

**S7 Appendix.** Exons surrounding intronic miRNA, and part of protein encoded by them.

*C. sinensis*

32nd exon

TTGGCCCTGGTTCTACAAACCGTGGTTTGTACGTCCGGCCCATCTGCTACCCGTTTCGACCACAGAAAGCGATTCCGGAGCAGGACGAG  
GATAGGAGTGGCGACGAGGCTGAATTCGGTATTGCAACGGCTATCGACCAGTTAAAGTCTATACTGGATTGCGAG

33rd exon

CCACCCAGTGACCCTACGATCCTTCAGTCTGCGCACTCGGTGGCTGTTGCAACCCAAAGCCTGATTCACACAGCTAGGTCTATTGGATT  
GGCCCCACCGTCGGATGCAGTGGACCGTGCTCGGCGTGCTGGCACTTCTCACCATGGTGCCTCGCTATGGCGAACCGAACTCACTGTGG  
CCTTGGAACACAGGATATGTGCCAGCTAGCCCAACTGTGTTTCAGCCGTTCTTCAGGAGGAGAATGCACATCCTGACTCGAAAGATCT  
ATTTGGCACCTCCACACGTCTTGTTCGGTCCAAGGAGCGTCTGTTGGCCGCTGTACGTCGGGTTGCCGCTGCTTCTGCTCAGCTCCTGAT  
GTCCGCCAAATCCAGAAGGTCCAAATGTTCTTCCGCGGATATTCAAAGTTGCAG

>csi

VPGSTNRGLYVRPICYFRPQKAIPEQDEDRSGDEAEFRIATAIDQLKSILDCEPPSDPTILQSAHSVAVATQSLIHTARSIGLAPPSDAVDRAR  
RAGTSHHGASLWRTELTVLATQDMCQLAQLCSAVLQEENAHPSKDLFGTSTRLVPSKERLLAAVRRVAAASAQLLMSAKSRRSKCSSA  
DIQKLQ

*S. japonicum*

40th exon

GTGGTGGTAGTGGCTCAGGATCATCACATAAAAGTATTTTTATCCGCCCTACATGTTATCCTCTTCAAGTGTCACATGATCAAGGTGGT  
GAACAAATTATTAACGATGAAGCTGAATGTCGGATTGTGGATGCTATCAATCAACTTAATTTATCGCTGGAAAAATGC

41st exon

TTAGTAGATAATAAATTAGCTCAATCTCTTCTTGTTTCGGCTCGATCAGTGGCTGTGTCTGTTCAAATCTCATCAGAACCGCAAGGACT  
GTTGTTTCCGTACCACCAAACGATGCGGTGGAGAGAGCTCGGACAGCAGAAAGTGCTTCGCAAAGAGTACTAGTTCGGCTGTTCTAT  
GGCGTACTGAACTCAATGTATCTCTTGCCACCCAACACTTATGTCAGTTGAGCAAACCTGTGTTCCGAAACAGTACCGTCCTCAACCTCC  
ACGAAACTTGAGAACAACACTGGGGAGCTATCAGGAGGATTGATTCTGTGCGGTGAAAGGCTTCTGGCTGCTGTGCGTCAAGTGGCGA  
CTGCGGGAGCCCAGTTGCTCTTAGCAGCCAAATTGAGGAAAGAAGCTCTAATGTCTTCTGATATCCGGAAATTA AAAAG

>sj

GGSGSGSSHKSIFIRPTCYPLQVSHDQGGEQIINDEAECRIVDAINQLNLSLEKCLVDNKLAQSLVARSVAVSVQNLIRTARTVVSVPND  
A  
VERARTAESASQKSTSSAVLWRTELNVSLATQHLCQLSKLCSSETVPSSTSTKLENNTGELSGGLILSRERLLAAVRQVATAGAQLLLAAKLRK  
EALMSSDIRKLLK

*S. mansoni*

7th exon

GTGGCAGTTCAAATCACACAAAAGTATTTTCATTCGTCCCACATGTTACCCTCTTCAAATATCGTCTGAGCAAACCACTGAGCAAAC  
T  
ATGAACGATGAAGCAGAATGTCGAATTGTCGATGCTATTAATCAGCTTAATTCATCGTTGGAAAAATGC

8th exon

TCGGCGGACAATAAATTAGCTCAATCTCTTCTTGTCACCGCGCGATCAGTCGCTGTATCTGTTCAAATCTTATCAGAACTGCAAGGAC  
T  
TGTTATTTCCGTACCCCAAGCAATGCTGTCGACAGAGCTCGGACGGCAGAAGGTGCTTCACAAAAGAGTACTAGCTCAGCTGCTCTTT  
GGCGTACTGAACTTAATGTATCGCTTGCTACTCAACACTTGTGTCAACTGTCTAAATTATGTTCCGAAACAGTACCATCCATAACCTCG  
C  
CAAAAATTGGAGAATAACGCCGGGGAGTTATCAGGAGGATTAATTTTATCACGCGAAAGACTTCTGGCTGCTGTGCGTCAAGTGGCAA  
CTGCAGGAGCTCAGTTACTCTTAGCAGCTAAATTAAGAAAAGAAGCTTTAATGTCTGCTGATATTCGAAAGTTGAAA

>sma

GSSKSHKSIFIRPTCYPLQISSEQTTEQTMNDEAECRIVDAINQLNSSLEKCSADNKLAQSLLVTARSVAVSVQNLIRTARTVISVPPSNAVDRA  
RTAEGASQKSTSSAALWRTELVSLATQHLCQLSKLCSETVPSITSQKLENNAGELSGGLILSRERLLAAVRQVATAGAQLLLAAKLRKEAL  
MSADIRKLLK

*E. granulosus*

44th exon

ATGGCTCCAACAGAGCCACAAGTAGCCAGATCAGTTGTCTGCAATCCCAGCTCGATTCAACAGGTCGTCTGTTGACTGGAAGTGGAGGC  
TGCGCTAGAAGCCAGTAGACGAATTGATGTTGCTTTAGGCCTACTGGAAGGTGATTTTTATCAG

45th exon

AGCATGCAGAGGTCGACCAATCAGGATGTTGTACATCACACCCAACCAATCCTGAGTATGGCTCGTGCAATTACCCTAGCAACACGGG  
AATTCGTACAGACTGTCCAATTAGCTTCCACCTCCAAAGCCACGGCTAATTTTGGTCGACTGG

>egr

GSNRATSSQISCLQSQLDSTGRLLTGTEAALEASRRIDVALGLLEGDFYQSMQRSTNQDVVHHTQPILSMARAITLATREFVQTVQLASTSKA  
TANFGRL

*E. multilocularis*

39th exon

ATGGCTCCTACAGAGCCACGAGTAGCCAGATCAGTTGTCTGCAATCCCAGCTCGATTCAACAGGTCGTCTGTTGACTGGAAGTGGAGGCT  
GCGCTAGAAGCCAGTAGACGAATTGATGTTGCTTTAGGCCTACTGGAAGGTGATTTTTATCAG

40th exon

AGCATGCAGAGGACGACCAATCAGGATGTTGTACATCACACCCAACCAATCCTGAGTATGGCTCGTGCAGTTACCCTAGCAACACGGG  
AATTCGTACAGACTGTCCAATTAGCTTCCACCTCCAAAGCCGCGGCTAATTTTGGTCGACTG

>emu

GSYRATSSQISCLQSQLDSTGRLLTGNEAALEASRRIDVALGLLEGDFYQSMQRRTTNQDVVHHTQPILSMARAVTLATREFVQTVQLASTSK  
AAANFGRL

*H. microstoma*

37th exon

ATGGATTTAGCAAGTCTATTAGTATTCGAACTAGCTGCCTTCAATCTCAATTAGACACAAAGGTTTTTCTTATGAGCGGTGCAGAAGCT  
GCCATTGAAGCAATTCACCGGATTGATATCGCTCTGGGTCTGCTGGAATCGGATCTCAACAAG

ex38th exon

AGCAAGCAAGAACCGATCAATCAGGATATTGTGGTTCATACGCAACCTATATTGAGCTTAGCTCGATCAACTACTTTAGCTATACGAGA  
ATTTGTTCAAACAGTCCAATTGGCGTTGGCCTCTCGAGAATCGACTAATCTCGGCCGATTA

>hmi

GFSKSI SIRT SCLQSQLD TKVFLMSGAEAAIEAIHRIDIALGLLES DLN KSKQEPINQDIVVHTQPILSLARSTTLAIREFVQTVQLALASRESTNL  
GRL

*T. solium*

40th exon

ATGGCTCCTACAGGGCTACAACCAGTCAGCTCAGTTGTCTACAATCCCAGCTCGATTCAACAGGTCGCCTGCTAACTGGGACCGAGGCT  
GCATTGGAAGCCAGTAGACGAATCGATGCTGCCCTAGGCTTACTGGAGGGCGATCTCTATCAG

41st exon

AGTATGCAAAAATCAATCAATCAGGATGTCGCACATCACACACAACCAATCCTAAGCATGGCCCGTGCAGTTGCCCTAGCAACACGGG  
AATTCGTGCAGACTGTCCAATTAGCTTTCACCTCCAAGACCTCTGCAAATTTGGGTCGATTGG

>tso

GSYRATTSQLSCLQSQLDSTGRLLTGTEAALEASRRIDAALGLLEGDLYQSMQKSINQDVAHHTQPILSMARAVALATREFVQTVQLAFTSK  
TSANLGRL

sj a GSGSGSSHKSI F I R P T C Y P L -- Q V S H D Q G G E Q I I N D E A E C R I V D A I N Q L N L S L E  
s m a --- G S S K S H K S I F I R P T C Y P L -- Q I S S E Q T T E Q T M N D E A E C R I V D A I N Q L N S S L E  
c s i -- V G P G S T N R G L Y V R P I C Y P F R P Q K A I P E Q D E D R S G D E A E F R I A T A I D Q L K S I L D  
\* . . . . . : : : \* \* \* \* : \* : : \* : . \* \* \* \* \* \* . \* \* : \* \* : \* :

sj a K C L V D N K L A Q S L L V S A R S V A V S V Q N L I R T A R T V V S V P P N D A V E R A R T A E S A S Q K S  
s m a K C S A D N K L A Q S L L V T A R S V A V S V Q N L I R T A R T V I S V P P S N A V D R A R T A E G A S Q K S  
c s i --- C E P P S D P T I L Q S A H S V A V A T Q S L I H T A R S I G L A P P S D A V D R A R R A G --- T S  
: : \* : \* : \* \* \* \* : . \* . \* \* : \* \* \* \* : : . \* \* . : \* \* : \* \* \* \* \* \* . \*

sj a T S S A V L W R T E L N V S L A T Q H L C Q L S K L C S E T V P S S T S T K L E N N T G E L S G G L I L S R E  
s m a T S S A A L W R T E L N V S L A T Q H L C Q L S K L C S E T V P S I T S Q K L E N N A G E L S G G L I L S R E  
c s i H H G A S L W R T E L T V A L A T Q D M C Q L A Q L C S A V L Q E E N A H P D S K D L F G T S T R L V P S K E  
. \* \* \* \* \* \* . \* : \* \* \* \* . : \* \* \* \* : \* \* \* \* . : . . : . : : \* \* \* : \* : \*

sj a R L L A A V R Q V A T A G A Q L L L A A K L R K E A L M S S D I R K L K  
s m a R L L A A V R Q V A T A G A Q L L L A A K L R K E A L M S A D I R K L K  
c s i R L L A A V R R V A A A S A Q L L M S A K S R R S K C S S A D I Q K L Q  
\* \* \* \* \* \* : \* \* : \* . \* \* \* \* : : \* \* \* \* : \* : . \* : \* \* : \* \* :

egr GSNRATSSQISCLQSQLDSTGRLLTGTEAALEASRRIDVALGLLEGDFYQSMQRS  
emu GSYRATSSQISCLQSQLDSTGRLLTGNEAALEASRRIDVALGLLEGDFYQSMQRT  
tso GSYRATTSQLSCLQSQLDSTGRLLTGTEAALEASRRIDAALGLLEGDLYQSMQKS  
hmi GFSKISISIRTSCLSQLDSTKVFLMSGAEAAIEAIHRIDIALGLLES DLNKSKQEP  
\* :: : : \*\*\*\*\*:. \*::\* \*\*:\* \*\* :\*\*\* \*\*\*\*\*.\*: :\* \*..

egr TNQDVVHHTQPILSMARAITLATREFVQTVQLASTSKATANFGRL  
emu TNQDVVHHTQPILSMARAVTLATREFVQTVQLASTSKAAANFGRL  
tso INQDVAHHTQPILSMARAVATLATREFVQTVQLAFTSKTSANLGR  
hmi INQDIVVHTQPILSLARSTTLAIREFVQTVQLALASRESTNLGR  
\*\*\*:. \*\*\*\*\*:\*: :\*\* \*\*\*\*\* \*\* :\*: :\*:\*\*\*

csi --VGPGSTNRGLYVRPICYPFRPQKAIPEQDEDRSGDEAEFRIATAIDQLK-SIL  
sja GGSGSGSSHKSIFIRPTCYPL--QVSHDQGGEQIINDEAECRIVDAINQLN-LSL  
sma ---GSSKSHKSIFIRPTCYPL--QISSEQTTEQTMNDEAECRIVDAINQLN-SSL  
egr ---G---SNRATSSQISCL----QSQLDSTGRLLTGTEAALEASRRIDVAL-GLL  
emu ---G---SYRATSSQISCL----QSQLDSTGRLLTGNEAALEASRRIDVAL-GLL  
hmi ---G---FSKISISIRTSCL----QSQLDTKVFLMSGAEAAIEAIHRIDIAL-GLL  
tso ---G---SYRATTSQLSCL----QSQLDSTGRLLTGTEAALEASRRIDAAL-GLL  
\* :. : \* \* . \*\* . \*:

csi ---D-----C--EPPSD--PTILQSA-----HSVAVATQSLIHTARSIGLAPP  
sja E--K-----CLVDNKLA--QSLLVSA-----RSVAVSVQNLIRTARTVVSVP  
sma --EKC-----SADNKLA--QSLLVTA-----RSVAVSVQNLIRTARTVISVPP  
egr --E-G----D-----FYQSMQ---RSTNQ-----DVVHHTQPILSMARAITLA-T  
emu --E-G----D-----FYQSMQ---RSTNQ-----DVVHHTQPILSMARAVTLA-T  
hmi E-SDL--N-----KSKQE---PI---N-----QDIVVHTQPILSLARSTTLA-I  
tso EGD-L-----YQSMQ---KSINQ-----DVAHHTQPILSMARAVALA-T  
. . . . \* :: \*\*:

csi SDAVDRARRA-GT----SHH-----GASLWRTELTVLATQDMCQLAQLCSAVLQEENAHDP  
sja NDAVERARTA-ES---ASQKSTS---SAVLWRTELVSLATQHLCQLSKLCSSETVPSSTSTKL  
sma SNAVDRARTAEGA----SQKSTS---SAALWRTELVSLATQHLCQLSKLCSSETVPSITSQKL  
egr REFVQTVQLA-ST----SKA-----TANFGRL-----  
emu REFVQTVQLA-ST----SKA-----AANFGRL-----  
hmi REFVQTVQLA-LA----SRE-----STNLGRL-----  
tso REFVQTVQLA-FT----SKT-----SANLGRL-----  
: \*: .: \* : \* : : .: :\*

csi SKDLFGTSTRLVPSKERLLAAVRRVAAASAQLLMSAKSRRSKCSSADIQKLQ  
sja ENNTGELSGGLILSRERLLAAVRQVATAGAQLLLAAKLRKEALMSSDIRKLLK  
sma ENNAGELSGGLILSRERLLAAVRQVATAGAQLLLAAKLRKEALMSADIRKLLK  
egr -----  
emu -----  
hmi -----  
tso -----