**Supplementary Data S3.** Trimmed RIOK-3 amino acid sequences alignment used in the analysis of the phylogenetic relationship of RIOK-3 from nematodes.

>*Tsp*-RIOK-3

DSDESVEERDDEELEYVNNKLDCKNKHDFINDNKLFL-----------DYFILKVTQFLNSVPKVLYFKMDDVLLN

MTKR----FVAVKMFQNSCNGVLFQ----------ELAVDTTTRMILFKMINGN-LLESVDGQVATGKESVVFHAV

GGSDLIQEKQCSNFAVKIFKTALNEFQNRIDYVQEDFRFKNTRKILKLWAEKEYRNLKRLKTNGLPCPDPVTVQSH

VLVMSFIGDE-KVSAPKLKDVQL---DLATWEVLYDELKSIMKSMFRNCRLVHADLSEFNILYW-NEKLWIIDVAQ

ATDLSNPQCFSYLARDCRNV----NNVGRTTLLCLGLYFVSRYFICVVFRRTWGSGMQCARAVQRSYRFEVHQR--

--LHLQRRSGRSCQQQSS-------

>*Sra*-RIOK-3

DALLQEYEDEEDIKEKSWIKKYEKKDNFLGDND---INKNDCVATTKHDTELAKIRNADKTMNFAIGMNIGDCSDE

KISN--KVFNKLRQYSKDEIKRNFKIKDKAEKSTYEQGMDEDARLIIFKLIQRN-ELDTVEGIIASGKESIVLHA-

-------KKEEWNFAIKVYKKTLSEFKNRNEYVKDDFRFKNPRHVLKVWTLREFLNLRRLMKAEINAPEPLYVKKN

VLVMRMIGED--KPALKLKDVLFQ--DEESKELAFKMVEKIICDMYKNCKLVHGDLSEFNLLYH-KGVIYVIDVSQ

AMDLSHPNSLVFLLRDIENILNFFNSIGTQNLPSSGVLFEKVTNIPIDPTKSVEVQVEQFEADNRNIHLRDDKAKP

CNVEIRAMAEEECNDC---------

>*Asu*-RIOK-3

DYDEESSEDDEDIREFATNLFYENVKEEFPPCG--FVKDAEGNVITKHDKEVMERRNTNKVMQLPIDFPTGDVVGE

KLSD--RVFNTLRAYSKTDQKRNIRVKDKEEKAISEQSMDAATRMILYKWINSGELFDRVEGVIATGKESVVLHAA

TRADNVLNLEEAHYAIKVYKMTLAEFKNRSEYVQNDYRFKNPRRVLRVWAEKEFMNLHRMFRAGLRCPEPIRLRRH

VMMMSLIGSG-GRAAPKLKSIEWE--DQESKADAFQQVREAMSRMFKECRLVHGDLSEFNILYH-LGHAYIIDVSQ

AIDVSHPRSLFFLLRDIENVLEYFGRVGTEELPSATELFNEITGLCMDPEKNLLVQVEHFEKDNRSVQLREDKANP

ADRELRLYDAEVAITHED-PAELYN

>*Bma*-RIOK-3

DLEEELSEDDEDLREVAIDFLYSRPKDEFPSSG--YMRDGSGHLITKHDKEIAERRNSEKVMHLPIDIPTGDVVGE

KLSN--RVYNKLRNYCKTDQRRNARVKDKDEKATNELSMDKVTRLIIYRFITTG-LFDVIGNVIAT-----VLRAI

AHGDGVRLFEEKHCALKVFKMALSEFKNRSEYVQDDYRFKNPRRVLRIWAEKE------MVRAGVKCPKPIRLRKH

IMIMTFIGSN-GIAARKLKDIEWI--DQEIIYDTFLQVKEAMIKMFSDCNLVHGDLSEFNILYH-ENDVYIIDVSQ

AMDISHPRALFFLLRDINNVLEFFGKLGTKNLPSATELFNEITGLNMDPEKNLVVQVEHFEKDNRNVQLRCDKANP

ADMELRLYNAEVAETHND-LAEPYN

>*Llo*-RIOK-3

DLEEELSEDDEDLREIAIDFVYSRTKDEFPPSG--YMRNASGHLITKHDKEIAERRNSEKVMHLPINIPTGDVVGE

RLSN--RVYNKLRNYGKVDQRRNAREKDKDEKATNELSMDKVTRLIIYRFITSG-LFDVIENVIATGKESIVLHAT

AH-DGMRLLEERHCALKVYKMTLSEFKNRSEYVQDDYRFRNPRRVLRIWAEKEYTNLNRMVRGGVKCPKPIRLRKH

IMIMTFIGSN-GIAARKLKDIEWS--DQEIIYNTFLQVKAEMIKMFTNCNLVHGDLSEFNVLYH-ESDVYIIDVSQ

AMDISHPRALFFLLRDVDNVLEFFAKLGAKNLPSATELFNEITGLNMDPEENLAVQVEHFEKDNRNVQLRCDKANP

ADMELRLYDAEVAETHND-PAEPYN

>*Ppa*-RIOK-3

NDDDSFESDEEDMRELNTNKKYEKMNEALGPFIGGLMRTPNGDVMSKHDPSIVSTKNVERVMNGSIDVPTGDCYSV

DMNSGGNVFNKLRSFAKTEQKRINRLKDKEEKATIETSVDAVTRLTLFKWINQG-LFDRVEGIVATGKESAVLSAE

AH-SLLEDDQPYFLAIKVYKTTLTDFKNRGEYVVNDFRFKNPRRVMRIWAEKEFMNLTRMFNKQLPCPEPIKLRKH

IMVMGFIGDDQGIPAPKLRNVQFD--EEAEKISAFEQTKNILLRMYKECNLVHGDFSEFNLLYK-DGVVYVIDVSQ

AMDLSHPRVLHYLLRDIENVLLFFNRHETPNLPSHTALFNEITDLSMSEEGDLSCQVEEFEACNRNTQLRIDKSKP

ADLELRKMQSEQGSSQ---LAAEYI

>*Hco*-RIOK-3

QYSD-VSSDDEDVRQFATDLLYAKLTDDVPSHSGPVFRNAGGDLVTKHDANVSARRNADKAMNDKVNLAFGDMNQE

QISS--RVFNSLRNFSKSETKRLHKLKDKEEKATIETSMDAVTRLHLFKWINQG-IFDSVEGIIATGKESAVLNA-

-----INNESGERFAIKVFKTSLTEFKNRSEYVKDDFRFKNPRGVLKIWAEREFMNLSRMVKCGLPCPVPVKLKRH

LLLMSLIGEN-GAAAPRLKNIDWEFSTIEERKDIFSQVIDIMNRMYRDCRLVHGDLSEFNLLLS-EGKVYVIDVSQ

SMDLSHPRNLHFLIRDIENVLAFFQRLDIPELPTPVALFNMITDLSMSEEGSLIVQVEQFSEENRANQV--NKSKP

ADFEWAAYNAERKEYRDDSPARDYN

>*Cbr*-RIOK-3

QETDSEDEDDDALRQAATDMLYAKLDAENASESR-LRPEGPSTSRTKHDTGVSGRRNADKTFNDRNSLPTGDMVGD

KINN--KVFNKLMAFGKSEAKRQMRHKDKEEKATMDTSVDSDTRLLLLKWINQG-VFDSVDGIIATGKESAVLHA-

------AQDSATSYAIKVYKTTLSEFKNRSEYVKDDFRFKNPRGVLKIWAEREFMNLSRMAKHGLPCPQPVKVRRN

VLVMSFLGDD-GLAAPRLKNVEWEFFTDEERRSVYDQVQTIMCRMYKECLLVHADLSEFNLLLTPDNKVHVIDVSQ

AMDLSHPRSLQFLTRDIQNVIAFFTKIGVPNLPTYVQLFNLITDLEMVEDHDLLVQVEQFSEENRSADLRHDKSRP

ADMELKKYNEEKKANRGISPARDYN

>*Cel*-RIOK-3

QETDSENEDDDALRQAATDMLYAKLDEENATNSR-LRPEGPSTSRTKHDTGVSGRRNADKTFNDRNTLPTGDMVGD

KLNN--KVFNKLMAFGKSESKRQMRNKDKEEKATMDTSVDSDTRLLLLKWINQG-VFDSVDGIIATGKESAVLHA-

------AQDSATSYAIKVYKTTLSEFKNRSEYVKDDFRFKNPRGVLKIWAEREFMNLSRMAKHGLPCPQPVKVRRN

VLVMSFLGDQ-GLAAPRLKNVEWEFFTDDERRNVYDQVQSIMCRMYKECLLVHADLSEFNLLLTPDNKVHVIDVSQ

AMDLSHPRSLQFLTRDIQNIITFFTRIGTPNLPTYVQLFNLITDLDMVEDHDLLVQVEQFSEENRSVDLRHDKSRP

ADMELKKYNEEKKANRGISPAREYN