

## Supplementary Material

## Supplementary Figures and Tables

## Supplementary Figures

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1 MALE LV GAV ALV GAV VGE LFKAI LNGLRAISFNPVPLKDIR  
121 TCCAAGCTTAATGCTATAATGCCCTGGTGAGACAAATCGAGCTTAATGATTATCTGATTACCCMAAAGAAGAACAGAGAAATTGAGGGGCTGTGAGGTGAAGGAGCAGTTG  
SKLNNAIMPVLVKQIDELNLDYLDYPKETEETEKLRLGMDDEGQKLY  
241 CTCTCCAGTGCGGGATGTGAAATTGGGGACTCTTAATTATITGAAGAGACCATCTAACCCAAAAGCTTCGGGAATGGATACTGCACATTGGAGCTTCATGGATTTGATOTG  
LLQCGDVKLGDLNYLKRPSYTQKLRRELDTALRSFMDVLM  
361 CAGATGGCTAGAGATCAGAAGAAGAACATGAAGATGATGAAACCAATGATGGAGATCATTTGTAGACTGTATAAGAGGTGGTCGAGAACCTATGGATTGTTGTCACCATG  
QMARDQKKNMNMNQMMETICRLEDNDNRGGSKPKMPLDFVPPC  
481 CTGGTTCCACTCCAGAGAACACCGCTGGGGAGAACCCAGTTAAGGACTGGAAGCTCCTAAATGGGCTICAATCTGTCGTCAGCCTCCCTGGCTGGGA  
LVPQLREETVGLEKEPVKELKVKLKLNGVQMLVVTATPAGV  
601 AAAACACACTGGCTTAAATTGGCAGACAGAACCTGGGGAGAACCCAGTTAAGGACTGGAAGCTCCTAAATGGGCTICAATCTGTCGTCAGCCTCCCTGGCTGGGA  
201 KTTLAALKFCHDKEVKDIFQEKIFFVVPVSRKPFDLKLIILKDI  
721 GAAAGCCTAGAGGAATTCAATGCCGTAAAGTGTGAAAGCTGCTATTCTGCTATTAGAATTGGTTGAAGCACAGAACCTGATAATGCCCTGTTGATGTTGAGATGAT  
241 ESSLRGIQLPDLQSDERAFCYLELWLKQITSVNRPVLIVLD  
841 GTGTTGAGGTGGCAAGAATCTTCAGGTTCTCTGATTAAGCTGTITTCAGGAGAAGATCTTGTCCGAGTCAGGTTTATTTCCCAAAGATTAGTAGGTTTATTTGGA  
281 WWSGQESEVLLLDKFLQPLCKILVTSRFYFPRFSSESYYLE  
961 CCTTGAACCATGACAATGCCATACAATTCTCCCTGCCATCACTGGACAAAGCAATTCTAAGCTCCCGATGATGAAACTCTAGAAAGATAATTGGGGCATGCAAGACATA  
321 PLNHENAVQLFRRARASALDKGISMPLDDEPTVEKIIIGGCKRL  
1081 CCTCTTGCACTGAAGGTAATCGGGGGTCTCTTCCCACAAACCGACATCTGTTGGAAAGTAACGGGGAGATTGGCTAGAAGTGGCTCCATATTGATCTGACAATGAACCTCTT  
361 PLALKVIGRSLSLHKPTSTVSWKVTGGRNLARSGSISIFDSDNELL  
1201 GAATGCGCTTCAAGACCACTTGGATCTGGATTAACATGCTAACTAAGAAGCTTCTGATTAGGCTCTTCTGATGAACTTCAGGATCAAGAACATTCTGCTCTACCTTCATTGACATG  
401 ECLQSSSLDVLDDNMVTTKKSFMDDLGGSFHEDQRISASTFTIDM  
1321 TGCCAGCTTGTACACACTAGACGAAAGTGAAGCAATGGTTACCCCTGACGAACTATCTCGAAGCTTCTGAGCTTAAATTGTCACAGCGAGAAAATATGGATGATGACTTTAT  
441 CTCVLYLTLDSEAMVTLDELLSSRSLVNFVTARKYGYD  
1441 GAAGAGTACTCTTTACTCAGCATGATATCTCAGACATTGGCTATTCACTGTGATGAAATGGAGCCATAGAACAAAGGAAAGATTGATCTTAGACATTAATGGAATGATCTCCC  
481 EEEYSFTQHIDLRLAITHLMMNMPEIEQRKRLIILDINGNDLPL  
1561 AAATGGTGGGTTGATCAAGAAAAGCATCTTCCTATGCTCGCCCTTATATCCAATAACCACAGATAAGAGAATCTCAGCAAGTGGCCCTGACATGGAAGCCTGAGTGGGGTTCTGATT  
521 KWWDVWDQEKEHTSYARLTSITSTTDKRFSASWPDMEAPEVEVLI  
1681 CTTAATCTTGCACTGACAACCTACAATTCTGGGTTCTCAAAAGAATGATRAAGCTGAAAGTTTGTATAACATATTGTTCTTACTGAGGTGACAAAGTGAAGAATAT  
561 LDNLQSQRTTYNLPGFIFIKRMNKLKVLIDITYFGSFLTEVTSEDN  
1801 CAAACTACTGACAGCTAACAGATCTGGAAACGAACTCAGGTTTGGGATTCTCAGATCTCTTCTGATGAAATCTGAGCCAAACACTGATAAAATCTGAGAAAATACCTCTTATG  
601 QLLDSDLTSLERTRFERISVPIFSNPNPKPLTINLQKISFFM  
1921 TCCAAATTGGTCAACATCTGATGGGCTCTAACCCCCATCTCAGATTGTTGGCAACCTGCTGGGAGATTCCATAGACTCTGCAACATTTGAGTGRAGTCCCCATAGGTGTTG  
641 CKFGQQTFTFMDPSTPISDLDLPLNNLIEISIDFCNCNLSEVPNRLC  
2041 GAAATTGTCAGCTGGAGAACGAGCTAACAAATGCCATGGACTATCTCTCTGGCAGAACAGTGGAGCTGATTAACCTAAAAAAATCAAGGCTAACGATCTGCAATT  
681 FAVTSVQLKLDLTSITNCNGHLGLSSLPEDVGVKGKLINLKNLRLRSCTICLH  
2161 GAAGAGTTCCAGACTGCAACAGAACGAGCTGGGAAATTGCTCTGGTGTATATCTAATCTGTTGATCTGGTCTGGCAAGCTCCCGAGAAAGATTGGTGAATTCTAATTTGAAAGCTT  
721 EEFPESTTKLRELVLLDISNCIGLAKLPEKIGEFEHNLLEXL  
2281 GACATGAGACACTGCTGGACTTGTGAGCAAGCTGCCACTGTCGATGGAAAGCTGAAAGTTTATGCTGATAGAGAGGTTGAGAGTGGCTGAGAAAGGTGACACTGGCT  
761 DMRCHCWSDSLKPLSISGKLNVNKFLCDRREVGEWLRKVAPRL  
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801 AKQVKVQVEEAEANLWLGCF\*

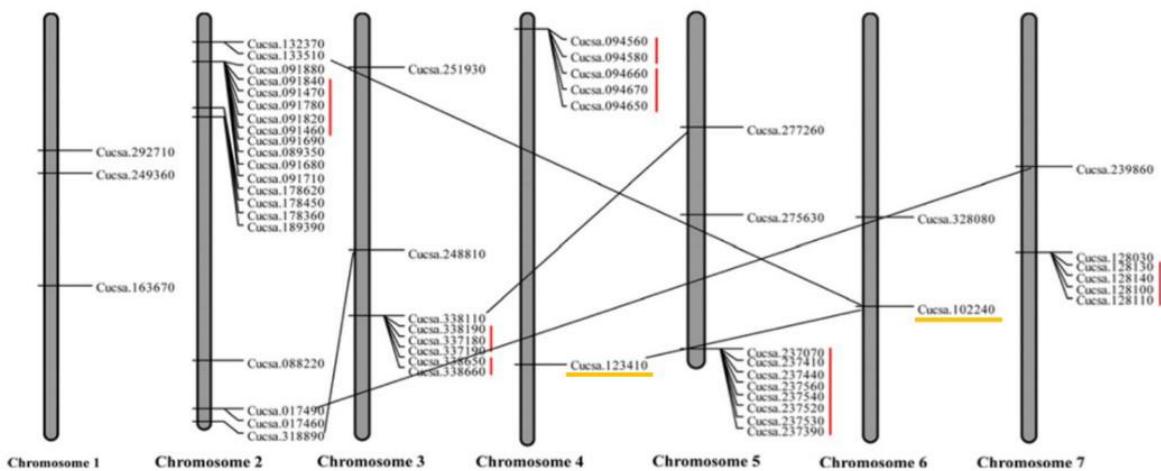
**Figure S1.** Nucleotide and deduced amino acid sequences of cucumber *CsRSF1* CDS encoding a protein. The deduced amino acid sequences are given below the nucleotide sequences. The transcriptional start site is shown in red and the termination codon is marked by an asterisk (\*).

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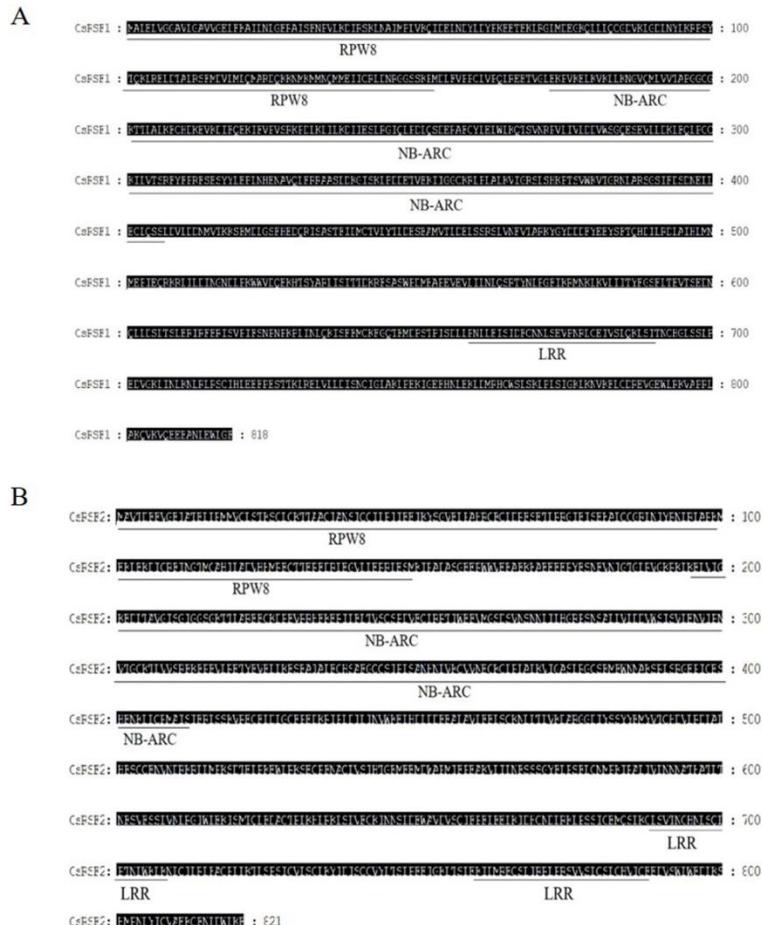
1      ATGGCGGTTACAGATTCTTGTGGAGAGATAGCCACTGNGCTTCAGAATGATGGTACAACATTCTGCCTTGAAACGAGGGCAGCTCAATCGCAAATCTATT
1      M A V T D F F V G E I A T E L L R M M V Q L S T K S C L C K T T A A Q I A N S I
121     CAACAAATTCTGCCATTATTGAAGAGATCAAGTACTGGGAGTTGAATTACCCGCTCATGCCAAATTCTGAGTTAGATCGCTTCAGCGAAACTCTTAGAAGAGGCATCGAGATTCCGAG
41      Q Q I L P I I E E I K Y S G V E L P A H R Q F Q L D R F S E T L R R G I E I S E
241     AAGGCTCTTCATATGTCGGCCGATTAACATTACAGAAACTTACGGCTCGGAGGAAGATGGAGAACCTTGAAAAGGATATATGTCGATTCATTAATGGCACCATGCGAGCATACCTG
81      K A L Q C G R L N I Y T L R L A R K M E K L E K D I C R F I N G T M Q A H I L
361     GCGCAGCTGAGATCATATGAGATTCAGACCGACCGAGCGGTTGACCGGCTTGAGGTTTGTGAGCAGCGCTTGAGATGAGATAGCAGAGCTTGGAGAGGAGAAGG
121     A D V H H M R F Q T T E R F D R L E G V L L E R R L E S M K I R A D A S G E E R
481     CGCTGGGTTGAGGAGCCGTTAAAGAACCGCAGGAGGAGGAAAGGATAGAGACIAATTCTCGAATATACCAACTGGATCCGTTGGGAGAGAAAATGAAGGAGCTGGTATTGGA
161     W W V E E A F K K A E E E E R Y E S N F V N I G T G L R V G K R K L K E L V I G
601     AAGGAGGATTIAACCGCGGTTGGGATTAGTGGATTTGGGCTCGGGAGACIACCTTACGGGATCTGCGAACATCCGAGAGACACTTAAAGAGAGAATTCTGTC
201     K E D L T A V G I S G G K T T L A R E F C K D P E V R R H F K E R I L F
721     TAAACGGTGTACACTCCCTGATGTCGAGCAGCTGAGGAGAACATCTGGGATTCTGATGGGACTGATAGCTCAATTCTAATAATTGATTTACATGGAGGCCTCAAATICA
241     L T V S Q S P D V E Q L R R T I W E F V M G S D S V N S N N L I L H G R F S N S
841     CGCCTTITGGCTCTGGATCATGTCGCTCAATTCTGAAATCTTATCCTAACCTAACGTTCTGGTGTCAAACACTCTGTTTACCATCAATCCTGAACTTCTAGAGAA
281     A L L V L D D V W S I S V L E N V I P N V T G C K T L V V S R F K F P E V L R E
961     ACTTATGAGTAGAGCTTGTGAAAGAACATGAGCAATTGCTCTGTTTGCACACTAGCTTCGRCACACAGTCGATTCTCTGCTAATCACAACTTGTCAAACAGCTTGTGAAT
321     T Y E V E L L K E S Z A I A L F C H S A F G Q Q S I P L S A N H N L V K Q V V N
1081    GAATGCAAATGTTGGCTCTGGCTTAAACTCATAGGAGCATCTCAGAGCACAGAGCAGATCTCTGGAAATATGCCAAAGTCTAGTTGTCACGTGGCAGCTATTGGCAGTCC
361     E C K C L P L A L K V I G A S L R Q C S E M F W N A K S R L S R G E P I C E S
1201    CATGAGAACAAATCTCTCAAACATGCCAATCAGTATTGAAACGCCCTCGACIAACTGAGAACATGTTICCTGCACCTGGGATCTTCCTGAAACACAAATTCCTCTGACATT
401     H E N K L L Q R M A I S I E R L S S K V R E C F L D L G C C F P E D K R I P L D I
1321    CTCATCAATGTTGCAACAGCTTACATGATCTGAGGAAAGCTCTGCTTCTGACTTACAGAACATCTTACGTTGCTGAAACATCTTACGTTGCTGAAACATGCCACCCGCTGACATT
441     L I N V W K E L H D L D D E E A L A V F E L S Q K N L L T L V K D A R G G D I
1441    CATAGGACTTATTATGAGATGTCATGTCACTAACACGATGTTAAAGGCACCTTCTGACATTTCAGCTGCCAGGAAATGCAACGACCCAACCGATIACGTGCCCCAAAGGAC
481     Y S S Y M V T Q H D V L R D L A L H F C S Q E N V N D R K R L L M P K S D
1561    ACAGAGCTTCCAAAAGAATGGTAAGCAAATCGGAACAGCCATTAACTCCCAAATTGTTCAATTACACAGGCAATGGAAAGAACATGGATTGGCCCTATGATAATTCTGAGCT
521     T E L P K E W L R K S E Q P F N A Q L V S I H T G E M E E M D W A P M I F P E A
1681    AAAGTGCTCATTTAAACTCTCTGAGTGTGATACTTCAACGATGTTAAAGGCACCTTCTGACATTGCAACATGCCAGAGATAAGGCAATTGCTAAATAACATGCAACACATGCAACTCTCACC
561     K V L I L N F S S S G Y F L P S F L C N M P K I R A L I V L N N A T H A T L T
1801    AATTTCICAGTTTTCTAGTTGGTCACTTGAGAGGCCATCCTGGAAAAAAATTTCATGACACAACTTTCGATGAAACATCTGAGCTTCTGCTGAGCTACCTCTGCTGAGCT
601     N F S V F S S L V N L R G I W L E K I S Q L F D C T C P L K H L R K L S L V
1921    TTCTGCAAGATCAACACAGCCCTGACAGAGTGTAGATGATCTCCAGATCTCCGTTCTTCTGAACTTGAATCTGCAACAGCTGGTAAGCTACCTCTGAGCTT
641     F C K I N N S L D E M A V D V S Q I F P F L F E L K I D H C N D L R K L P S S I
2041    TGIGAGATGCAAAGCTCAAGTGCTACCAACTGTCATAATCTCAGICAACTCCCTACCAACTTATGGAAGCTGAAACATCTGAGACTTTTGCTGCTGCCCACTC
681     C E M Q S L R C L S V T N C H N L S Q L P T N L W K L K N L Q I L R L F A C P L
2161    CTCAAACCTATCCCCAACGCTTGTGACTCTGTCATAAGGACATTGACATCTCCAACTTGTGTCTACTTAAACCGACCTCTGAGAAAATTGGCAAGCTGACAAGCTAGAGAAA
721     L K T L S P S I C V L C S C L K Y I D I S Q C V Y L T S L P E E I G K L T S L E K
2281    ATTGAGATGAGAGATGTCACATAGAGGAGACTACCTAGATCAGTTGTCATTGCAATCTCTGTCAGTAACTGCGGAAGAGCCTCGTGGCCTATGGGAGGATTGAAGAGT
761     I D M R E C S L I R R L P R S V V S L Q S L C H V I C E E D V S W L W E D L K S
2401    CATATGCCTATTGATCACATTCAAGTCGCCGAGAAATGCTTCAACTTGAATTGGCTCAAAGAGTGA
801     H M P N L Y I Q V A E K C F N L D W L K E *

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**Figure S2.** Nucleotide and deduced amino acid sequences of cucumber *CsRSF2* CDS encoding a protein. The deduced amino acid sequences are given below the nucleotide sequences. The transcriptional start site is shown in red and the termination codon is marked by an asterisk (\*).



**Figure S3.** Chromosome location of NBS-LRR superfamily in the cucumber. The yellow lines represent *CsRSF1* (Cucs.102240) and *CsRSF2* (Cucs.123410).



**Figure S4.** The structural domain of CsRSF protein. (A) The structural domain of CsRSF1 protein. (B) The structural domain of CsRSF2 protein. Lines represent the sequences of NB-ARC (NBS), LRR and RPW8 domains.

## Supplementary Tables

**Table S1** The primers of PCR used in this study.

Analysis	Primer name	Sequence(5'-3')
PCR for <i>CsRSF1</i>	<i>CsRSF1</i> -F <i>CsRSF1</i> -R	TTGATACATATGCCCGTCGACATGGCGCTGGAATTGGT G GCCCTGCTCACCATGGATCCAAAACCAAGCCACTCC AGGTT
PCR for <i>CsRSF2</i>	<i>CsRSF2</i> -F <i>CsRSF2</i> -R	TTGATACATATGCCCGTCGACATGGCGGTACAGATTTC TTTGT GCCCTGCTCACCATGGATCCCTCTTGAGCCAATCTA AGTTGAAG
<i>CsRSF1</i> -silencing vector	TRVC <i>CsRSF1</i> -F TRVC <i>CsRSF1</i> -R	AAGGTTACCGAATTCTCTAGAGCTCTCCTCTGCAC TTTCA GGGACATGCCGGCGCTCGAGGTCTGCTTGATATAT CTAACTG
<i>CsRSF2</i> -silencing vector	TRVC <i>CsRSF2</i> -F TRVC <i>CsRSF2</i> -R	AAGGTTACCGAATTCTCTAGATCACTCTTGAGCCAAT CTAAG GGGACATGCCGGCGCTCGAGAAGCATTGTGTACT TTCTTG
<i>CsRSF1</i> -overexpression vector	GFP <i>CsRSF1</i> -F GFP <i>CsRSF1</i> -R	TTGATACATATGCCCGTCGACATGGCGCTGGAATTGGT G GCCCTGCTCACCATGGATCCAAAACCAAGCCACTCC AGGTT
<i>CsRSF2</i> -overexpression vector	GFP <i>CsRSF2</i> -F GFP <i>CsRSF2</i> -R	TTGATACATATGCCCGTCGACATGGCGGTACAGATTTC TTTGT GCCCTGCTCACCATGGATCCCTCTTGAGCCAATCTA AGTTGAAG
Chimeric primer for <i>CsRSF1</i> -GFP	<i>CsRSF1</i> -GFP-F <i>CsRSF1</i> -GFP-R	CAAGCTGCCACTGTCGATTG TGGTGCAGATGAACCTCAGGGT
Chimeric primer for <i>CsRSF2</i> -GFP	<i>CsRSF2</i> -GFP-F <i>CsRSF2</i> -GFP-R	TACCTAGATCAGTTGTGTCTTGCA TGGTGCAGATGAACCTCAGGGT

**Table S2** The primers of qRT-PCR used in this study.

Analysis	Primer name	Sequence(5'-3')
<i>CsActin</i> gene for qRT-PCR	Actin-F Actin-R	TCGTGCTGGATTCTGGTG GGCAGTGGTGGTGAACAT
qRT-PCR for <i>CsRSF1</i>	q- <i>CsRSF1</i> -F q- <i>CsRSF1</i> -R	CTACCTTCATTGACATGTGCAC TTCGAGAGGATAGTCGTCAAG
qRT-PCR for <i>CsRSF2</i>	q- <i>CsRSF2</i> -F q- <i>CsRSF2</i> -R	CGGGAAAGACTACTTAGCTAG GTTTGCAACCAGTTACGTTG
<i>Chitinase</i> for qRT-RCR in transgenic cucumber	<i>Chitinase</i> -F <i>Chitinase</i> -R	GCCGCAGTGTCCAATACCAAG TCAGGAGATTGTCCCGCGTTA
<i>CuPil</i> for qRT-RCR in transgenic cucumber	<i>CuPil</i> -F <i>CuPil</i> -R	GCACCAAAACAACGAAAAGG GGCTATAAGGACCGCTACCAT
<i>PR-1a</i> for qRT-RCR in transgenic cucumber	<i>PR-1a</i> -F <i>PR-1a</i> -R	GAACTCTGGCGGACCTTA GCATCTCACTTTGGCACATC