

## Supplementary data

**Supplementary Table 1. primer pairs used in isolation of *Gh14-3-3* genes.**

| Gene no.         | Primers   |
|------------------|---|
| <i>Gh14-3-3L</i> | 5'-ATGGAGAAGGAAAGAGAGCAACAAGTTTAC-3'<br>5'-TTAACTCTCAGCCTGAGGTTTCATCTGCTTT-3' |
| <i>Gh14-3-3a</i> | 5'-ATGGAAAGAGAGCAACAAGTTTACTTGGCA-3'<br>5'-TTAACTCTCTGCCTGAGGCTCATCTCCTTT-3'  |
| <i>Gh14-3-3e</i> | 5'-ATGTCCCAACTGAATCATCACGAGAGGAA-3'<br>5'-TCACTGCTGTCCCTCGCCTGACTCGTGCTT-3'   |
| <i>Gh14-3-3f</i> | 5'-ATGGCGACGATGGTGCCTGACAATCTAAGC-3'<br>5'-CTATGGCTCGTCTAACTGGTCCTGAACATC-3'  |

**Supplementary Table 2. primer pairs used in overexpression of *Gh14-3-3* genes in yeast cells.**

| Gene no.         | Primers   |
|------------------|---|
| <i>Gh14-3-3L</i> | 5'-GGGCTCGAGATGGAGAAGGAAAGAG-3'<br>5'-GGGGGATCCTTAACTCTCAGCCTGAG-3' |
| <i>Gh14-3-3a</i> | 5'-GGGCTCGAGATGGAAAGAGAGCAAC-3'<br>5'-GGGGGATCCTTAACTCTCTGCCTGAG-3' |
| <i>Gh14-3-3e</i> | 5'-GGGCTCGAGATGTCCCAACTGAATC-3'<br>5'-CTTGGATCCTCACTGCTGTCCCTCGC-3' |

**Supplementary Table 3. Primer pairs used in yeast two-hybrid analysis.**

| Gene no.         | Primers   |
|------------------|---|
| <i>Gh14-3-3L</i> | 5'-GGGCATATGATGGAGAAGGAAAGAGAGCA-3'<br>5'-CTTGGATCCTTAACTCTCAGCCTGAGGTTTC-3'  |
| <i>Gh14-3-3a</i> | 5'-GGGCATATGGAAAGAGAGCAAGTTTACTTGG-3'<br>5'-CTTGGATCCTTAACTCTCTGCCTGAGGCTC-3' |
| <i>Gh14-3-3e</i> | 5'-GGGCATATGTCCCAACTGAATCATCACGAG-3'<br>5'-CTTGGATCCTCACTGCTGTCCCTCGCCTG-3'   |
| <i>Gh14-3-3f</i> | 5'-CTTCATATGGCGACGATGGTGCCTGACA-3'<br>5'-CTTGGATCCCTATGGCTCGTCTAACTG G-3'     |
| <i>Gh14-3-3g</i> | 5'-GGGCATATGTCGCCAACCGAATCATCACG-3'<br>5'-CTTGGATCCTCACTGCTGTCCCTCTCCTG-3'    |
| <i>Gh14-3-3h</i> | 5'-CTTCATATGGATTTCTCCAAGAACGTGA-3'<br>5'-CTTGAA TTCTCATTTCATCTCCTTCACCCAC-3'  |



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tggaagatggaaggactttgctgattacaatftcaaaaggagtcactctcaccttctctctctgctggtggttctaa

## 12. aspartic proteinase

gtttgtgagatggcagtcacatgggtgcaaaagccaactaaacagaaccagactcaggagcgtatacttgattacgtcaatgagctctgaccggtgctagccaatgggaga  
atcagttgttgattgtaacagcctatctgctatgcttagtgcgcttcacaattgggtgaaagatacttgagcttaccctgagcagctacattctaaaagttggtagggagagctag  
ctcaatgacattagcggattcggctctcctgctgacgtaccgctcctcgcgaccactctgacitctggcgacgtgtttatgggtaagttccatcaggttttcgactatggaacatgca  
aattggatttcagaggtactataa

## 13. KEU (keule); protein transporter

ccatgccaagttccatggctcatcaccagctgctgcatccatacatgaggtccagttgctcattccatgagatcaaggaggacccaacatgggctcggcctcgtggtcaga  
cgatgggtattcaagtgattctgtaagacatacatcgagtgattgaaaaagaggggcaaacgcattttgtttatagctggtggagctacaagatctgagctaagagctgtg  
cacaagctaccggaaagtcgaacagggaaagttgttttagctcaaccagattgatgtcccaacagttcatcacgaaactgaagcagttgactccaagtgaaatcattggat  
gatctgcagatatga

## 14. sulfite oxidase

ccattgagagtaattgtccaggtgttataggtgcacgttctgcaagtggtgattctatcaacaataagctgaagaatccagggtctctcatgcaaaaagattacaagatgtt  
ccgccctctgttgattgggataacatcaattggtctacaaggaggccacaatggatttccagttcagctctgattgttctttggaagatgctcagtaataaaccggaaaggt  
aacaattagtgatagcaatcatcaggaggggcccaggaatcgaagaggtgatatactattgatggcggtaaaacctggttgaagcactagatctcagaaccgggtacc  
ccttacaatagcagatcgttaagcagtgacaatgggcatgggtgctttttgaggtcacagttgatccatcactacagctactgagatcgttccaagcgggtgattcggctcaaat  
gtgcaacctgaaaaactgcaagatatttgaacctaagaggtattctcaacactcatggcatcaggttcaagttcgcgtcgggactcaaatatgtaa

## 15. multicopper oxidase

ggatttatggaagtcacccatcagaacaatgacactaagatgcatactatcacatgagtgatgcattttctgtcggaaatggattatggtgagtgctggagaatagcaggg  
gcacataataaagtgaggacgggattgcccgtccacaacacaggtttatctctggtcagtgactgcaatctgatatactgacaatgctggagctggaaccttagaactgaa  
acctgactcatggtatctgtgcaagaacatgctcaggggttcaatcccaggctacaacaaaactgagttgcctatgcctgacaatgcccttttgcgggtccctaaagca  
agttcaaaaagcccgaggtgatcatcatcattggcaacatcaatagagggtagatcaaaaactgttctttacagtgctgatgtttctcgaaccttttctcgtttcccgctag

## 16. cytosolic phosphoglucomutase

ggggcccgatcagatgtgcaaaagttgcaacgctgatgagttgatacaagatccctgtgatggttcaagcatcaaggtattcgttttctcagaggacggatcac  
gattggtcttccgtctctggaactggttcagaaggtgcaactatccgtctgacatcgacaatacgaagaggtatccataaaaataggaagagattccaagaagctctgtct  
ctctgtggaagttgctctgaaacttccgaagatcgagaggtcaccggccgatccgaccaactgttatcacatag

## 17. transferase

aaagaagcagagatgggagcttgaatcgtcaaaatgggatgattgggggctaatgaagttgatttggagatgggaataaacctgcgatgttctgattggttagatcagc  
gttgggtggctgtcattgtattctctctcaggaagataaatacactgtgaaatcattgcaaatcctagcaagtagaggggccattaaactagcagcatgaatcgaaaat  
gctataaaaagaaaagggaaatgctaataattctccttttattgtcatttaaactgttggcattgccaag

## 18. carbonic anhydrase

aggtgatgaaactaaaggcataatggaaatggaaagtgtgtgattgtttgacaagtgaaaaatgggttctcagttcaaaagccataaataatgaaaactggaatgctat  
caagcactgccaaagggtcaagctcctaaattatggtgattgctctgagatcaagggatgcccctcaacctcttggattgaaaccaggagaagcctcatggttcgcaat  
gttgcgaataggtccaacatagagagtgcccatcgaactaatcctgactggaattgctgtaaatcacttgaagttgaaaactgtttcatattgctatagctgctgtgg  
tggcattcgtgccctcatgagatgcaagataaaagcggaaatcaagtagcttaccggagttgggttattgctggaagaaatgcaaaactaagtacaagggctgctgctcaaacct  
cagttttaccagcaatgcacactcggagaaggaatcaatcaaaatcattgttgaactgctactatccatgagatagaagaa

## 19. neutral/alkaline invertase

ggatatttagtgcaaaaatgatgctggaggaccatcacactggggatgattcattggaagaggacaacagatgaagccattgctaagagatcctcctggaattgcta  
a

## 20. autoinhibited H<sup>+</sup> ATPase

gagcgaaccatttcacagagctgaaacaaatggctgaggaagcgaagggagagcagaatgctaggtgagagaactgcatacactgaaagggcatgtggaatcgtggtg  
tgagattgaagaacctggacatagacacaatccagcaagcgtacacgggtgtaa

## 21. ATP binding protein

taccagattggctgagctgtttgacacatccagatcgtatgatcctcctgacgtccgatcaccttttctgaaagctggaagagaggtgcaaaactcaaccagtttggcagag  
gttgatagaatcgtgagaccaggtggaatgattgttcgtgatgaatcagatgccattggtgaggtgagaattgttgaatcactgactgggaagttcatttaactttctcaaa  
gatcaagaaggaataactgagctcagaaggtgattggcggcctacagcatatccagcttccatctga

## 22. signal transducer

actccattgctgtcgtgtgacaggttctgtttttcagcaggtaaaggctactgcttcatcaggaagtagcactcctgacttgcctagaggcctgaaggtatcaaatggtatc  
atgggagctcaaggtcagcagcaaccacccggaggaagattgggatgagtgccacagccgaggaactcaagccctgaaaggcgaatagctccttgaggatgagc  
aacggcattgagggagtgggagaacggcgagatagtagaacagcgtcgacaaggtgccattagtaaaatgaaagtttattgaaatcaagagatatttcaagata  
tggtaagcaaaaggagccaaggtgaaaacagcggttcggattcatcagaaggtctcgttcggccaatcctgaagaaagccaatcaacacatccagaatag

## 23. signal transducer2

gaggacctcgggtcggcagtagggaatgaaaagtagtgatgaaatgattgcaaaagcctctggttgggtcagatggtcacgcggctgcgaaaggaaaaagctccc  
tgatgctcgtgctcagttctgttttccgactcaaggcctactgctgattacgaagtagaacctccgaaatggctgcccgaatgatctaactattggatcactgggacg  
ctctatgctatgctcctcccccataagattgggatgagagaccacagcttacgaaacagacccattctaaaagttgatgagccataactatgacatcgcttttggaa  
gctggtgcacaactgtacagactcctgaaaccacccagatctgcttaccaggtttgaaaggttttcaaacgttttacttttcaacgagatgg

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## 24. calmodulin binding protein

ggaaaagaaccgaacaacgaccagtcacgtggtaagaatgcacatttcgaaggagaaatcagcaagcttacgctcgttaccactcaatttggataataacaatccccgaaa  
tcaagccaaaagccaaaccgaacatcaagtcacatcccttctccgaaccacctccacacatcccgaagctgaagtcgcaagccctagcggcagatcattacccccg  
gatgacgacacaagaagcatagtcagcgtgcaatccgaaccgaagcagacagcattgcccggctcagcgtgacgacgagagcttagcaagctcggcgtcactctc  
cgagttatatgggtaccactaaatcgcaagagccaaaaccaggttgcaaaagcccttgggactagaaagcaatggtacacccgataaaggaccgatcatgacgcaaaaaa  
cgaactgcataatccacttccaccggccaagccgagcggcactccggcccaccgagagtcgataccagcattactaa

## 25. plant synaptotagmin

agaggcgagaagagaagcaaaagcacgtaaaagaaaaacagagatccaagatgggagagggagttcacattcatgttgatgaacctctgttaataaattgcatgtgga  
agttcaaaagcagttcatcaaggttgccctgctccatcccaaggaacactgggttatattgatataatcttcagatgttgaacaacaaaagaatcaatgagagatccatctg  
atagactcaaaagaatggcgccgatccagattgagttgcagtgagagaatataatga

## 26. Root phototropism protein

atgtacagagccatagatatctactcaaggtcaccctactataactgacttggagaggaagaagtttgcagcctaattgattgccagaacctctcgggagcctgcgctc  
acgctgcgcaaaatgaccgttctctgctcagaccgtgttcaagttcttactacgaacaacaacgccttcgagacgctatgaacggaagcagatcaagtggaacttccccctcc  
atacttccagagtgaaattataccctcaacagatataccaccagtttgaatgaacttccagcttgaacgagagaacgagacttgaactagagctagtaaaatgaaaatg  
agattgaaagaataagaagaccatccgctgttccgtagcagcaagcagtcctatggaaattattgtaccatcatctgataagcctcttggcaagaaaatcattcatgaatt  
cagtttcaagaaccttggacgcttatacttccggttccgcttccggtgcaaaagctcgaacaagacctagcaaatagagggcactccatttctga

## 27. PSI P700 apoprotein A2

ggatggttaagagattatctatggttaacttccacaacttacaatgggtataaccatttggatgaaatgattatcagctctggcgtggtgattcttattggacatctgttgggct  
accggattatgttttaattcttggcgcgagattggcaagaatgatgaaactttagcatggcctcatgaacgcacacctttagctaatgttattcagatgagagataaacagctg  
gctcttttattgtcagggcaagattggttgattgcccactttctgtaggttatataattactatgcggcttctgattgcctttacatcgggcaaaattggttaa

## 28. Harpin-induced 1

acagccaaaaccacaagaagtgctacagttacaaccaatcaccgatcgttgcacagacgacgacatcgtattggagaaggttctctcgttctctcgtgcacg  
gaactaaaaacacgaccttgaagctgccataactagtagcaaccaagaactgatgacgctgacgctgcaaatgaaagaaagcttgaagagcaagaaggggctgcca  
ttaaagataaagctgatactaaagtggaagcaaaaatggagcattgaagcacaagaaggttggataaggggtgttgaagggattaaagctactgccccgaagcaaaa  
tcagcaaccacagctcaacttcaatgcaaaatgaaggttattgagactaagatctggaatggacttctga

## 29. clathrin coat assembly protein ap-1

aaagctagaagtcagtagacaaggagcgtagtagctacaaaatgtgagattcgggtgctgctcactgatctccagtcacaaatattcggacatcaatgggatctgcagcttat  
gcacctgaaaatgatcattaatgtgaaaataagatcttctcgttggaaagagtagatattgagggccgagttacttctctagcataacagatgaagagcaactccagag  
agaaaagctctattctgtgaaaggttgagattccgtattttaccgttctggatagacaggttcgatattcgaagatcattgagaaaagtgctaccaggctctccatgggtacgatat  
atcaaatggcaggcagtagtaactaagacttattaa

## 30. hypothetical protein

aggggaaaggttccatgtgaacggcacttgacatgggttagtgcacctaagagacgggggaagcccgtccgacagcgcgtccagcgcgagcttcaaaaggaatcgggt  
taaaattcctgaaccgggacgcggcgtgacggcaacgttagggagtcgggagacgctggcggggcctcgggaagagttatcttctgtttaaagcctgcccaccctgg  
aaacggctcagccggaggttaggtccagcggcggaaagagcaccgcacgctgcctggttccggctcggccccggcggccttgaataatcggaggaccagtgccgtc  
cgccccggctgactcataaccgcatcaggtcccaaggtgaacagcctctgctcaatggaacaattagtagcaagggaaagtcggcaaaatggatccgtaacctcgggaaaa  
ggattgctctgagggctggcagcggggtccagctcccgaaccctgctgctcggcgcactgctcagctgctccccggcggagagcgggtcggcgtcggcggcc  
ggggacggactgggaacggctccctcggggccttccccggcgacgaaca

## 31. conserved hypothetical protein

atggcgattcaggttcagacactcaaaaccaacaagcaaaactgagtagccccctcagactcactgcgttaaatcgactcttggcttaccagaggaatgaccgttctta  
tatcatgctgtccgtgaactgtaccagggcctgtgatttgcggcctctgcatcgagcggctcaaaagatgaggttggatccgtaaccgttatctccaccagaggaagcattg  
gatcgtcacatcagtttctgtaataagttcagggcgtgagtccttcagatgaaacagagcacccttttccatgggaagagttcttcgacgaagcttgattcggcagacct  
cttagactaaatcaagtagcgtattgccgacttgaaggagtcacaacgccttctctctcagatccgatagtttctcagctcttctactaa

## 32. predicted protein

agtgttcagagccagacttggcagaactccaagacaggttattcatcaaaaggaagcagaagcactcactacacaagtcaaaagcatcagggtcggtagggcagctcgtt  
ggttttggtttggctcacagcttctccagaagactgtgggattagcttaagcctcgtcagataaacagctaaagctgggtgaaaagaataaattctactatgatgaaaactta  
agagatgggttgaggaaggtgctgaacctccagctgaagaaccagccttggcaccacctcaaccactgctgattccagaatggaaggtctactacaacttgaactctacatt  
gaacagcagaggtctccttgaatgggagcccagaattaaaaatcaaccctgaactgcttctgggtccacctattctaccatcctcaatcaattctcagctggtg  
acgaatgggtgttcgagcaagatattgacacattcaaccaaggtggtggtggccaagcaaaattatccaatcactgctgttccctctgtaagcctgcaattggcagcaaatg  
caaaagttcttattccattctgcatcaacaacgagcaaatgatggaggaatagccgaaaatgcacaagaagaaaatggaactagtaataaccctacgacatccaatgcgaa  
tgagttctatgaatctgcctgaatatacagaagttt

## 33. predicted protein

gagtttctgagagactcctgacgtctcccagctcatgacatcgggttaaaacttccattatgtccgctaaatcaactcacagtgccgagtcatacacttggtaagcaggc  
gattcacagcagcggcagcagcagtagcgggagttacaactcggcagttcgaattgattgctgacccagaacagggttcttcgagagagcgtcagtagccatt  
ccctcaaaaacaaaggttcttcttacttaccicaagccttagcagtttctgactctgttccggctcgggttaggagagcttttagaccgggtgattggagcagggcggca  
gagtgccgctggcggctggagagtcattgtcgaatgagagcagtgctgactgacataattgaaggaatgaacagaacgtaccgtctacagctctgaggaagaaagaaag  
gattgaaagataccgatccaaaagaaacctcaggaactcacaagaataatcaagttatcatagtaggaaaacattggcagacagcagggcgaagaatccagagcaggtttgca  
ggaatgaagaaattgaaaagaattgtctcaagttgaatggagccaccacatccacattggtgacatcatga

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### 34. predicted protein

tccccgaccgaaaaacttgaccaatcgctggcagaagaaatggggttgaatgggggtcagcatcagtgaggttggttcatagcagggaaccacagtgagacgtgtgtc  
aagacccgacctgccgaggaagaccgggtgagagttcaggaaggaggtaaggtcacctgctgtgaatagatctgtaatgggtcggagcccgtctggaagaaggaccaa  
tcaatccccgtgtagggccagactgatccgggagagacggataatagcaaaaaagtggagcagcagcatggtgcaactactacaaccacatggaaggaaaaatggccaagt  
agcaataacaatgcagctacatcaagtgtcccaaatgaatcacttgaaaatcctctgttcccttgaatgttcatctttctctag

### 35. predicted protein

ggcggacactttttgttatctaaaggcgaagactctgaagtgggcgaactcggccagcggcgcaaatgccgggctccggctccgcacctgctgacaccttgaagc  
acttttagtgtgcctttagtttagaatgtgtcgttcagcatcacgagctacaagccttctcatttcagtgctcgcctttgaatctcagtagggggcctttagcttttgattagatgag  
gggtcgcg

### 36. hypothetical protein isoform 2

gaagaatgggaaaaactgcagctgaagattgcaactccatcaagaaacagatgaatcagaccaagataaaaagagagtgaattccccaaaaatggtaaatgttgaagaaggat  
agcagaacacagtaaaagtgggatgcagctgctccatctcgatcaagaagaataatgacaagttgtgggttgggaaaaggcatggggagaacaaaatgccgagacctc  
tgaaagttcgaaggcccgacctcgatggtccaggggatcgaagtccggcttcatctgccaacacaggagcattctattctgtag

### 37. unnamed protein product

ggagatgcatgcagcacagcatgtatactgaaagtgatactgctattctctgatgggaaagcaccctctgaaaagcttcagaaggagagaaaaccagtcacacctaaagta  
tgccgaagattttgcatcaaaacgaagaagctggagaatggtttacagagcttgacaagagagcctcaatctggacttaagattggaatgacagatctagagaagattccgt  
catcaatgtttccaagttccatggctgggggcaagctgacggcactgagacctcattgctctgatgcaattgctagttctcaaaattctctccagagatcgaattgcac  
tcccgatgccccgtaatcctcctgacaggggtacaatgtcttcccttga

### 38. hypothetical protein

gacggtgaagattcaaggagactgaagttcaaaagcaagcctaaaggacccttgataaccatggatgctctacaagaggttttacctacgagaaaaggatatcaagtttataat  
ggcaaatcaaaagtccttactagttctgctgatgctgctactgctcctctgttaaaagaattgcaaaaccggacaatccttataatgaaaacgcaagaacttattaactcgtggtca  
aagcgattaggcaactcatatggaagtgaatgcttccggaactactatgagtagctcagacttgaacttgatgcatcatcaccgtctagttgtcttccacctctacatccacagta  
taaaaaatcaactatgattagttcatcgtatgctgctcaaccgaattgaaaccctccgtgccggcttctct

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