

**Glycine-rich RNA-binding proteins are functionally conserved in *Arabidopsis thaliana* and *Oryza sativa* during cold adaptation process**

Joo Yeol Kim, Won Yong Kim, Kyung Jin Kwak, Seung Han Oh, Yeon Soo Han, and Hunseung Kang

**Supplemental Table S1.** Gene-specific primer pairs used in the RT-PCR experiments

Gene	Primer (5' to 3')
<u>For real-time RT-PCR</u>	
OsGRP1	Forward; GTTCAATGCTGCTCGTCTGATGTCC Reverse; ACCCGAGCTTCAGTCACATCCC
OsGRP2	Forward; GAGATGCCCAACCACGTCTTCC Reverse; TGTGGTATCTGTGGTATCGAGGTCG
OsGRP3	Forward; GACTCCAAGATCATCAACGACAGG Reverse; GTCGAGCTCCTTGCCGTTTCATG
OsGRP4	Forward; GAAGCCGCCAATAAAGCAAAGG Reverse; TGTCGCTCTTGGACTGGAATCTG
OsGRP5	Forward; GGTGGGACAACGACTACAATGGC Reverse; TTGGAGAAGGAGTCCTTGAGGGAG
OsGRP6	Forward; AACATCAGGGTTAACTGCCAATG Reverse; ACCACTGTAGCCACCACCACCATAG
pBC121	Forward; TTGACTGGCTTTCCAACAACATTGC Reverse; TTTGTGAGAGGCAACCTATGTGTGG
DREB1A	Forward; GGGATCAAGCAGGAGATGAGCG Reverse; TGCCTCGTCTCCCTGAACTTGG
OsActin	Forward; TCGGATAATGGAACTGGTATGG Reverse; AAGACAGCCCTGGGCGCATCA
<u>For RT-PCR</u>	
OsGRP1	Forward; CGGTAGCTTCCTCAGGCACAG Reverse; CCTCTTGACCTTCCAGATTCTCTG
OsGRP4	Forward; CAAATTCACAAAACATGGC Reverse; TTCAAACACAGCAGGTAGG
OsGRP6	Forward; ATGGGAATAGCCAATAAG Reverse; TACTACTATCGGCGCATAAC
AtActin	Forward; CAGAGCGGGAAATTGTAAGAG Reverse; CCTTTCAGGTGGTGCAACGAC

## Supplemental Figure Legend

**Supplemental Figure S1.** Alignment of the amino acid sequences of OsGRPs. The alignment was made using the ClustalW program. Gaps in the sequences are indicated by dashes. The positions of ribonucleoprotein (RNP) 1 and 2 regions are indicated by boxes. The arbitrary gene number for each OsGRP is indicated in parenthesis next to the corresponding accession numbers.

**Supplemental Figure S2.** Growth of BX04 *E. coli* mutant cells expressing OsGRPs at 37°C. The diluted cultures ( $10^{-1}$  to  $10^{-5}$  dilution) of the BX04 cells harboring each OsGRP, CspA (positive control), or pINIII vector (negative control) were spotted on LB-agar plates and incubated at 37°C. The pictures were taken 1 day after incubation.

**Supplemental Figure S3.** Purification of recombinant proteins and nucleic acid-melting activities of OsGRPs. (A) The OsGRPs were cloned into pGEX-4T-3 vector, and *E. coli* BL21 cells harboring each construct were cultured in the presence of 0.4 mM IPTG. The GST-OsGRP fusion proteins as well as GST (negative control) and CspA (positive control) were purified and analyzed via SDS-PAGE. (B) For DNA-melting assay, the fluorescence of a molecular beacon was monitored as the recombinant GST fusion proteins (10 to 30 µg) were added.

**Supplemental Figure S4.** Confirmation of transgenic *Arabidopsis* plants expressing OsGRP. Expression of (A) OsGRP1, (B) OsGRP4, and (C) OsGRP6 in *grp7* mutant was verified in the transgenic lines (C1-5, C1-7 and C1-9 for OsGRP1; C4-2, C4-7 and C4-11 for OsGRP4; C6-4 and C6-5 for OsGRP6) by RT-PCR analysis. Actin was used as a reference to show that

equal amounts of RNA were used in the analysis.

**Supplemental Figure S5.** Cellular localization of OsGRP1 and OsGRP4. Confocal image of the leaf and root showing the localization of OsGRP1-GFP and OsGRP4-GFP fusion proteins in the chloroplast and in the nucleus, respectively. Bar = 50  $\mu\text{m}$ .

RNP2

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Os03g46770 (3) 1 -----MAAPDVEYRCFVGGLAWATDDRSLEAAFSTY
Os12g31800 (6) 1 MALANKIGNLLLR-----ATSSSPALYQSIRCMSSKLFVGGLSYGTDEQSLRDTFANY
Os01g68790 (1) 1 MAAFNKLGSFLHSGLTSSASAGSSPAMFNAARLMSTKLFVGGLSWNTNDSLKEAFTSF
Os05g13620 (5) 1 MSAP-----WWDNDYNGRTGSDSKGQESRVYVGNLEYRADERSLKDSSFSNY
Os04g33810 (4) 1 MAMAALREASRLVSRRESPAAYARPFLLHSRGTTYRLFTGGLSQFATEDSLAAFSQY
Os03g56020 (2) 1 -----MLEERKLFVAGLPQCTREGDLRGHFARY

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RNP1

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Os03g46770 (3) 32 GEILLSKIIINDRETGRSRGFGFVTFSSEQSMR--DATEGMNGKELDGRNIIVNEACSRRS
Os12g31800 (6) 55 GCVLEAKIINDRETGRSRGFGFITYASSEEDAS--AITALIGKOLDGRNIRVNIAERTG
Os01g68790 (1) 61 GDVTEARVINDRESGRSRGFGFVSFANGDAK--SAMDAMIGKELEGRSIRVNEAERPP
Os05g13620 (5) 47 G-AVSSEIAVDRETGRSRGFGFVSFQDSKSAS--DAIKGMNGQDIGRNVIVCEAQFRSR
Os04g33810 (4) 61 GCVLEATIVIDMTINREKGFGFVKFASEEDAN--KAKEMNGKVLNGRVIYVDIAKARMN
Os03g56020 (2) 29 GEVVHTRVVLDMASGNSRGFGFVVFAEEAATLRALADEMPNHVFRGRKVMMEDLLIIH

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Os03g46770 (3) 90 -----GGGGGGYGGGGGGYGGGRGGGGYGGGGGSYGRREEG--YGGGGY
Os12g31800 (6) 113 GFRSGGGGYGGGGYGGGGGGYGGGGYSGGGYGGGGYSGGGGGGGYQGGGGYGGNNGG
Os01g68790 (1) 119 -----CNRGGGGYGGGGG-----YCNQGGY
Os05g13620 (5) 104 R-----
Os04g33810 (4) 119 -----RTT
Os03g56020 (2) 89 -----VMLMEDQLDISMILWVLTIMLKIIKLLLSTSIPQ

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Os03g46770 (3) 134 GGRGGGGGGYGGSRG-----GGYGGDSG
Os12g31800 (6) 173 YGNRGGGGGGYGVAEGSADAFSGINLGGDGSFGGNPAGSFGDAGSTGGDFSGAGDSF
Os01g68790 (1) 140 GDGNRGGGY-----
Os05g13620 (5) -----
Os04g33810 (4) 122 DSSPRTCPPKPPDRC-----
Os03g56020 (2) 124 IPCRNDLLRQRRSWMGRR-----

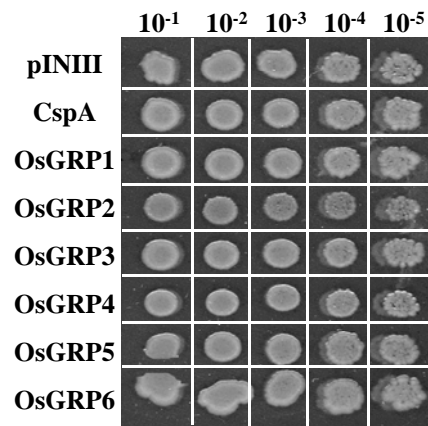
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Os03g46770 (3) 158 GNWRN-----
Os12g31800 (6) 233 GSRKNDELMDDLFKDDEPDNYANKQG
Os01g68790 (1) -----
Os05g13620 (5) -----
Os04g33810 (4) -----
Os03g56020 (2) -----

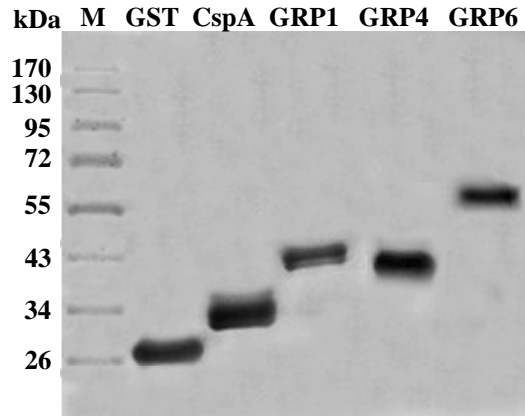
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Supplemental Fig. S1

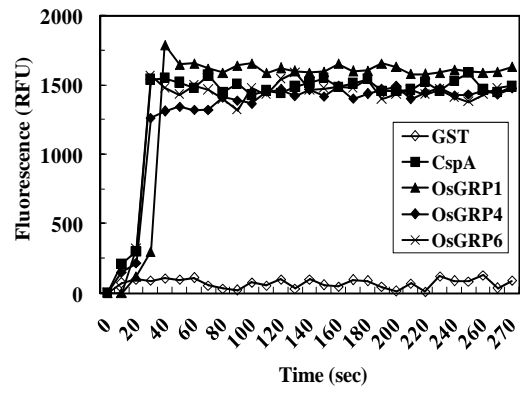


**Supplemental Fig. S2**

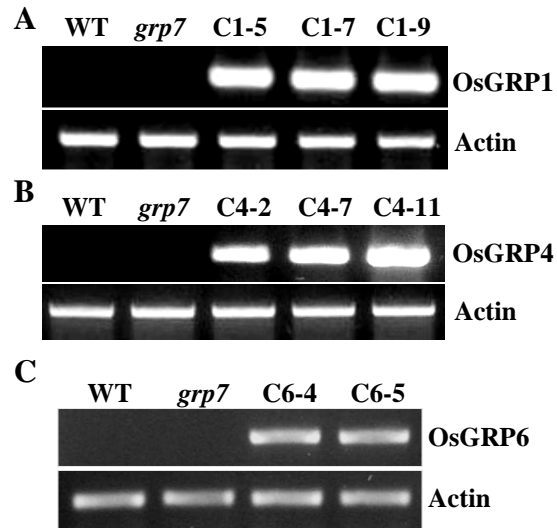
**A**



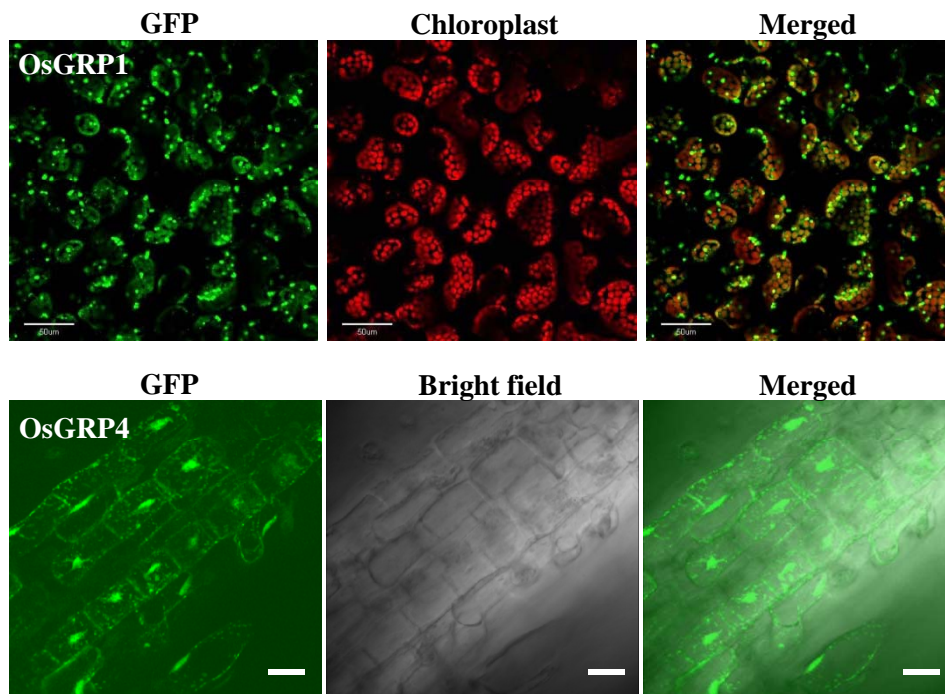
**B**



**Supplemental Fig. S3**



Supplemental Fig. S4



**Supplemental Fig. S5**