

## Supplementary Data

### **Functional conservation in human and *Drosophila* of Metazoan ADAR2 involved in RNA editing: loss of ADAR1 in insects.**

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**Supplementary Table.** Sequence of oligonucleotides used for RT and sequencing .

***Rdl***

657R	AGCTGATCGATAGCACATACATGG
1381F	GCTCGTTATGGTCTTTGGCAGTC
1993F	TTCCAGCCCATCTTCTGCATCCGG
1042F	TCGGTGTCTCGAGTGAGGTTTCGC
1560R	CGCCCACATTTGCATTGGGATTGGG
540R	CGTCACCCAGCATGCTGCCACCGCC
1680R	TGTGGGCGTGGTGTCCATGCCCGTG
489F	CGGATCCATACAGTGCAAGCGG
1715R	CACTGTTTGCTTGGGCGCATGCGG
939R	GTAGATTCATCGGACACGATGCGG
960R	GGCGATCCATGGGGAAATATTGTAG
961F	AGCTGTGCCACATTGAAATCGAAAGC
541F	TAAACATATCCGCTATTCTCGACTCC

***Ca alpha 1D***

1774F	GCTGGCCAAAGAGACAACAACGCCGT
2255R	CTTTAAAATTGAATTCAGCACAACTG
2306R	GCAATGTGAAACAGTGGCACCATGGC

***eag***

2674R	GACGAAATTTGGAGAAGATCTTCCGG
1741F	CCGGGCCAGAATTGGTTAATGGGCCG
2340R	CCACAACCTCGTCGTCCTGTATCAC
2700R	CCTTACTGCCCCGCTTGGACCTG
1768F	CACGGAAAAGCATGTACGTGACGG
2417F	GCGTGCTCTGACCTATTGTGATTTG

***nic 34E***

4241R	CAATTAACCACCTCGCCCATATGG
3433F	CGGGTGAAAAATTATCACTGGG
3391F	CATGGCCTTGCTCGGATTCCTGACC
4372R	CTTGGATGTATTATTTAGTTGATGG
4218R	CTACGAGACAATAATATGTGGTGCTG
3589F	TCAACGATTTTAATATTAATTAT
3981F	GGTCACCCATCATACGTGCATCAC
3735R	GGTCGGGAACTCCAGGATCAGC

**Supplementary Table 2.** Invertebrate and human ADARs accession numbers used for the alignments/phylogenetic analysis.

Common Name	Scientific name	(NCBI Accession Number) or {JGI Name or ID}
Acorn worm	<i>Saccoglossus kowalevskii</i>	ADAR1 (Translated from NW_003134359) ADAR2 (XP_002740631)
Amphipod	<i>Parhyale hawaiiensis</i>	ADAR2 {Translated from AFHB17469.g2, AFHB25923.g2}
Anemone	<i>Nematostella vectensis</i>	ADAR1 (XP_001642062) ADAR2 (XP_001629615)
Beetle	<i>Tribolium castaneum</i>	ADAR2 (XP_969823)
Coral	<i>Acropora millepora</i>	ADAR2 (Translated from EZ011992)
Fly	<i>Drosophila melanogaster</i>	ADAR2 (AAF45665)
Human	<i>Homo sapiens</i>	ADAR1 (NP_001102) ADAR2 (NP_001103)
Hydrozoan	<i>Hydra magnipapillata</i>	ADAR (XP_002166223)
Lancelet	<i>Branchiostoma floridae</i>	ADAR1 (XP_002605887) <sup>1</sup> ADAR2 (XP_002595015)
Leech	<i>Helobdella robusta</i>	ADAR1 {193655} ADAR2 {167455}
Louse	<i>Pediculus humanus</i>	ADAR2 (XP_002428026)
Mite	<i>Varroa destructor</i>	ADAR1 (Translated from ADDG01088043) ADAR2 (Translated from ADDG01007263)
Nematode	<i>Caenorhabditis elegans</i>	Adr-1 (NP_492154) Adr-2 (NP_498594)
Octopus	<i>Octopus vulgaris</i>	ADAR1 <sup>2</sup> ADAR2 <sup>3</sup>
Polychaete	<i>Capitella teleta</i>	ADAR1 {183692} ADAR2 {JGI 176450}
Slug	<i>Aplysia californica</i>	ADAR1 (Translated from AASC02013163)
Limpet	<i>Lottia gigantea</i>	ADAR1 {133644} ADAR2 {128560}
Sponge	<i>Amphipredon queenslandica</i>	No ADAR/ADAT found
Squid	<i>Loligo opalescens, Loligo pealei</i>	ADAR1 <sup>2</sup> ADAR2 (ACO52475)
Tick	<i>Ixodes scapularis</i>	ADAR1 (XP_002403965) ADAR2 (XP_002434473)
Trematode	<i>Schistosoma mansoni</i>	No ADAR found
Trichoplax	<i>Trichoplax adhaerens</i>	ADAT1 {55696}
Tunicate	<i>Ciona intestinalis</i>	ADAR1 (XP_002122509) ADAR2 (XP_002128212)
Urchin	<i>Strongylocentrotus purpuratus</i>	ADAR1 (XP_001183590) ADAR2 (XP_781832)
Water flea	<i>Daphnia pulex</i>	ADAR2 {Translated from 211108}

1. Predicted protein XP\_002605887 had high similarity with ADAR1 consensus except for a poorly conserved region (residues 131-156). That specific region was blasted against *B. floridae* nucleotide database, and sequence ABEP02011549 appeared as a high score hit. Residues 131-266 were deleted from the predicted protein sequence and replaced by those translated from the nucleotide sequence. Residues 157-266 were >95% identical between both sequences, confirming that the replaced region is indeed homologous to ADAR1.

2. To be submitted to GenBank upon acceptance.

3. Kindly provided by L. Moroz (The Whitney Laboratory for Marine Bioscience, University of Florida) from an octopus EST library.

**Supplementary Figure 1. *In vitro* poisoned primer extension assay of hADAR2 and hADAR (S/G).**

A mutation was introduced in human ADAR2 to mimic the self-editing event found in exon 7 in *Drosophila* ADAR. A poisoned primer extension assay was performed with increasing amounts of purified recombinant proteins to measure RNA editing *in vitro* at the Q/R site in the *GluR2 B13* minigene transcript. The mutation in hADAR2 reduced editing activity eightfold which is the same reduction in activity that is observed with the *Drosophila* proteins.

**Supplementary Figure 2. Alignment of invertebrate ADARs with human ADAR1 and ADAR2.**

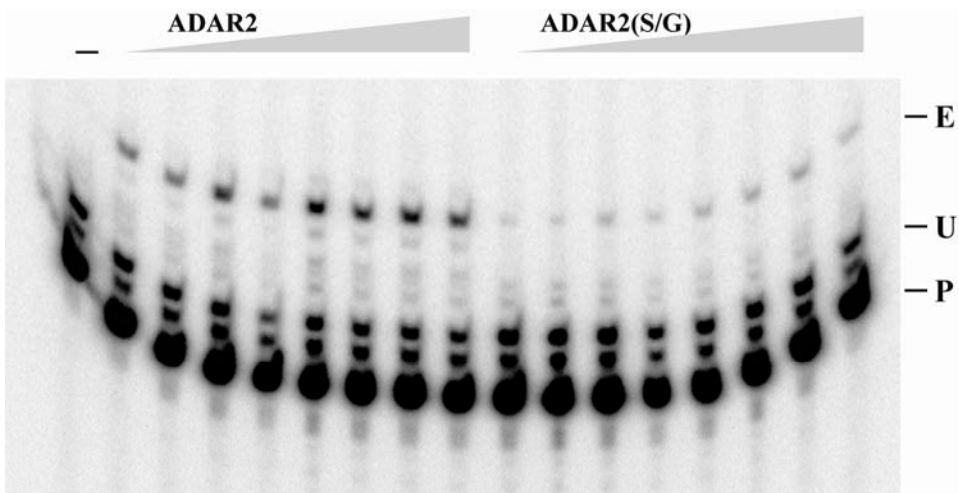
Only the core deaminase domain was used for the alignment. Positions that were defined as characteristic of vertebrate ADAR1 or ADAR2 by (1) are highlighted in red and blue, respectively. Residues that chelate zinc at the catalytic core are highlighted in black. All invertebrate ADAR sequences should be considered putative except for fruit fly and squid ADAR2.

**Supplementary Figure 3. Phylogenetic tree of metazoan ADAR sequences.**

Nodes include bootstrap values (n=1000). The tree was generated using the complete deaminase domain sequences and the *Trichoplax* ADAT sequence as an out group.

## **Reference**

1. Keegan, L.P., Leroy, A., Sproul, D. and O'Connell, M.A. (2004) Adenosine deaminases acting on RNA (ADARs): RNA-editing enzymes. *Genome Biol*, **5**, 209.



*GluR2 B13 minigene Q/R site*

Figure S1

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10      20      30      40      50
Acom_worm_ADAR1  ---G-NR-CV-TGDM-SL-EGH-TV-NDSH-AE-I-TRRS-FLR-
Urchin_ADAR1    V-SL-ETGN-R-CV-TGDK-L-SMEGR-TV-NDSH-AE-I-TRRA-FLRYL-YNQLQAY- --KNET-I-L-TQG
Mite_ADAR1
Tick_ADAR1      V-C-F-E-T-G-S-R-I-T-G-C-L-S-D-G-T-V-NDSH-AE-V-I-TRRS-FLR-FL-YQQL-KS-YG- --PEHA-I-L-E-P-T
Leech_ADAR1     ---G-NR-C-I-S-S-Q-H-S-L-D-G-L-S-NDSH-AE-V-I-VRR-FLRY-
Polychaete_ADAR1 V-C-I-E-T-G-N-R-C-I-T-G-T-Y-M-S-L-E-G-A-T-V-NDSH-AE-V-I-TRRC-FLR-FL-YHQL-LNYS- --R-D-T-I-L-C-P-G
Anemone_ADAR1   V-S-L-E-A-G-N-R-C-V-T-G-Q-R-S-M-E-G-K-V-NDSH-AE-I-I-ARRS-FLR-FL-YAQL-HA-HF- --DKS-I-F-E-K-R-N
Slug_ADAR1      ---G-NR-CV-TGDK-S-L-H-G-H-T-V-NDSH-AE-V-I-TRR-FLR-FL-YQQL-QT-QY- --LDH-PL-F-E-P-S
Limpet_ADAR1    V-S-V-S-G-N-R-C-I-T-G-E-E-S-L-E-G-N-T-V-NDSH-AE-I-I-TRR-FLR-FL-YQQL-L-T-Y-T- --TPHE-F-F-E-G
Tunicate_ADAR1  V-S-L-S-G-N-R-C-V-P-G-D-Q-S-L-C-G-E-T-V-NDSH-AE-I-I-ARR-FLR-FL-YK-Q-I-F-D-F-Q-N-D-L-T-K-T-I-F-V-G
Lancelet_ADAR1  V-A-M-T-G-S-C-L-M-G-K-N-I-G-T-D-G-R-T-V-NDSH-AE-V-V-V-R-R-S-FLR-FL-YR-L-K-N-V-L- --EGS-I-F-E-K-H
Octopus_ADAR1   V-S-V-T-G-N-R-C-L-T-G-D-R-S-L-E-G-N-S-V-NDSH-AE-M-V-T-R-R-FLR-FL-YR-H-L-L-E-Y-D- --APND-L-F-E-K-G
Squid_ADAR1     V-S-V-T-G-N-R-C-L-T-G-D-H-S-L-E-G-N-S-V-NDSH-AE-M-I-T-R-R-FLR-FL-YK-H-L-L-E-Y-D- --PPHD-L-F-E-K-G
Human_ADAR1     V-S-L-T-G-N-R-C-V-K-G-D-S-S-L-K-G-E-T-V-NDSH-AE-I-I-S-R-R-FLR-FL-Y-S-L-M-K-Y-N-S- --QKDS-I-F-E-P-A
Human_ADAR2     V-S-V-S-T-G-N-K-C-I-N-G-E-Y-M-S-R-C-L-A-N-D-H-AE-I-I-S-R-R-FLR-FL-Y-T-Q-L-L-V-L-N-N-K-D-K-R-S-I-F-O-K-S
Fly_ADAR2       V-S-V-S-T-G-N-K-C-V-S-G-E-L-S-V-N-G-A-V-NDSH-AE-I-V-S-R-R-FLR-FL-Y-Q-L-D-L-Q-C-N-A-T-A-Y-G-S-I-F-V-R-N
Squid_ADAR2     V-G-I-E-T-G-N-K-C-I-N-G-E-Y-M-S-R-G-F-A-N-D-H-AE-I-I-ARR-FLR-F-I-Y-D-Q-L-L-H-L-S-N-A-E-G-Q-S-I-F-FLR
Octopus_ADAR2   ---G-F-G-V-NDSH-AE-I-I-ARR-FLR-Y-I-Y-D-Q-L-L-H-L-S-N-P-D-N-S-I-F-FLR
Acom_worm_ADAR2 V-C-V-S-T-G-N-K-C-I-N-G-E-Y-M-S-Q-G-L-A-N-D-H-AE-I-V-T-R-R-S-V-H-Y-L-Y-T-Q-L-L-H-L-T-N-E-G-D-K-S-I-F-O-P-C
Urchin_ADAR2    V-I-T-I-S-T-G-N-K-C-I-N-G-E-Y-M-S-Q-G-L-A-N-D-H-AE-I-I-S-R-R-FLR-FL-Y-S-Q-K-L-F-L-D-N-Q-G-E-S-S-I-F-V-P-H
Lancelet_ADAR2  V-S-L-A-T-G-N-K-C-I-N-G-E-Y-M-S-V-K-G-K-A-N-D-H-AE-I-V-S-R-R-FLR-FL-Y-S-Q-L-D-L-L-E-G-V-K-E-E-S-I-F-E-S-K
Tunicate_ADAR2  V-S-V-A-T-G-N-K-C-I-N-G-E-Y-I-S-Q-G-S-A-L-F-D-H-AE-I-V-A-K-R-FLR-FL-Y-E-Q-L-L-S-L-P-Q-T-D-P-I-F-E-L
Mite_ADAR2      I-L-C-I-T-T-G-N-K-C-L-S-G-K-Y-L-A-M-E-G-S-A-L-F-D-H-G-E-I-L-A-R-R-C-F-K-F-L-L-Y-Q-Q-L-D-T-Y-
Tick_ADAR2      V-M-T-V-A-T-G-N-K-C-I-N-G-E-Y-I-S-M-N-G-A-V-L-D-H-AE-V-V-S-R-R-C-K-D-F-L-Y-Q-Q-L-L-W-Q-K-G-R-G-E-S-V-L-E-R
Beetle_ADAR2    I-S-V-T-T-G-N-K-C-I-S-G-E-H-I-S-M-N-G-C-S-L-N-D-H-AE-I-I-S-R-R-C-I-T-Y-F-Y-D-Q-L-L-I-A-N-S-Q-P-E-K-S-I-F-T-Q-R
Louse_ADAR2     V-L-T-V-S-T-G-N-K-C-I-S-G-D-R-I-S-A-N-G-S-V-NDSH-AE-I-I-S-R-R-C-N-Y-F-Y-S-E-L-K-Y-V-K-D-T-G-R-N-S-I-F-L-K-S
Amphipod_ADAR2 V-S-L-C-G-T-K-C-L-G-D-S-E-W-C-P-R-G-R-S-V-H-D-S-H-AE-V-L-A-K-R-F-O-R-Y-L-M-D-Q-
Water_flea_ADAR2 V-C-V-T-T-G-S-K-C-I-N-G-G-C-L-S-M-E-G-E-A-N-D-H-AE-V-L-A-R-R-C-V-S-Y-L-Y-D-Q-L-N-I-G-S-
Limpet_ADAR2    V-S-V-A-T-G-N-K-C-I-N-G-E-Y-M-S-Q-G-L-S-N-D-H-AE-I-I-ARRS-FLR-FL-Y-F-A-Q-L-Q-L-L-D-Q-A-E-N-S-I-F-E-R-N
Leech_ADAR2     L-S-L-A-S-G-T-K-C-I-N-G-E-F-I-S-N-N-G-R-A-I-N-D-H-AE-I-L-A-R-R-C-K-N-F-L-Q-Q-L-N-L-F-F-S-C-E-T-D-D-V-I-F-D-V-H
Polychaete_ADAR2 V-S-V-T-T-G-N-K-C-I-N-G-E-Y-I-N-D-R-G-C-A-L-N-D-H-AE-I-L-A-R-R-C-L-R-R-Y-F-Q-Q-L-S-R-A-A-N-S-T-A-Q-Q-S-I-F-E-A-R
Coral_ADAR2     V-S-L-E-T-G-T-K-F-I-C-G-E-Y-M-S-Q-G-L-A-N-D-H-G-E-I-I-ARRS-FLR-FL-F-S-Q-L-L-C-A-E-G-Y-E-E-D-S-I-F-E-K-K
Anemone_ADAR2   M-S-I-E-T-G-T-K-F-I-S-G-E-Y-I-S-K-G-Y-A-N-D-H-G-E-I-I-ARR-FLR-FL-FL-Y-N-Q-L-L-C-V-Q-G-D-N-S-S-I-F-E-K-L

70      80      90      100     110
Acom_worm_ADAR1  ---G-L-L-R-T-K-M-E-G-G
Urchin_ADAR1    T-N-G-K-L-R-L-P-D-V-S-L-H-L-Y-I-S-T-A-P-C-G-D-S-A-O-F-S-R-T-D-A-E-N-G-P-G-D-H-L-P-T-F-E-K-T-S-G-L-L-R-T-K-M-E-G-G
Mite_ADAR1
Tick_ADAR1      E-D-G-E-K-I-R-M-P-D-V-T-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-A-H-T-T-K-D-D-K-T-Q-H-P-I-L-T-K-S-C-G-L-L-R-T-K-L-E-A-G
Leech_ADAR1
Polychaete_ADAR1 S-G-N-R-L-R-I-K-D-Q-C-S-L-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-S-P-R-D-S-N-T-Q-S-H-K-P-T-F-T-S-K-V-G-I-L-R-T-K-M-E-S-G
Anemone_ADAR1    N-S-R-L-R-A-V-R-G-Q-V-S-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-T-P-R-E-G-N-T-D-L-H-K-P-A-F-T-S-K-L-G-I-L-R-T-K-M-E-D-G
Slug_ADAR1       Q-S-G-K-L-K-V-K-D-S-V-T-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-S-P-R-L-V-F-T- --H-R-P-T-V-G-S-A-C-G-L-L-R-T-K-M-E-G-G
Limpet_ADAR1    P-S-G-K-L-R-I-K-S-N-F-T-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-S-P-R-D-A-S-N-G-P-E-H-N-P-T-I-S-N-V-G-V-L-R-T-K-M-E-G-G
Tunicate_ADAR1  E-Y-N-R-L-K-K-H-G-I-G-H-L-Y-I-S-T-T-P-C-D-S-I-F-A-T-S-D-V-S-V-E-N-H-Y-P-I-M-E-N-R-K-C-G-I-L-R-T-K-M-E-K-G
Lancelet_ADAR1  S-D-S-L-L-V-M-K-E-G-V-S-F-H-L-Y-L-T-T-A-P-C-G-D-A-A-T-H-I-T-R-D-D-T-R-T-O-D-S-H-K-P-T-D-S-V-O-H-G-A-L-S-I-K-G-O-A-G
Octopus_ADAR1   E-R-S-I-C-R-I-K-T-N-I-T-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-S-P-R-D-T-S-S-A-K-E-H-N-P-T-F-S-S-V-G-L-L-R-T-K-M-E-G-G
Squid_ADAR1     E-R-S-L-C-R-I-K-T-N-I-T-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-S-P-R-D-T-S-S-V-K-D-H-N-P-T-F-S-S-V-G-L-L-R-T-K-M-E-G-G
Human_ADAR1     K-G-E-K-I-Q-I-K-K-T-V-S-F-H-L-Y-I-S-T-A-P-C-G-D-S-A-L-F-K-S-C-S-R-A-M-E-T-H-Y-V-Y-E-M-P-K-O-C-K-L-R-T-K-M-E-N-G
Human_ADAR2     E-R-G-E-F-R-K-E-N-V-F-H-L-Y-I-S-T-S-P-C-D-A-R-I-F-S-P-H-E-P-I-L- --E-A-D-R-H-P-N-R-K-A-R-G-L-R-T-K-M-E-S-G
Fly_ADAR2       T-D-Q-Q-Y-K-K-G-V-H-F-H-L-Y-I-N-T-A-P-C-D-A-R-I-F-S-P-H-E-N-D- --T-V-K-H-P-N-R-K-A-R-G-L-R-T-K-M-E-S-C
Squid_ADAR2     D-A-G-E-Y-K-K-P-N-I-F-H-L-Y-I-S-T-A-P-C-D-A-R-I-F-S-P-H-G-Q-D-V- --T-G-R-H-P-N-R-K-A-R-G-L-R-T-K-M-E-S-G
Octopus_ADAR2   E-K-G-E-Y-Q-K-E-N-I-F-H-L-Y-I-S-T-A-P-C-D-A-R-I-F-S-P-H-G-Q-D-V- --T-G-R-H-P-N-R-K-
Acom_worm_ADAR2 D-G-G-E-Y-K-I-R-S-D-V-L-F-H-L-Y-I-S-T-S-P-C-D-A-R-I-F-S-P-H-E-I-T-S- --E-T-D-R-H-P-N-R-K-A-R-G-L-R-T-K-M-E-S-G
Urchin_ADAR2    P-S-G-E-Y-K-I-R-S-D-I-K-F-H-L-Y-I-S-T-A-P-C-D-A-R-I-F-S-P-H-E-S-C- --S-E-P-D-R-H-P-N-R-R-A-R-G-L-R-T-K-M-E-S-G
Lancelet_ADAR2 E-D-G-E-Y-R-L-K-D-D-V-E-F-H-L-Y-I-S-T-S-P-C-D-A-R-I-F-S-P-H-E-A-D-T- --D-A-A-R-H-P-N-R-K-A-R-G-L-R-T-K-M-E-G
Tunicate_ADAR2  P-T-G-E-Y-K-V-P-D-V-Y-F-H-L-Y-I-N-T-S-P-C-D-A-R-I-F-S-P-H-E-T-K- --D-G-N-H-P-N-R-K-S-A-R-G-L-R-T-K-M-E-G
Mite_ADAR2      ---K-P-G-I-L-H-L-F-I-S-T-S-P-C-D-G-R-I-F-A-N-E-K-A-C- --T-E-M-P-R-N-A-G-R-A-S-G-V-L-R-T-K-M-E-G-G
Tick_ADAR2      Q-G-G-E-F-R-I-K-P-I-K-F-H-L-Y-I-S-T-S-P-C-D-G-R-I-F-S-P-H-E-L-D-S- --A-E-A-D-R-H-P-N-R-R-V-G-L-L-R-T-K-M-E-A-G
Beetle_ADAR2    E-D-G-E-Y-K-I-K-P-G-L-D-F-H-L-Y-I-N-T-A-P-C-D-A-R-I-F-S-P-H-E-S- --E-V-K-H-P-N-R-K-C-S-A-R-G-L-R-T-K-M-E-S-G
Louse_ADAR2     P-N-K-E-F-L-I-D-P-K-Y-F-H-L-Y-I-T-S-A-P-C-D-S-L-F-S-P-H-D-V-C- --F-K-H-P-N-R-K-A-R-G-L-R-T-K-M-E-R-G
Amphipod_ADAR2 ---Q-V-K-D-G-I-T-F-H-F-Y-V-S-S-T-P-C-D-R-S-V-F-P-Q-N-F-L-D- --V-S-V-H-P-N-R-L-C-G-L-L-R-T-K-M-E-C-G
Water_flea_ADAR2 -Q-N- --L-K-T-K-S-D-V-L-F-H-L-Y-V-S-S-A-P-C-D-A-R-I-F-T-L-N-E-S-L-A- --S-P-E-D-L-H-P-N-R-O-G-A-L-R-T-K-M-E-S-G
Limpet_ADAR2    G-D-A-E-F-Q-K-E-N-I-K-F-H-L-Y-I-N-T-A-P-C-D-A-R-I-F-S-P-H-E-A-E-M- --K-A-G-R-H-P-N-R-K-A-R-G-L-R-T-K-M-E-S-G
Leech_ADAR2     S-S-G-E-C-V-K-P-S-V-K-F-H-L-Y-V-S-T-S-P-C-D-A-R-I-F-S-P-H-E-Q-K-E-E-A-E-A-Q-S-A-K-K-L-A-R-G-I-L-R-T-K-M-E-S-G
Polychaete_ADAR2 E-G-G-E-Y-K-I-P-G-I-E-F-H-L-Y-I-S-T-S-P-C-D-A-R-I-F-S-P-H-E-A-Q-D- --A-D-K-D-P-H-P-N-R-K-A-R-G-L-R-T-K-M-E-S-G
Coral_ADAR2     D-S-G-L-Y-G-V-R-D-Y-V-E-F-H-L-Y-I-N-T-S-P-C-D-A-R-I-F-S-P-H-E-P-V-M- --G-V-A-D-K-H-P-C-R-T-R-L-L-R-V-K-L-E-N-G
Anemone_ADAR2   P-S-G-L-Y-G-L-K-D-Q-V-E-F-H-L-Y-I-S-T-S-P-C-D-A-R-V-F-S-P-H-E-G-D-P- --E-I-D-R-H-A-N-S-K-K-R-G-I-L-R-V-K-M-E-N-G

130     140     150     160     170
Acom_worm_ADAR1 E-G-T-I-P-I-D-P-E-S-S-V-C-T-W-D-G-I-R-G-E-R-L-R-T-M-S-C-S-D-K-I-A-R-W-N-L-L-G-Q-G-A-L-L-T-H-F-I-Q-P-I-Y-I
Urchin_ADAR1    E-G-T-I-P-V-T-T-R-E-S-V-C-T-W-D-G-I-M-R-G-E-R-L-R-T-M-S-C-S-D-K-V-A-W-N-L-L-G-Q-G-A-L-L-S-H-F-I-E-P-M-Y-I
Mite_ADAR1     E-G-T-V-P-D-V-D-S-T-D-Y-T-W-D-A-I-L-G-E-R-L-R-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-M-Q-G-L-L-S-H-F-L-Q-P-V-Y-L
Tick_ADAR1     E-G-T-V-P-V-D-L-T-T-D-Y-T-W-D-A-I-L-G-E-R-L-R-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-Q-G-A-L-L-S-H-F-L-Q-P-V-Y-I
Leech_ADAR1
Polychaete_ADAR1 E-G-T-I-P-I-E-D-F-V-S-T-W-D-G-I-L-R-G-E-R-L-R-T-M-S-C-S-D-K-V-C-R-W-N-V-L-G-M-Q-G-A-L-L-S-H-F-I-E-P-V-Y-I
Anemone_ADAR1   E-G-T-I-P-V-D-P-S-D-G-P-T-W-D-G-L-V-C-G-R-L-R-T-M-S-C-S-D-K-I-C-R-W-N-A-L-G-Q-G-A-L-L-S-H-F-I-E-P-V-Y-I
Slug_ADAR1      E-G-T-I-P-I-N-S-S-D-G-C-T-W-D-G-I-L-R-G-E-R-L-R-T-M-S-C-S-D-K-I-C-R-W-N-V-L-G-M-Q-G-A-L-L-S-H-F-L-D-P-V-Y-M
Limpet_ADAR1    E-G-T-I-P-I-E-S-D-F-T-V-C-T-W-D-G-I-V-R-G-E-R-L-R-T-M-S-C-T-D-K-I-C-R-W-N-V-V-G-M-Q-G-A-L-L-S-H-I-E-P-V-Y-I
Tunicate_ADAR1  E-G-C-I-P- --T-S-D-N-I-V-T-W-D-G-L-V-R-G-E-R-L-R-I-M-S-C-D-K-I-K-W-N-F-A-G-Q-G-A-L-L-N-T-F-I-E-P-I-Y
Lancelet_ADAR1  F-S-T-R-P-L-N-K-G-A-K-L-Y-T-W-D-Q-L-R-G-T-D-Q-I-G-T-M-S-C-S-D-K-L-K-W-N-V-L-G-Q-G-A-L-L-S-H-F-I-E-P-V-Y-I
Octopus_ADAR1  E-G-T-I-P-I-D-A-D-F-T-E-T-W-D-G-I-O-R-G-E-R-L-R-T-M-S-C-S-D-K-I-C-R-W-N-V-V-G-Q-G-A-L-L-S-H-F-I-E-P-I-Y
Squid_ADAR1     E-G-T-I-P-I-D-A-D-F-T-E-T-W-D-G-I-O-R-G-E-R-L-R-T-M-S-C-S-D-K-I-C-R-W-N-V-V-G-Q-G-A-L-L-S-H-F-V-E-P-I-Y
Human_ADAR1     E-G-T-I-P-V-E-S-S-D-I-V-P-T-W-D-G-I-R-L-G-E-R-L-R-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-Q-G-A-L-L-T-F-L-Q-P-I-Y
Human_ADAR2     E-G-T-I-P-V-S-S-N-A-S-I-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-I-A-R-W-N-V-V-G-I-Q-S-L-L-S-I-F-V-E-P-I-Y
Fly_ADAR2       E-G-T-I-P-V-K-S-S-D-G-C-T-W-D-G-V-L-G-Q-R-L-L-T-M-S-C-S-D-K-I-A-R-W-N-I-V-G-I-Q-S-L-L-S-S-I-E-P-V-Y-I
Squid_ADAR2     E-G-T-I-P-V-S-S-S-G-F-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-V-Q-G-A-L-L-C-H-F-M-H-P-I-Y
Octopus_ADAR2   ---E-R-L-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-I-Q-S-L-L-S-H-F-M-N-P-I-Y
Acom_worm_ADAR2 E-G-T-I-P-V-K-P-D-S-S-I-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-I-Q-G-A-L-L-S-N-F-I-E-P-V-Y-I
Urchin_ADAR2    E-G-T-I-P-V-K-S-G-P-S-I-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-L-A-R-W-N-V-L-G-V-Q-G-S-L-L-T-F-I-E-P-I-Y-I
Lancelet_ADAR2  E-G-T-I-P-V-T-S-S-S-S-V-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-I-Q-G-A-L-L-S-Y-F-E-P-I-Y
Tunicate_ADAR2  E-G-T-I-P-V-E-R-G-M-C-T-W-D-A-I-T-G-E-R-L-L-T-M-S-C-S-D-K-I-K-W-N-V-V-G-I-Q-S-L-L-S-M-Y-I-E-P-V-Y-I
Mite_ADAR2      E-G-T-I-P-L-P-A-S-F-T-V-C-T-W-D-G-I-N-G-D-R-L-L-T-H-S-C-S-D-K-L-A-R-W-N-V-L-G-Q-G-A-L-L-S-H-F-V-H-P-V-Y-I
Tick_ADAR2      E-G-T-I-P-L-L-G-P-V-M-C-T-W-D-G-V-L-H-G-Q-R-L-L-T-M-S-C-S-D-K-L-A-R-W-N-V-L-G-Q-G-S-L-L-S-L-F-M-E-P-V-Y-I
Beetle_ADAR2    E-G-T-I-P-V-K-A-S-G-L-I-C-T-W-D-G-I-L-G-E-R-L-L-T-M-S-C-S-D-K-I-C-R-W-N-V-V-G-V-Q-G-A-L-L-S-H-F-I-E-P-I-Y
Louse_ADAR2     E-G-T-I-P-V-N-S-D-L-I-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-L-K-W-N-V-V-G-V-Q-G-A-L-L-S-N-F-I-Q-P-V-Y-I
Amphipod_ADAR2 E-G-T-I-P-I-K- --E-S-V-C-T-W-D-G-V-M-C-G-E-R-L-L-T-M-S-C-S-D-K-L-A-R-W-N-V-L-G-I-Q-G-L-L-S-H-F-Y-M-P-V-Y-I
Water_flea_ADAR2 E-G-T-I-P-V- --N-E-S-I-C-T-W-D-G-I-L-S-G-E-R-L-L-T-M-S-C-S-D-K-L-A-R-W-N-V-V-G-I-Q-S-L-L-S-N-L-I-D-P-I-Y
Limpet_ADAR2    E-G-T-I-P-V-S-N-G-T-T-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-I-A-R-W-N-V-L-G-I-Q-S-L-L-S-V-S-F-V-K-P-I-Y
Leech_ADAR2     E-G-T-I-P-V-T-S-H-E-G-V-S-W-D-G-I-L-G-R-L-L-I-M-S-C-S-D-K-V-A-R-W-N-V-L-G-C-Q-G-S-L-L-S-H-F-V-L-P-I-Y
Polychaete_ADAR2 E-G-T-I-P-V-K-S-C-S-V-I-C-T-W-D-G-V-L-G-Q-R-L-L-T-M-S-C-S-D-K-L-S-K-W-V-L-G-V-Q-G-A-L-L-S-H-F-I-E-P-V-Y-I
Coral_ADAR2     E-G-T-I-P-A-I-N-G-V-I-C-T-W-D-G-V-L-G-E-R-L-L-T-M-S-C-S-D-K-L-C-R-W-N-V-T-G-I-Q-S-L-L-S-H-F-V-E-P-I-Y
Anemone_ADAR2  E-G-T-I-P-V-A-N-C-D-A-I-C-T-W-D-G-I-T-G-E-K-L-R-T-M-S-C-S-D-K-I-C-K-W-N-T-L-G-V-Q-G-A-L-L-S-H-F-I-E-P-V-Y-I

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Figure S2

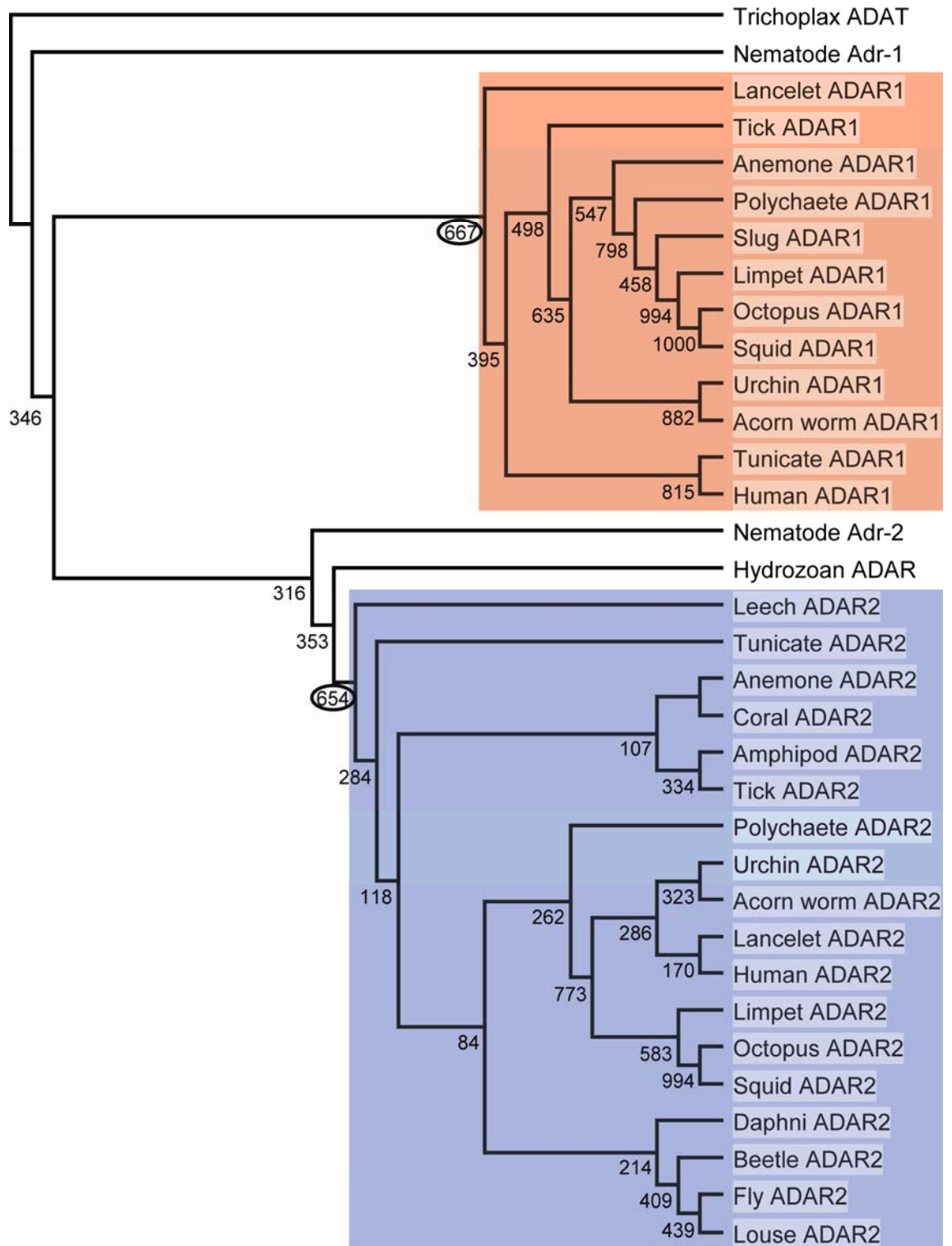


Figure S3