

Supplementary Data 3. Sequence of protein components of the small RNA machinery from *Nematostella*, *Amphimedon* and *Trichoplax*.

>Nematostella vectensis Ago1
MASNNPVRNVGGNFNPVPPKRPNHGSTGRTIALRANFPVQLPRGNIHYYDLSICPDKCPRRVNRDVVEMVM
LNYHKVFGGMKPVDGRKNLYTRDPLPIGKTPTEFEVVLPTDNSQDKKFVTLKWVSVQSLYALEKALEG
TCNQI PFTEI QALDVVLRLHPLSMKYPVGRSFFSPDGYDFPLERGREVWFGFHQS1RPSQWKMLLNIDV
SATAFYKCQSVVEFMCEVLRIRKDDEKHAPLNDADRIFTREIKGLKVEITHCGPMKRKYRVINVTKQP
AQALQFPLTLESGTAQITVARYFDQDKHKQRLRYPHLPCLQVGQEQRHTYLPLEVCNI VPGQRCVKLLTD
TQTSKMRATARSAPDREREIRGLVKKANFDEDAAVXKDFSISIGKNMVELOQGRVLPPPKLVYGGVKRIEK
I IHSFSGWVDMRGRQLFHGIEIRWTIAACFVVKQQMCTEDSLRRFSNLQMK1SEQGPM I SCPPVFFFYRA
NPDEVERMFRRLAHEAPDLQMLIVLVLPGKTPVVAEVRKVGDMLGVITC1QGKNTVFKPSPTLSNLCLK
INAKLGGVNNILAPEIRPPVFREPVI FLGADVTHPAA GDDKRPSSA AVVGSMADHPSRYYASVRVQTHRQ
EII AELAAMVRELLVQFYRSTRHKPQRI VFYRDGVSEGQFRQVLVHELKAIREACI KLEVGYQPGISFIV
VQKRHHTRFLFCORDQDKCGKSGNVPPGTTVDRGITHPTEFDFYLCSHAGIQGTSRSPSHYHVWLWDNNFSA
DELQALTYQLCHTYVRCTRAVSI PAPAYYAHLVAFRARYHMMDRDKEA GNDNSSVASGEDCRGPQLLANA
VOVHPKVLOGMYFA

>Nematostella vectensis Ago2

I KRKFTVMGLSHPAFNRRLEDENTTVEAYFRNKYNISLRYPHLPCLLVGQKKNSVPMEVCSMIPTQR
KRLTDEQTAAMIRKTAKPANERQRDINQWVDELTASDQYLKNKEYGMRINKQMVAIEGRVLPAPELTLG
NPQGSALTPSDGAWDMRGKSFEARTVEWVWALVCFSHPKCPEKELEGFARQGMNVRSEGMRMNPVPCR
AEYASRVRQEVEGI FGKLLEDFKSLSL,I VVAL PDRGNKDVKYNEVKRVDVTWLGI PTQCVQMKTFAKMPQV
CSNIAMKINGKLLGGTNHVIADRKLATITDDKGKKI FDSPVI IFGADVTHPAPGDNGIPSIAAVVASLDRN
ASRYCARVRPQTHMKCKQAQEIIIVDLADMVKELMIEFYKXTKRKPARIIFYRDGVSEGQFQQLLEEVRA
VQQACAMLEKDYQLITVVVQVQRHRHARLFEEGRDARGKSRNVPGATTVDTVICHFFEDFYLCSSHAGI
QGTSRPTHYHVLYDDNGFSADLKQALTYQLCHTFARCTRVSMSMAPAYYAHLAAFRAR
-Nemastomella vectensis Aao3

Nematostellaria vectensis Agardh
OENMELPKRPGYGRGGRKIKL RANEFFOW

QENKPFGRKGTRKTRKRAKTFVTLFNFVDTIYHDEELTSPAFAVSVCVDVVAATRIGETKGV
NCCKPAFDGRRNLYCREPLPLKSEASALKVLTPLGTDGGKERKFTLKIKEAGLVSIEKDQFLNGEPRFKV
PQDAIQGMDIVLRLRQMPSMSMKFTAVGRCCFPFPNGHCHDLGGGCELWTGFYQSVRPSQWKTMLNNIDVSSKG
FQKSMPVIDFMLEYLRLDRNRNVLDTWRVMDERDKKKLTTEIKGLRVEWTTHIKRKFTVGMGLSHPAFNFRR
LEDNTETTVEAYFRNKYNSILSLRYPHLPCLLVQGQKNSVPMEVCNMIPTQRKLRTDQEATAAMIRTKATPAN
ERORDINQWVDELATASDQYLKNEYGMRINKQMVIAEGRVLPAPELTLLGGNPQGSALTSDGAWMRGK
FFEARTVEVWALVCFSHPKWCPEKLEGFARQMGNVRCSRSEGMRMNPPVCRAEYASRVQEVEGIIFGKLLHD
FNSLQLIVVALPDGRNKDVYNEVKRVTGDTVLGIPFTQCVOMQKFMTAKPQVCNSIAMKINGKLGNTNHVIA
DSLKATITDDKGNSIFNSPVIIFGADVTHTPAPGDNGIPSIAAVVASLNRNASRYCARVRPQTHMKCQQA
EIVDLDADMVHITYIRLWRKLESHDQTMFRRFQVLLVEEVRAVQVQACAMLEKDYQPLITFVVVQKRHHAR
LFAEEGRDARGKSRNVPAAGTTVDTVIICHPFEFDYLCOSHAGIQ

>Trichoplax adhaerens Agc
M A T T E W M B R O N S E C H U K I

MAATAFTKAALPQRNGFGSKGRIVAYVANHYPISTFQAEINSIYQDMDTNPVEPKIKSDLRDFISILQSSYS
QLFRGVVTAFDVRGCRNLYANKRNLNGISSDGKTFITDKEMRPGAIKSFKIQIKEVQLQ1LTDLNRALRGETD
VPVQIAQDVVLRLAKLAKFTMVYRSFYPEPADDWRSLGCHGESWRGYQQSARSTQTGLSLNIDTSHTI
AFYEAVLVHNFIAKYFNQDEIRSLRDFQRKTMASELKVNKVTAHLHGDKKRKYRITDISNNKPQNIQFDHN
GKRVSVDTYFKTTTGYTIRYPDPLCKLMNNKEIHLPMEVCEIIIPGQYYKKKINERETASMVRFAAIIPADQ
RRKGIDTFTVNRATQYSTDPVSKGFIQVDPHMVKKDVARLSPVKVYIYRSGEMLPRDGWSNLQNAQFISSS
QVHSWGCWVFWDRMLNPKVEVLISLKKSTADCGIEGINEKNCM0QKINIDKANHQFLANLALKINAKL
GGTNNTINQSELLKKPTIIFGADVTHPGIGDQTPSVAIIVGSANIDLSHYFAIRIQEHRKEIIQDLSQS
VVKTMMMSFYRKLLHRKPERIIFYRDVGSEGVQFNDVIREELTAIEKACRSIEEGYRPAITFLVVQKRHHTR
FFPSQNKDSVGKARNVPGLVVDRGVCHPSQDFYLCSHFGIQGTSRPTPYHVHLLDENKLSDASLQEFTY
OLCHVYCRCRTRSVSIPAPVYVYSSHHLARFRARSYMAQLGGEMRPQEMRNKIEQVLSKNIGGAVFFA

>Amphimedon queenslandica Agol

MSDRGGKGSRSGRGRGRRGSSVGRGRSNAGRDRSTRNDTPVGGLSSRPSETETPHSVGVQVKQSNSPKGPTPSBT
PSVTKPEPTAPAVPLTFKRESNNGPVTQGSPPNSGSPSSTSSPSSSCIGSSIMSSPQSOLSYASPIVTCS
TSSSSKLDSPHPFSKYDPRPPGPGVTLGRPIVLQTNHFPKIFPTKGELYHVDTLPDCTPRRINRAVII
EIEKKYRENLQGILAYDGTKNITYSKPLFRSKFELVPLKLDEKDKEKKFEEVIIKVUGSIPLDVLSQLST
VHTTQSSDVQSAIQGLDILVRLTPSMSFVTVGRSFFTPTVTRGHPLGGGREAWTGYQSVRPSMGWTIT
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SIIRQLPCPSSLTDQQRQFAKDIKGLKVKVTHLAYPRKYKVKDITQKSRSRDLFFDCDQGQTSVDDYFKSK
GKPLRYPDPLCPCLMEHGKNPHIYIPMEYCEVLQGKQNCNNKLTPEQTSAMIRHTAKPAYERQKQIMEKIHA
DGDEYLKNFGIKVSKRMSEVAGRVLDPKMEVGEKRSVEPRNGSWDTRGKSFWHGISIKKWGII
INVFASELSKASNEKRMMRMPPIEYTFTKPRDDLEHLIRRTKFAGCDIVILLDGKQKPTYNEVKRVDGNDT
GIRTQCVLFKNACKPNTATMSNICLKINSKLGGTNSIPNYEKTDYAFPWESPFIIFGADVTAPHAPNDK
PSLAAVTASMDENAMDYRAKVKLVRQEVFKIDELAGIVKEMLLKFKYRKNDKCKPQRIFIYRDVGSEGQO
KEVILNEVAIIQKAQCLSLPGDYKPGITFLVWVQKRHHTRLFCTDRLRQEGKAGNVPPGTTVDITHPREFT
FFLCSHAGIQGTSKPAHYHVWLDDNRFSADELQALTYKLCHCFRCRNRSVSYPARTYYSHAAFRARYTLC
EWBHKCCSYCQGSGTPTGCGTQXGSEPLFCSVQKMBALIKNFVQDPMVY

DWEEKSSSYHSDTDSSFSYSSEDILSDVSK
• *Amphimedon queenslandica* Agassiz

>Amphimedon queenslandica Ago2
MSR1GTP1D3SSHWSMPMDRTYSASLPLPVPAHSLPPVTLLPVTLGLPPFPGPGRGGGGPVIPTFPPIPST
MSPSITSSPLTPTQPTTSITPGSILWPWTSSAHLHPTLSLQPFRPNFGQIGRPIGLRANHFQVKIPTS
TLYHYDVAIHPDKCPRRVNREIIEALIQTAKDYFEEQHPVFDGKKNLYSRKPLPGIGRDREVEITVTLGDD
NRERAFKVSVKYVAQVNALLSDLVRGESLAPIPFESIQALDVMVRHLPSMTYTPVGRSFAPPGEPEGYPTI
GNGREVWFGFHQSIRPSMWKMMMNIDVSATAFVKRQCVLDFVHEVLDLSDSDEVTHTGPPIRRKYRVCNVTH
RPASAQTFLPQLQLENGDVFDCSVQYFKEKYHIDLQYPFLPCLQKGKHHYTLPLEVCVDLWPGQRCKIKLW
EMQTSRMIKATSRTAPDRETEINRLVARANFNADPYVQDFGIVSVDTKMVTVTGRVLPPPKLQYGGKARVQZ
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GVERVEAVEPVLFRQLLTMEGLQLILVVLPGKTPVYAEVKRVGDTLLGVATQCVQTRNVRNTSPQTLNSLC
LKLINVKLGINSI1IVPMNMRPPI1FREPVPVIFPMGADVTTHPPAGDEKKPSIAALVASMDAHPSRSYATVRI1QOH
QELISELAAMREMLIYEFKSTRFKPQRUIFYRDVGSEGQFLQVLSHELASIRLACRKLEDGYQPGISFIV
VQKRHHTRFLFCSDRDKVGKSGNI1PAGTTDVGITHPTEFDFLFLCSHAGVQGTSPSHYHVLWDNDGFTAD
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KIHEGMCNVMYFA

>Nematostella vectensis Piwi1
MTGRARGRARGRSEAAQPGGADAARRPGEPQPATGRGRSRGPPAGAVGVGPPKQPPPPQQVAPPTQOQ
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DFKKARFALIGEQRELLGNIRAFDGMVLFLPKKLDPQVTKIMAVRTRTETPDEPVEITITLTNEPADSP
TCLHLFNIILKRILKYIDMKQVGRNNYYIKNAIAIPKHGLELWPGBTTSILKYEHSILLGADVSHKVLRK
QTFLDFLYEYLKNMQGRGNFHDEAKKLVGEIVLTRYNNKTYRVDDIDWNKPNSFTTPKGIEISFNDDYY
KKNYDFTITDQEQLPLFSKPKKRKGADDPVLLPFLCPLTGLSLSSDMRDFSVMKDLAHVTRLDPKARSKD
LNKLISEINNNPDASGELSFGWGLRFGRNLLDFDRGILPGEKIFOQNKGNSYDPKSADSWEIREIRGAPLHST
VNLENWVIVHTNRDGSVATDFQQTTLARVCVCPMGINTTKPRMVPLNDDRTDSYLKALSNEIQADFQPIVVT
IVPSNRKDRYDSIKKLCLEKGVPQSQQVSVRTLSKKQMLMSVCTKIGIQLNCKLGGEAWAVDIPLKNLMI
VGIDTYHDDSSQKGSRSGVGFVASLNKPCTRQREYYSRCTFQHSGQELVDGLKVCMTAAALRQWQQINGVLPD
KIIFRDVGWDQGLRAVIEHPQVILSTFKQFDQGDYDPKFGTVVKKRIQTRLFMEAREDPDMRNLMNP
PGTVVDKEVTRSEWFDFEIVSOSVRGQTSPTHONYIHDTRGLPDRPHWOOOLSYKLTHIYNNWPGBTVRVPA

PCQYAHKLAFLVGQSLHKEPSLKLADKLYFL
>Nematostella vectensis Piwi2
IPLSCNYIRIHCPEQAVFQYCVSYSPEIDNRSERFHLLQQHPGFRGPQKAFDSTMLFLPRLPQPVTQLQ
STRRSRGSPVTTFTFRVVPDDAIFQVYNILFRRVMKILDMQVGRYFYNPKTPAHIHQHNIVLWPGY
ITSLQHYEGGLMCLCDVHHRLRTSCLDYLMNMHSKVGDRFRDEVSKELIGSVLTTTNNKTYRVDDID
WNKRPTSTFTFHNGEQMTFVEYKKSYEIEIRLDQPMIVRNPKTEQKRGGVIEVILLIPELCKLTGLN
DAMRKDFRVMKDIAAHTRVNPQMQRQEAMKKFVMSINSTPEALEQLTAWNLRLLDTSTLMTEGRQFPPEKII
YGNNTGSAGDQADWGRDATREKVISAVNLNNWMVFFTQRDSGKANDFVQTMNKCAPAMGIQVNQPKMNQL
RDDRTETYLRSIRENLHPQVQVVVIFPPTSRDDRYAAVKLCCVESPVPSQVIISKTISNPTKLRSVVQK
IALQINVKLGELWALDIPIRSLSMVCIGDVHKARGGRSVGGLVCSMNRSLTRWYSDVCFQSPQELID
GLKMLLIKGIRKWHDVNNALPERIIVYRDGVGDQLKVVAGVEYQVQFEECAFSGESYKPKLAVLUVVQKR
INTRIFSAEPLGNPGPSLHDHTVRKDWNDFLVLVSQHVRQAEVTPTTHVVYVYDTSNWKPDIMQKLSYK
LTHLYNWPGTVRPAPCQYAHKLAYQVGQSIHGQPSQELCDRLFFL

>Nematostella vectensis Piwi3

MTGRARGRARGRENNTQNTRPGEPPVSYGNQEVDRAVGYGRNAIGSSHNPQGLTDEFPSLSLGNTRNQ
AENSGINTHVGNDIGFNTVGGVQQIOLATNHFAUTMRGDQDCLYQYSLEFSDEHAKAKRMQAIRSIE
NTIGEVWLVDKGQMMFLPVQLPDEITECCQGSIRRDTPEGVPVQVITYRCVDLANSFGQVNLNTIMAR
IQQTLMKIRGDYFYTEDPFVIPQHRIEILPGFRTSIQHHNDGNYLLGLDVAHKYLSETVVEFLHNLSQL
RMPNHDSYTDEATRQLCGEIVLTRYNNKTYKILEADWDKPNPLSTFLRDGSEITFVDDYTRQYDRVLEVL
DQPLLLAKPGRTRPGVQTVYLLPELCFMGLSADMRSDFNLMRSISDVTAPKDRATELTFRMGDFV
HIKNRKKEQYRFFFVSDQNLTHFSGRVLNPEISIQGRQTYRVNPTEGDSREIRSSQMHAMPLQNW
IVVTLRDSAATDFLQTMLRVGPPMGVPVNQPHVLQNDQINSYLMALRGLIREENPSMVIVPPTNRKDR
YDAIKLCCIEMPVPSQVIVKRTLGRNRLMSVCTKICIQXSTKLGEWPATPTPALVLMVVGIDVFHDK
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QIEAVIOHEIQQFLAQAFRSINTGTLNPELAVTIVQKRILPRFYAVRPGRRGRDYSNPPGTLVDTVTR
PHCFDFLVSQSQRQGTVPSPHYTIYNTISGWQAKIFQOLLSYKLTHLYFNWPGTIRVPAPCQYAHKLAY
LVGESLHREPSIQLSDKLYFL

>Amphimedon queenslandica Piwi1

MEDRPLPKTGRGAALAKVLEQSAGRTPGGVQSAAGRAGPGVQYGSPIAMAAPLPMGGRGQSMTPPPHTIG
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TQSLIPKQSPSGAPPSSDQLSQLQQLQGAVSPSPSKTPPTSSPRSPPSPASQATLKANQHSPPGPAHSQTNL
PVTSAGSPQFTLLSDGEIRQGISQGRIPGLANYVLSKRSNTVQYMFNSNPPVESPKNMRYGMINEHKDLI
GPTRAFDGSVLYLPLKITDDIVTRKSIRSTDGTETIDITLTNLEYRECTQLFNIIRRVRLRAIDMQEVG
RHYFDKNHPIKIPQHMKELWPGYVTSIHFDAEHLLLLDVSCHKMLRMDTALDFLYELYSSCKDGFQEEAT
RQLVGSIVLTRYNNKTYRVDDIADWKNPQSTFIDHNGRPMSTIEYYRNTYGRDITDKEQPLLVRPKKRN
HFKGRGRGLPFTDAEVEQVICLVPCLSMGTDKARSDFRVMKDLAAHTRITPAQREIAIKKFVRTVNE
SEKAKEELSSWGLSLHPNILETNGRLYKPETVLFRDGSVVAQLADWSRQLVKEHVISAVALTHWLLVTK
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KLCCVECPIPSQVINARTISQQQKLRSVTQKVALQINVVKLGELWAVKTPLENAMVIGIDVYHDSTRGKRS
VLGFVSTNSTKFFTRWYSRVTIQGANQEIGDGLKICFQSSLRKYIEINHNLDRIVIFRDGVGDQVKTVVE
FEIPQMKSLAMFGESYKPKLGFVIVQKRATRLFSHGPQGYENPCPGTVLDHTVTRKGWYDYFLVSQHVR
QGTVTPTHYHVVLNDAGLKDPMQKLTYKLTHMYNWPGTIRVPAPCQYAHKLAFLVGQSLHREPSLEISD
RLFFL

>Amphimedon queenslandica Piwi2

MSTRGGGRGRGVGRGRSRGGGMMDTRPGEQAAAPRGVRDQDGQQQVGRGRRAAAPIQPPQEQOPPP
TSTAAPVQOMQOMSLGEPRGGGRIERRQDDDIHTKPEHITNKKGSFGNQTPIMSNYLVLRNRPGHAIQYQ
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ANSPVCLQLNIFRKILAKLEMKQIIGRHYNNPKIPNIIREHSLIEWPGFITSIAQYESNVMLCADISHKI
LRTDTVLDFLHSLKSTRDFTEATKSIVGEVILTRYNNRTYRVDDIDWEKTPASTFKTSTGEEISFITYYK
KDEMEARRGRDPATLGPLLIPELCTMTGLTEEARANFKIMRDVATYTRQAPPORIDTLNKFINDVNTNP
DVKSILGGWNLEFEKSLIKFQGRTLPTEKINQKGSYTYQQAGADWSRDMRGKSMISSVNLKNYLIVCTNR
DAGVAEFIGTICKRGPIMIDEQPEVLRDNTDSFLRAVSGQLRDKSTQMVIVVLPQQKKDLYDAVK
KLCCVDAPVSPQCVSRTLSKKQTLMSVATKIVLQMNCKLGELWALDIPVGVHCMVIGIDTYHDSASKR
SVAIFIASTNSTLTRYYSQTMFQSGQELGDNLKACMTMALKKYHSINNTFPDRIVVYRDGVGDQHLHIVK
EHEVQMLESFSSSTGDSYKPKFAVVVVKRINTRLFADPQRQPSNPLPGTVVDDQVTKPDWYDFLVSQ
SVRQGTVSPHTFNVIHDTGQLTYKLTHLYNWPGTIRVPAPCQYAHKLAFLVGQSLHREPSLEISD
IADRLYFL

>Amphimedon queenslandica Piwi3

MRLALLYHHEALIGKVHSFDGMVLYLPHRLHNNPPEEVISKTEGDTIHITIKLTNELSANSVPCVCLQFLNI
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LKSTRDFTEATKSIVGEVILTRYNNRTYRVDDIDWEKTPASTFKTSTGEEISFITYYK
KDEMEARRGRDPATLGPLLIPELCTMTGLTEEARANFKIMRDVATYTRQAPPORIDTLNKFINDVNTNP
DVKSILGGWNLEFEKSLIKFQGRTLPTEKINQKGSYF

>Nematostella vectensis Dicer1

LQAMFSNERTVLLHPDSEELLQALTTKSAGDADFLERLEMLGDAFLKQAVSIFLYCCYKDGDEGKLT
TSQLSNRALYRVCARGLPEYLQNTQLDRVSWTPSLQAAEVEVGSPGKQSQTKASNRCQSASROPENR
PEMSTLEKPETARDKALHQSIQDKSVADEAIGAYLTTCCYQGALHFLDWLGKVLPESPMSTDGPR
SSKYSIFTPTITEYNSNPQVLRFAVQLOGFENRIGYEFSNKLYLIQALTHASYSQNRLTDYCQRL
GDALDFLVTLEIYSRNTNLDPGEGLTDLRQALVNNNIFAEIAVKHGFNKSFLQMSPEWFNKIGFVFDHV
EREARGIQISKDPFLTLSNDEEGIEAPKVLGDIIFESVAGAIFLDSGMDLVLTWRVYRMLK

>Nematostella vectensis Dicer2

IGRAGSLRRRAYKCKIICPCTNSLPDPGQSCYYAVHLVLTQDHERAVRSQGTRLKDPEKPLSLGI
ILNKSPLKPLPAIFIYDRAGEMTVSLKHCYNTMLTSQQLALIQRFHRYFTDVLNLEKGESSLNFPKEN
NGCFLVLLRNRTDQTTNPDRREGQTNPYEEGQTTPNDRGGQTTNDEAQENIRKGFDGFPKLSDVHASGV
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LEDSTTSFDDCDPPPITSDFEVFRDSVTTAAPSRLYYVADIRYDESPSTSFFPSPSVAPTFGDYK
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RDTNMPSILYRVDAALLAEELRQKLAVEAGICMPVWPEGHDLQLSIEEMVAGPIHAAAASSDVT
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ALLDYLVTRHVLQRFLRPLSPGAITDRLRSAVNNYSLACLTQIRDHFHKHMRSMSMALFKV
VRRFV
RRLSEI
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SVIYPLTIEH
YVSHLPISPTRQLVEMMPGAATFTCLSQNVIGHHAELVVK
>Trichoplax adhaerens Dicer1

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ILLSRVT
TSYRQDLANHSTKAEMLIPIYAINLLDNHRHLSEVISSIRNIEDWISLPSQNK
RIVDYNMNDTSKVL
EGYVKDFKATYEGLGGYGLYIINSVINELVKVINDPSKWL
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AYALSSILD
KVAEHDNA
FCSI
KSDFV
VGHGTRV
SSL

VATNMSSHQQTRAINKFRQDVNIVATNVLEEGIDVPKCNLVFRFDEIKTFGSYLAQKGRARAQHAYII
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GQLDDNLVWPVYKLQSFSKNVSFDDESDNSIDNKATVEDAIGKVEVCPQKIPAVLNDCPKEKQDLYLY
ALVMKALPPYKAVNIFDKVNFGIILSHKLPEKICTFAFQINRDDLRYNARFSISGYMLIPIIVNSTTGNDNF
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SSKTIPELCKKRYFLSASWVWKVITCIPSFLWRMETLNLHAALELDKVLFSGISPINGISISKNTFTLKLLE
ALTLAEADDISLERLEFLGDSFLKFIIAANLFISSHPKYHEGQLTNELTJKVIRNDNLKLKGKSTPCIEYYI
GKPFNLLKNEGWIIPGYKLLSSKVKNLDEKVTSLDGDKAVTHQFKSSKSIADMKAIALAILLEFDERHAY
KYFISWLKDGIKFTINASAASLLPDDDNISNSEINKIYETNNLIERLEKVIGYSFQNKLFMIRALTHSYHH
HDIAIESNQKLEFLGDTILQYIIARHFFNSHPDAKPAKLAHDFOEAIVNNKCLAVIGIAVGSKVYVFQESPD
LFRRIDQFAKIITCDYMIDDEMNYNDRTEALFENFTEEVKIPKPVSDVVEALIGAIYIDTGESIAEVTKAL
MPLIQRISLVLRDIPISPIRQLYEKVPGEVSVKKGIDGLSHTISSSLANGKEYAKATNFKQAKNIVSE
TAPADLGNRQG

>Trichoplax adhaerens Dicer2
MSGQKWLIPOLTNETKEMALVPGCGKAYF

MSQOLKLRLRQLTNFTKFALVRQQSKVLEKHTNLKIGNYAGEDGVDLWKQPKWEELESHQVLVMTAIIQLQIILQHGYIKVSHINLLIFDECHQAVGRHVYAQMIRDYVHTEDAIRRPFIIGLTASVHKGCKESQIELKIQELESMSLRSVATTTFQQLNSKYSTKPQDFDVKFLGKSLSYLDDVTIHKEYWSKSRSRDELYLHDYNRQLHLTRIESAHKDCCISVYEELGEFGLHIMIKSLITQFEGLKVGINYRVEIKILQLILRNLNQIQEVNTDVGDGSNWKSYSVSHPKIFLLNLVQKYQANLKDNIKEFCGIIIFVEKRCIATVLSQLNTLADLMPSTWSLFKCGFVIGHGTKVSSNQVMNTNRQACNINKFRQHQINLLIATNTVIEEGIDIPKCNIVIRTFNEIKTFSSYMPQSKGRARAKLHSFHIMIDEKKMMLNQIYQWLSKLEQYLQHQHNRREAAKEMIDFLSNLEFELSPPFIEIKSTGAALKTVHNICQLLNWYCSLPRDITYTPASLWKFDELGELEYRATITMPSCSPLTISGPGYMKNNKAAMETAFIVCKELYKIGQFNDHLIPANYLVAEVSKDDEDINNENEDSKVNILEYERHLPEIQLQNCVPQNEAVALSLYFLSLSLHPSYEVDKRFQGIITSKLLPQFSRPLNIDRDLKYETFMMAKSVAFAHNDLQFEASNSYSGYLVVPIRSESTPIEDRWEQDIDYDFLSSRIASYNKTFIPIDLGNLDILNDAITRTNYGNNPSSYEVQIQRHPTPVNDLWGESENLFNIFTYQEKGIMIKNTTQPPLRKYLSKRNMLRSNSGQKSQFSVCSNKQSQTQSVADTTIHHHSKGKSKVIELIPELKRSIFPAWSVKSACIRSILWRMESMLSVKEFENKMQESWIVGSSRNERQLOQNNNSLMTILKALTALARANDFNLETLEFLGDSYLYKAVSISFFLSSYSKFHEGQLSSLKSKIVSNENLYQIGIIMKGMLPGYIIGHNVNDQIWVPPGFSIAKKSDSLGEELQSTLNLSMSRTSVRPTQKLKNKCIAIDVBAEMLLGJGILLEGENSANNFITNNLGIKVGRSLHNIAKLDDARKEISKIYNAHNLKDLEAVLGYSFKDRKLISALSHTHATYHNHRNIAEKGVECYQRLEFLGDAIQLQIVVHRCHYHANNNYKPADLHFDEVSQLESNAVMTMVYGIHKYFFYNSPSLFSQINQLQIVDTNECEQRLLSTEKALVYSNSLKDGVMIPKPLGDLFESLIGAIIFIDCGRSIEVNNLVLRLRNLQPHAIFAQGVPKSPIRILHEKFPSGLLFFKEKTEDNSLRKLSLQVPDGSYFTATGINNNNSKWWIICMMBZBZSYEBCNQ

YKHCKKVL^CMMALRCYDENSN
->*Trichoplax adhaerens* Dicer3

>Trichoplax adhaerens Dicer4
MI-UNISW-MUGOUPBGI-WPBPWVJW

MLKISKKLNLKGQKRRQQLHKEVFNAKADVITSNEYKPGEPYVVEITTLLEHPFQLVNGAIVQKLSTYGG
ILTCKQLPKLPRRIIPTMKGKAHVNFIAREKPLFLTEEELDNCFKHRFLFENVKTRDKTRFICNKESIKY
YLVLPVLRENGELHYELITSCINFLRNENPYRNQRCVKEVILQFPQVVVKPSTSLSNQSLNWMLIRKVSDAT
PMSEFHDTSTAATFYDYKNQYSIDISDKEQKLVCLRKIPSNNNMLKKFHRILTTSKSQSPHVFPELLA
IHPLSLASRFMTTVCLPSILFRVESLLSVDLRLKIARETGLGLDDSRMDNSFIPLLQDASTYYTKKIGILP
HVFHQIKLKDRYTTLITLGNGKDNYLHSNEEKRRLVDRLKGRREKKQLVNHCKQLRTISKLTKTRK
WLKIVPISVSKRLFPKFHKRRLLHSKLSKRNKAVLKRPGPSVSMQLALTSISADDFFNHERLEILGDSYL
KFITTADYFFRNPMPNMEGAMSLMRAINVSNSHLRSRSTSCLKGLTLYQFNTPFKLQWLPGFTCIRNNANLW
ANNMLTDGSKQRDSESFKQVMVSKNI SDTVGLVGVYSLASGPVDAARLLPWIGLDIDPNVLEIKDKSVNF
EIPTTDIEDIQLSSCILRNTDYQFNNFYWLRAFTHSSVASENYQRLEYLGDAILEYLLIEFVYCRKPYFGP
GKISHFSKVMTRNTQFSLIAIQAFCYTHIRCHSKLKLDDMSIQNFKEILLDNHDQHDPIGHFANLAYQ
YQV1RSNSKKHRRMFLDHPKLGMLTSEGIGTSNTSAKDAIRNMLSHLECSQDIEIESSNKS

>*Trichoplax adhaerens* Dicer5

MTTTTRGK1VVVKVADYFEKKLDQDAISQIHNFSKFVFEEMITCANSSIFQFDALNGLKYLVPILRSDSRYDLDLDFEVNLNFCKEETHKLJYVTSPASHDIIQYENAMAVARNYRGDLTEWFFVSNCDSMPSKFNTPDVASYSEYYK1KYKDIDIQDANQLLEVARFKKMHITLNAKQSGSITHDIRTLSVNSNSNSIVLIPELCL1HV1PAELWLWLSQYLAJVLYRVESLIAFELRELLRSQANI CDIYSVDYLITAVGSAPCLLEAITLSSAQDHFNLIERLEFLGDRYLNKITYITLLEHPSWSINEVNRMLFLTKNKFLRGLGAGRIPYYIVGCPFNQNKSWVPPGFVNINQTVSELSIAMSREYTHQPLTKKAJADCVEGLIGYCLVCGRNSVLRFMRWLGEI SECDG1QELIIPSIDFTNLYSETANSVETILNYSFRNRSLLMLALTHKSYSGLIESIYEKLAFLDTLLIYQICLFLTYQOQTDYQPKDYLHLLYEJLTCNRMYGIVAIASDLCKFLHKSRELTLQIDEIYQALEADDVQSFSSTVQSGCSYKMKTTLLELSEI1QEWFVKELGDFTAFAVVAANDFLNDPYPDEDTAGRASI NSLNLN1DFVKTCECDNLPVSLTQQQMFYSLPNPVRTEFYDVKSGSYSTCNVSVULKNSTEKTFAKGKEDHEAKTJAMA1LTTRYD1ENPNPNOFO

>Amphimedon queenslandica Dicer

KDYYIIPVPTINSLDGKTVDDIKLDFAHAKSIVSYEAGEKRKPSPVTPSSLNSCLVTPAYRDSTIPGLQE
IFWVEMDESKTPLSPNYPKFANFVEFFFSKYDYEIIDKDQPALICRRVNTSFLKLFTSRYLMSEPAVKKT
DITMFPELVHFPVSFSWRVLCPMLWRVESLLIAHKLSTRIMETGIGRENSDTFLLTDSVRGYAD
SGHGVLPSSRLQLYNDLTPDITKVPSEETRYSNRGPNDCLILQALTPRGANDSINLERLELLGDSFLKLV
TSVYLYNLRPNSHEGKLSEARSRRVANINLFVLGKKKGITSAILSDDFVGIDSFKERLTWVPPGYAALEE
SHKVTDKSVADEALIGAHTVAGGLEGGITLWKFGIKINDGSTIAPPKSTSSNTRSLLAESDISS
HFGSPPAPKLAIFSDKAISTRNRILPQVSIQKGIEYNSKNEILLIEAMTHSSYHRNDITGCYQRLEFLGDA
ILDYLVTCHIYQSDSAEPEGEITERSALVCNSRFAKLAISLNHLHKSLCHGSNLFNDMKKYAQSLRQREK
EDMFEEMSINDNDSAQAIVESIKDGFDDDDDDDDIEPPKSLSDCFAEALAGAVFIDSGMNLQTVWEAF
SPFLEPLLKPKKKNLPPLTICELHKLIPKDLEVKKVLSEGRSLCIIIEIKDKNICEMATARSYNAKNF
AASRVLKKLAEK

>Amphimedon queenslandica Dicer2
LGKKKGITSAILSDDFVSGIDSFKERLTWVPPGYTALEESHKVTDKSVADTVEALIGAHTVAGGLEGGITL
MKWFGIKINDGSTIAPPKSTSSNTHSLLAEDSISFSSHFRSPAPKLAFLDKAISTRNRILPQVS
SIQGKIEYSFKNELLIEAMTHSSYHRNDITGCYQRLEFLGDAILDYLVTCHIYQSDSSAEPGRMTELRSA
LVCNSRFAELAISLNLRSLCHGSNLFNDMKKYAQSLKREKEDELRKLEEMSINDDDSAQVIVESMEDG
DIDDDDEDDEDDDIIEPPKSLSDCFAEALAGAVFIDSGMNLQTVWEFTSPFLEPLFEKFKNDPPLTICELHKL
IPKDLEVKKV

>Amphimedon queenslandica Dicer3
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QQANYIRTHIDLNVTGTYGEMGVDARLTKWNSELECNHILVMTRQIFLDMLSHGFIIMSRVNLLIFDCH
HAVKNDPYQVIMKHYNDERYMCNKPHILGLTASIISGKCKPDKLEERIRKLEATLNARVETATDIAEVAKY
ATNPQSLVTYAGTSNQHHSLETVRLKSVISETLKFMQAPQSSRAGTVPSRLQCYLEECIYVMENISITS
AVEAVRIELITEIKDMLDEGDAVGEDWLTLCHNLKLSIFSSQCNELLFDGVNDHSPKFSKLLEILLNLR
SQAEDFCGIVFVEORMTAMCLSQITEIKLPGIRCFSIVGHASSGGKIMEKKVSGSGGMNAKKQQEVLKKF
RSGTLNLLIATSVVEGLDVRKCNVIRYDFPKTFQSHVQSKGRARAKDSRYLVIDQTEQESKCTCDIKEY
AKLEEMLASLCHNRSRDEDEVSQRLHMKPQYQPGPSPLIDSSLSSHHYRQKLPGDQYTVMAPDF
KLEPVDDAICQLDGRYETLFMCTVLPCTSPVRSQAGIAVPRVNLRAQSAAFIAIQDLHKAGELDEHLKP
LSRDDDSDENKEKEAKKTKAGTNRKVTYKXNEVPSLCKESFPYIGKFLVVFILGETSLTTLGILT
SKRIPVTKIPQFPLFAGHSTINVSEEHLDATIQELEVLKKFHEIIFTDIISIKGEDLKLFSFETSDSYL
IVPVTVYOLCPLQCFVDTIETAKNMIIAAERGRKAEDLASPTWFDWPDKLFLVFKSYVEETSHDQFOLYEV
SYNEEPTPLSLFPGSTKSFEFLNKYGYSIVYICDPSLTCKPMSVNGVRLVSRFKDNTRSSASAPD
DESSQRSSERLRFPELCKVWPPIASFWKLRCRVPSIIHRLVGFLLAEQASISSTFGIGVTEVVEYRCHP
DIMREGPNEMEHNSESVFHWRDGGYIVDADTSNQLHSQVNAEGVIRGSPNSLLLQLSTGTSAKDSFDLER
LETLGDSFLKLAVSVLFCGRKGDKHEGKLTRSRINRISNFNLLSFLAKKKGLPGLQOTEQFEPPLSGWIPPGF
SLSLSDSALPDHVPPNTPPAV1QKYYYYHVTDKGIADEALSTELLGAYLIAGGLGAGFSFLDWGLQKPTESSSS
FSQDVMTSSCNVRQKQSQSSLMSIEEASPCINIELQNSTHVSFSCCLPPPSLLDSSAPDTTIDKLSSA
VPGGGRRSSLYDKLSWDFSDRALLQLATHPSYSNKNRVTRSQRLEFLGDAVLVDLITCCLYTFPSYTPG
QITETRSALVNNTVFAEIAVKKLSLHTYLLVPLSPSLFRKITEYEVFLQEDERESGSEKELIYCRFGDQSEN
VHEEMNGDIAMLEESEEADITELEPPKVLGDSLQSLAGALFLDSGMSLETVWSYFPPFRPLIESFKEKGP
PVHPIQELMRTEPSVEIMQSSTRSKHRCITKVIDKDIQVSCIAESYKTAKNGAAKRVIRKIKEIGNRQD
MADD

>Amphimedon queenslandica Dicer4
MTSTPGQGNAGNGASTILIAAISAVIPLLVTNIGILIVSVLVCRRRLYKTTNGNDTFSSDERKADINQZ
DIITMDKGQNIILLASTNPAYGVIGEQDNCNTGVSANPAYGITERGVSANPAYGINTRGIEIILLCFMSNG
ILLEANGQSCTEGFMDSLLQGKATSPMGNLRNNRLSNYKNYIIDLATRWWIEDNIKFTCATVUTEILIG
VDIRTVDYDTRGRNLYPKFEVWAPTNDDVYTREMSIEIRLTPDNFTTNGQYHFTLPTPLNVSSGYRIGVYQ
PPDDRSSVRFHYVVDLPVSIEFNRLAWLGSVLRLATSVYLYNTRPHNSNGELAVARDRLVSNYIISLYLGKK
KGITCTMQSTYFEKLRLLPGGYEASAKEFYK1ISLQNIQVADIVEALIAGHTLTGGLIGGINLMKWLGVM
CNDSPVTLHTHVPHTQSILFADSSQIFSSYFGSPPPSLTVSDKERHSIMSEMSSIEKGLQYTFKKNLILL
DAMTHSSYTCGTLKSRKFLGDAILDYLVTCHVHVFFQQEFSSVRVHVLKSAIFRDSCFAELAVSLNLH
LRHNSPQLLIANMTSYRERLEKKNEELGKFEIISMNSDEVGAESLKGDDDMTHPKSLRECFSVLAGAVF
IDSGMNLQTVWKTFSPLF

>Nematostella vectensis Drosha
STVTGKKLENLYAAFEKEKILQLKSPVNMLPGHDDPAAVHSDSDKSDFESVTDFCDGDDESMSSDDEKHS
TGSPSPQVKERKLNDPRLRHLKDLWNEKGETNCEPVCVKEKMTGIRHAYVPGEMEIIPRC DLLGNNSN
LHHYWTWTVTPHANFMDTRPTTIQHKGREFVFGESFLSHHRLKVPPCSILYRINYIEYEIHFIHPVPKNFC
IKGLDLFSDFLFDKVLELHDWALKGVFSVNSDNQCPRFHFLPFRVRRSGKVDELLSMDKVLAHLMDSYKP
LIQVRTSRQYTPDWGKLSKSCRNQIVTRPCMKAFAVRVDDIEFSSADDTRSGVTRYPYIHHGIRPVQM
SYVGNPKYQKLWKSYYVKLRLANSSTSASVKKVSSSPLRSKSENKDSMRRDFRARLNSQGVMATGIHSD
VCQHAMLLPVLVHHIYHTCLRTLDAKLYGTFDRMIRHNERLEFLGDAVLELICSKHLMFPLPDMEGH
YGDRIIHNVHSKKKGITHLVRMANLKGVEEDRSMIRHNERLEFLGDAVLELICSKHLMFPLPDMEGH
TFRSALVQNRHLALLAKMLDSLSDYMFQSHGPDLQCEDDLNHAMANCLEALLGAVYLEAGLQVATELFSRLA
FTEQDLYDKWMELPKHLRQDQEPEGDRHLIGSSPVLQKLVEFERGSGIPFTHTLARAFTHPOVGNLNT
LGDNQRLERFLQGDSVQLFVVSFLYQHFDPDHEGHTLRLRSSLVNSRQAEIARQLNLOEFINTGPTNVREK
MLADLVEALIAAVFDKGRLRHEVFCRVCFSSRLDESDIVNQEWIDSKSQQLQCCLAMRTEGKSPDLPYRI
LQDAGPAHHKKYQGVYFQGTRCGKGEGSSIHQAEAAKDALESRYFPEHARQKLLDRKYDK

>Trichoplax adhaerens Drosha
MSKINSVTKRALANK THANIRDGCEMDHILCSLFNCGIKKNPHYAGGNHMTDIDDLKELNPQKARKILSTEL
ETSILDNETLEYLGDAVINYISVSLFMMFPDLSSEGDLSVYRSLVNNKQLGRLGKSELMGTTWMNLVTHPL
QEQQFPDGRILIPKSQLQGLTDFFEESIGVEFKHIRLLAKAFTHPSAGLNHLTIGDYQRLEFLGDAILSYM
LASHVYRQFPHYREGHLSILRSSLNNELQSKVAEDLLLKDLYLTGVNDRDKDIIIDPLGKFDPKSRLNNYC
IMMRKTNKQPEYKVVYRNYSFGNQREFTVFLHKGCIATKGIGSSIKMAEKAASKALESGTVIISLTDF
EESIGVEFKHILRLLAKAFTHPSAGLNHLTIGDYQRLEFLGDAILSYMFLASHVYRQFPHYREGHLSILRSSL
SNNELQSKVAEDLLLKDLYLTGVNDRDKLILHSKRQKIMADILESFIGALFIDKGISYVEAFCSVCFSSKIK
DIPDLGKFDPKSRLNNYCIMMRKTNKQPEYPKY

>Amphimedon queenslandica Drosha
MNKEVLSEVSFCPEYQPVWGLKEEDKLTSIREIFSKSLCQTQKPTPVDPPLIPFNAHHSSNNQLSGLDHIPQ
LVMKQYNIIDYTISLKPPLPTFYKVEDIVLMLQFIFVDDLLNIFDWFNKLVSDFKLFMPRFECKDRKDNL
IPASMCNIMESLISFYKPLSLPRPASVTKEMGVRQYSNCIIHNSNKSPPSIRVDSINWHSRDSFALVHL
CHFVPSDHISSTPSDVTSTGRHHRPHKQKQEGTRYACSRKHTRETVEVQLELQSSSSYHFTGIFTDCTQALL
CPQLSSHLLFHLSLVDLEAGINLYKFKDRSFLLELATHTHSFITQYNGSRPLPEIILISLSNCGTRAHV
SAATGKAPPSPKRKGSGIEGLTEAAETSREKYKDDGDIVLPRDNERLEFLGDAVIEFLCSIQLYLMFPSFTDS
VIFRKALICCNQNLATVAKRIHLEKYLMDVNFKNADINHIYANTLEALIGAVYKDSINTSSIVLATLLFP
EEDLRGJWLSEYKDQLQVDSTDGDRHMSFNKLEESIGVFRFTNIRLLARAFTHPSYGC
DYQRMEFLGDAILQFLTSVDYVDTPLHHEGHLSTFRTAIVHNKQLAEVSVELGFPQHLLLGKDQV
VHADLIESFITALYLDKGMEHVMLMFCVKCLFPKLAWSLRKKERGREKDRERE
GSGKMKTEDAFAISS
AKGLKFLLDSKTRLQHASIEQGGFRKQSNIHSKAMLLPLVGVYFRRRIATGTGGSSQAGMNAAEKGLDS
YIIVPNCLKTTSN

>Nematostella vectensis Pasha
GKLPNLSSLPDGWLALNHRSGGIIYLRPRTVCTWSRPFYHIGSGSVRKHDIPAAAIPCFHQMRSLACOSPED
SGLPPDKDNVLTTLNNTWNENNGSTDDKVEDFSCSPTETKSPEREELYTCALNKQSQFKYNVFSKSGIEL
IDGDTLHSYLSNIFEFQNVTHEQEQNLCCSSSSOMNISETEVPAILESLPYSFKGVDVNNKQPKEWV
KTPVAILHEYAQRELKVKPEYSHTEGNNAAATPVAEVRI
SGMVGKGE
GASKR
LAKQHA
ETA
LEV
IPEV

FNKISNHEITSEEHQIFDKLKIDD SKVFEVTTKSGSLSPYHILQECLKRYQGVYQSTIDFKMKPEPDQRQH
TYEITCAGHTATGFCKNKKIGRQLAAQAILKKLHPHIKTWGALLRIYSERPSSVVKKVG
>Amphimedon queenslandica Pasha
MFAILTCTRDPMLSNYSSLLPDGWVPIQHESGGQKHKV PATAIPCIDKWL SGFETSLQLHKIGTYKS NKL
QEYLMIRWPSGYPIESVSTNTGEKKEARQKRKRKLP AEDQGIVVPELISKVVTVTIPKKYIKPDHQGKTNS
ATWTVNL SHKEPV SILLEFCQN YLRSEIDYATTETGTLGSGQTPYHCTAVIGGVHYGSGSGSSKRSAKQCA
ALPVYSSN YARI LSSISIEDIQSPILLNQVGLPSPWSILQCCQRLKGSGVDEPDFKIELTLPEQETSQN
DSANTSSQDASIQSYYKLSCGPNFQVTGTCRGKDQQAQKMLKLLHPDLTWDSSLKIYTGMQSKLP
KTTMDHLPPEISNKTENEDLLKQLRAEMRKLTGVKTCNKEI
>Nematostella vectensis Hen1
KFDPPVYRQRYHRVIEVVKEHAKRVLDFGCAEAKMLRS LINSTTNIEELGVVDIDRDLLEDSIFRIRPL
TTDYLTPRPHPLAVS LYQGSISKADDRFCDFDV VACIEIVEHLVPEHLEAMPAVLLGQLSPLVAIVITPN
ADFNVLFPDLVGF RHW DHKF EWTRA EFKDW ATSQADKFGY SVTFEGIGSGPSGTEHLGCCSQMALFIK
>Amphimedon queenslandica Hen1A
MMDDLEDT SIAAAVLF RPPVYQQRYGAVLELSRKIEPKKVIDMGCAECKLLKSLKFHRHIESLIGIDINEF
LLQSNQNSLQPLITDYLHRRSRPLKIQLFKGSIDEVDSRMIDCDLFSCIEVIEHLYPSVLERVPAAIFQKL
RPQVVIISTPNDFNVLFPELVGFRHDHKFEWSRQEFQA
>Amphimedon queenslandica Hen1B
MGCAECELLKSLKFHRHIESLIGIDINESLLQSNQNSLQPLITDYLHRRSRPLKIQLFKGSIDEADSRMMD
CDLFSCIEVIEHLYPSVLERVPAAIFQKL RPQAVIISTPNDFNVLFPEFVGFRHDHKFEWSRQEFQACG
VGDPPANMTYLGHC S QIAIFRRIEKEEEEEREEVDEEDDSNEEKEEERLGSPYELIYECEFPYEPDPPTQS
ERLSNEAEYYLRLVRRERNRYLEIGGEPTIENGSHENSGL TESPRHRDFIRIELNELL MFPV I QEL TNSV
TDISEALRQHSS LMLSED SMNAIF YEESSEEEEEEAPP SDTPA AVIEEEESWD