G-YRDAAS-TMK----K--
	<i>Strongyloides ratti</i>	CEF62413	--D-F-LNC--V--KGI L-EEDLSD--LRRH-QR--K-
	<i>Wuchereria bancrofti</i>	EJW88400	--NIQ-LSQ-IA--R-I AN--YRD TAS-TMK----K--
	<i>Toxocara canis</i>	KHN72701	--NIQ-LSQ-IA--K-I AN--AHKDAASLANK----S--
	<i>Trichinella britovi</i>	KRY52189	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella murrelli</i>	KRX45023	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella nativa</i>	KRZ55341	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella nelsoni</i>	KRX16494	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella papuae</i>	KRZ76031	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella patagoniensis</i>	KRY15104	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella pseudospiralis</i>	KRX93022	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella sp. T9</i>	KRX58782	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella sp. T8</i>	KRZ97225	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella sp. T6</i>	KRX80779	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella spiralis</i>	KRY35759	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichinella zimbabwensis</i>	KRZ10195	--VE-LMQ-IG--MRI VSS--YHSGNLQK-IK-----
	<i>Trichuris suis</i>	KFD52473	K-N--LLV-VG--MRI AV--YHSGNLQK-IK-----
	<i>Trichuris trichiura</i>	CDW52048	K-N--LLV-VG--MRI AV--YHSGNLQK-IK-----
Outgroups (0/>100)	<i>Homo sapiens</i>	EAW87810	F-DS--LKS-VN--M-T AT-EAYKD--NLQKVVQ--Q--
	<i>Mus musculus</i>	XP_006497875	F-DS--LKS-VN--M-T AT-EAYKD--NLQKVVQ--Q--

Supplementary Figure 10. Partial sequence alignments of a SMAII-like (spore membrane assembly protein 2-like) apotein with a CSI consisting of a 2 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		65	103
Caenorhabditis homologs 1 (0/6)	<i>Caenorhabditis elegans</i>	NP_001254962	WYFSKHYKGVPTLEHDEG K KHVIESAVIPEYLDDIYPE
	<i>Caenorhabditis brenneri</i>	EGT52105	-----A----- -LF--
	<i>Caenorhabditis remanei</i>	POM37290	-----A----- -H-----LF--
	<i>Caenorhabditis latens</i>	OZG10203	-----A----- -H-----LF--
	<i>Caenorhabditis briggsae</i>	XP_002642151	-----A-L----- -H-----LF--
	<i>Caenorhabditis nigoni</i>	PIC37794	-----A-L----- -H-----LF--
Caenorhabditis homologs 2 (0/6)	<i>Caenorhabditis elegans</i>	NP_498728	--WT--Q-KA-AV--N -V----GF-----AF--
	<i>Caenorhabditis brenneri</i>	EGT56590	-----Q-KA-AV--- -V----GF-----AF--
	<i>Caenorhabditis remanei</i>	OZF78070	-----Q-KA-AI--N -I----GY-----AF--
	<i>Caenorhabditis latens</i>	OZG17648	-----Q-KA-AI--N -I----GY-----AF--
	<i>Caenorhabditis nigoni</i>	PIC40033	-FY---Q-KA-AI--- -I----GF-----AF--
	<i>Caenorhabditis briggsae</i>	XP_002642703	-FY---Q-KA-AI--- -I----GF-----AF--
Other Nematodes (0/22)	<i>Diploscapter pachys</i>	1240346389	--K--Q-K--F--- -V----LM-----AF-N
	<i>Pristionchus pacificus</i>	1253266495	--N--PQ-K--F-K- -QI---GI-----G----
	<i>Anisakis simplex</i>	1528886049	--K--PQ-NL----- -II---T--VQ---ELF--
	<i>Toxocara canis</i>	1535084310	--K--PE-K--A--YN -NI-V---I--Q----LL--
	<i>Loa loa</i>	312091393	-FL---PE-T--V----- -L-SD-R--I-----AF--
	<i>Strongyloides ratti</i>	1376147712	--L--SPT---LF--- -YIT--N--L-----FSA
	<i>Brugia timori</i>	1535290525	-FL---PE-T--L----- -L-PD-R--I-----AF--
	<i>Brugia malayi</i>	170591346	-FL---PE-T--L----- -L-PD-R--I-----AF--
	<i>Wuchereria bancrofti</i>	1528677019	-FL---PE-T--L----- -L-PD-R--I-----AF--
	<i>Onchocerca ochengi</i>	1528803377	-FY--NPE-V--V--N -L-NG-QM-I-----V---
	<i>Ancylostoma ceylanicum</i>	597840312	FL---PE-K--V--K -QNI-D--L-S---W-Q-H
	<i>Litomosoides sigmodontis</i>	1528641557	-FLK-SPL-R--A--MN -VTIY--S--A---EVF--
	<i>Acanthocheilonema viteae</i>	1511235889	-FLN-SPL-R--A--MN -VTIY--S--A---E-F--
	<i>Onchocerca flexuosa</i>	1233063254	-FLN-SPL-R--AF-MN -IIIIY--S--A---E-F--
	<i>Teladorsagia circumcincta</i>	1276828720	--LA-SPL-S--A--IN -VIW--K-LA---EVF-T
	<i>Haemonchus placei</i>	1535225151	--LA-SPL-S--A--IN -VIW--K-LA---EVF-M
	<i>Heligmosomoides polygyrus</i>	1530586556	--LA-SPL-S--A--IN -VIW--K-LA---EVF-S
	<i>Ancylostoma duodenale</i>	748384251	--LA-SPL-S--A--IN -RVIW--K-LA---EVF-S
	<i>Haemonchus contortus</i>	560138214	--LA-SPL-S--A--IN -VIW--K-LA---EVF-M
	<i>Angiostrongylus costaricensis</i>	1529400037	--LA-SPL-S--A--IN -NVIF--K-LA---EVF-S
	<i>Ancylostoma caninum</i>	1432393302	--LA-SPL-S--A--IN -RVIW--K-LA---EVF-S
	<i>Necator americanus</i>	915240016	--LA-SPL-S--A--IN -NVIW--K-LA---EMF-S
Outgroups (0/>100)	<i>Homo sapiens</i>	NP_001177932	-F-K-NPF-L--V--NSQ- QLIY---ITC---EA--G
	<i>Mus musculus</i>	NP_080895	--YT--PF--I-V--NSQC QL-Y--VIAC-----V--G

Supplementary Figure 11. Partial sequence alignments of a Glutathione transferase omega-1 protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI.

		46	90
Caenorhabditis (5/6)	<i>Caenorhabditis elegans</i>	NP_001254973	LCKIMLNETEQLAGLLAAKEIVAYQKSP R IIAIRSMADAFKRSL
	<i>Caenorhabditis briggsae</i>	XP_002642446	-----IPAM-ST--VLP-NT-- -V---A-----
	<i>Caenorhabditis nigoni</i>	PIC13841	-----IPAM-ST--VLP-NTN- -V---A-----
	<i>Caenorhabditis remanei</i>	POM39937	-----PS---T--FLP-HSNL ----A-----
	<i>Caenorhabditis brenneri</i>	EGT56767	-----VD--PAIM-T-AV-PHLTDL K-V--L-----
	<i>Caenorhabditis latens</i>	OZG01391	--V--DVPDEVNS--S-KLALKYSGSDL E-MKAI-A-AQ----
Other Nematodes (0/31)	<i>Diploscapter pachys</i>	PAV73536	---LTDGAAAVPVM-ST--AA--SGPS -S-VKQL-K--EE---
	<i>Oesophagostomum dentatum</i>	KHJ81246	-----DADSIPL--ST-VLQPVGRG E-MKC--E--KE---
	<i>Ancylostoma caninum</i>	RCN32955	-----A-SIPL--ST-VLQPVGRG VD-MKC--E--KE---
	<i>Ancylostoma duodenale</i>	KIH66516	-----A-SIPL--ST-VLQPVGRG VD-MKC--E--KE---
	<i>Ancylostoma ceylanicum</i>	EPB72600	-----A-SIPL--ST-VLQPVGRG VD-MK---E--KE---
	<i>Strongylus vulgaris</i>	VDM73537	----ADSIPL---T-VLQPV-GRE VD-MKC--E--KE---
	<i>Dictyocaulus viviparus</i>	KJH43501	----M--A-SVPF--ST-VAQSIRGRD VD-MKC--E--KE---
	<i>Necator americanus</i>	XP_013303392	-----ADSIPL--SN-VLQ-VHGRD VD-MK---E--KE---
	<i>Haemonchus contortus</i>	CDJ89185	-----ADTIPL--ST-T-QSIRGRE -E-MK---E--TE---
	<i>Haemonchus placei</i>	VDO28354	-----ADTIPL--ST-T-QSIRGRE -E-MK---E--TE---
	<i>Toxocara canis</i>	KHN88339	-A-----A-EVPLI-SG-IA-K-KGRD VE-M--V-A--QQ---
	<i>Anisakis simplex</i>	VDK27391	-A---M--A-EVPSI-SG-LALK-KGRD VE-MQ-V-Q--QQ---
	<i>Soboliphyme baturini</i>	VD092414	-----LPDDVQS--S--IALK-VGRE VD-MKAV--SK----
	<i>Wuchereria bancrofti</i>	EJW84880	-A-----EREISL--SS-LAAK-SGRD LD-MKDI-S--EN-C-
	<i>Brugia pahangi</i>	VDN91962	-A-----EREIGL--SS-LAAK-SGRD LD-MKDI-S--EN-C-
	<i>Brugia malayi</i>	CDP99050	-A-----EREIGL--SS-LAAK-SGRD LD-MKDI-S--EN-C-
	<i>Loa loa</i>	XP_020301826	-A-----ETEVS--SS-LATK-SGRD LD-M-DI-T--EN---
	<i>Acanthocheilonema viteae</i>	VBB27213	-T-----EIEVQS--SS-QAMK-SGRD LD--K-I-A--DN---
	<i>Onchocerca flexuosa</i>	VDP14909	-A-----ELEVHSI-SS-LAAK-SGRD LD---TI-E-LEN---
	<i>Onchocerca ochengi</i>	VDK79902	VA-----EVEVRSI-SS-LAAK-SGRD LD---TI-E-LEN---
	<i>Litomosoides sigmodontis</i>	VDK81777	IA-----ETEVPT--SG-QTIKHSRD LD-MKRI-E--HN---
	<i>Strongyloides ratti</i>	XP_024507529	---V--DSPDDVKS--SQ-LALK-SGRD LD-M-AV-N-AK----
	<i>Trichinella pseudospiralis</i>	KRZ32121	-----LPDEVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichinella zimbabwensis</i>	KRZ06531	-----LPDEVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichinella spiralis</i>	XP_003375869	-----LPDDVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichinella sp. T6</i>	KRX70901	-----LPDDVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichinella britovi</i>	KRY56382	-----LPDDVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichinella murrelli</i>	KRX35477	-----LPDDVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichinella nelsoni</i>	KRX19233	-----LPDDVHI-VQG-LGMKHAGRQ LE-MKAV-T-SKE---
	<i>Trichuris trichiura</i>	CDW54525	-----RP-DVSII-SG-LATK-VGRE VD-MKAV-H-SKE---
	<i>Trichuris suis</i>	KFD62841	-----RP-DVSII-SG-LATK-VGRE VD-MKAV-H-SKE---
Outgroups (0/>100)	<i>Homo sapiens</i>	5VGZ_X	-----TP-DVQA-VSG -LALR-AGRQ TE-LKCV-Q-SKN---
	<i>Mus musculus</i>	EDL15644	-----TP-DVQA-VSG -LALR-AGRQ TE-LKCV-Q-SKN---

Supplementary Figure 12. Partial sequence alignments of a 26S proteasome regulatory protein subunit with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		92	130		
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001256283	VKRAALNELVDHVS GA P	KGSLSDAVYPEAIGMFSTNLFR	
	<i>Caenorhabditis remanei</i>	XP_003100389	-----	A-----H-----	
	<i>Caenorhabditis latens</i>	OZG13626	-----	A-----H-----	
	<i>Caenorhabditis brenneri</i>	EGT55351	-----	A R---E---N-----	
	<i>Caenorhabditis nigoni</i>	PIC26850	-----Y--A-	S--T-----N-----	
	<i>Caenorhabditis briggsae</i>	XP_002636421	-----Y--A-	S--T-----N-----	
	<i>Diploscapter pachys</i>	PAV63148	I-----I--ITTT	--AIVE-I---V-K-V-K-I--	
	<i>Heligmosomoides polygyrus</i>	VD029824	-----I-Y--TC	RDAIT-NI----N--AL----	
	<i>Dictyocaulus viviparus</i>	KJH45358	-----I-Y--TC	RDAIT-NI----N--AV----	
	<i>Enterobius vermicularis</i>	VDD95190	I-----I--ITTV	--AITE-I---V-N-V-M-I--	
	<i>Gongylophora pulchrum</i>	VDN17983	I-----I--ITTV	--AITESI---V-K-V-K-I--	
	<i>Onchocerca ochengi</i>	VDK71745	I-----I--ITTV	--AITESI---V-K-V-K-I--	
	<i>Cylicostephanus goldi</i>	VDN34744	I-----I--ITTT	--AIVESI---V-K-V-K-I--	
	<i>Teladorsagia circumcincta</i>	PI072193	-----I-Y--TC	RDAITEN-----N--AL----	
	Other Nematodes (0/39)	<i>Capitella teleta</i>	ELU16316	-----M-EY-TQN	R-VIT-----S-R--GV----
		<i>Haemonchus contortus</i>	CDJ84163	-----I-Y--TC	RDAITENI----N--AV----
<i>Onchocerca flexuosa</i>		VD026608	I-----I--ITTV	--AITESI---V-K-V-K-I--	
<i>Brugia timori</i>		VD024925	I-----I--ITTV	--AITELI---V-K-V-K-I--	
<i>Brugia pahangi</i>		VDN92265	I-----I--ITTV	--AITELI---V-K-V-K-I--	
<i>Brugia malayi</i>		CRZ24423	I-----I--ITTV	--AITELI---V-K-V-K-I--	
<i>Loa loa</i>		XP_020303422	I-----I--ITTV	--AITELI---V-K-V-K-I--	
<i>Angiostrongylus costaricensis</i>		VDM53307	---T---I-Y--TC	RDVIT-N-----N--AV----	
<i>Ancylostoma ceylanicum</i>		EPB69273	I-----I--ITTT	--AIVESI---V-K-V-K-I--	
<i>Necator americanus</i>		XP_013294654	I-----I--ITTT	--AIVESI---V-K-V-K-I--	
<i>Wuchereria bancrofti</i>		VDM09038	I-----I--ITTV	--AITELI---V-K-V-K-I--	
<i>Ancylostoma duodenale</i>		KIH63659	I-----I--ITTT	--AIVESI---V-K-V-K-I--	
<i>Thelazia callipaeda</i>		VDN06789	I-----I--ITTV	--AITESI---I-K-A-K-I--	
<i>Toxocara canis</i>		KHN78251	I-----I--ITTV	--AITEPI---V-K-V-K-I--	
<i>Ancylostoma caninum</i>		RCN34933	-----I-Y--TC	RDVITEN-----N--AL----	
<i>Acanthocheilonema viteae</i>		VBB32494	I-----I--ITTV	--AITELI---M-K-V-K-I--	
<i>Acanthaster planci</i>		XP_022087591	-----F--THQ	R-VITEPI---VK---I-M--	
<i>Haemonchus placei</i>		VD023997	-----I-Y--TC	RDAITENI----N--AI----	
<i>Oesophagostomum dentatum</i>		KHJ92877	I-----I--ITTT	--AIVESI---V-K-V-K-I--	
<i>Trichinella patagoniensis</i>		KRY08455	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella pseudospiralis</i>		KRZ40843	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella sp. T6</i>		KRX84522	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella zimbabwensis</i>		KRZ12447	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella sp. T9</i>		KRX66464	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella papuae</i>		KRZ78327	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella britovi</i>		KRY60742	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella sp. T8</i>		KRZ86685	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella nelsoni</i>		KRX17598	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella spiralis</i>		KRY43433	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella nativa</i>		KRZ61030	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichinella murrelli</i>		KRX50117	--ST---I-Y--AN	REIFTESI---VVN--AV-T--	
<i>Trichuris trichiura</i>		CDW53420	--IT-T-MI-FIGN	--I-TESI---VVK-V-V-I--	
<i>Soboliphyme baturini</i>		VDP13876	---LN---I-YI-SN	R-I-TERI---IFSV-AL-T--	
Outgroups (0/>100)	<i>Homo sapiens</i>	NP_851308	---G---M-EYITHS	RDVVTE-I----VT---V----	
	<i>Mus musculus</i>	NP_033384	---G---M-EYITHS	RDVVTE-I----VT---V----	

Supplementary Figure 13. Partial sequence alignments of a Serine/Threonine protein phosphatase 2A Regulatory protein subunit with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		176	211
Caenorhabditis homolog 1 (0/6)	<i>Caenorhabditis elegans</i>	NP_001293265	LEALASLLASNKYFFD
	<i>Caenorhabditis nigoni</i>	PIC50339	-----N-----
	<i>Caenorhabditis briggsae</i>	CAR98690	-----N-----
	<i>Caenorhabditis remanei</i>	XP_003109234	-----N-----
	<i>Caenorhabditis angaria</i>	ACI49217	---SAQ-S-----N
	<i>Caenorhabditis brenneri</i>	EGT46436	-----N-----
Caenorhabditis homolog 2 (0/6)	<i>Caenorhabditis elegans</i>	NP_496604	-D-ISTQ-GDKP-L-G
	<i>Caenorhabditis latens</i>	OZG15802	-D--STQ-GDK--L-G
	<i>Caenorhabditis remanei</i>	OZF85650	-D--STQ-GDK--L-G
	<i>Caenorhabditis briggsae</i>	XP_002631730	-D--SVQ-GEK--L-G
	<i>Caenorhabditis nigoni</i>	PIC47567	-D--SVQ-GEK--L-G
	<i>Caenorhabditis brenneri</i>	EGT44430	-D--SIQ--DKP-L-G
Other Nematodes (0/33)	<i>Diploscapter pachys</i>	PAV73992	-K-VSVI-GDKD--G
	<i>Strongyloides ratti</i>	XP_024505706	-K--SV--GDKP--G
	<i>Nippostrongylus brasiliensis</i>	VDL79647	-D-INMF-GNK---G
	<i>Loa loa</i>	XP_003137781	-T--SVF-GDKQ--G
	<i>Toxocara canis</i>	KHN80093	-L--SVF-ADKPF--G
	<i>Pristionchus pacificus</i>	PDM69804	-K-SICIF-GDKP--GG
	<i>Thelazia callipaeda</i>	VDN06273	-T--SVF-DDK-F--G
	<i>Heligmosomoides polygyrus</i>	VDO72907	-D-INMF-GNK---G
	<i>Strongylus vulgaris</i>	VDM73748	FD--KTI-GEQ-FL-G
	<i>Ancylostoma caninum</i>	RCN37793	-R--S-Q-G-KP-L-G
	<i>Ancylostoma ceylanicum</i>	EPB70131	-R--S-Q-G-KP-L-G
	<i>Ancylostoma duodenale</i>	KIH46080	-R--S-Q-G-KP-L-G
	<i>Dictyocaulus viviparus</i>	KJH41673	-R--S-Q-G-KP-L-G
	<i>Angiostrongylus costaricensis</i>	VDM51872	-R--S-Q-G-KP-L-G
	<i>Oesophagostomum dentatum</i>	KHJ95729	-R--SLQ-G-KP-L-G
	<i>Haemonchus contortus</i>	CDJ97722	FDTYRD--GDK-FL-G
	<i>Teladorsagia circumcincta</i>	PI068216	-R--S-Q-G-KPFL-G
	<i>Brugia pahangi</i>	VDN85522	IA-IDVI-GDK-FL-G
	<i>Wuchereria bancrofti</i>	VDM20389	IA-IDVI-GDK-FL-G
	<i>Brugia malayi</i>	CTP81381	IA-IDVI-GDK-FL-G
	<i>Dracunculus medinensis</i>	VDN55503	IR-VDLI-GDK-FL-G
	<i>Brugia timori</i>	VDO23595	IA-IDVI-GDK-FL-G
	<i>Necator americanus</i>	XP_013298689	-R--S-Q-G-KS-L-G
	<i>Acanthocheilonema viteae</i>	VBB25728	IA-IDVI-GDK-FL-G
	<i>Soboliphyme baturini</i>	VDP46272	-RSFSVF-GEKA-LMG
	<i>Onchocerca flexuosa</i>	VDP13294	IA-IDII-GDK-FL-G
	<i>Onchocerca ochengi</i>	VDK63043	IA-IDII-GDK-FL-G
	<i>Litomosoides sigmodontis</i>	VDK75340	IAVIDVI-GDK-FL-G
	<i>Trichinella sp. T9</i>	KRX54821	VQY-SER-GEQP---G
	<i>Trichinella murrelli</i>	KRX37203	VQY-SER-GEQP---G
	<i>Trichinella zimbabwensis</i>	KRZ10266	VK-ISVF-GDKT-LSG
	<i>Trichinella pseudospiralis</i>	KRY82320	VK-ISVF-GDKT-LSG
	<i>Trichinella spiralis</i>	XP_003373651	VK-ISVF-GDKT-LSG

Supplementary Figure 14. Partial sequence alignments of a Failed axon connections-like protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI. The sequence alignment for homolog 1 of the species *Caenorhabditis latens* was not observed in the BLASTP search. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

			62		97	
Caenorhabditis (5/5)	{	<i>Caenorhabditis briggsae</i>	XP_002632399	PDLEWQAWLRGTR	RNVDMYWNLYFD	RFPPSDTEIA
		<i>Caenorhabditis remanei</i>	XP_003103438	-----	-----	-----
		<i>Caenorhabditis latens</i>	OZF87462	-----	-----	-----
		<i>Caenorhabditis brenneri</i>	EGT41957	-A-----	-----	-----R--T
		<i>Caenorhabditis elegans</i>	NP_001255924	-----	-----	-----R---
Other Nematodes (0/25)	{	<i>Ancylostoma duodenale</i>	KIH45006	-GV---S--K---	-----	-----D---
		<i>Ancylostoma ceylanicum</i>	EYC31492	-GV---S--K---	-----	-----D---
		<i>Ancylostoma caninum</i>	RCN50008	-GV---S--K---	-----	-----D---
		<i>Cylicostephanus goldi</i>	VDN23744	-GV---S--K---	-----	-----Q-L-
		<i>Angiostrongylus costaricensis</i>	VDM56116	-TV---S--K---	-----	-----EE---
		<i>Heligmosomoides polygyrus</i>	VDP16140	-SV---S--K---	-----	-----EQ---
		<i>Dictyocaulus viviparus</i>	KJH44480	VSV-----K---	-----	-----E---
		<i>Oesophagostomum dentatum</i>	KHJ80075	-GI---S--K-V-	-----	-----Q-L-
		<i>Necator americanus</i>	XP_013290957	-SV---S--K-A-	-----	-----EE--P
		<i>Toxocara canis</i>	VDM47853	-V-----K---	-----	-----E--Q
		<i>Haemonchus placei</i>	VDO38169	-S---S--K---	-----	-----EE-LQ
		<i>Diploscapter pachys</i>	PAV87825	-PI--SS-VK---	-----	-I--T-Q---
		<i>Dracunculus medinensis</i>	VDN53121	-SP--ES-----	-----	-----SE-LE
		<i>Enterobius vermicularis</i>	VDD97068	-SV--L--K---	-----	KH--GE-AR
		<i>Anisakis simplex</i>	VDK55739	-S---S--K---	-----	TS--LEQLS
		<i>Gongylonema pulchrum</i>	VDN21460	-PP--MT---V-	-----	KL--TED-V-
		<i>Wuchereria bancrofti</i>	EJW87638	-SP--LT---I-	-----	KL--TEE--L
		<i>Brugia pahangi</i>	VDN85631	-SP--LT---I-	-----	KL--TEE--L
		<i>Brugia malayi</i>	XP_001895178	-SP--LT---I-	-----	KL--TEE--L
		<i>Litomosoides sigmodontis</i>	VDK73513	-SP--LT---I-	-----	KL--TQE--L
		<i>Onchocerca ochengi</i>	VDK71796	-SP--LT---M-	-----	KL--TSE--L
		<i>Loa loa</i>	XP_003141261	-SP--LT---L-	-----	KL--TQE--L
		<i>Onchocerca flexuosa</i>	VDO37915	-PP--LT---I-	-----	KL--TPE--L
		<i>Thelazia callipaeda</i>	VDN02353	-PP--LT---I-	-----	NI--TPE--M
		<i>Acanthocheilonema viteae</i>	VBB26498	-PP--LT---I-	-----	KS--TPE-VL

Supplementary Figure 15. Partial sequence alignments of a NADH dehydrogenase 1 alpha sub-complex assembly factor 2 protein with a CSI consisting of a 13 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. The sequence alignment of the species *Caenorhabditis nigoni* was not observed in the BLASTP search. Many homologous sequences for this protein were not observed for non-nematode organisms in BLASTP search.

		135	170	
Caenorhabditis (6/6)	<i>Caenorhabditis brenneri</i>	EGT45899	MKESRRIKFKTNDDEGNGN	FTAQLELTNYKAKDSGT
	<i>Caenorhabditis briggsae</i>	XP_002645170	-----	-----
	<i>Caenorhabditis elegans</i>	NP_001024421	-----	-----
	<i>Caenorhabditis briggsae</i>	XP_002645169	I--T-----	-----TVE-----
	<i>Caenorhabditis nigoni</i>	PIC19380	-----S--	-----V---K-TV-----
	<i>Diploscapter pachys</i>	PAV75577	I-----T-SSD-GS-	T Y--T--K-----
Other Nematodes (0/41)	<i>Gongylonema pulchrum</i>	VDK68579	-----GLTPD-GA-	T-----K-----
	<i>Onchocerca flexuosa</i>	VDP13540	-----GLTPD-GA-	T-----K-----
	<i>Baylisascaris schroederi</i>	ACL31520	-----SLTPD-GA-	T-----K-----
	<i>Ascaris suum</i>	BAC06575	-----SLTPD-GA-	T-----K-----
	<i>Toxocara canis</i>	KHN88700	-----SLTPD-GA-	T-----K-----
	<i>Anisakis simplex</i>	VDK45727	-----NLTPD-GA-	T-----K-----
	<i>Litomosoides sigmodontis</i>	VDM92971	-----GLTPD-GA-	T-----K-----
	<i>Brugia malayi</i>	XP_001899521	-----GLTPD-GA-	T-----K-----
	<i>Loa loa</i>	XP_003137600	-----GLTPD-GA-	T-----K-----
	<i>Brugia pahangi</i>	VDN91454	-----GLTPD-GA-	T-----K-----
	<i>Brugia timori</i>	VDO27064	-----GLTPD-GA-	T-----K-----
	<i>Onchocerca flexuosa</i>	OZC08359	-----GLTPD-GA-	T-----K-----
	<i>Pristionchus pacificus</i>	PDM66066	---T---NLSPD-GA-	T-----K-----
	<i>Thelazia callipaeda</i>	VDN01526	-----GLVPD-GA-	T-----K-----
	<i>Necator americanus</i>	XP_013297867	---T-R-L-TPD-PN-	T--K--K-----
	<i>Ancylostoma caninum</i>	RCN38460	---T-R-L-TPD-PN-	T--K--K-----
	<i>Teladorsagia circumcincta</i>	PIO67639	---T-R-L-SPD-PN-	T--K--K-----
	<i>Vicugna pacos</i>	XP_006219910	---T-R-L-SPD-PN-	T--K--K-----
	<i>Haemonchus contortus</i>	ADZ24723	---T-R-L-SPD-PN-	T--K--K-----
	<i>Nippostrongylus brasiliensis</i>	VDL70373	---T-R-V-TPD-PN-	T--K--K-----
	<i>Ancylostoma duodenale</i>	KIH68744	---T-R-L-TPD-PN-	T--K--K-----
	<i>Dictyocaulus viviparus</i>	KJH47142	---T-R-F-SPD-PN-	T--K--K-----
	<i>Strongylus vulgaris</i>	VDM74829	---T-R-L-TPD-PN-	T--K--K-----
	<i>Dracunculus medinensis</i>	VDN56371	-----GLTPD-GA-	T--M--K-----
	<i>Ancylostoma ceylanicum</i>	EPB67396	---T-R-L-TPD-PN-	T--K--K-----
	<i>Oesophagostomum dentatum</i>	KHJ98154	---T-R-F-TPD-PN-	T--K--K-----
	<i>Angiostrongylus costaricensis</i>	VDM63399	---T-R-F-TPD-PN-	T--K--K-----
	<i>Enterobius vermicularis</i>	VDD87484	-----GLSPD-GA-	T Y-L--K-----T--
	<i>Haemonchus placei</i>	VDO32598	-----THII-TPDDRE-	T--K--KKC-PN--V-
	<i>Strongyloides ratti</i>	XP_024509872	I--GN--GIQNIKDSGNG	N Y-L--R-----
	<i>Heligmosomoides polygyrus</i>	VDP57378	---T-Q--STPD-PN-	T--VK--K--N-C--
	<i>Soboliphyme baturini</i>	VDP10778	---GK---VFEPDEGE-	T--Q--Q-K--QK----
	<i>Trichinella spiralis</i>	XP_003369356	---GN--S-VLQQ-EEPM	H Y-----R--T--K-
	<i>Trichinella nativa</i>	KRZ50882	---GN--S-VLQQ-EEPM	H Y-----R--T--K-
	<i>Trichinella pseudospiralis</i>	KRX93535	---GN--S-VLQQ-EEPM	H Y-----R--T--K-
	<i>Trichinella sp. T6</i>	KRX74678	---GN--S-VLQQ-EEPM	H Y-----R--T--K-
	<i>Trichinella nelsoni</i>	KRX15059	---GN--S-VLQQ-EEPM	H Y-----R--T--K-
	<i>Trichinella zimbabwensis</i>	KRZ08200	---GN--S-VLQK-EEPM	H Y-----R--T--K-
	<i>Trichuris suis</i>	KFD56086	---N---ILQED-ENH	A Y---H-K-----V-
	<i>Trichuris trichiura</i>	CDW58363	---N---ILQED-ENH	A Y---H-K-----V-
	Outgroups (0/>100)	<i>Homo sapiens</i>	CAD12458	IE--E-L-QSQ-- -- I QF -TIC-VQLV-Q-L-
<i>Mus musculus</i>		NP_085039	LGN--TRVR -D- T -DV-ITTLR----F	

Supplementary Figure 16. Partial sequence alignments of a Disorganized muscle protein 1 protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		54	78
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001024482	VAKMVGNRKHNK D MDYYKLSRAIR
	<i>Caenorhabditis brenneri</i>	EGT29973	-----
	<i>Caenorhabditis briggsae</i>	XP_002644498	-----
	<i>Caenorhabditis nigoni</i>	PIC18007	-----
	<i>Caenorhabditis latens</i>	OZG25708	-----
	<i>Caenorhabditis remanei</i>	OZG08321	-----
Other Nematodes (0/47)	<i>Diploscapter pachys</i>	PAV75468	L-RL--EK-N--- -T-E----M-
	<i>Ancylostoma caninum</i>	RCN52589	L-RL--E--N--- -T-E----M-
	<i>Ancylostoma ceylanicum</i>	EYC16575	L-RL--E--N--- -T-E----M-
	<i>Ancylostoma duodenale</i>	KIH66619	L-RL--E--N--- -T-E----M-
	<i>Nippostrongylus brasiliensis</i>	VDL69293	L-RL--E--N--- -T-E----M-
	<i>Necator americanus</i>	XP_013299955	L-RL--E--N--- -T-E----M-
	<i>Dictyocaulus viviparus</i>	KJH43386	L-RL--E--N--- -T-E----M-
	<i>Strongylus vulgaris</i>	VDM74654	L-RL--E--N--- -T-E----M-
	<i>Heligmosomoides polygyrus</i>	VDP00764	L-RL--E--N--- -T-E----M-
	<i>Angiostrongylus costaricensis</i>	VDM54068	L-RL--E--N--- -T-E----M-
	<i>Teladorsagia circumcincta</i>	PIO69733	L-RL--E--N--- -T-E----M-
	<i>Haemonchus contortus</i>	CDJ88503	L-RL--E--N--- -T-E----M-
	<i>Haemonchus placei</i>	VDO23124	L-RL--E--N--- -T-E----M-
	<i>Pristionchus pacificus</i>	PDM84773	L-RL--E--N-Q- -T-E----M-
	<i>Toxocara canis</i>	KHN82222	L-RL--EK-N-Q- -T-E----M-
	<i>Anisakis simplex</i>	VDK42097	L-RL--EK-N-Q- -T-E----M-
	<i>Strongyloides ratti</i>	XP_024498651	L-RL--EK-N-Q- -T-E----M-
	<i>Gongylonema pulchrum</i>	VDN40596	L-RL--EK-N-Q- -T-E----M-
	<i>Litomosoides sigmodontis</i>	VDK75710	L-QL--E--N-Q- -T-E----M-
	<i>Onchocerca flexuosa</i>	OZC10835	L-QL--E--N-Q- -T-E----M-
	<i>Acanthocheilonema viteae</i>	VBB28739	L-QL--E--N-Q- -T-E----M-
	<i>Brugia pahangi</i>	VDN81825	L-QL--E--N-Q- -T-E----M-
	<i>Brugia malayi</i>	XP_001896909	L-QL--E--N-Q- -T-E----M-
	<i>Onchocerca ochengi</i>	VDK65325	L-QL--E--N-Q- -T-E----M-
	<i>Wuchereria bancrofti</i>	EJW86133	L-QL--E--N-Q- -T-E----M-
	<i>Loa loa</i>	XP_020307442	L-QL--E--N-Q- -T-E----M-
	<i>Brugia timori</i>	VDO09094	M-QL--E--N-Q- -T-E----M-
	<i>Enterobius vermicularis</i>	VDD84864	L-RL--KK-N-A- -T-E----M-
	<i>Dracunculus medinensis</i>	VDN57494	L--L--EK-N-Q- -T-E----M-
	<i>Thelazia callipaeda</i>	VDN01542	L-RF--Q--NR-Q -N-D----SL-
	<i>Soboliphyme baturini</i>	VD094383	--RR--E--NKPN -N-D----L-
	<i>Oesophagostomum dentatum</i>	KHJ94529	L-RF--Q--NRAQ -N-D----SL-
	<i>Cylicostephanus goldi</i>	VDK85783	L-RF--Q--NRAQ -N-D----SL-
	<i>Trichinella nelsoni</i>	KRX19706	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella britovi</i>	KRY49119	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella zimbabwensis</i>	KRZ07064	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella pseudospiralis</i>	KRX90070	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella spiralis</i>	XP_003382250	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella sp. T8</i>	KRZ90731	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella patagoniensis</i>	KRY20366	L-RL--MK-N-SR -T-E----M-
	<i>Trichinella murrelli</i>	KRX36026	L-RL--MK-N-SR -T-E----M-
<i>Trichinella papuae</i>	KRZ75693	L-RL--MK-N-SR -T-E----M-	
<i>Trichinella nativa</i>	KRZ56336	L-RL--MK-N-SR -T-E----M-	
<i>Trichuris suis</i>	KFD57331	M-QL--LK-N-SR -T-E----M-	
<i>Trichuris trichiura</i>	CDW53786	M-QL--LK-N-SR -T-E----M-	
<i>Trichinella sp. T6</i>	KRX73529	--RL--L--NKPN -N-D----L-	
<i>Trichinella sp. T9</i>	KRX62147	--RL--L--NKPN -N-D----L-	
Outgroups (0/>100)	<i>Homo sapiens</i>	AAA52411	--RR--K--NKP- -N-E----GL-
	<i>Mus musculus</i>	CBA13447	---L--L--NK-N -N-D----L-

Supplementary Figure 17. Partial sequence alignments of an ETS (E26 transformation-specific) class transcription factor protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		430	466
Caenorhabditis (6/6)	<i>Caenorhabditis brenneri</i>	EGT38541	HLIGADSLPSRDQLDNNL V PFLPHLSNAEERAFVILN
	<i>Caenorhabditis briggsae</i>	CAP24891	-----
	<i>Caenorhabditis elegans</i>	NP_001293390	-----
	<i>Caenorhabditis nigoni</i>	PIC55883	-----
	<i>Caenorhabditis remanei</i>	XP_003114575	-----
	<i>Caenorhabditis latens</i>	OZG11498	-----
Other Nematodes (0/36)	<i>Heligmosomoides polygyrus</i>	VD067565	Q-----D-----V-
	<i>Nippostrongylus brasiliensis</i>	VDL79693	Q-----D-----V-
	<i>Haemonchus contortus</i>	CDJ80361	Q-----D-----V-
	<i>Oesophagostomum dentatum</i>	KHJ83169	-----S-- Q-----D-----V-
	<i>Ancylostoma ceylanicum</i>	EYC04497	-----S-- Q-----D-----V-
	<i>Necator americanus</i>	XP_013308737	-----S-- Q-----D-----V-
	<i>Angiostrongylus costaricensis</i>	VDM59654	Q----I--D-----V-
	<i>Ancylostoma caninum</i>	RCN53200	-----S-- Q-----D-----V-
	<i>Ancylostoma duodenale</i>	KIH54863	-----S-- Q-----D-----V-
	<i>Dictyocaulus viviparus</i>	KJH53574	Q----I-SPD-----V-
	<i>Anisakis simplex</i>	VDK50202	-----T---P-- Q-----T-D-----M-
	<i>Toxocara canis</i>	KHN85013	--V-----P-- Q-----TPD-----
	<i>Thelazia callipaeda</i>	VDN04120	--V--T---K---T-- Q-----APD-----VM-
	<i>Dracunculus medinensis</i>	VDN54005	---S---KN--P-- Q-----SPD-----V-
	<i>Brugia timori</i>	VD022248	-----T---K---T-- Q-----APD-----IAVM-
	<i>Onchocerca ochengi</i>	VDK66508	-----T---K---A-- Q-----APD---I-VM-
	<i>Wuchereria bancrofti</i>	VDM20530	-----T---K---T-- Q-----APD---IAVM-
	<i>Brugia pahangi</i>	VDN94771	-----T---K---T-- Q-----APD---IAVM-
	<i>Brugia malayi</i>	XP_001901269	-----T---K---T-- Q-----APD---IAVM-
	<i>Litomosoides sigmodontis</i>	VDK75146	-----T---K---A-- Q-----APD---IAVM-
	<i>Onchocerca flexuosa</i>	OZC12839	-----T---K---A-- Q-----APD---IAVM-
	<i>Loa loa</i>	XP_003140865	-----K---TD- Q-----APD---IAVM-
	<i>Strongyloides ratti</i>	XP_024507890	---S---CKG--I-- Q-----AS---I-LVS-
	<i>Trichinella zimbabwensis</i>	KRZ03728	--V-P--M-ATA-VES-A SYI-NI-S-K--M-VI-
	<i>Trichinella papuae</i>	KRZ71993	--V-P--M-AIS-VES-T SYI-NI-S-K--M-VI-
	<i>Soboliphyme baturini</i>	VDP22009	--L-PG-I-TKS--EEH- Q-F---SPD---M-VS-
	<i>Trichinella pseudospiralis</i>	KRZ34022	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-
	<i>Trichinella patagoniensis</i>	KRY17046	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-
	<i>Trichinella spiralis</i>	KRY28779	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-
	<i>Trichinella nativa</i>	OUC40531	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-
	<i>Trichinella sp. T9</i>	KRX57766	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-
	<i>Trichinella sp. T6</i>	KRX72098	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-
<i>Trichinella britovi</i>	KRY49319	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-	
<i>Trichinella murrelli</i>	KRX38890	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-	
<i>Trichinella sp. T8</i>	KRZ87771	--V-P--M-AIA-VES-A SYI-NI-S-K--M-VI-	
<i>Trichinella nelsoni</i>	KRX14027	--V-P--M-AIA-IET-A SYI-NI-S-K--M-VI-	

Supplementary Figure 18. Partial sequence alignments of a Glycine-rich domain-containing protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001255199	DEAVAYGAAIMAAVLSG	AEEVQDMRLIDIVPMSIG
	<i>Caenorhabditis remanei</i>	XP_003097172	-----V-----	
	<i>Caenorhabditis brenneri</i>	EGT52753	-----V-----	
	<i>Caenorhabditis briggsae</i>	CAP27311	-----V----T-	
	<i>Caenorhabditis nigoni</i>	PIC49760	-----V----T-	
	<i>Caenorhabditis latens</i>	OZG13115	-----V-----	
	<i>Diploscapter pachys</i>	PAV72947	-----VQ--I---	
Other Nematodes (0/55)	<i>Anisakis simplex</i>	VDK75896	-----VQ--I---	DK S-T---LL-L--A-L-L-
	<i>Meloidogyne enterolobii</i>	AHG55039	-----VQ--I---	DK S-N---LL-L--A-L-L-
	<i>Ditylenchus destructor</i>	AHF71091	-----VQ--I-C-	DK S-N---LL-L--A-L-L-
	<i>Haemonchus contortus</i>	CDJ88360	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Onchocerca volvulus</i>	P11503.2	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Brugia malayi</i>	AAR01009	-----VHS-I---	DK S-A---LL-L--A-L-L-
	<i>Teladorsagia circumcincta</i>	PI068034	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Dirofilaria immitis</i>	AAA28298	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Onchocerca flexuosa</i>	VDP11183	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Litomosoides sigmodontis</i>	VDK67489	-----VQ--I---	DK S-T---LL-L--A-L-L-
	<i>Brugia pahangi</i>	AAA27857	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Bursaphelenchus mucronatus</i>	ACU00685	-----VQ--I-C-	DK S-N---LL-L--A-L-L-
	<i>Enterobius vermicularis</i>	VDD92026	-----VQ--I---	DK S-T---LL-L--A-L-L-
	<i>Toxocara canis</i>	VDM39102	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Acanthocheilonema viteae</i>	VBB31912	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Wuchereria bancrofti</i>	AAF32254	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Pristionchus pacificus</i>	PDM79784	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Onchocerca ochengi</i>	VDK66984	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Gongylonema pulchrum</i>	VDN19430	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Anisakis pegreffii</i>	AIU38247	-----VQ--I---	DK S-T---LL-L--A-L-L-
	<i>Heterodera glycines</i>	AAN78300	-----VQ--I---	DK S-T---LL-L--A-L-L-
	<i>Strongylus vulgaris</i>	VDM66254	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Haemonchus placei</i>	VD034176	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Loa loa</i>	XP_020306180	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Ancylostoma caninum</i>	AK062674	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Ancylostoma ceylanicum</i>	EPB70622	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Thelazia callipaeda</i>	VDN04920	-----SVQ--I---	DK S-A---LL-L--A-L-L-
	<i>Heligmosomoides polygyrus</i>	VD081416	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Necator americanus</i>	XP_013293739	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Strongyloides ratti</i>	XP_024502726	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Dracunculus medinensis</i>	ADI54942	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Angiostrongylus vasorum</i>	ABV46675	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Setaria digitata</i>	AAD13154	-----VQ--I---	DK S-A---LLFV--A-L-L-
	<i>Dictyocaulus viviparus</i>	KJH46194	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Parastrongyloides trichosuri</i>	AAF87583	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Aphelenchoides besseyi</i>	AKH40414	----F--VQ--I-C-	DK S-N---LL-L--A-L-L-
	<i>Angiostrongylus costaricensis</i>	VDM64089	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Nippostrongylus brasiliensis</i>	VDL68456	-----VQ--I---	DK S-A---LL-L--A-L-L-
	<i>Soboliphyme baturini</i>	VDP32341	-----VQ--I---	EK H-A---LL-L--T-L-L-
	<i>Bursaphelenchus xylophilus</i>	ABG74349	-----VQ--I-C-	DK S-K---LL-L--A-L-L-
	<i>Trichinella zimbabwensis</i>	KRZ18308	-----VQ--I---	EK H-A---LL-L--T-L-L-
	<i>Trichinella britovi</i>	KRY58600	-----VQ--I---	EK H-A---LL-L--T-L-L-
<i>Trichinella spiralis</i>	KRY38488	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella papuae</i>	KRZ69869	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella pseudospiralis</i>	KRY78483	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella sp. T8</i>	KRZ89860	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella nelsoni</i>	KRX27085	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella sp. T9</i>	KRX62956	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella sp. T6</i>	KRX70487	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella murrelli</i>	KRX42824	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella nativa</i>	KRZ63003	-----VQ--I---	EK H-A---LL-L--T-L-L-	
<i>Trichinella patagoniensis</i>	KRY05166	-----VQ--I---	EG N-K---LL-L--T-L-L-	
<i>Trichuris trichiura</i>	CDW56034	-----VQ--I---	DK H-A---LL-L--T-L-L-	
Outgroups (0/>100)	<i>Trichuris suis</i>	KFD56098	-----VQ--I---	DK H-A---LL-L--T-L-L-
	<i>Homo sapiens</i>	BAD96505	-----VQ--I---	DK S-N---LL-L--T-L-L-
	<i>Mus musculus</i>	BAE42451	-----VQ--I---	DK S-N---LL-L--T-L-L-

Supplementary Figure 19. Partial sequence alignments of a Heat shock protein 70 protein with a CSI consisting of a 2 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous partial sequence alignments of other nematode species were not observed in the BLASTP search.

		441	476
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001255199	GERVLCSHNRQLGEISL
	<i>Caenorhabditis remanei</i>	XP_003097172	-----N--K-----V-----
	<i>Caenorhabditis nigoni</i>	PIC49759	-----N--K-----
	<i>Caenorhabditis briggsae</i>	XP_002632174	-----H--K-----
	<i>Caenorhabditis latens</i>	OZG13117	-----N--K-----V-----
	<i>Caenorhabditis brenneri</i>	EGT52753	-----T-----N--K----I--V-----
Other Nematodes (0/16)	<i>Pristionchus pacificus</i>	PDM75588	---A-TKD-H---NFE- S G-P-TP--VPQIEVVF-I-
	<i>Anisakis simplex</i>	VDK65257	---A-TKD-N---RFD- T Q-P-AP--VPQIEV-FDL-
	<i>Soboliphyme baturini</i>	VD098716	---EMAA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella murrelli</i>	KRX50303	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella sp. T6</i>	KRX76699	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella sp. T9</i>	KRX62429	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella pseudospiralis</i>	KRZ33796	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella spiralis</i>	KRY33164	---EMA--KL--QF-- I G-P-AP--VPQIEV-FDI-
	<i>Trichinella nativa</i>	KRZ57762	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella britovi</i>	KRY58424	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella patagoniensis</i>	KRY23083	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella sp. T8</i>	KRZ92825	---EMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella nelsoni</i>	KRX21108	---EMA--KL--QF-- I G-P-AP--VPQIEV-FDI-
	<i>Trichuris suis</i>	KFD55321	---DMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichuris trichiura</i>	CDW60853	---DMA--KL--QF-- V G-P-AP--VPQIEV-FDI-
	<i>Trichinella zimbabwensis</i>	KRZ16667	---EMA--KL--QF-- V G-P-AP--VPQIEVAFDI-
Outgroups (0/>200)	<i>Homo sapiens</i>	AAH15699	---AMTKD-NL--KFE- T G-P-AP--VPQIEV-FDI-
	<i>Mus musculus</i>	BAE29904	---AMTKD-NL--KFE- T G-P-AP--VPQIEV-FDI-

Supplementary Figure 20. Partial sequence alignments of a Heat shock protein 70 protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous partial sequence alignments of other nematode species were not observed in the BLASTP search.

		123	151
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001024661	GPIIGQFCGHFEN RILNTSSHNALTLWWH
	<i>Caenorhabditis brenneri</i>	EGT30233	-----K-----
	<i>Caenorhabditis remanei</i>	POM49287	-----M-----
	<i>Caenorhabditis briggsae</i>	XP_002644596	-----M-----
	<i>Caenorhabditis nigoni</i>	PIC18220	-----M-----
	<i>Caenorhabditis latens</i>	OZG25193	-----M-----
Other Nematodes (0/28)	<i>Diploscapter pachys</i>	PAV79326	--V-----RIAP L TV--V--E--MS----
	<i>Soboliphyme baturini</i>	VDP02479	-----I--KVK- R TL-A--TY--M----
	<i>Gongylonema pulchrum</i>	VDK29616	---L-----AIK- S SE-TV-TE-----
	<i>Toxocara canis</i>	VDM24306	---V-----IIR- A SE-AI--E-----
	<i>Onchocerca flexuosa</i>	OZC09977	---L-----TIR- A SE-AV-TE-----
	<i>Onchocerca ochengi</i>	VDK65250	---L-----TIR- A SE-AV-TE-----
	<i>Thelazia callipaeda</i>	VDN01074	---L-----TIR- A SE-AV-TE-----
	<i>Wuchereria bancrofti</i>	VDM14467	---L-----TIR- A SE-AV-TE-----
	<i>Angiostrongylus costaricensis</i>	VDM52576	-----KRT- A SE-S--TL-----
	<i>Ancylostoma duodenale</i>	KIH43381	-----KLT- T SE-SV-TL-----
	<i>Ancylostoma ceylanicum</i>	EPB66588	-----KLT- T SE-SV-TL-----
	<i>Anisakis simplex</i>	VDK46880	---V-----IIR- A SE-AI--E-----
	<i>Ancylostoma caninum</i>	RCN52527	-----KLT- T SE-SV-TL-----
	<i>Cylicostephanus goldi</i>	VDK45323	-----KRT- A SE-SS-TL-----
	<i>Heligmosomoides polygyrus</i>	VDP41706	-----RRT- T TE-SV-TM-----
	<i>Litomosoides sigmodontis</i>	VDK71987	---L-----TIR- A SE-AV-TE-----
	<i>Brugia malayi</i>	XP_001899277	---L-----TIR- A SE-AV-TE-----
	<i>Brugia pahangi</i>	VDN90800	---L-----TIR- A SE-AV-TE-----
	<i>Brugia timori</i>	VDO32583	---L-----TIR- A SE-AV-TE-----
	<i>Loa loa</i>	XP_020303780	---L-----TIR- A SE-AV-TE-----
	<i>Acanthocheilonema viteae</i>	VBB30517	---L-----TIR- A SE-AV-TE-----
	<i>Oesophagostomum dentatum</i>	KHJ99798	-----KHS- A SE-SV-TL-----
	<i>Haemonchus placei</i>	VDO80095	-----RRN- V TD-SL-TM-----
	<i>Haemonchus contortus</i>	CDJ98395	-----RRN- V TD-SL-TM-----
	<i>Necator americanus</i>	XP_013293602	-----KRT- T SE-SV-TL-----
	<i>Strongylus vulgaris</i>	VDM79066	-----KRT- A SE-SV-TL-----
	<i>Dictyocaulus viviparus</i>	KJH41256	-----KRS- I SE-SI-TL-----
	<i>Dracunculus medinensis</i>	VDN58727	---L-----LIR- A SE-AV-TE-----

Supplementary Figure 21. Partial sequence alignments of an Abnormal cell migration protein 13 protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

			143	175
Caenorhabditis (6/6)	<i>Caenorhabditis remanei</i>	XP_003089575	CIHLAACSAGQWLPM	S NPHLPADLFTSCLTTP
	<i>Caenorhabditis latens</i>	OZG15523	-----	-----
	<i>Caenorhabditis elegans</i>	NP_001293858	-----	-----
	<i>Caenorhabditis nigoni</i>	PIC32995	-----Y---	-----
	<i>Caenorhabditis briggsae</i>	XP_002632899	-----Y---	-----
	<i>Caenorhabditis brenneri</i>	EGT53100	-----F---	-----
Other Nematodes (0/38)	<i>Diploscapter pachys</i>	PAV89799	--Q-G--R-DEF--T	--D-----A--S--
	<i>Soboliphyme baturini</i>	VDP10977	-----M-D-V---	--E-----
	<i>Angiostrongylus costaricensis</i>	VDM53003	--Q---REDER---	--E-----
	<i>Heligmosomoides polygyrus</i>	VD079049	--Q---REDER--T	--D-----
	<i>Nippostrongylus brasiliensis</i>	VDL64489	--Q---REDER--T	--E-----
	<i>Haemonchus placei</i>	VD026483	--Q---REDER--T	--D-----
	<i>Dictyocaulus viviparus</i>	KJH44437	--Q---REDER--T	--E-----
	<i>Haemonchus contortus</i>	CDJ97476	--Q---REDER--T	--D-----
	<i>Strongylus vulgaris</i>	VDM65179	-----REDER--T	--AE-----
	<i>Ancylostoma ceylanicum</i>	EYC05101	-----REDER--T	--AD-----
	<i>Ancylostoma duodenale</i>	KIH69120	-----REDER--T	--AD-----
	<i>Ancylostoma caninum</i>	RCN45671	-----REDER--T	--AD-----
	<i>Pristionchus pacificus</i>	PDM76953	--Q---KV-EK---	AAE-----A---
	<i>Acanthocheilonema viteae</i>	VBB31036	---I---GDHEL---	DSR-----IL---
	<i>Onchocerca ochengi</i>	VDK78612	---IG--ADHEL---	DSR-----IL---
	<i>Thelazia callipaeda</i>	VDN06650	---IG--GDNEL---	DSR-----IL---
	<i>Necator americanus</i>	XP_013298983	---G--REDER--T	--ADV-----
	<i>Litomosoides sigmodontis</i>	VDK77318	---IG--GDQEL---	DSR-----IL---
	<i>Wuchereria bancrofti</i>	EJW88084	---IG--GDHEL---	DSR-----IL---
	<i>Brugia malayi</i>	CRZ22876	---IG--GDHEL---	DSR-----IL---
	<i>Brugia pahangi</i>	VDN91436	---IG--GDHEL---	DSR-----IL---
	<i>Loa loa</i>	XP_020306206	---IG--GDHEL---	DSR-----IL---
	<i>Brugia timori</i>	VD052578	---IG--GDHEL---	DSR-----IL---
	<i>Onchocerca flexuosa</i>	VD044874	---IG--ADHEL---	DSR-----IL---
	<i>Trichinella murrelli</i>	KRX38173	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella spiralis</i>	KRY35465	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella sp. T8</i>	KRZ85612	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella nativa</i>	KRZ49841	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella britovi</i>	KRY46767	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella sp. T6</i>	KRX75381	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella nelsoni</i>	KRX15293	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella pseudospiralis</i>	KRY84144	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella zimbabwensis</i>	KRZ05231	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella papuae</i>	KRZ73461	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella patagoniensis</i>	KRY09658	--Q---ARD-T--T	D-A-----C-----
	<i>Trichinella sp. T9</i>	KRX61440	--Q---ARD-T--T	D-A-----C-----
	<i>Trichuris suis</i>	KFD50574	--Q---A-D-E--T	H-D-----C-----
	<i>Trichuris trichiura</i>	CDW56927	--Q---A-D-E--T	H-D-----C-----
Outgroups (0/>200)	<i>Homo sapiens</i>	NP_001156506	--Q---E-TEL---	I-D-----
	<i>Mus musculus</i>	XP_006534426	--Q---E-HEL---	I-D-----

Supplementary Figure 22. Partial sequence alignments of a Regulatory-associated protein of mTOR-like protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		141	170
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001024661	SSHNALTLWWHSN
	<i>Caenorhabditis remanei</i>	XP_003117772	-----
	<i>Caenorhabditis briggsae</i>	CAP33035.2	-----
	<i>Caenorhabditis latens</i>	OZG25193	-----
	<i>Caenorhabditis nigoni</i>	PIC18220	-----
	<i>Caenorhabditis brenneri</i>	EGT30233	-----
Other Nematodes (0/28)	<i>Diploscapter pachys</i>	PAV79335	--E--MS----A- SEV SD-EKR-----SA--
	<i>Anisakis simplex</i>	VDK46880	--E-----D ADL -PNHSGE--R-L-SA--
	<i>Toxocara canis</i>	VDM24306	--E-----D ADL -PNHSGE--R-L-SA--
	<i>Angiostrongylus costaricensis</i>	VDM52576	-TL-----TD SLL -QQHPA---R--NA--
	<i>Dictyocaulus viviparus</i>	KJH41256	-TL-----TD SLL -QQHPA---R--NA--
	<i>Gongylonema pulchrum</i>	VDK29616	-TE-----TD AEL -LQHSGE--R-L-SA--
	<i>Litomosoides sigmodontis</i>	VDK71987	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Onchocerca ochengi</i>	VDK65250	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Loa loa</i>	XP_020303780	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Brugia malayi</i>	CRZ25839	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Brugia timori</i>	VD032583	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Acanthocheilonema viteae</i>	VBB30517	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Brugia pahangi</i>	VDN90800	-TE-----TD AEL -FHH-GE--R-L-SA--
	<i>Nippostrongylus brasiliensis</i>	VDL77150	-TM-----TD ALL -QQHPA---Q--NA--
	<i>Wuchereria bancrofti</i>	EJW83984	-TE-----TD AEL -FHH-GD--R-L-SA--
	<i>Haemonchus placei</i>	VDO80095	-TM-----TD AIL -QQHPA---Q--NA--
	<i>Haemonchus contortus</i>	CDJ85812	-TM-----TD AIL -QQHPA---Q--NA--
	<i>Thelazia callipaeda</i>	VDN01074	-TE-----TD AQT SFHRSGE--R-L-SA--
	<i>Dracunculus medinensis</i>	VDN58727	-TE-----D ANL -INH-GE--R-L-SA--
	<i>Onchocerca flexuosa</i>	OZC09977	-TE-----TD ADL -FHH-GE--R-L-SA--
	<i>Heligmosomoides polygyrus</i>	VDP41706	-TM-----TD ALL SQQHPA---H--NA--
	<i>Ancylostoma duodenale</i>	KIH43381	-TL-----TD PLL AQQHPA---R-Q-NA--
	<i>Oesophagostomum dentatum</i>	KHJ99798	-TL-----TD PLL AQQHPA---R-Q-NA--
	<i>Ancylostoma ceylanicum</i>	EYB97855	-TL-----TD PLL AQQHPA---R-Q-NA--
	<i>Necator americanus</i>	XP_013293602	-TL-----TD PLL AQQHPA---R-Q-NA--
	<i>Strongylus vulgaris</i>	VDM79066	-TL-----TD PLL AQQHPA---R-Q-NA--
	<i>Ancylostoma caninum</i>	RCN52527	-TL-----TD PLL AQQHPA---R-Q-NA--
	<i>Cylicostephanus goldi</i>	VDK45323	-TL-----TD PLL AQQHPA---R-Q-NA--

Supplementary Figure 23. Partial sequence alignments of an Abnormal cell migration protein 13 protein with a CSI consisting of a 3 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

			220	251		
Caenorhabditis (6/6)	{	<i>Caenorhabditis elegans</i>	NP_001024660	KGFKLHWGSFRVSKTGNC	VTGEFSCNGECIP	
		<i>Caenorhabditis remanei</i>	XP_003117772	-----A-----	-----	
		<i>Caenorhabditis latens</i>	OZG25193	-----A-----	-----	
		<i>Caenorhabditis briggsae</i>	XP_002644596	-----A-----R----	-----	
		<i>Caenorhabditis brenneri</i>	EGT30233	-----R-----	-----	
		<i>Caenorhabditis nigoni</i>	PIC18220	R-----A-----R----	-----	
Other Nematodes (0/22)	{	<i>Diploscapter pachys</i>	PAV79326	-----SA---*I-VP-	S KNR----R-D-F--	*VKKAA
		<i>Nippostrongylus brasiliensis</i>	VDL77150	---Q---NA---TAQVP-	Y YGR--A---NQ---	
		<i>Dictyocaulus viviparus</i>	KJH41256	---R---NA---TANVP-	S S-R--A-SHN----	
		<i>Angiostrongylus costaricensis</i>	VDM52576	---R---NA---TANVP-	S SSR--A--QS----	
		<i>Oesophagostomum dentatum</i>	KHJ99798	---R-Q-NA---TANVP-	S TSR--A--GN----	
		<i>Haemonchus placei</i>	VDO80095	---Q---NA---TAGVP-	S AGR--A--HDQ---	
		<i>Haemonchus contortus</i>	CDJ98395	---Q---NA---TAGVP-	S AGR--A--HDQ---	
		<i>Toxocara canis</i>	VDM24306	E--R-L-SA--K-N-AP-	N TQR--T-A-Q----	
		<i>Cylicostephanus goldi</i>	VDK45323	---R-Q-NA---TANVP-	S PSR--A--GN----	
		<i>Ancylostoma ceylanicum</i>	EPB66588	---R-Q-NA--ITSNVP-	S SSR--A--GN----	
		<i>Ancylostoma caninum</i>	RCN52527	---R-Q-NA--ITSNVP-	S SSR--A--GN----	
		<i>Ancylostoma duodenale</i>	KIH43381	---R-Q-NA--ITSNVP-	S SSR--A--GN----	
		<i>Necator americanus</i>	XP_013293602	---R-Q-NA---TTNVP-	S PSR--A--GN----	
		<i>Anisakis simplex</i>	VDK46880	E--R-L-SA--K-NSEP-	N TQR--T-A-H----	
		<i>Rhincodon typus</i>	XP_020369132	E--FRHLGDDKIPRRRQ	C LPN----S-----	
		<i>Brugia pahangi</i>	VDN90800	E--R-L-SA--K-NIAP-	N IQR--T-K-Q---A	
		<i>Brugia malayi</i>	CRZ25839	E--R-L-SA--K-NIAP-	N IQR--T-K-Q---A	
		<i>Onchocerca ochengi</i>	VDK65250	E--R-L-SA--K-NVAP-	N AQR--T-K-Q---A	
		<i>Onchocerca flexuosa</i>	OZC09977	E--R-L-SA--K-NVAP-	N AQR--T-K-Q---A	
		<i>Gongylonema pulchrum</i>	VDK29616	E--R-L-SA--K-NIAP-	N NQR--T-K-Q----	
<i>Acanthocheilonema viteae</i>	VBB30517	E--R-L-SA--K-NIAP-	N AQR--T-K-Q---A			
Outgroups (0/>200)	{	<i>Loa loa</i>	XP_020303780	E--R-L-SA--K-NIAP-	N AQR--T-R-Q---A	
		<i>Homo sapiens</i>	XP_011509485		- L HN -----	
		<i>Mus musculus</i>	BAD90371		- L PNQ -R-TS-Q-VL	

Supplementary Figure 24. Partial sequence alignments of an Abnormal cell migration protein 13 protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		1460	1497
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_500018	MLAAWFTFLLHDHLKTY D AGKKLYELFWGIKQQMEKGP
	<i>Caenorhabditis remanei</i>	XP_003099038	-----
	<i>Caenorhabditis nigoni</i>	PIC37034	-----F-----
	<i>Caenorhabditis briggsae</i>	XP_002634865	-----F-----
	<i>Caenorhabditis brenneri</i>	EGT33873	-----F-----
	<i>Caenorhabditis latens</i>	OZG19088	-----
Other Nematodes (0/27)	<i>Diploscapter pachys</i>	PAV71746	--T-----MY--LKE P-RC--N-YYs---I----
	<i>Ancylostoma ceylanicum</i>	EPB68178	-----M--Y-RNF ---R--D-Y-----
	<i>Ancylostoma duodenale</i>	KIH66538	-----M--Y-RNF ---R--D-Y-----
	<i>Brugia malayi</i>	CRZ23938	----Y-I-MYRY-TEC --R----Y-AM-----
	<i>Dictyocaulus viviparus</i>	KJH51742	-----Y-RNF ---R--D-Y-----
	<i>Haemonchus contortus</i>	CDJ83976	-----M--Y-RN- ---R--D-Y-----
	<i>Loa loa</i>	XP_020306889	----Y-I-MYRY-TEC --R----Y-AM-----
	<i>Oesophagostomum dentatum</i>	KHJ95623	-----M--Y-RNF ---R--D-Y-----
	<i>Onchocerca flexuosa</i>	OZC11101	----Y-I-MYRY-TEC --R----Y-AM-----
	<i>Pristionchus pacificus</i>	PDM64129	-----S--M-NY-EES ---R-FD-Y-----
	<i>Strongyloides ratti</i>	CEF60012	--S--A-FMYKF-RDC G-QQ-FQ-Y-S---TT----
	<i>Wuchereria bancrofti</i>	EJW80286	----Y-I-MYRY-TEC --R----Y-AM-----
	<i>Teladorsagia circumcincta</i>	PIO53665	-----M--Y-RN- ---R--D-Y-----
	<i>Toxocara canis</i>	KHN85487	----Y--M-RY-RER --Q----Y-A---V----
	<i>Trichinella britovi</i>	KRY48614	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella murrelli</i>	KRX43850	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella nativa</i>	KRZ55370	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella nelsoni</i>	KRX17302	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella patagoniensis</i>	KRY11761	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella pseudospiralis</i>	KRY68294	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella sp. T6</i>	KRX84092	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella sp. T8</i>	KRZ95482	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella sp. T9</i>	KRX59942	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella spiralis</i>	KRY35089	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichinella zimbabwensis</i>	KRZ11671	-----M-KY-LDC --QP-FT-Y-A---V----
	<i>Trichuris suis</i>	KFD50499	-----M-KY-LEC --QP-FM-Y-A---V----
	<i>Trichuris trichiura</i>	CDW56793	-----MYKY-LEC --QP-FM-Y-A---V----
Outgroups (0/>200)	<i>Homo sapiens</i>	XP_011529485	--TN-----KF--EC --EP-FL -YCA----
	<i>Mus musculus</i>	BAA13190	--TN-----KF--EC --EP-FL -YCA----

Supplementary Figure 25. Partial sequence alignments of a Plexin protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		1020	1070
Caenorhabditis homolog 1 (4/4)	<i>Caenorhabditis elegans</i>	NP_503362	GKPSDFWPTVTHALTYNFCRSTTTVALPAPVLYAH
	<i>Caenorhabditis brenneri</i>	EGT57012	-VA-----N-EK L-V-----CI-Y-----T-S--Q--L----
	<i>Caenorhabditis latens</i>	OZF81803	-LA-----WN--P- CLPT-----M--A-S-----
	<i>Caenorhabditis remanei</i>	OZF90277	-LA-----WN--P- CLPT-----M--A-S-----
Caenorhabditis homolog 2 (5/5)	<i>Caenorhabditis brenneri</i>	EGT32090	-IA-----D PYVA-----L--T-SV-S-S-----
	<i>Caenorhabditis briggsae</i>	CAP22335	-LA-----NN-K V-GT-----L--A--N-----
	<i>Caenorhabditis latens</i>	OZG10323	-LV-----WN--K CLPT-----T-----
	<i>Caenorhabditis nigoni</i>	PIC13092	-LA-----ND-K V-GT-----L-----S--N-----R
	<i>Caenorhabditis remanei</i>	OZF89967	-LV-----WN--K CLPT-----T-----
Other Nematodes (0/46)	<i>Diploscapter pachys</i>	PAV88210	-TS--A---W-E-Q PSPA---I---S--YV-CMKISISI-G-IF---
	<i>Ascaris suum</i>	AEF32755	-TS--A--T--Y-S-N LSPDD-QQ-AY--CHLYA-CARS-SI---Y---
	<i>Gongylonema pulchrum</i>	VDN33859	-TS--S----Y-S-N LTPDE-QHL-F--CHVYA-CNRS-SI---Y---
	<i>Onchocerca flexuosa</i>	OZC04814	-TS--A--I--Y-S-H LSADE-QQLVY--CHVYA-CNKS-SI---Y---
	<i>Acanthocheilonema viteae</i>	VBB30375	-TS--S----Y-S-N LTSDE-QQL-F--CHLYA-CNRS-SI---Y---
	<i>Loa loa</i>	XP_020304102	-TS--S--T--Y-S-H LSADE-QQMIY--CHVYA-CNKS-SI---Y---
	<i>Anisakis simplex</i>	VDK54211	-TS--A--T--Y-S-N LSADQ-QQMAY--CHLYT-CARS-SI---IY---
	<i>Thelazia callipaeda</i>	VDM97873	-TS--S--I--Y-S-L LSADE-QQMIY--CHVYA-CNKS-SI---Y---
	<i>Wuchereria bancrofti</i>	VDM09830	-TS--S--T--Y-S-H LSADE-QQMIY--CHVYA-CNKS-SI---Y---
	<i>Litomosoides sigmodontis</i>	VDK72737	-TS--S--I--Y-S-H LSADD-QQMIY--CHVYA-CNKS-SI---Y---
	<i>Brugia malayi</i>	CRZ24698	-TS--S--T--Y-S-L LSADE-QQMIY--CHIYA-CNKS-SI---Y---
	<i>Brugia timori</i>	VD027404	-TS--S--T--Y-S-L LSADE-QQMIY--CHIYA-CNKS-SI---Y---
	<i>Toxocara canis</i>	VDM38397	-TS--A--T--Y-S-N LLADQ-QQMAY--CHLYA-CARS-SI---Y---
	<i>Onchocerca ochengi</i>	VDM92461	-TS--A--T--Y-S-H LSADE-QQMAY--CHVYA-CNKS-SI---Y---
	<i>Brugia pahangi</i>	VDN87401	-TS--S--T--Y-S-L LSADE-QQMIY--CHIYA-CNKS-SI---Y---
	<i>Soboliphyme baturini</i>	VDP12733	-TS--S--H--W-DNN LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Necator americanus</i>	XP_013299213	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Teladorsagia circumcincta</i>	PI064661	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Heligmosomoides polygyrus</i>	VD099643	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Haemonchus contortus</i>	CDJ87551	-TS--S--H--W-DNQ LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Trichinella papuae</i>	KRZ78211	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Haemonchus placei</i>	VD055419	-TS--S--H--W-DNQ LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Dictyocaulus viviparus</i>	KJH45308	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Oesophagostomum dentatum</i>	KHJ99080	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Ancylostoma caninum</i>	RCN47663	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Pristionchus pacificus</i>	PDM64682	-TS--S--H--W-DSS LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Nippostrongylus brasiliensis</i>	VDL77997	-TT--A--T--VY-E-S QSPDKIYEMCYR-CFLYA-CRRP-S--C--Y---
	<i>Strongyloides ratti</i>	XP_024508426	-TS--S--H--W-DNQ I-ADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Ancylostoma ceylanicum</i>	EPB70479	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Dracunculus medinensis</i>	VDN60348	-TS--S--H--W-DNN LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Angiostrongylus costaricensis</i>	VDM60322	-TS--S--H--W-DNE LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Enterobius vermicularis</i>	VDD85869	-TS--S--H--W-DNS LTADELQQL-YQMCHTYV-C-RS-SI---AY---
	<i>Ancylostoma duodenale</i>	KIH64115	-TS--AR-H--W-DNN FSADEMQAI-YGMCHTYG-CARS-SI---Y---
	<i>Trichinella zimbabwensis</i>	KRZ12513	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella sp. T9</i>	KRX66470	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella pseudospiralis</i>	KRY88551	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella britovi</i>	KRY60812	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella murrelli</i>	KRX48413	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella nelsoni</i>	KRX23112	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella spiralis</i>	XP_003374460	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella sp. T6</i>	KRX84491	-TS--S--H--W-DNS LTADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella nativa</i>	KRZ52696	-TS--SY-H--W-DNN FSADEMQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella patagoniensis</i>	KRY16554	-TS--SY-H--W-DNN FSADEMQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichinella sp. T8</i>	KRZ95990	-TS--SY-H--W-DNN FSADEMQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichuris suis</i>	KHJ40100	-TS--S--H--W-DNN LSADELQQL-YQ-CHTYV-C-RS-SI---AY---
	<i>Trichuris trichiura</i>	CDW54952	-TS--S--H--W-DNN LSADELQQL-YQ-CHTYV-C-RS-SI---AY---
Outgroups (0/>200)	<i>Homo sapiens</i>	EAW92208	-TS--S--H--W-DNR FSSDELQIL-YQ-CHTYV-C-RS-SI---AY---
	<i>Mus musculus</i>	NP_067286	-SVS---N-IY-SSG LKPDHIQRL-YK-CHVYNNWPGVIRV---CQ---

Supplementary Figure 26. Partial sequence alignments of a Piwi-like protein protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI. The sequence alignment for homolog 1 of the species *Caenorhabditis nigoni* and *Caenorhabditis briggsae* was not observed in the BLAST search.

		70	99
Caenorhabditis homolog 1 (6/6)	<i>Caenorhabditis elegans</i>	NP_001123124	RAVVFRLGRLVP DVKGGPIFFIIPCIDT
	<i>Caenorhabditis latens</i>	OZG25387	-----I- E-----Q
	<i>Caenorhabditis remanei</i>	XP_003117911	-----I- E-----Q
	<i>Caenorhabditis briggsae</i>	XP_002645067	-----I- -----Q
	<i>Caenorhabditis nigoni</i>	PIC19183	-----I- E-----L----
	<i>Caenorhabditis brenneri</i>	EGT33172	-----L- E-----Q
Caenorhabditis homolog 2 (6/6)	<i>Caenorhabditis brenneri</i>	EGT29906	---I-----M- G GA-----V----
	<i>Caenorhabditis briggsae</i>	XP_002644793	---I-----M- G GA-----V----
	<i>Caenorhabditis nigoni</i>	PIC18440	---I-----M- G GA-----V----
	<i>Caenorhabditis elegans</i>	NP_001024566	---I-----M- G GA-----V----
	<i>Caenorhabditis latens</i>	OZG24410	---I-----M- G GA-----V----
	<i>Caenorhabditis remanei</i>	OZF84041	---I-----IK G GT----L--VL----
Other Nematodes (0/26)	<i>Diploscapter pachys</i>	PAV57820	-V-I--I----F G GAR--MI-----
	<i>Ancylostoma ceylanicum</i>	EPB70273	-V-I--I----F G GAR--MI-----
	<i>Ancylostoma duodenale</i>	KIH68818	---I-----M- G GA-----VL----S
	<i>Ascaris suum</i>	ERG80781	-V-I--I----F G GAR--MI-V-----
	<i>Brugia malayi</i>	XP_001895378	---I-----MT G KAR---L--L----S
	<i>Dictyocaulus viviparus</i>	KJH43651	-V-I--I----F G GAR--MI-----
	<i>Haemonchus contortus</i>	CDJ89985	---I-----M- G GA-----V----
	<i>Loa loa</i>	XP_020302578	---I-----MT G RAR---L--L----S
	<i>Necator americanus</i>	XP_013298666	-V-I--I----F G GAR--MI-----
	<i>Oesophagostomum dentatum</i>	KHJ99155	-V-I--I----F G GAR--MI-V-----
	<i>Pristionchus pacificus</i>	PDM83777	---I-----M- G GA-----V----
	<i>Strongyloides ratti</i>	CEF62830	---I-----M- G GA-----V----
	<i>Toxocara canis</i>	KHN87924	---I-----M- G GA-----V----
	<i>Trichinella britovi</i>	KRY60162	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella murrelli</i>	KRX44897	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella nativa</i>	KRZ62504	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella nelsoni</i>	KRX16776	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella papuae</i>	KRZ74240	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella patagoniensis</i>	KRY18828	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella pseudospiralis</i>	KRZ26557	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella sp. T6</i>	KRX75325	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella sp. T8</i>	KRZ95329	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella sp. T9</i>	KRX56998	-V-I-----M- G VAR---LV--M-----
	<i>Trichinella spiralis</i>	XP_003380470	-V-I-----M- G VAR---LV--M-----
	<i>Trichuris suis</i>	KHJ43320	-V-I-----M- G VAR---LV--M-----
	<i>Trichuris trichiura</i>	CDW55292	-V-I-----M- G VA---LV--M-----
Outgroups (0/>100)	<i>Homo sapiens</i>	NP_001257456	E--II-----IL Q GGA----L--L--T-
	<i>Mus musculus</i>	AAH58224	E-----IQ A DKA----LILVL----

Supplementary Figure 27. Partial sequence alignments of a Stomatin protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI.

		257	280
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001123140	QCQGCVWSKR RTAGERVYTVKATI
	<i>Caenorhabditis nigoni</i>	PIC17654	-----
	<i>Caenorhabditis briggsae</i>	XP_002644340	-----
	<i>Caenorhabditis latens</i>	OZG25237	-----
	<i>Caenorhabditis remanei</i>	POM50721	-----
	<i>Caenorhabditis brenneri</i>	EGT30457	-----
Other Nematodes (0/27)	<i>Diploscapter pachys</i>	PAV65431	-----N-A-- H KLHSDK-C-----
	<i>Cylicostephanus goldi</i>	VDK64261	----- H -LPN-K-----
	<i>Ancylostoma duodenale</i>	KIH53513	----- H -LPN-K-----
	<i>Necator americanus</i>	XP_013303822	----- H -LPN-K-----
	<i>Ancylostoma ceylanicum</i>	EPB79691	----- H -LPN-K-----
	<i>Strongylus vulgaris</i>	VDM75426	----- H -LPN-K-----
	<i>Haemonchus placei</i>	VDO32683	----- H -LSNDK-----
	<i>Ancylostoma caninum</i>	RCN33227	----- H -LPN-K-----
	<i>Oesophagostomum dentatum</i>	KHJ98476	----- H -LPN-K-----
	<i>Anisakis simplex</i>	VDK42437	----- R -KGP-A--S-R--
	<i>Angiostrongylus costaricensis</i>	VDM58682	----- H -LGNDK-----
	<i>Haemonchus contortus</i>	CDJ90030	----- H -LSNDK-----
	<i>Dictyocaulus viviparus</i>	KJH48789	----- H -LSNDK-----
	<i>Toxocara canis</i>	VDM36538	-----R- R KKGPA--S-R--
	<i>Dracunculus medinensis</i>	VDN50960	-----I---- H KKGP-A--S-----
	<i>Brugia timori</i>	VDO47024	-----N-- N KQGP-T-----
	<i>Brugia malayi</i>	XP_001898198	-----N-- N KQGP-T-----
	<i>Brugia pahangi</i>	VDN91899	-----N-- N KQGP-T-----
	<i>Acanthocheilonema viteae</i>	VBB29420	-----N-- N KRGP-T---R--
	<i>Enterobius vermicularis</i>	VDD93518	-----R- H KKGPA--S-R--
	<i>Wuchereria bancrofti</i>	VDM08568	-----N-- N KQGP-T---R--
	<i>Litomosoides sigmodontis</i>	VDK70981	-----N-- N KRGR-T---R--
	<i>Loa loa</i>	XP_020303432	-----N-- N KRGP-T---R--
	<i>Onchocerca ochengi</i>	VDK64311	-----N-- N KLGP-T---R--
	<i>Onchocerca flexuosa</i>	OZC10900	-----N-- N KLGP-T---R--
	<i>Pristionchus pacificus</i>	PDM60715	---SS--R- H KLGA--Y-----
	<i>Thelazia callipaeda</i>	VDN04565	----SI-N-- H KRGP-T--S-R--
Outgroups (0/>200)	<i>Homo sapiens</i>	CAB45716	H-L--I--R- D KKENKHLAP-IR--
	<i>Mus musculus</i>	XP_006529331	H-L--I--Q- D KKENKHLAP-IR--

Supplementary Figure 28. Partial sequence alignments of a Ral guanine nucleotide dissociation stimulator protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		261	290
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001309573	VYTDKSGAASISIRLPPK
	<i>Caenorhabditis nigoni</i>	PIC44232	-----T----V-----
	<i>Caenorhabditis brenneri</i>	EGT39972	-----T-----
	<i>Caenorhabditis remanei</i>	XP_003117505	-----T-----
	<i>Caenorhabditis latens</i>	OZF84301	-----T-----
	<i>Caenorhabditis briggsae</i>	XP_002630298	-----T----V-----
Other Nematodes (0/38)	<i>Diploscapter pachys</i>	PAV72156	I--R---TVAV---V- E AH-----
	<i>Ancylostoma duodenale</i>	KIH42539	L---T--T-VA---E- S -----
	<i>Ancylostoma ceylanicum</i>	EYC03167	L---T--T-VA---E- S -----
	<i>Oesophagostomum dentatum</i>	KHJ79213	L---T--T-VA---E- T --T-----
	<i>Necator americanus</i>	XP_013296219	L---T--T-VA---E- S -----
	<i>Teladorsagia circumcincta</i>	PI069203	L---T--T-VA---E- S -----
	<i>Dictyocaulus viviparus</i>	KJH44272	L---T--T-VA-K--D- S -----R-
	<i>Haemonchus contortus</i>	CDJ95820	L---T--T-VA---E- P -----
	<i>Pristionchus pacificus</i>	PDM62223	C---R-----AVEI--E A A-N-----
	<i>Loa loa</i>	XP_020304904	-QA-R---T--VTMSNG A LN-----RY
	<i>Ancylostoma caninum</i>	RCN36404	L---T--T-VA---E- S -----
	<i>Heligmosomoides polygyrus</i>	VD063815	L---T--T-VQ---E- S -----
	<i>Nippostrongylus brasiliensis</i>	VDL71649	L---T--T-VA---D- S --T-----
	<i>Haemonchus placei</i>	VDO42404	L---T--T-VA---E- P -----
	<i>Angiostrongylus costaricensis</i>	VDM53344	L---T--T-VA---E- Y --N-----
	<i>Strongylus vulgaris</i>	VDM79582	-T--T-VA---E- S --T-----
	<i>Anisakis simplex</i>	VDK45457	ILA-----T---NMCNE A L-----
	<i>Dracunculus medinensis</i>	VDN59128	-QA-R---T---KMCSE A L-----
	<i>Enterobius vermicularis</i>	VDD88292	-QA-----T--VSMCRE A L-T-----
	<i>Soboliphyme baturini</i>	VDO95451	IFA-----T-A-NMS-D T VGH-----
	<i>Thelazia callipaeda</i>	VDN04471	-KA-R---TV-VTMSNQ A MN-----Y
	<i>Gongylonema pulchrum</i>	VDN27534	LQA-R---T---TMSTE A LN-----
	<i>Onchocerca ochengi</i>	VDK64948	-KA-R---T---TMSNE A LN-----R-
	<i>Litomosoides sigmodontis</i>	VDK72628	-KA-R---T---TMSNE A LN-----R-
	<i>Acanthocheilonema viteae</i>	VBB29959	-KA-R---T--VTMSNE A LN-----R-
	<i>Wuchereria bancrofti</i>	VDM15282	-KA-R---T---TMSNE A LN-----R-
	<i>Brugia pahangi</i>	VDN85976	-KA-R---T---TMSNE A LN-----R-
	<i>Strongyloides ratti</i>	CEF60189	INS-D---T--LNMKNS D SKF-----R-
	<i>Trichinella murrelli</i>	KRX49645	-PA-QT---TVAVNMS-D C TR-----R-
	<i>Trichinella nelsoni</i>	KRX21745	-PA-QT---TVAVNMS-D C TR-----R-
	<i>Trichinella pseudospiralis</i>	KRX94659	-PA-QT---TVAVNMS-D C TR-----R-
	<i>Trichinella sp. T6</i>	KRX72173	-PA-QT---TVAVNMS-D Y TR-----R-
<i>Trichinella sp. T8</i>	KRZ90868	-PA-QT---TVAVNMS-D C TR-----R-	
<i>Trichinella spiralis</i>	KRY34230	-PA-QT---TVAVNMS-D C TR-----R-	
<i>Trichinella zimbabwensis</i>	KRZ08997	-PA-QT---TVAVNMS-D C TR-----R-	
<i>Trichuris suis</i>	KFD55831	-PA-----TVA-NMS-E C TKN-----R-	
<i>Trichuris trichiura</i>	CDW54076	-PA-----TVA-NMS-E C TKN-----R-	
<i>Toxocara canis</i>	KHN77300	-LA-----T---NMCSE A L-----	

Supplementary Figure 29. Partial sequence alignments of a Transglutaminase/ protease homolog protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

		209	242
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001033544	FELQSEDMIE S VKLSNHTLPYMIHGLGIPYLATY
	<i>Caenorhabditis remanei</i>	OZG06150	-----V-- - IR--S-----
	<i>Caenorhabditis latens</i>	OZG25132	-----V-- - IR--S-----
	<i>Caenorhabditis briggsae</i>	XP_002644672	Y-----E-V N IR--T-----S--
	<i>Caenorhabditis nigoni</i>	PIC18362	Y-----E-V N IR--T-----S--
	<i>Caenorhabditis brenneri</i>	EGT30451	Y-----V-- N IR--H-----D--
Other Nematodes (0/21)	<i>Diploscapter pachys</i>	PAV83346	YH-I---R-S LNIPKRAQ-QFNLII-LSSYEIH
	<i>Ancylostoma ceylanicum</i>	EYC37437	YL-LA--QLS LSANRASQ-CQFLMA-L-TCES-
	<i>Ancylostoma duodenale</i>	KIH69031	YR-LA--QLS LSANRTSQ-CQFLMA-L-TCES-
	<i>Brugia malayi</i>	XP_001898333	-S-TT--R-- MCTCDQGNLTLF-MSSV-HENV-
	<i>Dictyocaulus viviparus</i>	KJH48985	YR-L---RLS LSVKANSQ--QFSLA-V-SCDS-
	<i>Haemonchus contortus</i>	CDJ90309	YR-LA--RLS FSSKTFSH-CQVSMVA-V-AIES-
	<i>Loa loa</i>	XP_020303866	-T-TT--R-- MYTCDRGNLTFL-MSSL--ENV-
	<i>Necator americanus</i>	XP_013308897	YR-LA--QLS LSAK-CSQ-WQFSMA-L-SCES-
	<i>Oesophagostomum dentatum</i>	KHJ99848	YS-LA--RLS LSANRSSQ-CQFSMA-L-CFES-
	<i>Strongyloides ratti</i>	CEF63947	-MITA--I-D MNGVLPNQLHRLKMF----DKE-
	<i>Wuchereria bancrofti</i>	EJW85503	-N-TT--R-- MCTCDRGNLTFL-MSSV-HENV-
	<i>Pristionchus pacificus</i>	PDM64559	YD--A--R-S LA--AR-TAAQV-LGAL-HDGL-
	<i>Trichinella britovi</i>	KRY47448	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella murrelli</i>	KRX47109	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella nativa</i>	KRZ60864	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella nelsoni</i>	KRX17237	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella patagoniensis</i>	KRY18874	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella pseudospiralis</i>	KRX88958	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella sp. T6</i>	KRX73586	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella sp. T9</i>	KRX53517	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-
	<i>Trichinella spiralis</i>	KRY28374	-SVF---I-- M-D-EMLSCHQY-FS-L-GDQL-

Supplementary Figure 30. Partial sequence alignments of a Vacuolar protein sorting-associated protein 41 homolog protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search

			13	36	
Caenorhabditis (6/6)	{	<i>Caenorhabditis elegans</i>	NP_001317731	EPTYAEAHK	RPNEALLCFATPSDL
		<i>Caenorhabditis brenneri</i>	EGT44953	-----	-----
		<i>Caenorhabditis briggsae</i>	XP_002631115	-----	-----
		<i>Caenorhabditis latens</i>	OZG11344	-----	-----S-T--
		<i>Caenorhabditis nigoni</i>	PIC46074	-----	-----
		<i>Caenorhabditis remanei</i>	XP_003117041	-----	-----S-T--
Caenorhabditis (0/36)	{	<i>Diploscapter pachys</i>	PAV79982	-V---D---K	EQ---II---SRR--
		<i>Angiostrongylus costaricensis</i>	VDM55226	-V-F-D---	N ER--GVV---RE--
		<i>Haemonchus placei</i>	VDO40680	-V-F-D---	N ER--GVV---RE--
		<i>Haemonchus contortus</i>	CDJ85139	-V-F-D---	N ER--GVV---RE--
		<i>Teladorsagia circumcincta</i>	PIO62909	-V-F-D---	N ER--GVV---RE--
		<i>Strongylus vulgaris</i>	VDM65061	-V-F-D---	N ER--GVV---RE--
		<i>Heligmosomoides polygyrus</i>	VDO83327	-V-F-D---	N ER--GVV---RE--
		<i>Necator americanus</i>	XP_013301253	-V-F-D---	N ER--GVV---RE--
		<i>Ancylostoma ceylanicum</i>	EYC17281	-V-F-D---	N ER--GVV---RE--
		<i>Nippostrongylus brasiliensis</i>	VDL76374	-V-F-D---	N ER--GVV---RE--
		<i>Dictyocaulus viviparus</i>	KJH49634	-V-F-D---	N ER--GVV---RE--
		<i>Pristionchus pacificus</i>	PDM73741	-V---D---	Q VR--GII---SR---
		<i>Onchocerca flexuosa</i>	VDP18596	-V-F-D---	Q H---GIV--L-RE--
		<i>Litomosoides sigmodontis</i>	VDK84450	-V-F-D---	Q H---GIV--L-RE--
		<i>Enterobius vermicularis</i>	VDD86392	-V---D---	E H---GIV---SRE--
		<i>Onchocerca ochengi</i>	VDK67641	-V-F-D---	Q H---GIV--L-RE--
		<i>Loa loa</i>	XP_020301701	-V-F-D---	Q H---GIV--L-RD--
		<i>Gongylonema pulchrum</i>	VDN25083	-V-F-D---	Q HA--GIV--L-RE--
		<i>Brugia pahangi</i>	VDN91487	-V-F-D---	Q H---GIV--L-RD--
		<i>Brugia malayi</i>	XP_001902042	-V-F-D---	Q H---GIV--L-RD--
		<i>Wuchereria bancrofti</i>	VDM20183	-V-F-D---	Q H---GIV--L-RD--
		<i>Dracunculus medinensis</i>	VDN51147	-V-F-D---	Q -A--GVV--L-RE--
		<i>Thelazia callipaeda</i>	VDN03402	-V-F-D---	Q H---GIV--L-RD--
		<i>Toxocara canis</i>	KHN86131	-V-F-D---	Q HA--GVV--Q-RD--
		<i>Trichinella patagoniensis</i>	KRY13721	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella pseudospiralis</i>	KRX92226	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella papuae</i>	KRZ74679	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella nelsoni</i>	KRX21810	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella sp. T6</i>	KRX82412	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella spiralis</i>	KRY35895	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella sp. T8</i>	KRZ90387	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella sp. T9</i>	KRX54744	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella nativa</i>	KRZ60668	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella murrelli</i>	KRX48392	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichinella britovi</i>	KRY51015	-V---D--R	I KKH-GIV---SHYE-
		<i>Trichuris suis</i>	KFD48640	-V---D--R	A AR--GVV--TSH-E-
Outgroups (0/>200)	{	<i>Mus musculus</i>	AAH26944	-V---D---	G -K--GVIE-VSY--M
		<i>Homo sapiens</i>	AAA36649	-V---D---	G -K--GVIE-VSY--M

Supplementary Figure 31. Partial sequence alignments of a Serine/arginine-rich splicing factor protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		159	191
Caenorhabditis (6/6)	<i>Caenorhabditis nigoni</i>	PIC40784	YGLACDLLWSDPA Q PERNGWGLSHRGISFT
	<i>Caenorhabditis briggsae</i>	XP_002642928	-----S-----
	<i>Caenorhabditis elegans</i>	NP_001249242	-----S-----
	<i>Caenorhabditis remanei</i>	OZF95316	-----G-----
	<i>Caenorhabditis latens</i>	OZF87542	-----G-----
	<i>Caenorhabditis brenneri</i>	EGT35952	-----V---E S TSNI--S--A-----S
Other Nematodes (0/47)	<i>Diploscapter pachys</i>	PAV85879	T--L-----D KDVT---END--V---
	<i>Ancylostoma caninum</i>	RCN49073	--IG-----S -Q-D--V-----L---
	<i>Ancylostoma ceylanicum</i>	EPB70403	--IG-----S -Q-D--V-----
	<i>Cylicostephanus goldi</i>	VDK48331	--IG-----S -Q-D--V-----P
	<i>Necator americanus</i>	XP_013307020	--IG-----S -Q-D--V-----
	<i>Oesophagostomum dentatum</i>	KHJ94276	--IG-----S -QKD--V-----
	<i>Strongylus vulgaris</i>	VDM70279	--IG-----S -QKD--V-----
	<i>Ancylostoma duodenale</i>	KIH43961	--IG-----S -Q-D--V-----LP-
	<i>Haemonchus contortus</i>	CDJ91010	--IG--V----- LQ-D--V-----
	<i>Haemonchus placei</i>	VD028303	--IG--V----- LQ-D--V-----
	<i>Heligmosomoides polygyrus</i>	VDP38261	--IG--V----- -H-D--T-----
	<i>Dictyocaulus viviparus</i>	KJH47949	--IG-----S VQGD--I-----
	<i>Teladorsagia circumcincta</i>	PI071578	--IG--V----- LH-D--V-----
	<i>Angiostrongylus costaricensis</i>	VDM53877	--IG-----S TLGD--I-----
	<i>Toxocara canis</i>	VDM43604	--M--V---D EKH---SM-Q-----
	<i>Onchocerca flexuosa</i>	OZC05533	--VM--V---D DRYP--A--A-----
	<i>Litomosoides sigmodontis</i>	VDM93365	--M--I---D DRYP--A--A-----
	<i>Wuchereria bancrofti</i>	EJW73884	--M--I---D DRYP--A--A-----
	<i>Brugia timori</i>	VD032279	--M--I---D DRYP--A--A-----
	<i>Brugia malayi</i>	CRZ25408	--M--I---D DRYP--A--A-----
	<i>Brugia pahangi</i>	VDN91264	--M--I---D DRYP--A--A-----
	<i>Anisakis simplex</i>	VDK25200	--I--V---D DKY--A--P-----
	<i>Onchocerca ochengi</i>	VDM94263	--MM--V---D DRYP--A--A-----
	<i>Acanthocheilonema viteae</i>	VBB31930	--M--T---D DRYP--A--A-----
	<i>Loa loa</i>	XP_020300975	--M--T---D DRYP--A--A-----
	<i>Thelazia callipaeda</i>	VDN06638	--M--T---D DRYP--A--A-----
	<i>Pristionchus pacificus</i>	PDM74400	--M--V---D NKYP--A--T---Y-
	<i>Soboliphyme baturini</i>	VDP06334	F--I--I---R ALTM--AE-N-----
	<i>Gongylonema pulchrum</i>	VDK49626	IR-L-----D KDVQ---END--V---
	<i>Radopholus similis</i>	AZN18358	Q--L-----D KDVQ---END--V---
	<i>Nippostrongylus brasiliensis</i>	VDL74770	T--L-----D KDVT---END--V---
	<i>Strongyloides ratti</i>	XP_024505874	Q--L-----D KDVT---END--V---
	<i>Enterobius vermicularis</i>	VDD86098	T--L-----D KDVQ---END--V---
	<i>Trichinella spiralis</i>	XP_003377232	F--C-----D -GHK--AENA--V---
	<i>Trichinella nelsoni</i>	KRX27798	F--C-----D -GHK--AENA--V---
	<i>Trichinella papuae</i>	KRZ80860	--MC-----E QGL--AENA--V---
	<i>Trichinella zimbabwensis</i>	KRZ19022	--MC-----E QGL--AENA--V---
	<i>Trichinella pseudospiralis</i>	KRY91030	--C-----E QGL--AENA--V---
	<i>Trichinella nativa</i>	OUC48627	F--C-----E -GLK--AENT--V---
	<i>Trichinella sp. T8</i>	KRZ92852	F--C-----E -GLK--AENT--V---
	<i>Trichinella britovi</i>	KRY60959	F--C-----E -GLK--AENT--V---
	<i>Trichinella patagoniensis</i>	KRY19678	F--C-----E -GLK--AENA--V---
	<i>Trichinella sp. T6</i>	KRX85648	F--C-----E -GLK--AENT--V---
	<i>Trichinella sp. T9</i>	KRX64885	F--C-----E -GLK--AENT--V---
	<i>Trichinella murrelli</i>	KRX48811	F--C-----E -GLK--AENT--V---
	<i>Trichuris suis</i>	KFD70703	T--L-----D KDVQ---END--V---
	<i>Trichuris trichiura</i>	CDW56051	--F--V-A--D STIE---E-P-----
Outgroups (0/>200)	<i>Homo sapiens</i>	NP_996756	Q--L-----D KDVQ---END--V---
	<i>Mus musculus</i>	BAE42366	T--L-----D KDVQ---END--V---

Supplementary Figure 32. Partial sequence alignments of a Serine/threonine-protein phosphatase protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

			761	804
Caenorhabditis homolog 1 (6/6)	<i>Caenorhabditis elegans</i>	NP_001317749	GYESMTMEQIFFHLQALYFC	RPPGGSTGELTAKDARQHYSTRVN
	<i>Caenorhabditis brenneri</i>	EGT34367	-F-DFGLDKLY--IA--TW-	SAREEFPL-TKLTHPATP-F---
	<i>Caenorhabditis briggsae</i>	CAP35351	-FDNDNTRK---RVA--S--	A-RDTEIDYV-QREHPTD-F---
	<i>Caenorhabditis latens</i>	OZF91768	-F-DEKPKL-----T--NY-	SSRSLRSLAEQLTFTHPTN-F---
	<i>Caenorhabditis nigoni</i>	PIC48108	-F-DLSF-KLY-RIG--KW-	S-RSPL-L-DQL-QVHATT-F---
	<i>Caenorhabditis remanei</i>	XP_003109959	-F-NYDI-KLY--IH--N--	A-RDT-SLDEAMGWIHPTD-F---
Caenorhabditis homolog 2 (0/6)	<i>Caenorhabditis elegans</i>	NP_506520	-FQNFSQ-M--LAY-NNW-	S LVRPKHYIQIILT-VHAPSKY-AM
	<i>Caenorhabditis brenneri</i>	EGT35769	-F-DVSDM--YNY-VRR-	E TSSSPKNR--MLRRTHPTSRF---
	<i>Caenorhabditis briggsae</i>	CAP25386	-FQNFSQ-M--LAY-NNW-	S LVRPKHYIQIILT-VHAPSKY-AM
	<i>Caenorhabditis latens</i>	OZF96819	-FDDA-G--M--YNY-FRQ-	D VSDPNFRP-HLKNRPHPTPRY---
	<i>Caenorhabditis nigoni</i>	PIC46155	HF--LSS--L--VGY-QVW-	G AKTPETKTL-LLT-PHSPETA---
	<i>Caenorhabditis remanei</i>	XP_003109896	-FDDA-G--M--YNY-FRQ-	D VSDPNFRH-HLKNRPHPTPRY---
Other Nematodes (0/27)	<i>Ancylostoma caninum</i>	AAG29103	-L-QY-PN---WITYGYSW-	M SQTDS-LIRQLLT-VHSPG-C---
	<i>Ancylostoma ceylanicum</i>	AAQ75757	-L-QY-PN---WITYGYSW-	M SQTDS-LIRQLLT-VHSPG-C---
	<i>Ancylostoma duodenale</i>	KIH50844	-L-QY-PN---WITYGYSW-	M SQTDS-LIRQLLT-VHSPG-C---
	<i>Brugia malayi</i>	CDP96775	-L-HLD-N----LSS-QMW-	G HSRPAALIRQVLT-QHAPLRL---
	<i>Dictyocaulus viviparus</i>	KJH41117	-L-QFDN--M--LGY-TVW-	G HSTVD-LIN-ILT-SHAPQKY---
	<i>Diploscapter pachys</i>	PAV57490	-FQNFS--M--LAY-NNW-	A LIRPKYVQ-ALT-VHSPSKY-AI
	<i>Haemonchus contortus</i>	AAC31568	-L-KF-PN---WISYGYSW-	A KETQS-LVKRLLTNPHSPN-C---
	<i>Loa loa</i>	XP_020303789	-L-NLD-N----LSS-QTW-	G HSRPAALIRQVLT-QHAPSRF---
	<i>Necator americanus</i>	XP_013303479	TT-DI-AD-L--LGWG IIL-	E KYGEEELNAILV-NHAPSVL---
	<i>Oesophagostomum dentatum</i>	KHJ99552	-L-QYNN--M--LGY-TVW-	G HSTDD-MIN-ILT-PHSPQRY---
	<i>Onchocerca flexuosa</i>	OZC11274	-L-HLD-D---LSS-QMW-	G HSRPAALIRHILTGQHAPLRF---
	<i>Pristionchus pacificus</i>	PDM80021	-L--F-PD---WITYGGTW-	M KLTDERLARQLMT-VHSPS-C--D
	<i>Strongyloides ratti</i>	CEF59415	-F-KYSND---MSY-QTW-	G KAKQP-VIRQILG-PHSPMRF---
	<i>Teladorsagia circumcincta</i>	PI072527	-L-QYNN--M--MGY-TTW-	G HMTKDALIN-ILT-PHSPERY---
	<i>Toxocara canis</i>	KHN75499	-L-HYSDD-L--INS-YTW-	A ISRPAQVLDLSLLN-GHSPHRY---
	<i>Wuchereria bancrofti</i>	EJW80247	-MSDF-D----LSF-QVW-	G HQTKEAQIKQVLTNEHSPAKY---
	<i>Trichinella murrelli</i>	KRX48555	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella nelsoni</i>	KRX16250	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella papuae</i>	KRZ70145	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella patagoniensis</i>	KRY15148	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella pseudospiralis</i>	KRX92259	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella sp. T6</i>	KRX75996	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella sp. T8</i>	KRZ86267	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella sp. T9</i>	KRX55739	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella spiralis</i>	XP_003372438	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichinella zimbabwensis</i>	KRZ10628	-LVN--ND---LSY-NFW-	G HKKPAAALQQVLT-PHSPMF--I
	<i>Trichuris trichiura</i>	CDW59783	SL-QF--D---LSF-NFY-	G NSTNMF LHKMININEHAPDR---

Supplementary Figure 33. Partial sequence alignments of NEPrilysin metallopeptidase family protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI.

		224	262
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001251923	CPFRHSEKQVLKQKLGSDAI L KKEQIERIAELAEINQYD
	<i>Caenorhabditis brenneri</i>	EGT35184	-----IAL---R-S-EEV - ---HV-----A----
	<i>Caenorhabditis briggsae</i>	XP_002640609	-----S-ESV - ---VD-----S----
	<i>Caenorhabditis nigoni</i>	PIC54883	-----S-ESV - ---VD--S-----
	<i>Caenorhabditis remanei</i>	OZF76862	-----SGES- - --D-V-L-VD---S----
	<i>Caenorhabditis latens</i>	OZG16059	-----AGES- - --D-VDL-VD---S----
Other Nematodes (0/27)	<i>Ancylostoma ceylanicum</i>	EYB89256	---K-LDH-L-A-R-EK-GL NRN-VNQ-VNYSKASA--
	<i>Ancylostoma duodenale</i>	KIH58777	---K-LDH-L-A-R-EK-GL NRN-VNQ-VNYSKASA--
	<i>Brugia malayi</i>	XP_001901741	--Y---DLRL-T-N-E-SGL S-S---H-TL-SKNK---
	<i>Carlito syrichta</i>	XP_008068171	-----DPEL-----Q-YK- SPGG-SQ-LD-VKGTH-Q
	<i>Dictyocaulus viviparus</i>	KJH47173	---K-VHHPQ-AER-EKGL NTD--NH-INYSKA-AF-
	<i>Diploscapter pachys</i>	PAV61350	---A-M-TAL-T-R-KNCD- SDVEV-N-VGFSKTR---
	<i>Haemonchus contortus</i>	CDJ95440	---K-LDN-L-A-R-EK-GL NR---SQ-VNYTKT-AF-
	<i>Loa loa</i>	XP_020307065	--Y---DL-P-V-N-R-SGL S-S---H-TL-SKNT---
	<i>Necator americanus</i>	XP_013292330	---K-LDH-L-A-R-EK-GL NRD--SQ-VNYSKISA--
	<i>Oesophagostomum dentatum</i>	KHJ79721	---K-LDQ-L-A-R-QK-GL NAN--NQ-VNYSKASA--
	<i>Onchocerca flexuosa</i>	OZC08232	--Y--NDL-S-A-N-ENSGL S-PKS-H-IL-SKNT---
	<i>Pristionchus pacificus</i>	PDM67073	---K--TEDN--SI-KANK- -S-D-DEMIA-SKI--F-
	<i>Strongyloides ratti</i>	CEF65434	---K--D-RN-IHL-RNMGL TT--VDVVL-QIKT-RF-
	<i>Toxocara canis</i>	KHN76917	-----DAT--A-M-EKVLG L-HE-AT-VD-SKSS---
	<i>Wuchereria bancrofti</i>	EJW88833	--Y---DLRL-A-N-E-SGL P-S---H-TL-SKN----
	<i>Trichinella papuae</i>	KRZ77714	---K-CDAEH-Q-L-KNCG- H-DD-KN-VSY-SN-H-N
	<i>Trichinella pseudospiralis</i>	KRZ28229	---K-CDAEH-Q-L-KNCG- H-DD-KN-VNY-SN-H-N
	<i>Trichinella sp. T9</i>	KRX62449	---K-CDAEH-Q-L-KNCG- H-DN-KN-VNY-SN-H-N
	<i>Trichinella zimbabwensis</i>	KRZ08210	---K-CDAEH-Q-L-KNCG- H-DD-KN-VSY-SN-H-N
	<i>Trichinella nativa</i>	OUC41177	---K-CDAEH-Q-L-KNCG- H-DN-KN-VNY-SN-H-N
	<i>Trichinella sp. T6</i>	KRX74683	---K-CDAEH-Q-L-KNCG- H-DN-KN-VNY-SN-H-N
	<i>Trichinella britovi</i>	KRY25348	---K-FDAEH-Q-L-KNCG- H-DN-KN-VNY-SN-H-N
	<i>Trichinella nelsoni</i>	KRX15057	---K-CDAEH-Q-L-KNCG- H-DD-KN-VNY-SN-H-N
	<i>Trichinella spiralis</i>	KRY40501	---K-CDAEH-Q-L-KNCG- H-DD-KN-VNY-SN-H-N
	<i>Trichoplax adhaerens</i>	XP_002114281	-----TDPDL-R-R-L-NGL SS-GAKE-T---KGSH-Q
	<i>Trichuris suis</i>	KFD55183	---K-CDT---R-L-TEWGI G-DDA-K-V-FSQWKR--
	<i>Trichuris trichiura</i>	CDW57123	---K-CDV---R-L-TEWGI G-DDA-K-V-FSQWKR--
Outgroups (0/>100)	<i>Homo sapiens</i>	XP_016866496	-----DPEL-----Q-YK- SP GG-SQ-LD-VKGTH-
	<i>Mus musculus</i>	XP_011236757	-----DAEL----MQ-YK- PA SG-SQ-LD-VKG-H-

Supplementary Figure 34. Partial sequence alignments of a DNA PRImase homolog protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		56	91
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001252372	SSGIDGRLVASATGRF LGNMRHSYFANRNVMAKRR
	<i>Caenorhabditis brenneri</i>	EGT32311	-C-V-----S--L -R-IH-PF----SI-S----
	<i>Caenorhabditis latens</i>	OZG16099	---V---L---S--L -K-NHLPF----L-T----
	<i>Caenorhabditis briggsae</i>	XP_002640718	-C-V-----L -K--H-PF-----LLQ----
	<i>Caenorhabditis remanei</i>	OZF76907	-C-V---L---S--L -K-NHLPF----L-----
	<i>Caenorhabditis nigoni</i>	PIC54820	-C-V-----L -K--H-PF----LLQ----
Other Nematodes (0/24)	<i>Loa loa</i>	XP_020306018	-A-A---QV-LN--L AAV GSEKDFLFN---V-LT-L-K
	<i>Wuchereria bancrofti</i>	EJW81713	-A-A---QV-LN--L AAI GSEKDFVFN-C-V-LT-V-K
	<i>Onchocerca flexuosa</i>	VDO78063	-V-G---QV-LN--L AAV GSEKDFLFN-CQV-LT-I-K
	<i>Acanthocheilonema viteae</i>	VBB34527	-A-A---QV-LN--L AAV GSERDFLFS-C-V-LT-L-K
	<i>Litomosoides sigmodontis</i>	VDM91432	-A-A---QV-LN--L AAV GSQKDFLFS-C-V-LT-V-K
	<i>Brugia pahangi</i>	VDN83211	-A-A---QV-LN--L AAI RSEKDFVFN-C-V-LT-M-K
	<i>Brugia timori</i>	VD023402	-A-A---QV-LN--L AAI RSEKDFVFN-C-V-LT-V-K
	<i>Onchocerca ochengi</i>	VDK89390	-V-G---QV-LN--L AAV GSEKDFLFN-CQV-LT-V-K
	<i>Thelazia callipaeda</i>	VDM97139	-V-A---QI-LN--L VAS GSEKDFGFSVCQV--TVVKK
	<i>Gongylonema pulchrum</i>	VDN40914	-V-G---II-QN--L APH ESDNDL-FN-C-V--T-L-K
	<i>Dracunculus medinensis</i>	VDN51116	-V-G----V-LN--I VPH GTQRDVFFK-C-VL-TVI-K
	<i>Toxocara canis</i>	VDM40044	TV-A---EV-LN-HI VPR HAQIDFPFNSC-VA-T-V-K
	<i>Angiostrongylus costaricensis</i>	VDM56220	-C-V---LL--N--L ATF GSS-DFAFSVLKSAL-IT--
	<i>Dictyocaulus viviparus</i>	KJH41983	-C-V---LL--N--L VTF GST-DYGFVSVL--SSLTIS--
	<i>Strongylus vulgaris</i>	VDM65762	-C-A--K-LL-TN--L VTT CHIKDYGFSLKLTALT-V-K
	<i>Nippostrongylus brasiliensis</i>	VDL81967	-C-V---LL--N--L ATF ASAVD-PFCFVKAALT-T--
	<i>Haemonchus contortus</i>	CDJ92092	-C-V---LL-SN--L VTF ASPCDYGFSLMKSSLT-T--
	<i>Haemonchus placei</i>	VDO35340	-C-V---LL-SN--L VTF ASPCDYGFSLMKSSLT-T--
	<i>Ancylostoma duodenale</i>	KIH63320	-C-L--KVLL-TN--L VTI ANTVDGFGSLLKLTALTIV--
	<i>Ancylostoma ceylanicum</i>	EYB93854	-C-L--KVLL-TN--L VTI ANTVDGFGSLLKLTALTIV--
	<i>Ancylostoma caninum</i>	RCN47650	-C-L--KVLL-TN--L VTI ANTVDGFGSLLKLTALTIV--
	<i>Pristionchus pacificus</i>	PDM66927	TA-A--MEL-MN-KV VPR GCGQDL-VNLHTEPIL-I-
	<i>Enterobius vermicularis</i>	VDD92248	TV-A--Q-NL-L---L LPA CKQRQFNFGGI-TLLS--KK
	<i>Oesophagostomum dentatum</i>	KHJ81200	TC-A--K-LL--N-L VTP SHTSDYGFSLKLTALCIV--

Supplementary Figure 35. Partial sequence alignments of a Probable maleylacetoacetate isomerase protein with a CSI consisting of a 3 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. Homologous sequences for this protein were not observed for many non-nematode organisms in the BLASTP search.

			39	61	
Caenorhabditis Homolog 1 (5/5)	}	<i>Caenorhabditis elegans</i>	NP_001254102	VVYLYQFPR	P ANRQPNLSPYCLK
		<i>Caenorhabditis brenneri</i>	EGT46528	-----	-----F---
		<i>Caenorhabditis briggsae</i>	XP_002630778	-----	---L-----
		<i>Caenorhabditis nigoni</i>	PIC46704	-----	---L-----F---
		<i>Caenorhabditis remanei</i>	XP_003108831	-----	--KL-----F---
Caenorhabditis Homolog 2 (0/6)	}	<i>Caenorhabditis brenneri</i>	EGT48831	-----	CRLL----S--M-
		<i>Caenorhabditis elegans</i>	NP_496813	-----	-RLL----F-M-
		<i>Caenorhabditis latens</i>	OZG18599	-----	TRLL-----F-M-
		<i>Caenorhabditis nigoni</i>	PIC26241	-----	I-TV----S----
		<i>Caenorhabditis briggsae</i>	CAP37749	-----	TRVL----TF-M-
		<i>Caenorhabditis remanei</i>	XP_003102439	-----	TRLL-----F-M-
Other Nematodes (0/41)	}	<i>Diploscapter pachys</i>	PAV87405	T---F----	TQHL-----F---
		<i>Brugia malayi</i>	XP_001898570	I-----N-	-SSS--I--F-F-
		<i>Ancylostoma ceylanicum</i>	EPB73791	T-----	SKAL--V--F---
		<i>Ancylostoma duodenale</i>	KIH57073	T-----	SPVL-----F-M-
		<i>Ascaris suum</i>	ERG82980	-----K-	SPIM--I--F---
		<i>Dictyocaulus viviparus</i>	KJH50494	-----	CKEI-----F---
		<i>Haemonchus contortus</i>	CDJ97726	I-----	-RSV----T----
		<i>Loa loa</i>	XP_003138099	-I-----S-	-SSS--I--F-F-
		<i>Necator americanus</i>	XP_013293585	T-----	SPVL-----F---
		<i>Oesophagostomum dentatum</i>	KHJ90324	T-----	SKYV--V--F---
		<i>Onchocerca flexuosa</i>	OZC11826	-----N-	-SSS--I--F-F-
		<i>Pristionchus pacificus</i>	PDM61759	I-----	SPIL-----
		<i>Strongyloides ratti</i>	CEF67762	-----K-	TPAL--M--F---
		<i>Wuchereria bancrofti</i>	EJW83270	-----N-	-SSS--I--F-F-
		<i>Teladorsagia circumcincta</i>	PIO65880	-----	PKML-----
		<i>Haemonchus placei</i>	VD062328	I-----	-KSV-----
		<i>Pristionchus pacificus</i>	PDM61759	I-----	SPIL-----
		<i>Strongylus vulgaris</i>	VDM84836	I-----	-KTV--I-----
		<i>Heligmosomoides polygyrus</i>	VDP08595	-----	SPVM-----F---
		<i>Ancylostoma ceylanicum</i>	EPB76689	-----	SPVL-----F---
		<i>Dictyocaulus viviparus</i>	KJH50494	-----	CKEI-----F---
		<i>Toxocara canis</i>	KHN81881	-----	VKCI-----F---
		<i>Nippostrongylus brasiliensis</i>	VDL85117	-----	SPTV--V--F---
		<i>Angiostrongylus costaricensis</i>	VDM52956	-----	SKTI--M--F---
		<i>Acanthocheilonema viteae</i>	VBB33885	-----	VKHI--I--F---
		<i>Anisakis simplex</i>	VDK43584	I-----	SKGI-S--F---
		<i>Gongylonema pulchrum</i>	VDK37804	-----	-KCI-SQ--F---
		<i>Thelazia callipaeda</i>	VDN01285	-----G-	S-SA--I--F-F-
		<i>Onchocerca ochengi</i>	VDK63043	-----N-	-SSS--I--F-F-
		<i>Wuchereria bancrofti</i>	EJW83270	-----N-	-SSS--I--F-F-
		<i>Litomosoides sigmodontis</i>	VDK72690	I-----S-	-SSS--I--F-F-
		<i>Loa loa</i>	XP_003138099	-I-----S-	-SSS--I--F-F-
		<i>Enterobius vermicularis</i>	VDD85294	-----	VKYV-SF--F---
		<i>Soboliphyme baturini</i>	VDP18697	---F----	SSFI--I--F---
		<i>Brugia pahangi</i>	VDN88413	I-----N-	-SSS--I--F-F-
		<i>Brugia malayi</i>	CTP81381	I-----N-	-SSS--I--F-F-
		<i>Brugia timori</i>	VD023595	I-----N-	-SSS--I--F-F-
		<i>Ancylostoma caninum</i>	RCN39977	-----	TKIL-SP-AP---
		<i>Trichinella spiralis</i>	XP_003373650	---F-P--	STYI--I--FS--
		<i>Trichinella zimbabwensis</i>	KRZ10264	---F-P--	STYI--I--FS--
		<i>Trichinella pseudospiralis</i>	KRX89604	---F-P--	STYI--I--FS--

Supplementary Figure 36. Partial sequence alignments of a Glutathione S-transferase protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI. The sequence alignment for homolog 1 of the species *Caenorhabditis latens* was not observed in the BLASTP search.

		32	52
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_001254124	KYQVVKYH S NIPMSPLTTHRL
	<i>Caenorhabditis briggsae</i>	XP_002646742	----- -
	<i>Caenorhabditis nigoni</i>	PIC45241	----- -
	<i>Caenorhabditis remanei</i>	XP_003113789	-----R-- -
	<i>Caenorhabditis latens</i>	OZG16232	----- -
	<i>Caenorhabditis brenneri</i>	EGT55705	----- - K-----
Other Nematodes (0/30)	<i>Diploscapter pachys</i>	PAV72616	-K--R-P IV-L---A---
	<i>Ancylostoma ceylanicum</i>	EYC06479	---I--- HV-C---A---
	<i>Ancylostoma duodenale</i>	KIH68239	---I--- HV-C---A---
	<i>Brugia malayi</i>	XP_001896433	-R--IR-E YV-L---SA---
	<i>Dictyocaulus viviparus</i>	KJH48055	----- HV-C---A---
	<i>Haemonchus contortus</i>	CDJ98226	----- HV-C---A---
	<i>Oesophagostomum dentatum</i>	KHJ95417	---I--- RV-C---A---
	<i>Necator americanus</i>	XP_013301552	---I--- HV-C---A---
	<i>Pristionchus pacificus</i>	PDM61696	-R--T-E H--L---A---
	<i>Wuchereria bancrofti</i>	EJW74639	-R--IR-E YV-L---SA---
	<i>Haemonchus placei</i>	VD036023	----- HV-C---A---
	<i>Heligmosomoides polygyrus</i>	VDP18530	----- HV-C---A---
	<i>Nippostrongylus brasiliensis</i>	VDL81814	----- HV-C---A---
	<i>Ancylostoma caninum</i>	RCN34876	---I--- HV-C---A---
	<i>Angiostrongylus costaricensis</i>	VDM60974	-----D HV-C---A---
	<i>Dracunculus medinensis</i>	VDN60070	-R--R-Q R--L---A---
	<i>Soboliphyme baturini</i>	VDP07701	Q---R-V AV-L---SQ--
	<i>Thelazia callipaeda</i>	VDN02079	-R--R-Q YV-L---SA---
	<i>Litomosoides sigmodontis</i>	VDK68374	-H--IR-E Y--L---SA---
	<i>Enterobius vermicularis</i>	VDD95055	-R----D FL-L---SA---
	<i>Onchocerca flexuosa</i>	VDP20800	-R--IR-T YV-L---SA---
	<i>Onchocerca ochengi</i>	VDK83226	-R--IR-A YV-L---SA---
	<i>Acanthocheilonema viteae</i>	VBB25206	-H--IR-E YV-L---SA---
	<i>Brugia timori</i>	VDO42288	-R--IR-E YV-L---SA---
	<i>Brugia pahangi</i>	VDN84995	-R--IR-E YV-L---SA---
	<i>Loa loa</i>	XP_003142184	-R--IR-E YV-L---SA---
	<i>Brugia malayi</i>	XP_001896433	-R--IR-E YV-L---SA---
<i>Anisakis simplex</i>	VDK20128	-R--R-E CV-L---SAR--	
<i>Trichuris suis</i>	KFD58678	QH--IR-V H--L--ISDQ--	
<i>Trichuris trichiura</i>	CDW58322	QH--IR-V D--L--VSDQ--	
Outgroups (0/>100)	<i>Homo sapiens</i>	NP_056158	Q--T-R-D IL-L--VSRN--
	<i>Mus musculus</i>	NP_080293	Q--T-R-D IL-L--SRN--

Supplementary Figure 37. Partial sequence alignments of a CTD nuclear envelope phosphatase 1 homolog protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		208	248
Caenorhabditis (6/6)	<i>Caenorhabditis elegans</i>	NP_506895	MYIFGGRSDESGQ VGDEHL FHTIHDQYDDTLMALNLATGAW
	<i>Caenorhabditis brenneri</i>	EGT59124	-----QM----- --TQ-L-----S--V-
	<i>Caenorhabditis latens</i>	OZG18972	-----HN----- --TQ-L-----T--V-
	<i>Caenorhabditis remanei</i>	OZF77388	-----HN----- --TQ-L-----T--V-
	<i>Caenorhabditis nigoni</i>	PIC29033	-----HN----- --TQ-L---S---D-E-QE-
	<i>Caenorhabditis briggsae</i>	XP_002637963	-----HN----- --TQ-L---S---D-E-QE-
Other Nematodes (0/33)	<i>Diploscapter pachys</i>	PAV83173	--V-----IT-E --STR-T---R---D-K--L-
	<i>Heligmosomoides polygyrus</i>	VD086832	-----YT-- -SET --STR-M--ER-K--D-R--E-
	<i>Ancylostoma duodenale</i>	KIH61473	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Ancylostoma ceylanicum</i>	EYB92376	-----HT-- --STR-M--ER-K---R--E-
	<i>Strongylus vulgaris</i>	VDM79853	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Dictyocaulus viviparus</i>	KJH53729	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Ancylostoma caninum</i>	RCN28697	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Necator americanus</i>	XP_013307245	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Oesophagostomum dentatum</i>	KHJ87750	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Angiostrongylus costaricensis</i>	VDM62307	-----HT-- --STR-M--ER-K--D-R--E-
	<i>Haemonchus contortus</i>	CDJ94868	-----YT-- --STR-M--ER-K--D-R--E-
	<i>Teladorsagia circumcincta</i>	PI068211	-----YT-- --STR-M--ER-K--D-R--E-
	<i>Nippostrongylus brasiliensis</i>	VDL81029	-----YT-- --STR-M--ER-K--D-R--E-
	<i>Haemonchus placei</i>	VDO35379	-----YT-- --STR-M--ER-K--D-R--E-
	<i>Wuchereria bancrofti</i>	EJW80092	-----LH-A --SSR-Y-S-V-KV---K--R-
	<i>Brugia timori</i>	VD043970	-----LH-A --SSR-Y-S-V-KV---K--R-
	<i>Loa loa</i>	XP_003148138	-----LQ-A --SSR-Y-S-V-KV---K--R-
	<i>Brugia pahangi</i>	VDN94587	-----LH-A --SSR-Y-S-V-KV---K--R-
	<i>Brugia malayi</i>	XP_001895672	-----LH-A --SSR-Y-S-V-KV---K--R-
	<i>Litomosoides sigmodontis</i>	VDK89662	-----LH-A --SSR-Y-S-V-KV---K--R-
	<i>Acanthocheilonema viteae</i>	VBB30887	--V-----LH-A --SSR-Y-S-V-KV---K--H-
	<i>Anisakis simplex</i>	VDK18725	-----QL-- --SSR-F-CKR-KV-D-KKFE-
	<i>Toxocara canis</i>	VDM42343	--V-----QL-- --SSR-L-C-R-KV-D-K-TQ-
<i>Trichinella spiralis</i>	KRY37343	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella murrelli</i>	KRX46935	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella britovi</i>	KRY52927	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella patagoniensis</i>	KRY19859	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella nativa</i>	OUC43113	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella nelsoni</i>	KRX18119	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella sp. T6</i>	KRX81102	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichinella sp. T8</i>	KRZ93130	--V-----A-P H-SNVER-PTD-FY-D-S-FE-	
<i>Trichuris suis</i>	KHJ46275	--V-----P ---NSEL-NTE--Y-DF-DNS-	
<i>Trichuris trichiura</i>	CDW55263	--V-----P ---NSEL-NTE--Y-DFTDNS-	
Outgroups (0/>100)	<i>Homo sapiens</i>	AAH41793	--V---A-RF-P --SNNEI-CNRIRVFDTR-E--
	<i>Mus musculus</i>	BAB23704	--V---A-RF-P --SNNEI-CNRIRVFDTR-E--

Supplementary Figure 38. Partial sequence alignments of a Kelch-domain protein with a CSI consisting of a 6 aa insertion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species.

		946	983
Caenorhabditis homolog 1 (0/6)	<i>Caenorhabditis elegans</i>	NP_741705	LAEVEGRNFFLERLIDDLKNN
	<i>Caenorhabditis latens</i>	OZG22582	-----K-E-R--
	<i>Caenorhabditis nigoni</i>	PIC15211	-----K-E-R--
	<i>Caenorhabditis remanei</i>	POM49663	-----K-E-R--
	<i>Caenorhabditis briggsae</i>	XP_002643265	-----K-E-R--
	<i>Caenorhabditis brenneri</i>	EGT43922	-----*-----K-E-----
Caenorhabditis homolog 2 (0/6)	<i>Caenorhabditis remanei</i>	POM51826	-SDL---VL--KQ-E--NYQ LE DDQRSY-AA-NDK----
	<i>Caenorhabditis latens</i>	OZG23421	-SDL---VL--KQ-E--NYQ LE DDQRSY-AA-NDK----
	<i>Caenorhabditis brenneri</i>	EGT30317	M-DL---LL--KQVE--NYQ ME -DMRSY-Q--NDK-SS-
	<i>Caenorhabditis nigoni</i>	PIC18245	M-DL---LL--KQVE--NYQ ME -DMRTY-Q--NDK-SS-
	<i>Caenorhabditis briggsae</i>	XP_002644610	M-DL---LL--KQVE--NYQ ME -DMRTY-Q--NDK-SS-
	<i>Caenorhabditis elegans</i>	NP_508836	M-DL---LL--KQ-E--NYQ ME -DMRSY-Q--NDK-TS-
Other Nematodes (0/49)	<i>Ancylostoma ceylanicum</i>	EYC23157	--NL---HI--K--Q--NYQ ID D-SRVTMAH-S-K-DE-
	<i>Ancylostoma caninum</i>	RCN38944	--NL---HI--K--Q--NYQ ID D-SRVTMAH-S-K-DE-
	<i>Oesophagostomum dentatum</i>	KHJ96139	--NL---HI--K--Q--NYQ ID D-SRVTMAH-S-K-DE-
	<i>Cylicostephanus goldi</i>	VDN25456	--NL---HI--K--Q--NYQ IE D-SRVTMAH-S-K-DE-
	<i>Angiostrongylus costaricensis</i>	VDM56448	--NL---HI--K--Q--NFQ IE D-SRVTMAH-S-K-DE-
	<i>Dictyocaulus viviparus</i>	KJH42959	--NL---HI--K--Q--NFQ IE D-SRVTMAH-S-K-DE-
	<i>Necator americanus</i>	XP_013302480	--NL---HI--K--Q--NYQ IE D-SRVTMAH-S-K-DE-
	<i>Haemonchus contortus</i>	CDJ82493	--NL---HI--K--Q--TYQ IE D-NRVSMAM-S-K-DE-
	<i>Strongyloides ratti</i>	XP_024507819	--DL---AL--KQ-E--NYQ IE DDQRSY-AA-N-K-V--
	<i>Diploscapter pachys</i>	PAV81200	--DL---AM--KQ-QE-NYQ LE DDQRSY-AA-NDK----
	<i>Dracunculus medinensis</i>	VDN53013	--DL---AL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Nippostrongylus brasiliensis</i>	VDL80648	--DL---AL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Gongylonema pulchrum</i>	VDN18649	--DL---SL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Haemonchus placei</i>	VD026827	--DL---AL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Ancylostoma duodenale</i>	KIH69140	--DL---AL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Teladorsagia circumcincta</i>	PI076169	--DL---AL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Loa loa</i>	XP_020304756	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND--S--
	<i>Wuchereria bancrofti</i>	VDM16573	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND----
	<i>Brugia malayi</i>	CRZ23584	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND----
	<i>Onchocerca volvulus</i>	AAC41561	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND----
	<i>Litomosoides sigmodontis</i>	VDK86494	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND----
	<i>Onchocerca flexuosa</i>	OZC09651	--DL---SL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Thelazia callipaeda</i>	VDN06362	--DL---SL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Onchocerca ochengi</i>	VDK87566	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND----
	<i>Setaria digitata</i>	BAU25821	--DL---SL--KQMGE-NYQ LE DDQRSY-AA-ND----
	<i>Acanthocheilonema viteae</i>	VBB27072	--DL---SL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Dirofilaria immitis</i>	AAF37702	--DL---SL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Brugia timori</i>	VD034026	--DL---SL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Anisakis simplex</i>	VDK61084	--DL---AL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Heligmosomoides polygyrus</i>	VD088828	-SDL---AL--KQ-QE-NYQ LE DDQRSY-AA-ND----
	<i>Ascaris lumbricoides</i>	CAA60046	--DL---AL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Toxocara canis</i>	KHN74012	--DL---AL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Brugia pahangi</i>	VDN89362	--DL---SL--KQ-QE-NFQ LE DDQRSY-AA-ND----
	<i>Enterobius vermicularis</i>	VDD86780	--DL---SL--KQTQE-NYQ LE DDQRSY-AA-ND----
	<i>Pristionchus pacificus</i>	PDM84472	--DL---AL--KQTQE-NYQ LE DDQRSY-AA-ND--S--
	<i>Trichuris suis</i>	KFD55367	--DL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND----
	<i>Trichuris trichiura</i>	CDW54395	--DL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND----
	<i>Trichinella patagoniensis</i>	KRY09282	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella sp. T6</i>	KRX71243	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella spiralis</i>	KRY27589	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella britovi</i>	KRY45949	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella papuae</i>	KRZ68635	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella zimbabwensis</i>	KRZ06996	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella sp. T9</i>	KRX53078	-GDL-S--SL--KQVQE-TYQ LE DDQRQY-SA-ND--G--
	<i>Trichinella murrelli</i>	KRX38326	--DL-SK-VM--KQVQE-NHQ LE DDQRQY-MA-ND---L
	<i>Trichinella nelsoni</i>	KRX15494	--DL-SK-VM--KQVQE-NHQ LE DDQRQY-MA-ND---L
	<i>Trichinella sp. T8</i>	KRZ90607	--DL-SK-VM--KQVQE-NHQ LE DDQRQY-MA-ND---L
	<i>Trichinella nativa</i>	KRZ52411	--DL-SK-VM--KQVQE-NHQ LE DDQRQY-MA-ND---L
	<i>Trichinella pseudospiralis</i>	KRX90006	--DL-SK-VM--KQVQE-NHQ LE DDQRQY-MA-ND---L
Outgroups (0/>100)	<i>Homo Sapiens</i>	NP_003371	VDALK-T-ES---QMREEMEE-FA V--ANYQDTIGRLQDE-
	<i>Mus musculus</i>	NP_001124492	-ESLR-T-ES---QMREQEER HA R-SASYQEA--RLEEEG

Supplementary Figure 39. Partial sequence alignments of an Intermediate filament protein with a CSI consisting of a 2 aa deletion (shown in black box) that is specific for the *Caenorhabditis* genus and not present in any other nematode species. There are two homologs of this protein in the *Caenorhabditis* species, one of which contains the CSI.

		87		130	
Rhabditoidea (7/7)	<i>Caenorhabditis elegans</i>	NP_001255355	YVGNLLWYTTDADLLKALQSTGLA	RS QFADMKFFENRTNGQSKG	
	<i>Caenorhabditis nigoni</i>	PIC32931	-I-----IA--S	-----	
	<i>Caenorhabditis briggsae</i>	XP_002632965	-I-----IA--S	-----	
	<i>Caenorhabditis remanei</i>	POM45433	-----M--IST--	-----	
	<i>Caenorhabditis latens</i>	OZG15436	-----M--IST--	-----	
	<i>Caenorhabditis brenneri</i>	EGT39303	-----M--II--P	-----	
	<i>Diploscapter pachys</i>	PAV62065	---MD-F---EY--QQ-RAI--D	M- SLV---HD--I---R-	
	<i>Nippostrongylus brasiliensis</i>	VDL74792	-I--V-WA---VALQIK-I--T	DLI-----	
	<i>Dictyocaulus viviparus</i>	KJH44095	-I--V-WA---VALHIKAI-IT	DLI-----	
	<i>Pristionchus pacificus</i>	PDM70858	-I--MS-W---D--V-VIT-C-VD	DLV-L--Y---L-----	
	<i>Haemonchus contortus</i>	CDJ96265	-I--V-WA---VALHVQQL-IT	DLI-----	
	<i>Heligmosomoides polygyrus</i>	VDP39109	-I--V-WA---ILHVKAI-V-	DLI-----	
	<i>Necator americanus</i>	XP_013296525	-I--V-WA---VGLHIKAI-IP	DLI-----	
	<i>Ancylostoma duodenale</i>	KIH43897	-I--V-WA---VGLHIKAI-IP	DLI-----	
	<i>Ancylostoma ceylanicum</i>	EYC08983	-I--V-WA---VGLHIKAI-IP	DLI-----	
	<i>Ancylostoma caninum</i>	RCN53282	-I--V-WA---VGLHIKAI-IP	DLI-----	
	<i>Oesophagostomum dentatum</i>	KHJ89953	-I--V-WA---VGLHIKAI-IP	DLI-----	
	<i>Enterobius vermicularis</i>	VDD90720	-I--MT-W---V--QTLIL-C-VS	DLI-I--Y---N-----	
	Other Nematodes (1/42)	<i>Brugia timori</i>	VDO15610	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----
<i>Anisakis simplex</i>		VDK46003	-I--MT-W---V--QTVIL-C-A-	DLI-L--Y---N-----	
<i>Wuchereria bancrofti</i>		VDM07655	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Brugia malayi</i>		CDQ06651	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Brugia pahangi</i>		VDN82590	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Loa loa</i>		XP_020302758	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Toxocara canis</i>		KHN77344	-I--MT-W---V--QTLIL-C-AS	DLI-I--Y---N-----	
<i>Onchocerca flexuosa</i>		OZC07263	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Onchocerca ochengi</i>		VDK75787	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Thelazia callipaeda</i>		VDM99214	-I--MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Acanthocheilonema viteae</i>		VBB30190	-I--MT-W---V--QTIIL-C-AT	NLI-I--Y---N-----	
<i>Litomosoides sigmodontis</i>		VDK74201	-I--MT-W---V--QTIIL-C-AT	NLI-I--Y---N-----	
<i>Gongyionema pulchrum</i>		VDN31613	---MT-W---V--QTMIL-C-AT	NLI-I--Y---N-----	
<i>Dracunculus medinensis</i>		VDN55947	-I--MT-W---V--QSLIL-V-AT	DLI-I--Y---N---R-	
<i>Soboliphyme baturini</i>		VDP06154	---T-W---Q--AD-VA-INVT	DLV-I--Y---A-----	
<i>Strongyloides ratti</i>		XP_024502417	-IS--T-W---D--SEFVIQQ-CE	TPL-I--H-YKN-----	
<i>Trichinella patagoniensis</i>		KRY14057	---T-W--YF--Q---I-IT	DLVEVR-N---A-----	
<i>Trichinella britovi</i>		KRY57026	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella sp. T6</i>		KRX77213	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella nelsoni</i>		KRX21924	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella spiralis</i>		KRY39760	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella murrelli</i>		KRX49284	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella papuae</i>		KRZ74509	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella pseudospiralis</i>		KRX86329	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella nativa</i>		KRZ57179	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella sp. T9</i>		KRX60839	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella zimbabwensis</i>		KRZ15665	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichinella sp. T8</i>		KRZ90261	---T-W--YF--QN---I-IT	DLVEVR-N---A-----	
<i>Trichuris trichiura</i>		CDW56901	PNS--T-W---T-VE--AKMDIR	DVV-VR-Y---V-----	
<i>Trichuris suis</i>		KFD73083	---T-W---I-VE--AKMDIR	DVV-VR-Y---V-----	
Outgroups (0/56)		<i>Acanthochromis polyacanthus</i>	XP_022052239	-I--T-W---E--TE-IR-I-IT	DVLEI-----A-----
		<i>Acromyrmex echinator</i>	XP_011056593	---T-W-S-Q-ITD-V--I-VT	D--EV-----A-----
		<i>Bombus impatiens</i>	XP_012240732	---T-W-S-Q-ITD-V--I-VS	D-VEV-----A-----
		<i>Danio rerio</i>	XP_005164510	-I--T-W---E--TD-IR-I-IT	DVLEI-----A-----
		<i>Melipona quadrifasciata</i>	KOX77759	---T-W-S-Q-ITD-V--I-VS	D-VEV-----A-----
		<i>Monopterus albus</i>	XP_020455096	-I--T-W---E--TE-IL-I-IT	DVLEI-----A-----
		<i>Pelecanus crispus</i>	XP_009492064	-I--T-W---E--TE-VH-L-VN	DILEI-----A-----
		<i>Rhincodon typus</i>	XP_020384749	-I--T-W---E--TE--H-M-IT	DLLEI-----A-----
	<i>Homo sapiens</i>	3P5T_L	-I--T-W---E--TE-VH-L-VN	DILEI-----A-----	
	<i>Mus musculus</i>	BAC32898	-I--T-W---K--TE-VH-L-VN	DILEI-----A-----	

Supplementary Figure 40. Partial sequence alignments of a Cleavage Factor IM (CFIm) homolog protein with a CSI consisting of a 2 aa insertion (shown in black box) that is specific for the *Rhabditoidea* suborder. The CSI is not present in other nematodes or any non-nematode outgroup.

			158	200
Rhabditoidea (6/6)	<i>Caenorhabditis elegans</i>	NP_001021012	KDKLDVNFIFGLALHDQPLCE	RIPIAHIVEEISSQEKRVLDAK
	<i>Caenorhabditis remanei</i>	XP_003114838	-----GS-MA--H-----	-V-F-QL-----
	<i>Caenorhabditis brenneri</i>	EGT39543	-----A-YMA--H----I--	-V-F-QVGD-VAA-----
	<i>Caenorhabditis briggsae</i>	XP_002640351	-----AS-MA--H----I--	-V-IF-SLN---AA-----R
	<i>Caenorhabditis nigoni</i>	PIC52865	-----ASYMA--H----I--	-V-IF-SLN---VA-----R
	<i>Diploscapter pachys</i>	PAV72761	-E--AE-LLLNYDPN--MIQ	W-DKITLE-D-RA-----
Other Nematodes (0/21)	<i>Ancylostoma ceylanicum</i>	EYC21265	-E--ES-LVLNVNPE---LR	--SVLP-D-TA--R-----
	<i>Ancylostoma duodenale</i>	KIH64568	-E--ES-LVLNVNPE---LR	--SVLP-D--A--R-----
	<i>Brugia malayi</i>	CRZ25463	-KQ-ESSPSFSTNV---FIQ	AMSVSEQD-QQ--R---M--
	<i>Dictyocaulus viviparus</i>	KJH53557	-E--ES-LLLYVNPE---LR	-VTVLP-D-TN--R-----
	<i>Haemonchus contortus</i>	CDJ84966	-E--ES-LMLNVNP---ILR	--TVQP-D-TA--R-----
	<i>Loa loa</i>	XP_003138092	-KQ-ES-PSVNTNV---FIQ	AMSVSEQD-QQ--R---M--
	<i>Necator americanus</i>	XP_013307984	-E-MES-LLLHINPE---LR	--SVLP-D-AT--R-----
	<i>Oesophagostomum dentatum</i>	KHJ92924	-E--ES-LLLNVNPE---LR	--SV-P-DVTA--R-----
	<i>Onchocerca flexuosa</i>	OZC07137	-KQ-ES-PSVNTNV---FIQ	AVSVSEQD-QQ--RL---M--
	<i>Pristionchus pacificus</i>	AAV85979	GKSIEH-PR-TMDT----IA	GMVMEDDVKT--R--I----
	<i>Teladorsagia circumcincta</i>	PI061978	-E--ES-LMLHVNP---ILR	-VTVQP-D--A--R-----
	<i>Toxocara canis</i>	KHN80387	-KQ--S-PSVNTNVE---FVQ	AVTVNEQD-QQ--R---M--
	<i>Trichinella britovi</i>	KRY61524	-KS--S-PGANVNP----FQ	AVVITEDDVLL-Q---I---R
	<i>Trichinella nelsoni</i>	KRX26031	-KS--S-PGANVNP----FQ	AVVITEDDVLL-Q---I---R
	<i>Trichinella papuae</i>	KRZ75498	-KS--S-PGANVNP----FQ	AVVITEDDVLL-Q---I---R
	<i>Trichinella pseudospiralis</i>	KRY79108	-KS--S-PGANVNP----FQ	AVVITEDDVLL-Q---I---R
	<i>Trichinella spiralis</i>	XP_003378007	-KS--S-PGANVNP----FQ	AVVITEDDVLL-Q---I---R
	<i>Trichinella nativa</i>	KRZ63363	-KS--S-PGANVNP----FQ	AVVITEDDVLL-Q---I---R
	<i>Trichuris suis</i>	KHJ46414	-KA-ES-PNVNFPN----IQ	AVMISE-D-IM--R-----R
	<i>Trichuris trichiura</i>	CDW51823	-KA-ES-PNVNFPN----IQ	AVMISE-D-MM--R-----R
	<i>Wuchereria bancrofti</i>	EJW76445	-KQ-ESSPSVSTNV---FIQ	AMSVSEQD-QQ--R---M--
Outgroups (0/21)	<i>Acyrtosiphon pisum</i>	NP_001156167	RSHY-K E-VYRIP----VQ	EVSVT--D-K---E--IA---
	<i>Agrilus planipennis</i>	XP_018323606	RSS--K-PGVFLDPK---VQ	AVSIQD-D-KR--E--AA--R
	<i>Folsomia candida</i>	XP_021967669	RTN--N-PGVYINPE---IQ	A-VVAE-D-R---E---V---
	<i>Harpegnathos saltator</i>	XP_011136314	-AA-EK-PGVFLNP----VQ	AVSIAD-DLKR--E--AL---
	<i>Ooceraea biroi</i>	XP_011328960	-TA-EK-PGVFLNP----VQ	AVSIAD-D-KR--D--AV---
	<i>Priapulid caudatus</i>	XP_014677085	-SS--K-PGVYLNPN----MQ	ALMVSE-D-KR--TK--E---
<i>Trachymyrmex cornetzi</i>	XP_018365156	-TA-EK-PGVFLNP----VQ	AVSIAD-D-RR--D--VV---	
<i>Trichogramma pretiosum</i>	XP_014222284	-AQ-EK-PGSFLNP----LQ	AVTITD-D-KK--EK--A--Q	

Supplementary Figure 41. Partial sequence alignments of a Methyl-CpG-binding protein with a CSI consisting of a 2 aa insertion (shown in black box) that is specific for the Rhabditoidea suborder. The CSI is not present in other nematodes or any non-nematode outgroup.

		71	AS	105	
Rhabditoidea (7/7)	<i>Caenorhabditis elegans</i>	NP_001024660	MLVAPIGYSIRVRALQFDV	TENARTCEKDTLHV	
	<i>Caenorhabditis brenneri</i>	EGT30233	-----N-----	-----N-----I	
	<i>Caenorhabditis latens</i>	OZG25193	-----IH----	-----N-----	
	<i>Caenorhabditis remanei</i>	OZG08426	-----IH----	-----N-----	
	<i>Caenorhabditis nigoni</i>	PIC18220	-----N----IE--	-----N--R----	
	<i>Caenorhabditis briggsae</i>	CAP33035	-----N----IE--	-R-----N--R----	
	<i>Diploscapter pachys</i>	PAV79335	--I--V--R--L--IE--	-G SGGKGS-H-----	
	<i>Ancylostoma ceylanicum</i>	EYB97856	--I----R--L-V-E--	NGQNSV-----	
	<i>Ancylostoma duodenale</i>	KIH43381	--I----R--L-V-E--	NGQNSV-----	
	<i>Brugia malayi</i>	XP_001899277	LIT--S--R--L-V-D-N	LGD-HN-D-----	
	<i>Dictyocaulus viviparus</i>	KJH41256	--I----R--LKV-D-E-	NGKNSL-----	
	<i>Haemonchus contortus</i>	CDJ85812	--I--L--R--LKIIE--	NG-NSS-----	
	<i>Loa loa</i>	XP_020303780	LIT--S--R--L-V-D-N	LGD-HN-D-----	
	<i>Necator americanus</i>	XP_013293602	--I----R--L-V-E--	NGQNSI-----	
	<i>Oesophagostomum dentatum</i>	KHJ99798	--I----R--L-VME--	NGQKTV-----	
	Other Nematodes (0/29)	<i>Onchocerca flexuosa</i>	OZC09977	LIM--S--R--L-V-D-N	LG--HN-D-----
		<i>Teladorsagia circumcincta</i>	PI070590	--I--L--R--LKV-E--	NG-NSS-----
<i>Toxocara canis</i>		KHN87003	LIT--V--R--L-V-D-N	LGDPQN-D-----	
<i>Wuchereria bancrofti</i>		EJW83984	LIT--S--R--L-V-D-N	LGD-HN-D-----	
<i>Teladorsagia circumcincta</i>		PI070590	--I--L--R--LKV-E--	NG-NSS-----	
<i>Heligmosomoides polygyrus</i>		VDP41706	--I----RV--VVE--	NGRNTS-----	
<i>Cylicostephanus goldi</i>		VDK45323	-----R--L-V-E--	NGQSSN-----	
<i>Ancylostoma caninum</i>		RCN52527	--I----R--L-V-E--	NGQNSV-----	
<i>Strongylus vulgaris</i>		VDM79066	--I----R--L-V-E--	NGQNSN-----	
<i>Nippostrongylus brasiliensis</i>		VDL77150	-----R--L-VIE--	NGQNS--	
<i>Haemonchus placei</i>		VD080095	--I--L--R--LKIIE--	NG-NSS-----	
<i>Angiostrongylus costaricensi</i>		VDM52576	--I----R--LKV-D--	NGKHTV-----	
<i>Onchocerca ochengi</i>		VDK65250	LIT--S--R--L-V-D-N	LG--HN-D-----	
<i>Dracunculus medinensis</i>		VDN58727	LIT----R--L-V-D-N	LGDPKN-N-----	
<i>Gongylonema pulchrum</i>		VDK29616	LIT--V--R--L-V-D--	LGDSHN-D-----	
<i>Anisakis simplex</i>		VDK46880	LIT--V--R--L-V-D-N	LGDPQN-D-----	
<i>Litomosoides sigmodontis</i>		VDK71987	LIA--S--R--L-V-D-N	LGD-HN-D-----	
<i>Thelazia callipaeda</i>		VDN01074	LIT--A--R--L-V-D-N	LGD-HN-D-----	
<i>Acanthocheilonema viteae</i>		VBB30517	LIT--S--R--L-V-D-N	LGD-HN-D-----	
<i>Brugia timori</i>		VD032583	LIT--S--R--L-V-D-N	LGD-HN-D-----	
<i>Brugia pahangi</i>		VDN90800	LIT--S--R--L-V-D-N	LGD-HN-D-----	
Outgroups (0/>100)		<i>Drosophila melanogaster</i>	NP_476879	TIA--DNSYVQLIF-T--I	-SSEN-TF-YVQ-
		<i>Chrysemys picta bellii</i>	XP_005307507	L--SER--RVELTFQT-E-	-EEAD-GY-YIEL
		<i>Eurypyga helias</i>	XP_010159303	VI--ED--GVELIFQT-EI	-EEAD-GY-YME-
		<i>Gekko japonicus</i>	XP_015279232	L---E-HT-NLTFVA-E-	-RHSS-RW-SVTI
		<i>Papilio xuthus</i>	XP_013164435	SI---M-HFVKLTF-T-EL	-PEVN-GY-FVQ-
		<i>Limulus polyphemus</i>	XP_022247735	IE-ED-V-V-L-FMT-H-	-HEQD-GY-YVEI
		<i>Heterocephalus glaber</i>	XP_004839034	VI--ED--GVEL-FQT-E-	-EEAD-GY-YMEA
		<i>Exaiptasia pallida</i>	XP_020911194	KIASRS-- -KL-FKE--L	-EKF-SY-EVII
		<i>Homo sapiens</i>	XP_006527155	QV---VQ-R-SLQFEA-EL	-GNDV-KY-FVE-
		<i>Mus musculus</i>	XP_017173690	QV---VQ-R-SLQFEA-EL	-GNDV-KY-FVE-
		<i>Drosophila biarmipes</i>	XP_016960768	TIA--DNSYVQLIF-T--I	-SSEN-TF-YVQ-
	<i>Musca domestica</i>	XP_005182121	TIQ--PNSYVNLIF-T--L	-SSEN-TY-YVQ-	
	<i>Stomoxys calcitrans</i>	XP_013103389	TIQ-SPNSYVQLIF-T--L	-SSEN-TY-YVQ-	
	<i>Ceratitidis capitata</i>	XP_004523366	TIQ--ASSNVQLLF-T--I	-SSEN-TY-YVQ-	
	<i>Zeugodacus cucurbitae</i>	XP_011186021	TIQ--ASSNVQLLF-T--I	-ASEN-TY-YVQ-	
	<i>Sarcophaga bullata</i>	TMW45646	TIQ--PSSNVQLIF-T--L	--SEN-TY-YVQ-	
	<i>Vanessa tameamea</i>	XP_026492763	SI---V-QFV-LTF-T--L	-PEDN-GY-YVQ-	
	<i>Amyelois transitella</i>	XP_013200300	SI---P-QFVKLTF-T-EL	-PEAN-GY-YVQ-	
	<i>Chilo suppressalis</i>	RVE47431	SI----QFV-LTF-T-EL	-PEAN-GY-YVQ-	
	<i>Ostrinia furnacalis</i>	XP_028170358	SI---M-QFV-LTF-T-EL	-PEAN-GY-YVQ-	
<i>Eumeta japonica</i>	GBP18868	SI---L-HFV-LTF-T-EL	-PEPN-RY-YVQ-		

Supplementary Figure 42. Partial sequence alignments of an Abnormal cell migration protein 13 with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the Rhabditoidea suborder. The CSI is not present in other nematodes or any non-nematode outgroups.

		126	164	
Rhabditoidea (6/6)	<i>Caenorhabditis elegans</i>	NP_001250840	KEEWDPM SLRQTRHLTTFC SLF EKLPNLTEKSKQFNAFL	
	<i>Caenorhabditis remanei</i>	OZF79963	-----N-A----I-	
	<i>Caenorhabditis latens</i>	OZG18420	-----KN-A----I-	
	<i>Caenorhabditis briggsae</i>	CAP31469	-----N-A-C--I-	
	<i>Caenorhabditis brenneri</i>	EGT32791	-D-----KK-AM---I-	
	<i>Diploscapter pachys</i>	PAV85955	TT----L--S--NR-AQILNDL	
	<i>Pristionchus pacificus</i>	PDM66686	SD--E-V--T-STRIS-LIRTL	
	<i>Ancylostoma ceylanicum</i>	EYB89229	NV--E----K-SQR-GAVL-GL	
	<i>Ancylostoma duodenale</i>	KIH55911	NV--E----K-SQR-GAVL-GL	
	<i>Ascaris suum</i>	ERG87385	Q-Q---L-QK-CSR-GFLL-SL	
	<i>Brugia malayi</i>	XP_001893893	R-R---L-QH-C-N-GFLLNQL	
	<i>Dictyocaulus viviparus</i>	KJH47162	NV--E----K-SKR-GAVLCGL	
	<i>Haemonchus contortus</i>	CDJ93966	NV--E----K-SKR-GAVL-GL	
	<i>Necator americanus</i>	XP_013298932	NV--E----K-SQR-GAVL-GL	
	<i>Oesophagostomum dentatum</i>	KHJ88487	NV--E----K-SKR-GAVL-GL	
	Other Nematodes (0/30)	<i>Toxocara canis</i>	KHN84480	Q-Q---L-QK-CSR-GFLLDSL
<i>Wuchereria bancrofti</i>		EJW84293	R-R---L-QQ-C-N-GFLLDQL	
<i>Enterobius vermicularis</i>		VDD94889	-R---L-EK-CKR-GFLLDSL	
<i>Brugia pahangi</i>		VDN84991	-R---L-QH-C-N-GFLLNQL	
<i>Brugia timori</i>		VD028846	---L-QH-C-N-GFLLNQL	
<i>Onchocerca flexuosa</i>		VD064826	-R---L-QH-CQN-GFLLNQL	
<i>Onchocerca ochengi</i>		VDK64967	---L-QH-C-N-GFLLNQL	
<i>Litomosoides sigmodontis</i>		VDK71787	---L-QH-C-N-GFLL-QL	
<i>Acanthocheilonema viteae</i>		VBB26053	-R---L-QH-C-N-GFLL-QL	
<i>Gongylonema pulchrum</i>		VDN36303	-R---L-Q-HC-N-ALLLNQL	
<i>Loa loa</i>		XP_020302321	---L-QH-C-N-GFLLNQL	
<i>Trichinella britovi</i>		KRY50355	NKV---T-GK--R-VD-LDNL	
<i>Trichinella murrelli</i>		KRX42937	NKV---T-GK--R-VD-LDNL	
<i>Trichinella nativa</i>		KRZ54145	NKV---T-GK--R-VD-LDNL	
<i>Trichinella nelsoni</i>		KRX20309	NKV---T-GK--R-VD-LDNL	
<i>Trichinella papuae</i>		KRZ76140	NKV---T-GK--R-VD-LDNL	
<i>Trichinella pseudospiralis</i>		KRZ30430	NKV---T-GK--R-VH-LDNL	
<i>Trichinella spiralis</i>		XP_003379916	NKV---T-GK--R-VD-LDNL	
<i>Trichinella zimbabwensis</i>		KRZ05150	NKV---T-GK--R-VH-LDNL	
<i>Trichuris suis</i>		KHJ43583	-KV-R-A-SS--EL-CS-LRHL	
<i>Trichuris trichiura</i>		CDW52567	-KV-R-A-SS--EL-C--LRHL	
Outgroups (0/>100)		<i>Acanthaster planci</i>	XP_022100458	--V---V-ST--NR-VSLIHKL
		<i>Acromyrmex echinator</i>	XP_011056917	EKI-----TS--LR-VGTINRL
		<i>Aedes aegypti</i>	XP_021709601	EQV---L-TT--LK-VRLINRL
		<i>Microtus ochrogaster</i>	XP_005364761	EFI---L-AS--S--VH-R-V
		<i>Rattus norvegicus</i>	XP_006236765	EMI---L-TS---I--VH-RVA
		<i>Strongylocentrotus purpuratus</i>	XP_011664408	E-V-----TL--HR-IDTLHQL
		<i>Drosophila ananassae</i>	XP_001953199	T-S---L-TT--LR-VG-INRL
		<i>Homo sapiens</i>	NP_057715	ENM---F-TT--SRMVGITLKL
<i>Mus musculus</i>		XP_011239693	ETI---L-TS---S--VH-RVA	

Supplementary Figure 43. Partial sequence alignments of a PAX3- and PAX7 binding protein 1 protein with a CSI consisting of a 1 aa in (shown in black box) that is specific for the Rhabditoidea suborder. The CSI is not present in other nematodes or any non-nematode outgroup.

		234	270	
Chromadorea (28/30)	<i>Oesophagostomum dentatum</i>	KHJ83757	LLTINETTGEQAKPAVLKDFD	
	<i>Pristionchus pacificus</i>	PDM73700	- ISL-----IPNIRG-P	
	<i>Ancylostoma ceylanicum</i>	EYC21828	--S-----K-Q---	
	<i>Haemonchus contortus</i>	CDJ92987	--S-----L-REK-E---	
	<i>Dictyocaulus viviparus</i>	KJH51495	- ISL-----S-----	
	<i>Diploscapter pachys</i>	PAV75305	-VEL-----I-R--N	
	<i>Caenorhabditis brenneri</i>	EGT55552	- ISL---V--T----R--N	
	<i>Caenorhabditis remanei</i>	XP_003101477	- IAL---V--T----R--N	
	<i>Caenorhabditis elegans</i>	NP_001021339	- ISL---V--T---L-R--N	
	<i>Caenorhabditis briggsae</i>	CAP28989	- ISL---V--T----R--N	
	<i>Caenorhabditis latens</i>	OZG13909	- IAL---V--T----R--N	
	<i>Caenorhabditis nigoni</i>	PIC27080	- ISL---V--T----R--N	
	<i>Ascaris suum</i>	ERG81007	-ASL-----PNIRG--	
	<i>Toxocara canis</i>	KHN74907	-ASL-----PNIRG-V	
	<i>Brugia malayi</i>	CDQ04118	-A-L-----PNIRG-S	
	<i>Loa loa</i>	XP_003144956	-A-L-----PNIRG-S	
	<i>Onchocerca flexuosa</i>	OZC08312	-AAL-----PNIRG-S	
	<i>Litomosoides sigmodontis</i>	VDK69424	-A-L-----PNIRG-S	
	<i>Ancylostoma caninum</i>	RCN31337	--S-----L--K--Q---	
	<i>Cylicostephanus goldi</i>	VDK84008	--S-----N-----	
	<i>Haemonchus placei</i>	VD041434	--S-----L-REK-E---	
	<i>Heligmosomoides polygyrus</i>	VD094671	--S-----L-REK-Q---	
	<i>Angiostrongylus costaricensis</i>	VDM53442	- ISV-----S-----	
	<i>Brugia pahangi</i>	VDN86328	-A-L-----PNIRG-S	
	<i>Onchocerca ochengi</i>	VDM94527	-A-L-----PNIRG-S	
	<i>Acanthocheilonema viteae</i>	VBB27020	-V-L-----PNIRG-S	
	<i>Anisakis simplex</i>	VDK66445	-ASL-----PNIRG-P	
	<i>Thelazia callipaeda</i>	VDN01689	-ASL-----PNIRG-S	
	<i>Strongyloides ratti</i>	CEF66832	-IK-----C--PIFRGGN	
	<i>Wuchereria bancrofti</i>	EJW86797	-TAR-QS-I-SFR-P-FIYGI	
	Outgroups (0/62)	<i>Amyelois transitella</i>	XP_013186177	-VMN-R--L-AFRAPMFRGGA
		<i>Amborella trichopoda</i>	XP_020522962	-IST-Q--Y-NFR YRY-R R
		<i>Hydra vulgaris</i>	XP_012562211	--SK-R--L-SFRAPLFHYGA
<i>Theileria equi</i>		XP_004830431	-IS--K--I-FCE WKAS G	
<i>Zea mays</i>		ONM56237	-MST-Q--Y-NFR YRY -R R	
<i>Fonticula alba</i>		XP_009496369	-IAR-R--FD FSYFYHIYKE	
<i>Papilio xuthus</i>		XP_013166240	-VAH-R--L-AFRAPMFRGGA	
<i>Opisthorchis viverrini</i>	XP_009163389	-VMK-KL-L-FHR-PIFRDAS		
			KADYNMGMNFKQVF	
			--N-DV-RWK-IEI--	
			-----L--K--Q---	
			-----L-REK-E---	
			-----L--EK--L---	
			M-----RAA-L-KI-	
			A-----W--RA--	
			A-----W--RS--	
			A-----Y--QS--	
			A-----W--RA--	
			A-----W--RS--	
			A-----W--RA--	
			-----TYR-LRAA-	
			-----TYR-LRAA-	
			N-----IYR-LRA--	
			N-----TYR-LRA--	
			N-----TYR-LRA--	
			S---V-TYR-LRA--	
			-----L--K--Q---	
			-----RR--Q---	
			-----L-REK-E---	
			-----L-REK-Q---	
			-----L-RAK--M---	
			N-----IYR-LRA--	
			N-----TYR-LRA--	
			N---V-TYR-LRA--	
			-----TYR-LRAA-	
			N-----AYR-LRA--	
			I N-T--TTVKE-IRSAL	
			D -NGF-L-IRR--R---	
			D -NGFSL-AY---E---	
			R ANP--L-VV---EI-	
			D -DGF-I-T---IR---	
			G SYN--L-IIS-----	
			R ANP--I-IL---MEI-	
			L YDQ----PRG--A-I-	
			D -NGFSL-AF---E---	
			R RDSFDL-VKQ-MA---	

Supplementary Figure 44. Partial sequence alignments of a Palmitoyltransferase protein with a CSI consisting of a 1 aa deletion (shown in black box) that is specific for the Chromadorea class. The CSI is not present in any non-nematode outgroup. The CSI is not present in the species *Strongyloides ratti* and *Wuchereria bancrofti*. Blastp search shows no homologs of this protein present in species of the Enoplea class.

		255	282
Chromadorea (20/20)	<i>Oesophagostomum dentatum</i>	KHJ83757	KADYNGMGMNFKQVFG WGLWLFPLITS
	<i>Ancylostoma ceylanicum</i>	EYC21828	----L--K--Q---- -----N--
	<i>Haemonchus contortus</i>	CDJ92987	----L-REK--E---- -----K--
	<i>Dictyocaulus viviparus</i>	KJH51495	----L-EK--L---- -----R-T
	<i>Diploscapter pachys</i>	PAV75305	M-----RAA-L-KI-- -----V--P-D
	<i>Caenorhabditis brenneri</i>	EGT55552	A-----W--RA--- ----MW-IESN
	<i>Caenorhabditis remanei</i>	XP_003101477	A-----W--RS--- ----MW-IESN
	<i>Caenorhabditis elegans</i>	NP_001021339	A-----Y--QS--- -----C-IDS-
	<i>Caenorhabditis briggsae</i>	CAP28989	A-----W--RA--- --V-MW-IESN
	<i>Caenorhabditis latens</i>	OZG13909	A-----W--RS--- ----MW-IESN
	<i>Ascaris suum</i>	ERG81007	-----TYR-LRAA-- -----VS-H
	<i>Toxocara canis</i>	KHN74907	-----TYR-LRAA-- -----VS-H
	<i>Brugia malayi</i>	CDQ04118	N-----IYR-LRA--- ----A--VDSH
	<i>Loa loa</i>	XP_003144956	N-----TYR-LRA--- ----A--V
	<i>Onchocerca flexuosa</i>	OZC08312	N-----TYR-LRA--- ----A--VDSH
	<i>Pristionchus pacificus</i>	PDM73700	--N-DV-RWK-IEI--- -----VR-T
	<i>Strongyloides ratti</i>	CEF66832	N-T--TTVKE-IRSAL- -----VD-E
<i>Wuchereria bancrofti</i>	EJW75594	--IYR-LRA--- ----A--VDSH	
Other Nematodes (0/12)	<i>Trichuris suis</i>	KFD53008	-NGF-Y-TLR--QE--- KR LL--FL-VY--
	<i>Trichuris trichiura</i>	CDW56012	-NGF-Y-TLR--QE--- KR PL--FL-VY-
	<i>Trichinella nelsoni</i>	KRX27745	-EGF-L-TTR--REI-- DS PFY--I-VFS-
	<i>Trichinella spiralis</i>	KRY42951	-EGF-L-TTR--REI-- DS PFY--I-VFS-
	<i>Trichinella patagoniensis</i>	KRY17610	-EGF-L-TTR--REI-- DS PFY--I-VFS-
	<i>Trichinella sp. T9</i>	KRX64942	-EGF-L-TTR--REI-- DS PFY--I-VFS-
	<i>Trichinella murrelli</i>	KRX48841	-EGF-L-TTR--REI-- DS PFY--I-VFS-
	<i>Trichinella nativa</i>	KRZ58482	-EGF-L-TTR--REI-- DS PFY--I-VFS-
	<i>Trichinella papuae</i>	KRZ81046	-EGF-L-MSR--REI-- DS PFY--I-VFS-
	<i>Trichinella pseudospiralis</i>	KRY00051	-EGF-L-MSR--REI-- DS PFY--I-VFS-
<i>Trichinella zimbabwensis</i>	KRZ19084	-EGF-L-MSR--REI-- DS PFY--I-VFS-	
<i>Soboliphyme baturini</i>	VDP43282	-DGF-L-VRK--VE--- KN KVT-IL-IF--	
Outgroups (0/62)	<i>Aedes aegypti</i>	XP_021697678	-NGFSL--L---QE--- DD RK--FV-VY--
	<i>Hydra vulgaris</i>	XP_012562211	-DGF-I-T--IR---- NT TWK-F--IF-T
	<i>Papilio xuthus</i>	XP_013166236	-NGFSL-AF---E--- NS PN--ML-VF--
	<i>Sarcophilus harrisii</i>	XP_012408785	-NGF-L-FIR--Q---- EN KK---L-IGS-
	<i>Gossypium raimondii</i>	XP_012480671	YDLGRKK --E---- TK KS-----FS
	<i>Drosophila melanogaster</i>	NP_724868.2	-NG--L-RYA--CE--- DD -QY-FL-VFS-
	<i>Danio rerio</i>	XP_021331799	SKAFDV-VQA--L---- KK KR-----VFS-
<i>Stomoxys calcitrans</i>	XP_013106168	-NGF-L--FA--QE--- DN -K--FL-IYS-	

Supplementary Figure 45. Partial sequence alignments of a Palmitoyltransferase protein with a CSI consisting of a 2 aa deletion (shown in black box) that is specific for the Chromadorea class. The CSI is not present in any non-nematode outgroup.

		162	PHM	194
Chromadorea (33/33)	<i>Caenorhabditis brenneri</i>	EGT30700	AGLLGSFSYAFLTE	ANLTPKVALLIQLFIP
	<i>Caenorhabditis briggsae</i>	CAP22728	-----	-----
	<i>Caenorhabditis elegans</i>	NP_505237	-----	-----
	<i>Caenorhabditis latens</i>	OZF90828	-----	-----
	<i>Caenorhabditis nigoni</i>	PIC22854	-----	-----
	<i>Caenorhabditis remanei</i>	OZF85401	-----	-----
	<i>Ancylostoma ceylanicum</i>	EYG10320	-----D	RS- -D-Q-----
	<i>Ancylostoma duodenale</i>	KIH62876	-----D	RS- -D-Q-----
	<i>Brugia malayi</i>	XP_001901223	--II--LT--A--	--F L--S-RIT--M-VV-
	<i>Dictyocaulus viviparus</i>	KJH42909	-----LA-----	KS- -----D-V-L----
	<i>Diploscapter pachys</i>	PAV60708	--I-----L---	-K- G--S--TT-----
	<i>Necator americanus</i>	XP_013296815	--VV-A--G--D	RQL LA-S-TE-M-VM-VV-
	<i>Strongyloides ratti</i>	CEF68195	--V--A--G--	-NW ---S--N-C-VMQI--
	<i>Haemonchus contortus</i>	CDJ95123	--I-----	RT- G--Q--D-----
	<i>Loa loa</i>	XP_020304569	--IF--A--I--D	M-- LG---QN---LM-IV-
	<i>Oesophagostomum dentatum</i>	KHJ93977	-----D	RS- G--Q-----V-
	<i>Onchocerca flexuosa</i>	OZC12673	--II-ALA-V---	--F L--S--TT--M-IV-
	<i>Pristionchus pacificus</i>	PDM69720	--VF-ALA-S--D	AA- -----Q---TM-VV-
	<i>Teladorsagia circumcincta</i>	PI076278	--I-----L---	-S- G--Q-----
	<i>Toxocara canis</i>	KHN85722	--V--A-T--A--D	S-- LAMS-RT---TM----
	<i>Wuchereria bancrofti</i>	EJW86032	--II--LT--A--	--F L--S-RIT--M-VV-
	<i>Nippostrongylus brasiliensis</i>	VDL62951	-----D	KS- G--S-----
	<i>Ancylostoma caninum</i>	RCN29588	-----D	RS- -D-Q-----
	<i>Heligmosomoides polygyrus</i>	VDO71568	--I-----D	-AI G--Q-----V-
	<i>Haemonchus placei</i>	VDO66999	--I-----	RT- G--Q--D-----
	<i>Brugia timori</i>	VDO29491	--II--LT--A--	--F L--S-RIT--M-VV-
	<i>Brugia pahangi</i>	VDN82008	--II--LT--A--	--F L--S-RIT--M-VV-
	<i>Acanthocheilonema viteae</i>	VBB29710	--IF--A--M--D	M-- LG---QN---LM-IV-
	<i>Enterobius vermicularis</i>	VDD87126	-SIF--LI--G--	--F -H-S--N---LM-C--
	<i>Litomosoides sigmodontis</i>	VDK87641	--IF--A--I--D	MS- LG---QK---VM-IV-
	<i>Strongylus vulgaris</i>	VDM81356	--V-----G--D	RNL LG---AQ-M-VM-VV-
	<i>Angiostrongylus costaricensis</i>	VDM52847	--A-T---VM-D	VNL LA---TD-M-VM-VV-
	<i>Thelazia callipaeda</i>	VDN08382	--IF--T--L--D	KR- LG-L-QNT--TM-I--
Outgroups (0/>200)	<i>Acanthaster planci</i>	XP_022105346	S--VS-LT--G-A-	V-G-EKS--VMVVV-
	<i>Acinonyx jubatus</i>	XP_014917735	-----AL--LG--Q	-G-S-QHT--SM-G--
	<i>Acromyrmex echinatior</i>	XP_011053297	--VI-AV--G--L	V-SIENT--VM-IV-
	<i>Acropora digitifera</i>	XP_015763073	---F-AL--G--S	-GMS-RK-V-VMNV--
	<i>Homo sapiens</i>	AAD01558	-----AL--LG--Q	-G-S-QQT--SM-G--
	<i>Mus musculus</i>	AAH47120	-----L--LG--Q	-G-S-QHT--SM-G--
	<i>Callithrix jacchus</i>	XP_017834325	-----AL--LG--Q	-G-S-QHT--SM-G--
	<i>Thamnophis sirtalis</i>	XP_013931658	---I-AL--LG--Q	IG-S-QDT--FMTIV-
<i>Octopus bimaculoides</i>	XP_014786536	--IF-AL--G--M	L--S-RHTI-VM-I--	

Supplementary Figure 46. Partial sequence alignments of a Battenin protein with a CSI consisting of a 3 aa insertion (shown in black box) that is specific for the Chromadorea class. The CSI is not present in any other nematode species or non-nematode outgroup.

		122	155
Chromadorea homolog 1 (33/33)	<i>Dictyocaulus viviparus</i>	KJH47557	GQIQLWQFLLELLADA
	<i>Haemonchus contortus</i>	CDJ98481	-----A-----
	<i>Ancylostoma ceylanicum</i>	EYC19665	-----G-----
	<i>Ancylostoma duodenale</i>	KIH51654	-----G-----
	<i>Necator americanus</i>	XP_013309383	-----G-----
	<i>Oesophagostomum dentatum</i>	KHJ79766	-----G-----
	<i>Haemonchus placei</i>	VD042951	-----A-----
	<i>Heligmosomoides polygyrus</i>	VD088533	-----G-----
	<i>Angiostrongylus costaricensis</i>	VDM63452	-----G-----
	<i>Brugia malayi</i>	CRZ25787	-----S-T H
	<i>Diploscapter pachys</i>	PAV55673	-----EG S
	<i>Loa loa</i>	XP_020301541	-----S-T H
	<i>Onchocerca flexuosa</i>	OZC06734	-----S-T H
	<i>Teladorsagia circumcincta</i>	PIO60565	-----G-----
	<i>Toxocara canis</i>	KHN83764	-----S-- H
	<i>Wuchereria bancrofti</i>	EJW86656	-----S-T H
	<i>Acanthocheilonema viteae</i>	VBB28050	-----T H
	<i>Thelazia callipaeda</i>	VDM95915	-----S-T H
	<i>Gongylonema pulchrum</i>	VDK27269	-----S-T H
	<i>Litomosoides sigmodontis</i>	VDK82646	-----S-T H
	<i>Brugia pahangi</i>	VDN92405	-----S-T H
	<i>Brugia timori</i>	VD008037	-----S-T H
	<i>Onchocerca ochengi</i>	VDK80025	-----S-T H
	<i>Anisakis simplex</i>	VDK48258	-----S-- H
	<i>Dracunculus medinensis</i>	VDN58716	-----S-S Q
	<i>Caenorhabditis latens</i>	OZG24979	-TVH---IR---DQP K
	<i>Caenorhabditis remanei</i>	OZG07314	-TVH---IR---DQP K
	<i>Caenorhabditis nigoni</i>	PIC18783	-TVH---IR---DQP K
	<i>Caenorhabditis briggsae</i>	XP_002644898	-TVH---IR---DQP K
	<i>Caenorhabditis elegans</i>	NP_001123137	-TVH---IR---DQP K
	<i>Caenorhabditis brenneri</i>	EGT43113	-TVH---IR---DQP K
	<i>Strongyloides ratti</i>	XP_024499015	-----I---GND H
	<i>Enterobius vermicularis</i>	VDD96228	-TVH--H-IR---DQP K
Chromadorea homolog 2 (0/10)	<i>Strongyloides ratti</i>	CEF71270	-----S-S R
	<i>Nippostrongylus brasiliensis</i>	VDL85697	--T-----K RYDDV-T---TQ----
	<i>Enterobius vermicularis</i>	VDD92848	-----S-S C--DV-T---T-----
	<i>Caenorhabditis brenneri</i>	EGT30352	-----V-----N-----
	<i>Caenorhabditis elegans</i>	NP_001263956	-----V-----N-----
	<i>Caenorhabditis latens</i>	OZG25316	-----V-----N-----
	<i>Caenorhabditis remanei</i>	OZG07579	-----V-----N-----
	<i>Caenorhabditis nigoni</i>	PIC18295	-----V-ST-----N-----
	<i>Caenorhabditis briggsae</i>	XP_002644635	-----V-ST--T---N-----
	Enoplea (0/14)	<i>Trichinella nativa</i>	OUC48995
<i>Trichinella sp. T6</i>		KRX74809	-----S-G R-ME--T---TN----
<i>Trichinella patagoniensis</i>		KRY11413	-----S-G R-ME--T---TN----
<i>Trichinella nelsoni</i>		KRX14286	-----S-G R-ME--T---TN----
<i>Trichinella pseudospiralis</i>		KRX92484	-----S-G R-ME--T---TN----
<i>Trichinella zimbabwensis</i>		KRZ13603	-----S-G R-ME--T---TN----
<i>Trichinella papuae</i>		KRZ73610	-----S-G R-ME--T---TN----
<i>Trichinella spiralis</i>		XP_003368363	-----S-N ---AF-T---IN----
<i>Trichinella britovi</i>		KRY57928	-----S-N ---AF-T---IN----
<i>Trichinella murrelli</i>		KRX47624	-----S-N ---AF-T---IN----
<i>Trichuris suis</i>		KFD53731	-----S-G R-ME--T---TN----
<i>Trichuris trichiura</i>		CDW56634	-----S-N A--SF-----MN-----
<i>Soboliphyme baturini</i>		VD094732	-----S-S A-SAF-----TN----
<i>Acanthisitta chloris</i>		XP_009078900	-----S-S ---S--T---TN---M
Outgroups (0/>200)	<i>Aedes aegypti</i>	XP_021712753	-----S-S A--A--T---TN----
	<i>Aethina tumida</i>	XP_019876307	-----S-S ---A--T---TN----
	<i>Alligator mississippiensis</i>	KY039391	-----S-R A-L-----AN-----
	<i>Camelus bactrianus</i>	XP_010947219	-----R A--G-----GH-----
	<i>Octopus bimaculoides</i>	KOF74414	-----S-T G-SN--T---TN----
	<i>Sorex araneus</i>	XP_004617195	-----R A--G-----GH-----
	<i>Mus musculus</i>	BAC39053	-----S-S A--S--T---TN---M
<i>Homo sapiens</i>	NP_001257941	-----S-S A--S--T---TN---M	

Supplementary Figure 47. Partial sequence alignments of an ETS (E26 transformation-specific) class transcription factor protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the Chromadorea class. There are two homologs of this protein in the Chromadorea class, one of which contains the CSI. The CSI is not present in species of the Enoplea class and in any non-nematode outgroup.

		93	122
Chromadorea homolog 1 (34/34)	<i>Dictyocaulus viviparus</i>	KJH46562	HAPGCKLLLSGI N WDYHSVDTLRIYFEKFG
	<i>Oesophagostomum dentatum</i>	KHJ99864	Q-----L - - - - -R-----V-----
	<i>Caenorhabditis elegans</i>	NP_741785	P-----N--T NGV---S-V---T--
	<i>Caenorhabditis brenneri</i>	EGT31853	PL--Y-----V MRV-CI-F-LR--NTY-
	<i>Caenorhabditis briggsae</i>	XP_002644659	PS-----T SGV---S-V---T--
	<i>Caenorhabditis latens</i>	OZG25695	P-----T GGV---S-V---T--
	<i>Caenorhabditis remanei</i>	XP_003117544	P-----T SGI---S-V---T--
	<i>Ancylostoma ceylanicum</i>	EPB71169	Q-----L - - - - -R-----
	<i>Ancylostoma duodenale</i>	KIH66985	Q-----L - - - - -R-----
	<i>Haemonchus contortus</i>	CDJ83341	QS-----L - - - - -R-----
	<i>Necator americanus</i>	XP_013302959	Q-----L - - - - -R-----
	<i>Angiostrongylus costaricensis</i>	VDM52269	-----L - - - - -T-----
	<i>Nippostrongylus brasiliensis</i>	VDL71477	Q-----L - - - - -R-----
	<i>Strongylus vulgaris</i>	VDM74679	Q-----L - - - - -R-----V-----
	<i>Ancylostoma caninum</i>	RCN42914	Q-----L - - - - -R-----
	<i>Diploscapter pachys</i>	PAV85317	P-----L H FE-----CI-L-----
	<i>Pristionchus pacificus</i>	PDM83796	IPQ---EVT--S C-F-T-ELM-KH----
	<i>Ascaris suum</i>	ERG84717	PD---S---H -E--T--V--H--DT--
	<i>Brugia malayi</i>	XP_001897671	PD---S---H -AW-T--D--Q--DN--
	<i>Loa loa</i>	XP_020306622	PD---S---H -AW-T--D--Q--DN--
	<i>Onchocerca flexuosa</i>	OZC10654	PD---S---H -AW-T--D--Q--DN--
	<i>Strongyloides ratti</i>	CEF60414	PST---ITI---H --F-T--GI-T--DR--
	<i>Toxocara canis</i>	KHN76068	PD---S---H ----T--G--H--D---
	<i>Enterobius vermicularis</i>	VDD93996	----S---H --F-T--G--E--DS--
	<i>Anisakis simplex</i>	VDK45885	----S---H --F-T--E--H--DT--
	<i>Litomosoides sigmodontis</i>	VDK85343	S---S---H -AW-T--D--Q--D---
	<i>Brugia pahangi</i>	VDN92749	----S---H -AW-T--D--Q--DN--
	<i>Onchocerca ochengi</i>	VDK66688	----S---H -AW-T--D--Q--DN--
	<i>Acanthocheilonema viteae</i>	VBB25398	----S---H -AW-T--D--Q--DN--
	<i>Caenorhabditis nigoni</i>	PIC18338	S-----N--T SGV---S-V---T--
	<i>Gongylonema pulchrum</i>	VDN34668	----S---H -AW-T--D--Q--DS--
	<i>Thelazia callipaeda</i>	VDN00755	----S---H -AR-T--D--Q--DN--
	<i>Dracunculus medinensis</i>	VDN56236	----F---Y SSK----I--R--A---
	<i>Wuchereria bancrofti</i>	EJW79684	QIFV---H -AW-T--D--Q--DN--
	<i>Caenorhabditis brenneri</i>	EGT50557	NVSTKR-YV--V RED-TE-M-TE--S-Y-
	<i>Caenorhabditis briggsae</i>	CAP25844	NVSTKR-YV--V RED-TEEM-SD--S-Y-
	<i>Caenorhabditis elegans</i>	NP_500326	NVSTKR-YV--V RED-TE-M-TE--T-Y-
	<i>Caenorhabditis latens</i>	OZG20332	NVSTKR-YV--V RED-NE-M-TD--S-Y-
	<i>Caenorhabditis remanei</i>	XP_003094843	NVSTKR-YV--V RED-NE-M-TD--S-Y-
	<i>Dictyocaulus viviparus</i>	KJH52650	NVSTKR-YV--V RED-TEEMFTE--S---
	<i>Loa loa</i>	XP_020307328	NVSSKR-YV--V REE-TEQMFEED--SQ--
	<i>Oesophagostomum dentatum</i>	KHJ92511	NVSTKR-YV--V RED-TEEMFTE--S---
	<i>Onchocerca flexuosa</i>	OZC08989	NVSSKR-YV--V REE-TEQMFEED--NQ--
	<i>Pristionchus pacificus</i>	PDM78546	NVSSKR-YV--V REE-TDEQ-QD--A---
	<i>Wuchereria bancrofti</i>	EJW79347	NISSKR-YV--V REE-TE-MFKEH-G-Y-
<i>Toxocara canis</i>	KHN82967	NISSKR-YV--V RED-TE-MFKDH-G-Y-	
<i>Trichinella britovi</i>	KRY59221	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella murrelli</i>	KRX44628	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella nativa</i>	KRZ57303	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella nelsoni</i>	KRX20916	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella papuae</i>	KRZ68309	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella patagoniensis</i>	KRY20454	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella pseudospiralis</i>	KRZ44360	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella spiralis</i>	XP_003381660	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichinella zimbabwensis</i>	KRZ13867	-ISVK-VYI---K-E-TE-M--E--MQY-	
<i>Trichuris suis</i>	KHJ42825	-VSVK-VYI---K-E-TEEM--D--S-Y-	
<i>Trichuris trichiura</i>	CDW53958	-VSVK-VYI---K-E-TEEM--D--S-Y-	
<i>Acanthisitta chloris</i>	XP_009078363	-VTVK--FVG--KEDTEEHH--D--EY-	
<i>Alligator mississippiensis</i>	XP_014458634	-VTVK--FVG--KEDTEEHH--D--EY-	
<i>Bos taurus</i>	XP_015327666	LTVK--FVG--EDTEEHH--Y---Y-	
<i>Homo sapiens</i>	AAH00506	-VTVK--FVG--KEDTEEHH--D--EY-	
<i>Hypsibius dujardini</i>	OQV17871	Q-TV--AFVG-VKEGVEESD--E--S---	
<i>Mus musculus</i>	AAI72047	HLTVK-I-VG--KEDTKEHH--D--QY-	
<i>Lucilia cuprina</i>	KNC24965	NSSVK-VFVG-LKE--DEQC-KEH-QQ--	
<i>Xenopus laevis</i>	P51989	-VTVK--FVG--KEDTEEHH--E--EY-	
<i>Zonotrichia albicollis</i>	XP_005480939	-VTVK--FVG--KEDTEEHH--D--EY-	

Supplementary Figure 48. Partial sequence alignments of a Heterogeneous nuclear ribonucleoprotein A1 protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the Chromadorea class. There are two homologs of this protein in the Chromadorea class, one of which contains the CSI.

		139	171		
Chromadorea homolog 1 (19/19)	<i>Necator americanus</i>	XP_013302959	LRIYFEKFGSLDQVEILGDH	RGFGFVVVFEDQKS	
	<i>Ancylostoma ceylanicum</i>	EYB89670	-----	-----E-SA	
	<i>Ascaris suum</i>	ERG84717	--H--DT--VVE-----NP	--L-----N-S-	
	<i>Brugia malayi</i>	CRZ22460	--Q--DN--TVE-----NP	--L-----IY---E-	
	<i>Caenorhabditis brenneri</i>	EGT30022	--V---T--T-----QP	--L---IY---E-	
	<i>Caenorhabditis briggsae</i>	CAP33098	--V---T--T-----QP	--L---IY---E-	
	<i>Caenorhabditis elegans</i>	NP_741784	--V---T--T-----QP	--L---IY---E-	
	<i>Caenorhabditis latens</i>	OZG25695	--V---T--T-----QP	--L---IY---E-	
	<i>Caenorhabditis remanei</i>	OZG07648	--V---T--T-----QP	--L---IY---E-	
	<i>Dictyocaulus viviparus</i>	KJH46562	-----R	-----Y-----	
	<i>Diploscapter pachys</i>	PAV85315	I-L-----NP	--L---I--E-E-	
	<i>Haemonchus contortus</i>	CDJ83341	-----R	-----Y-----	
	<i>Loa loa</i>	XP_020306622	--Q--DN--TVE-----NP	--L-----S-P-	
	<i>Oesophagostomum dentatum</i>	KHJ99864	--V-----	-----	
	<i>Onchocerca flexuosa</i>	OZC10654	--Q--DN--TVE-----NP	--L-----N-S-	
	<i>Pristionchus pacificus</i>	PDM60141	--L-----T-----KP	--V-----RRED	
	<i>Strongyloides ratti</i>	CEF60414	I-T--DR--AVE-----NP	--M-----E-D-	
	<i>Toxocara canis</i>	KHN76068	--H--D--VVE-----NP	--L-----E-TA	
	<i>Wuchereria bancrofti</i>	EJW79684	--Q--DN--TVE-----NP	--L-----N-S-	
	Chromadorea homolog 2 (0/37)	<i>Caenorhabditis brenneri</i>	EGT29982	-HE---Q--DIEEAVVIT-R	NTQKS --Y---TMK--A-
		<i>Caenorhabditis briggsae</i>	XP_002644445	-HE---Q--DIEEAVVIT-R	NTQKS --Y---TMK--A-
		<i>Caenorhabditis latens</i>	OZG25472	-HE---Q--DIEEAVVIT-R	NTQKS --Y---TMK--A-
		<i>Caenorhabditis remanei</i>	XP_003117654	-HE---Q--DIEEAVVIT-R	NTQKS --Y---TMK--A-
		<i>Caenorhabditis nigoni</i>	PIC17906	-HE---Q--DIEEAVVIT-R	NTQKS --Y---TMK--A-
		<i>Caenorhabditis elegans</i>	NP_497799	MKQ---TY-KVEDAMLMF-K	ATQRH -----T-DSDEV
		<i>Strongylus vulgaris</i>	1529521408	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Ancylostoma duodenale</i>	748398207	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Angiostrongylus costaricensis</i>	1529411915	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Oesophagostomum dentatum</i>	732742957	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Haemonchus placei</i>	1535211029	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Haemonchus contortus</i>	560135604	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Heligmosomoides polygyrus</i>	1530613144	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
		<i>Diploscapter pachys</i>	1240347977	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA
<i>Ancylostoma ceylanicum</i>		510862001	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Dictyocaulus viviparus</i>		768182347	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Nippostrongylus brasiliensis</i>		1529650831	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Necator americanus</i>		915279951	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Toxocara canis</i>		1535096396	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Ancylostoma caninum</i>		1432398790	-HE---Q--DIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Enterobius vermicularis</i>		1529000477	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RA-	
<i>Onchocerca ochengi</i>		1528797026	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Litomosoides sigmodontis</i>		1528633243	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Dracunculus medinensis</i>		1535172495	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK--AA	
<i>Loa loa</i>		1158600458	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Acanthocheilonema viteae</i>		1511224209	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Anisakis simplex</i>		1528893083	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RAA	
<i>Thelazia callipaeda</i>		1528655218	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RVA	
<i>Wuchereria bancrofti</i>		1528678708	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RVA	
<i>Brugia pahangi</i>		1528772760	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RVA	
<i>Brugia malayi</i>		170577719	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RVA	
<i>Brugia timori</i>		1535296232	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RVA	
<i>Pristionchus pacificus</i>		1253290953	-HE---Q--EIEEAVVIT-R	QTQKS --Y---TMK-RPA	
<i>Soboliphyme baturini</i>	1535368442	--Q--Q--DIEEAVVIT-R	QTGKS --Y---TMKERS-		
<i>Strongyloides ratti</i>	1376136874	-HEF--VY-DIEEAVVIT-R	VTQKS --Y---TMK-RAA		
<i>Teladorsagia circumcincta</i>	1276837198	--D--GR--EVNECMVMR-P	ATKRA -----IT-V-PA-		
<i>Onchocerca flexuosa</i>	1528692356	-KAA--S--EISEAKVIR-P	HTLKS K-Y---S-PF-E-		
Other Nematodes (0/13)	<i>Trichinella pseudospiralis</i>	954298993	--E---Q--EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella papuae</i>	954590396	--E---Q--EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella zimbabwensis</i>	954482541	--E---Q--EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella sp. T8</i>	954617935	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella patagoniensis</i>	954337818	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella nativa</i>	954527271	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella nelsoni</i>	954210113	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella sp. T9</i>	954260219	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella spiralis</i>	954362426	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella murrelli</i>	954252124	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella sp. T6</i>	954293473	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	<i>Trichinella britovi</i>	954386464	--EH--QY-EIEEAVVIT-R	QTGKS --Y---TMK-RP-	
	Outgroups	<i>Trichuris suis</i>	669324980	--E---Q--DIEEAVVIT-R	QTGKS --Y---TMKERT-
<i>Acropora digitifera</i>		XP_015752827	--TNH--KT--VTESKLMF-K	VTNRH -----T-QTEDD	
<i>Cicer arietinum</i>		XP_004514931	M-M---Q--EILEAVVIT-K	YTGKY K-Y---T-K-PEA	
<i>Falco peregrinus</i>		XP_013159650	-KD--S--EVVDCTLKL-P	ITGRS -----L-KESE-	

Outgroups (0/>100)	{ <i>Fukomys damarensis</i> <i>Manihot esculenta</i> <i>Homo sapiens</i> <i>Mus musculus</i> <i>Saccharomyces cerevisiae</i> <i>Priapulus caudatus</i>	XP_010627066	-KD--S---EVVDCTLKL-P ITGRS -----L-KESE-
		XP_021620866	--E--QA--EVVEAV-MK-R ATGRA -----A-PAV
		XP_016879636	-D--S---EIRECMVMR- P TTKRS -----T-A-PA-
		BAC27370	-D--S---EIRECMVMR- P TTKRS -----T-T-PA-
		GAX68065	--E--G-Y-TVTDLK-MK-P ATGRS -----LS--KPS-
		XP_014673197	--E--S---EVTECMVMR-P TTKRS -----TYGNPEA

Supplementary Figure 49. Partial sequence alignments of a Heterogeneous nuclear ribonucleoprotein A1 protein with a CSI consisting of a 5 aa deletion (shown in black box) that is specific for the Chromadorea class. The CSI is not present in any non-nematode outgroup. There are two homologs of this protein in the *Caenorhabditis* genus, under the Chromadorea class, one of which contains the CSI.

		221	252	
Chromadorea (29/31)	<i>Caenorhabditis brenneri</i>	EGT30339	EEFKMKDGGKSTT	
	<i>Caenorhabditis briggsae</i>	XP_002644390	-----A---	
	<i>Caenorhabditis elegans</i>	NP_508610	-----T-----A---	
	<i>Caenorhabditis latens</i>	OZG25613	-----T-----A---	
	<i>Caenorhabditis remanei</i>	XP_003117797	-----T-----A---	
	<i>Ancylostoma ceylanicum</i>	EPB80520	-----A-I--H-FK-Y-ASA---	
	<i>Ascaris suum</i>	ERG79363	-----E--A--R-YA--N-YI--Q---	
	<i>Brugia malayi</i>	XP_001891554	---R--E---I--HS--NKYI--Q---	
	<i>Dictyocaulus viviparus</i>	KJH43166	---R--E--RA-I--R-H--FK-Y--AAA---	
	<i>Haemonchus contortus</i>	CDJ91770	-----E--A-I--R-H--FK-Y--AAA---	
	<i>Loa loa</i>	XP_020301888	---R--E---I--HS--NKYI--Q---	
	<i>Necator americanus</i>	XP_013290523	-----E--A-I--H--FK-Y--AAA---	
	<i>Oesophagostomum dentatum</i>	KHJ99479	-----E--A-I--Q--FN---PA---	
	<i>Onchocerca flexuosa</i>	OZC07703	---R--E---I--HS--NKYI--Q---	
	<i>Toxocara canis</i>	KHN74888	-----E--A-I--R-HT--N-YI--Q---	
	<i>Wuchereria bancrofti</i>	EJW88279	---R--E---I--HS--NKYI--Q---	
	<i>Diploscapter pachys</i>	PAV84640	---NI--P--LK--H--K----QA---	
	<i>Ancylostoma ceylanicum</i>	EPB80520	-----A-I--H--FK-Y--ASA---	
	<i>Ascaris suum</i>	ERG79363	-----E--A--R-YA--N-YI--Q---	
	<i>Brugia malayi</i>	XP_001891554	---R--E---I--HS--NKYI--Q---	
	<i>Dictyocaulus viviparus</i>	KJH43166	---R--E--RA-I--R-H--FK-Y--AAA---	
	<i>Haemonchus contortus</i>	CDJ91770	-----E--A-I--R-H--FK-Y--AAA---	
	<i>Loa loa</i>	XP_020301888	---R--E---I--HS--NKYI--Q---	
	<i>Necator americanus</i>	XP_013290523	-----E--A-I--H--FK-Y--AAA---	
	<i>Oesophagostomum dentatum</i>	KHJ99479	-----E--A-I--Q--FN---PA---	
	<i>Onchocerca flexuosa</i>	OZC07703	---R--E---I--HS--NKYI--Q---	
	<i>Toxocara canis</i>	KHN74888	-----E--A-I--R-HT--N-YI--Q---	
	<i>Wuchereria bancrofti</i>	EJW88279	---R--E---I--HS--NKYI--Q---	
	<i>Diploscapter pachys</i>	PAV84640	---NI--P--LK--H--K----QA---	
	<i>Pristionchus pacificus</i>	PDM77096	-----N--KK---G-LR-	
	<i>Strongyloides ratti</i>	CEF63735	-----E---YN--LH--DLYIH-DGS-Q	
	Outgroups (0/>100)	<i>Acanthisitta chloris</i>	XP_009078988	-----I-SQS-MVS--KK-FA-YI-IQ-C--
		<i>Amazona aestiva</i>	KQK83323	-----I-SQS-MVS--KK-FA-YI-IQ-C--
<i>Chelonia mydas</i>		EMP31408	--Y--I-SQS-MVS--KK-FA-YI-IQ-C--	
<i>Danio rerio</i>		XP_017211556	-DY--I-SQS-M-S--KK-FA--I-IQ-C--	
<i>Daphnia magna</i>		KZS19170	-DY-HL- PQ-MA--QR--ND--VQAS--	
<i>Homo sapiens</i>		20J4_A	-D--V-SQS-MAS--KK-FA-YI-IQAC--	
<i>Mus musculus</i>		NP_001334044	-----TRSTA-LV--HR-FE--DVQA-R-	
<i>Xiphophorus maculatus</i>		XP_005802346	--Y--I-SST-LVS--NK-FK--IEVQ--R-	

Supplementary Figure 50. Partial sequence alignments of a Regulator of G-protein signaling 7 protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the Chromadorea class. The CSI is not present in any non-nematode outgroup. The CSI is not present in the species *Pristionchus pacificus* and *Strongyloides ratti*.

		210	245
	<i>Caenorhabditis elegans</i>	NP_001294068	GQRIVGVNGLIYPTT G HKEVVALIKKDTMKTLLLV
	<i>Caenorhabditis briggsae</i>	CAP38400	-----N- - -D-----N-----
	<i>Caenorhabditis brenneri</i>	EGT34238	-----E----- - -S-----N-----
	<i>Caenorhabditis latens</i>	OZG08793	-----E---N- - -S-----N-----
	<i>Caenorhabditis remanei</i>	XP_003101224	-----E---N- - -S-----N-----
	<i>Caenorhabditis nigoni</i>	PIC32830	-----N- - -S-----N-----
	<i>Haemonchus contortus</i>	CDJ86857	-----V-V--N- P - - -Q- -RSPLR-----
	<i>Diploscapter pachys</i>	PAV68526	-----DT-V--- P - - - - -RSSLQ-----
	<i>Pristionchus pacificus</i>	PDM75425	A-----I--H- - P - - - - -NPVS-----
	<i>Strongyloides ratti</i>	CEF59908	-----I-N-I---N- P - - - -T- -RTPLEAR---
	<i>Toxocara canis</i>	KHN71588	-----S----- P - - - -G- -MNPLQ-D---
	<i>Wuchereria bancrofti</i>	EJW83604	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Brugia malayi</i>	XP_001899140	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Loa loa</i>	XP_020302439	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Ancylostoma duodenale</i>	KIH63028	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Ancylostoma ceylanicum</i>	EYC04072	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Brugia pahangi</i>	VDN81659	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Brugia timori</i>	VDO28175	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Onchocerca ochengi</i>	VDK65450	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Litomosoides sigmodontis</i>	VDK77581	-----S- - - - - A - - - -S- - -TNPLR-E---
	<i>Dracunculus medinensis</i>	VDN52796	-----Y- - - - - P - - -D-S- - -M-PLR-D---
	<i>Heligmosomoides polygyrus</i>	VDP23533	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Anisakis simplex</i>	VDK51478	-----H----- P - - - -G- -MNPLQ-D---
	<i>Haemonchus placei</i>	VDO07548	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Nippostrongylus brasiliensis</i>	VDL66851	-----V-V--N- P - - - -H- -RSPLR-----
	<i>Angiostrongylus costaricensis</i>	VDM53718	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Teladorsagia circumcincta</i>	PI064747	-----M-V--N- P - - - -Q- -RSPLR-----
	<i>Ancylostoma caninum</i>	RCN49057	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Necator americanus</i>	XP_013301750	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Dictyocaulus viviparus</i>	KJH47934	-----V-V--N- P - - - -Q- -RSPLC-----
	<i>Enterobius vermicularis</i>	VDD95482	-----K---S- P YRD- - - -ENPLV-E---
	<i>Soboliphyme baturini</i>	VDP38301	-----S-VFVD- P - - - -K- -QQPASVE---
	<i>Oesophagostomum dentatum</i>	KHJ91366	-----V-V--N- P - - - -Q- -RSPLR-----
	<i>Onchocerca flexuosa</i>	OZC04861	-----S- - - - - A - - - -S- - -NPLR-E---
	<i>Trichinella patagoniensis</i>	KRY22666	-----NT--VSS S - - -D-R- - -Q-PSGVQ---
	<i>Trichinella papuae</i>	KRZ78304	-----NT--VSS S - - -D-R- - -Q-PSGVQ---
	<i>Trichinella pseudospiralis</i>	KRY00923	-----NT--VSS S - - -D-R- - -Q-PSGVQ---
	<i>Trichinella spiralis</i>	XP_003374528	-----NT--VSS S - - -D-R- - -Q-PSGVQ---
	<i>Trichinella murrelli</i>	KRX50132	-----NT--VSS S - - -D-R- - -Q-PSGVQ---
	<i>Trichinella nativa</i>	KRZ61057	-----NT--VSS S - - -D-R- - -Q-PSGVQ---
	<i>Trichuris trichiura</i>	CDW52236	-----QTI--I-S S - - -D-R- - -Q-P-QVE---
	<i>Trichuris suis</i>	KFD54368	-----QT--I-S S - - -D-R- - -Q-P-QVE---
	<i>Dictyocaulus viviparus</i>	KJH47935	-D--FA--HS-IGES - - -K-ER--ENAVRCEM--
	<i>Ancylostoma ceylanicum</i>	EPB74572	-D--FA--HS-IGES - - -K-ER--ENAI RC EM--
	<i>Necator americanus</i>	XP_013301751	-D--YA--HS-IGES - - -K-ER--ENAVRCEM--
	<i>Haemonchus contortus</i>	CDJ86857	-D--FA--HS-IGES - - -K-ER--ENATRC EM--
	<i>Caenorhabditis nigoni</i>	PIC32832	-D--FA--HS-IGEN - - -K-ER--ANPNRC EM--
	<i>Caenorhabditis remanei</i>	OZF76366	-D--FA--HS-IGEN - - -K-ER--ANPNRC EM--
	<i>Caenorhabditis latens</i>	OZG08787	-D--FA--HS-IGEN - - -K-ER--ANPNRC EM--
	<i>Caenorhabditis elegans</i>	NP_001294068	-D--FA--HS-IGEN - - -K-ER--ANPNRC EM--
	<i>Caenorhabditis briggsae</i>	CAP38400	-D--FA--HS-IGEN - - -K-ER--ANPNRC EM--
	<i>Caenorhabditis brenneri</i>	EGT34238	-D--YA--HS-IGEN - - -K-ER--SNPNRC EM--
	<i>Diploscapter pachys</i>	PAV68526	-D--FA--S-VGEN - - -K-ER--QNPNC EM--
	<i>Pristionchus pacificus</i>	PDM75425	-D--FA--VS-QGE - - -K-ER--Q-P-RCE---
	<i>Strongyloides ratti</i>	CEF59908	-D--FA--A-VQGES - - -Q-IQR--ENPLQCE---
	<i>Toxocara canis</i>	KHN71588	-D--FA--HS-IGEN - - -Q-QR--ENPLQCE---
	<i>Ancylostoma duodenale</i>	KIH63027	-D--FA--HS-IGES - - -K-ER--ENAI RC EM--
	<i>Heligmosomoides polygyrus</i>	VDO87852	-D--FA--HS-VGES - - -K-ER--ENAVRC EM--
	<i>Ancylostoma caninum</i>	RCN49058	-D--FA--HS-IGES - - -K-ER--ENAI RC EM--
	<i>Haemonchus placei</i>	VDO77662	-D--FA--HS-IGES - - -K-ER--ENATRC EM--
	<i>Angiostrongylus costaricensis</i>	VDM53717	-D--FA--HN-IGES - - -K-ER--ENALRC EM--
	<i>Nippostrongylus brasiliensis</i>	VDL68338	-D--FA--HS-SGES - - -K-ER--ENSTRCE M--
	<i>Anisakis simplex</i>	VDK51478	-D--FA--HS-IGEN - - -R-ER--ENPLQCE---
	<i>Enterobius vermicularis</i>	VDD95482	-D--YA--N-VGES - - -RQ--QK--ENPLRCE---
	<i>Thelazia callipaeda</i>	VDM97278	-D--FA--HS-VGLN - - -RQ--QR--ENPLQCE---
	<i>Dracunculus medinensis</i>	VDN52796	-DY-YA--VS-IGEN - - -Q--QR--ENPLHCE---
	<i>Litomosoides sigmodontis</i>	VDK77581	-D-VLV--HC-IDEN - - -K--QR--ENPLQCE-I-
	<i>Oesophagostomum dentatum</i>	KHJ82768	-D-VV-A--FPVLAES - - -AL-D-MSSQLNLCLV-L
	<i>Ancylostoma ceylanicum</i>	EYC04066	-D--FA--HS-IGES - - -K-ER--ENAI RC EM--
	<i>Trichinella patagoniensis</i>	KRY22666	-D--A--VYVADQP - - -D--K--E-PLQCR-T-
	<i>Trichinella papuae</i>	KRZ78304	-D--A--VYVADQP - - -D--K--E-PLQCR-T-
	<i>Trichinella pseudospiralis</i>	KRY00923	-D--A--VYVADQP - - -D--K--E-PLQCR-T-
	<i>Trichinella spiralis</i>	XP_003374528	-D--A--VYVADQP - - -D--K--E-PLQCR-T-
	<i>Trichinella murrelli</i>	KRX50132	-D--A--VYVADQP - - -D--K--E-PLQCR-T-
	<i>Trichinella nativa</i>	KRZ61057	-D--A--IYVADQP - - -D--K--E-PLQCR-T-
	<i>Trichuris trichiura</i>	CDW52236	-D--A--TSVAELS - - -R--E-PL-CR-T-
	<i>Trichuris suis</i>	KFD54368	-D--A--TPVAELS - - -R--E-PL-CR-T-

Nematoda
homolog 1
(42/42)

Nematoda
homolog 2
(0/35)

Outgroups (0/>200)	}	<i>Acanthochromis polyacanthus</i>	XP_022058038	-D-L-F--EDVENES	-QQ--SR-RATEGRLE-I-
		<i>Aedes albopictus</i>	KXJ71430	-D--IE---TN-TTE-	--K--E---GVPNE-K---
		<i>Aethina tumida</i>	XP_019865902	-D--LE---ES-ANK-	--Q--E---AQSGE-K---
		<i>Agrilus planipennis</i>	XP_018333727	-D--LE---ES-ADKS	--Q--EA--ALPNE-K---
		<i>Homo sapiens</i>	AAH14513	-D-L-E---VNVEGE-	-HQ--QR--AVEGQ-R---
		<i>Octopus bimaculoides</i>	KOF98109	-D--IE---VN-GNEN	-QQ--QR--AGGEE-R---
		<i>Mus musculus</i>	AAD49224	-D-L-E---ENVEKE-	-QQ--SR-RAALNAVR---
		<i>Rhinolophus sinicus</i>	XP_019568739	-D-L-E---VNVEGE-	-HQ--QR--AVEGQ-Q---
		<i>Salmo salar</i>	XP_014058979	-D-L-F---ENVESES	-QQ--SR-RATVGQLE-I-

Supplementary Figure 51. Partial sequence alignments of an Na(+)/H(+) Exchange Regulatory Factor protein with a CSI consisting of a 1 aa insertion (shown in black box) that is specific for the entire Nematoda phylum. The CSI is not present in any non-nematode outgroup. There are two homologs of this protein in all Nematoda species, one of which contains the CSI.