

Table S1. Primers used in this study

	Sequence (5'-3')
ScaF	CTAACTGACCCGCCCTACT
ScaR	CAGGTACGAACATCGGAGT
EscaF	GCAGCACGACCAAGCAACGAC
EscaR	CAGTAGGCGGATACGGCGAAG
18sF	TATACGCTAGTGGAGCTGGAA
18sR	GGGGAGGTAGTGACGAAAAAT
qScaF	CATCACCATCTTCACTGCCAATA
qScaR	ACCGGAAATGAGCAATACGAC
dsGFP-F	TAATACGACTCACTATAGGGCGACGTAAACGGCCACAAGT
dsGFP-R	TAATACGACTCACTATAGGGCTTGTACAGCTCGTCCATGC
Nsg-Scarlet1	GAAATTAAATACGACTCACTATAG <u>AAGCTCCTCCTT</u> AGCCGAGTTTA GAGCTAGAAATAGCAAG
Nsg-Scarlet2	GAAATTAAATACGACTCACTATAG <u>AACTCGAGGGCTCCTGAAGGTTTA</u> GAGCTAGAAATAGCAAG
Nsg-Scarlet3	GAAATTAAATACGACTCACTATAG <u>TGAAGGGCATTTGTGACCAGTTTA</u> GAGCTAGAAATAGCAAG
Esg-Scarlet1	GAAATTAAATACGACTCACTATAG <u>TATGAAGGACATGGCCACCGCTTT</u> AGAGCTAGAAATAGCAAG
T7 sg-re	AAAAGCACCGACTCGGTGCCACTTTCAAGTTGATAACGGACTAGCC TTATTAACTTGCTATTCTAGCTCTAAAC

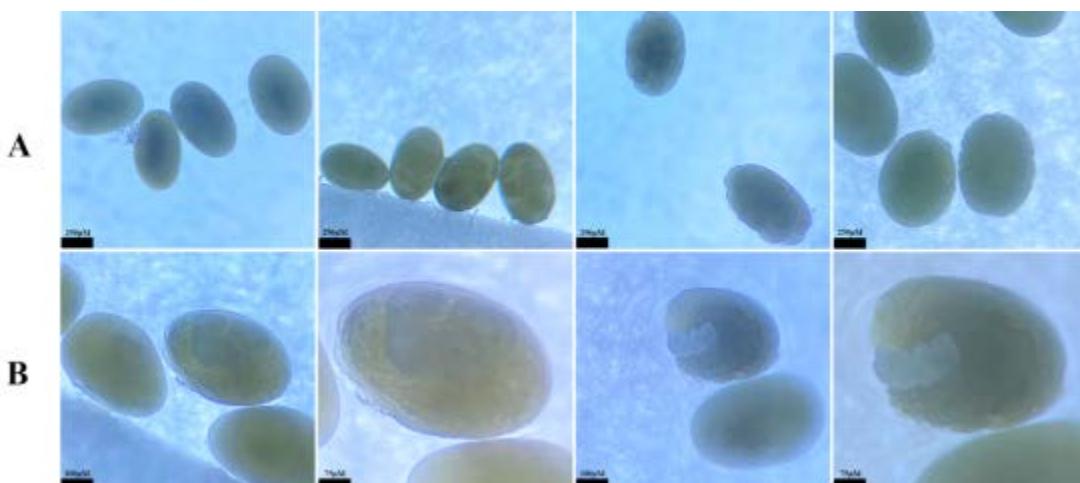


Fig. S1. Observation on embryo development following the microinjection with Phenol Red. (A) Embryos continued to develop after injection with Phenol Red. Single cell stage, 16 cell stage and morula stage of the embryos were shown from left to right. (B) Embryos developed to gastrula stage despite of partial yolk leakage. Leaking yolk coagulated the wound caused by microinjection.

1 ATGGGGTTGGAACAGCAGGAGGAGAGGGCTCTCCTGGCTCTCAGCAGTACGTCTCTATTCCCTCCAGC
 1 M G L E Q Q E E R A S L L G S Q Q Y V F Y S S S
 73 TCAGAGACATACTCCAGTGAATGTCACCGAGCGACCAAGACAATCCAGGTTGGTTAACGCAGTCTGGACTC
 25 S E T Y S S E C L P S D Q D N P G L V K Q S G L
 145 GGGTATGGAACCTGGAAAGTCCGGCAAGGAGGGCATCACGCTCACCTGGAAAGATCTCAGTGTCTATGTTCCC
 49 G Y G T W K S G K E G I T L T W K D L S V Y V P
 217 CAAAAGACGTCTGGTTAGGAAGTCTGAGGATCAAAGACCCTTAAACCGCTCTAAACATGTGTAGGA
 73 Q K T S W F R K S E D Q R P F K R V L N N V S G
 289 GCTGTAGACCGGAAAGTCTAGTGGCATTGATGGATCTAGTGGCCTGGAAATCCACCCATTGACTGCC
 97 A V R P G S L V A L M G S S G A G K S T L M T A
 361 CTGGCTCATCGAACCCCTGGTGGAGTTAGTGGACGGGACATCCTCGTGAACAGCCGTAGAGCCAATCGA
 121 L A H R T P G G V I V D G D I L V N S R R A N R
 433 ATGATGTCATCTTAGCAGGATACGTACATCAGGATGACCTCTCGTCGGGCTTTGACTGTCAAGGAGCAC
 145 M M S S L A G Y V H Q D D L F V G S L T V K E H
 505 TTAACCTCATGGCACGCTTGAGGATGGATCGCCGACGCAACTCTCAACCGAACGCCGGGTGCTAGAA
 169 L T F M A R L R M D R R R S N S Q R N A R V L E
 577 CTCCCTGAAGGAATTGGGCTGTTGAAGGCTCAGAACACACGATTGGTATTCCGGTCAAGACAAGTCGCTC
 193 L L K E L G L L K A Q N T R I G I P G Q D K S L
 649 TCGGGAGGAGAAAGAAAGAGACTGGCTTTGCCACTGAGATC**CTAACTGACCCGCCCTACTCTGTGAC**
 217 S G G E R K R L A F A T E I L T D P P L L F C D
 721 GAACCTACAACAGGATTAGATTCCCTACAATGCCGCAAGCTGGCAGGATGATGAAGGATATGGCTGCCGT
 241 E P T T G L D S Y N A R K L V R M M K D M A A R
 793 GGCAAGACGATCTTGCACTATTCAACCGCTCCGAGGCTTCGCAATGTTGACAAGCTCCTCCTT
 265 G K T I L C T I H Q P S S E V F A M F D K L L L
 865 TTAGCCGAAGGACGTGGCCTATATGGGTTCCCTTCAGGAGCCCTCGAGTTCTAGACAGCCTGGTAC
 289 L A E G R V A Y M G S S S G A L E F L D S L G H
 937 AAATGCCCTCAACGTTCAACCCAGCGGATTACTACATCCACACACTTGCTGTTCTGCCAGGTACGAACAT
 313 K C P S T F N P A D Y Y I H T L A V L P G H E H
 1009 **CGGAGT**CGGGAACGCAATTAGAGAAATATGCGACAATTGGCTGTTCCGGCATACGCAAGGACATCGATATT
 337 R S R E R I K R I C D N F A V S A Y A K D I D I
 1081 ACCATCCAGTATCAAGATAATATGTCATGTCACAATCTGATTCTGAGGAGCTAGTTCTCAGGAAGATATCTTC
 361 T I Q Y Q D N M C M S Q S D S G A S S Q E D I F
 1153 ATCAGGAATATTCCACATAAACCCAACTGGATGGTCAGCTTGGCTCACTGGCTTCCTGGTAGAT
 385 I R N I P H K P N W M V Q L W W L T W R S L V D
 1225 TCCTATCGAAATCCAGCAATTCCATCAGGATATTGCAAGAGATTCTGATAGCCTTTAGTGGGATC
 409 S Y R N P A I H S I R I L Q K I L I A F L V G I
 1297 TGCTACACGAACGTCAAGCTGAACCAGGCTGGTATCCAGGATATCGAAGGCGCTTATTCACTTCAATTAC
 433 C Y T N V K L N Q A G I Q D I E G V L F I F I T
 1369 GAGAACACCTTCCATCTGTACGGAGTGTCAACATCTCCACAGGAGATGCCCTCTCTTCTGGAG
 457 E N T F P S L Y G V L N I F P Q E M P L F L R E
 1441 TACAAAAACGGCATCTACAGGGCAGATACTACTATCTACCAAGAGTGTAGACTGATTCTGGCTTCATT
 481 Y K N G I Y R A D T Y Y L S K M I A L I P G F I
 1513 GTGGATCCAGTTGTCTTTGTTAATATGTTACTGGATGGTGGTTACAGCGCATGCCATCACTCTTC
 505 V D P V V F C L I C Y W M V G L Q R H A Y H F F
 1585 ATGACGGTTCTCATCACCATCTTCACTGCCAATACGCCCTCAGCATGGTTCCATGTTTCGGCATGTT
 529 M T V L I T I F T A N T A S A C G S M F S A M F
 1657 GAGAGTATACCATATAATGTTGTCCTGATACCCCTCGATGTCGTATTGTCATTTCCGGTGGTCTGTT
 553 E S I P Y I M L F L I P F D V V V L L I S G G L F
 1729 ATCAATCTCACAACAATGCCCTGGTCATCGGCTGGGTAAGATATTGTCGTGGTCATGTA
 577 C G A T G A A T G C A T G C G T G A A T T T G C G T G G T C A T G T A C T C G A A T G A A
 1801 I N L T T M P W F I G W V K Y L S W F M Y S N E
 GCTTGGCATTACACAGTGGAGAGGGCGTCAAGAACATAACGTTGAGATGCCACCTGGAGTTCCCTGTATC
 601 A L T I T Q W R G V K N I T C E M P P G V P C I
 1873 AGCACGGGCACCAAGTGATAACTGAATACGCGTCAAGTCGACCCACCTTCGTATGATTGGATTCTC
 625 S T G D Q V I T E Y A F K S T H L S Y D F G F L
 1945 TCCATACTCTATGTTGTTCCACGCCCTGGTCTGTACACGAGAGCTAGAAAGAAATGA
 649 S I L Y V C F H V L G F L G L Y T R A R K K *

Fig. S2. cDNA and amino acid sequence analyses of *scarlet* derived from transcriptome data.

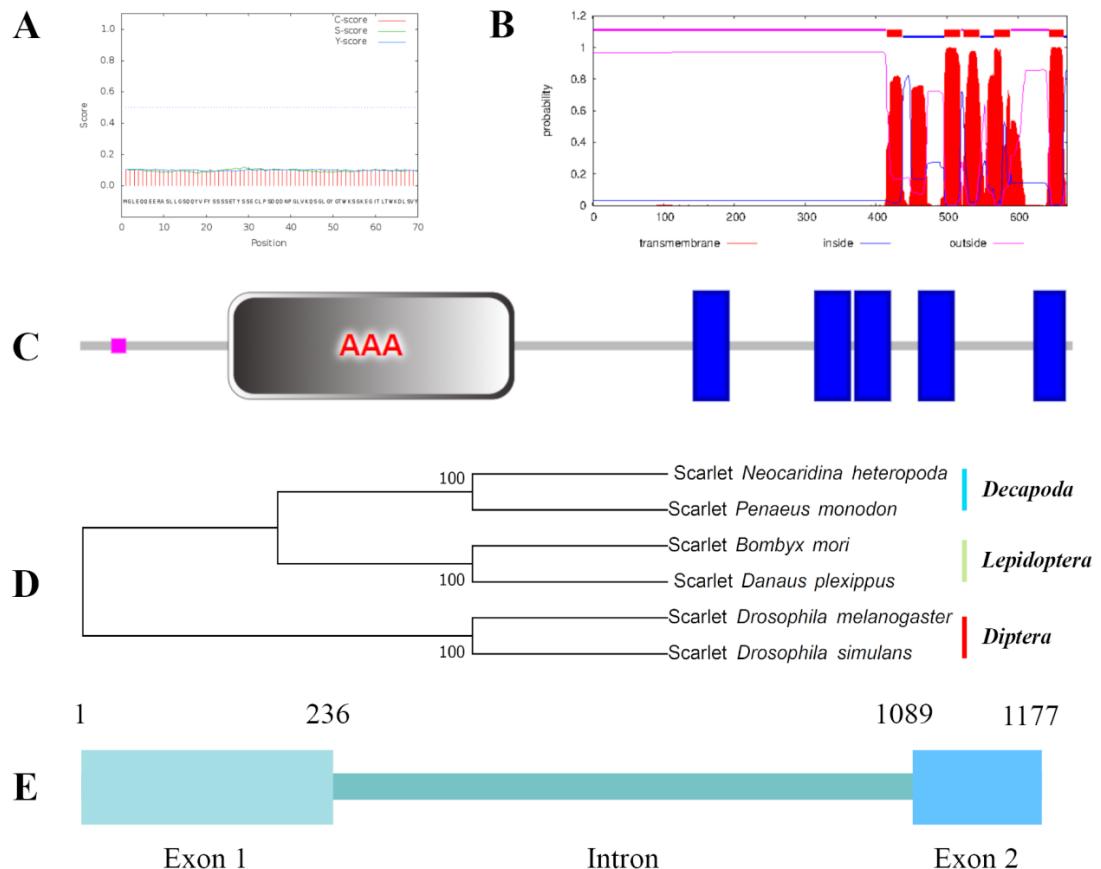
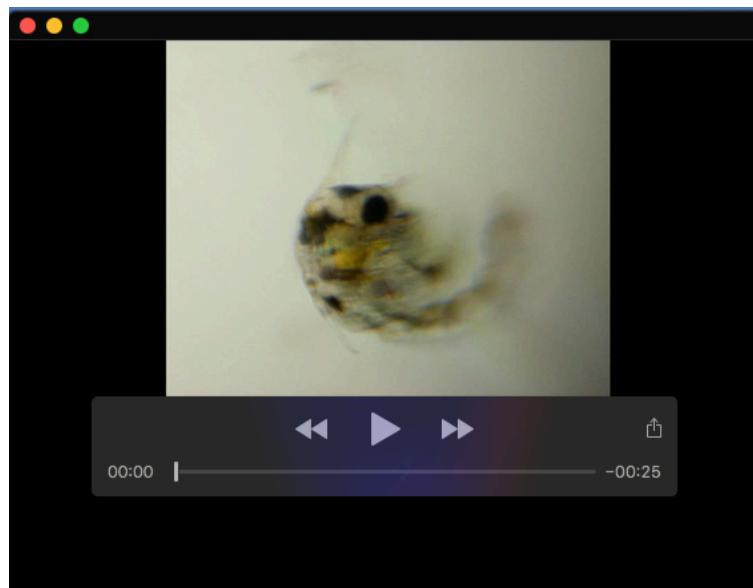


Fig. S3. Domain and bioinformatics analyses of *Nh-scarlet*. (A) The *Nh-Scarlet* protein contained no signal peptide. (B) The *Nh-Scarlet* protein contained multiple transmembrane domains. (C) Domain analysis of the *Nh-Scarlet* protein by SMART. The pink box representd the low complexity region, but its function was not clear. The AAA (ATPases associated with a variety of cellular activities) domain was associated with a variety of cellular activities. The five blue boxes represented transmembrane domains. (D) Phylogenetic tree of *Nh-scarlet*. Both *Nh-scarlet* and the *P. monodon* (Gene Bank: XP_037797831.1) belonged to the order *Decapoda*. *B. mori* (Gene Bank: NP_001243922.1) and *D. plexippus* (Gene Bank: OWR47211.1) belonged to *Lepidoptera*. *D. melanogaster* (Gene Bank: NP_524108.1) and *D. simulans* (Gene Bank: KMZ00060.1) belonged to *Diptera*. (E) Schematic representation of partial genomic structures of *Nh-scarlet*. Numbers represented sequence length.



Movie 1. Zoeae with black eyes in control group were active.



Movie 2. Survived zoeae which were successfully edited showed abnormal eye phenotype but normal vitality.