**Supplementary table S3:** **qPCR of stress responsive genes validate the role GPA1 and GCR1 in regulating abiotic stresses.** These genes have been implicated in various abiotic stress response previously and also found to be differentially regulated in our transcriptome data (GEO accession no. GSE 40217). The values are given as average of log2 fold change±SE obtained from 3 independent experiments each having technical triplicates. Values followed by different letters are significantly different at 5 % level as determined by Duncan’s test.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Control | cold (4 °C) | heat (37 °C) | NaCl (100 mM) |
|  | **Ws2** | ***gcr1-5*** | ***gpa1-5*** | ***gpa1-5gcr1-5*** | **Ws2** | ***gcr1-5*** | ***gpa1-5*** | ***gpa1-5gcr1-5*** | **Ws2** | ***gcr1-5*** | ***gpa1-5*** | ***gpa1-5gcr1-5*** | **Ws2** | ***gcr1-5*** | ***gpa1-5*** | ***gpa1-5gcr1-5*** |
| ERF13 | 0.00±0.00a | 1.60±0.15b | 1.45±0.06c | 1.91±0.12b | 4.23±0.52a | 5.13±0.32a | 5.93±0.20c | 6.10±0.12bc | -4.87±0.18ab | -2.20±0.06d | -3.24±0.09a | -1.88±0.12e | 9.53±0.35d | 11.90±0.17de | 11.37±0.21bd | 8.93±0.42ab |
| CML37 | 0.00±0.00a | 1.26±0.04b | 1.03±0.10a | 0.78±0.05b | 5.17±0.20bc | 6.29±0.32b | 5.33±0.07c | 5.08±0.27bc | 2.23±0.09d | 4.00±0.28e | 3.10±0.21b | 3.65±0.30bd | 7.83±0.20de | 10.81±0.26d | 9.23±0.32e | 8.11±0.11f |
| RRTF1 | 0.00±0.00a | 4.00±0.12b | 0.69±0.04c | 0.51±0.02d | -3.60±0.31e | 0.09±0.04be | -4.00±0.25d | -2.90±0.15b | -2.98±0.19bc | -1.97±0.28bd | -2.87±0.12f | -3.27±0.09de | 8.25±0.32f | 12.33±0.47f | 9.07±0.37d | 6.93±0.35c |
| LTP4 | 0.00±0.00a | -0.28±0.03b | -1.00±0.12c | -1.49±0.19c | -2.60±0.29d | -2.67±0.29d | -3.16±0.29c | -4.29±0.08bc | 4.73±0.24bc | 4.23±0.32d | 2.94±0.24d | 2.10±0.12cd | 10.64±0.48e | 10.71±0.26e | 8.61±0.09e | 8.26±0.31e |
| WRKY46 | 0.00±0.00a | 1.06±0.09b | 1.31±0.07c | 1.09±0.06b | 3.87±0.22d | 4.97±0.28e | 4.10±0.10e | 4.50±0.06d | -1.77±0.18bc | -1.73±0.23e | -2.47±0.17f | -3.03±0.22ef | 5.67±0.23e | 6.07±0.19de | 6.90±0.15de | 5.03±0.22g |
| RD26 | 0.00±0.00a | 0.74±0.05a | 0.43±0.04a | 1.15±0.08b | 6.47±0.28c | 7.03±0.43d | 7.37±0.56c | 8.07±0.09cd | 2.70±0.25b | 3.97±0.28e | 3.97±0.28e | 3.13±0.18de | 5.10±0.26c | 4.90±0.25e | 6.07±0.23c | 5.93±0.27bc |
| ERF6 | 0.00±0.00a | 0.68±0.03a | 0.70±0.04a | 1.12±0.04b | 8.80±0.21c | 9.07±0.24d | 8.10±0.17c | 11.47±0.35e | -6.73±0.24cd | -6.95±0.21cd | -5.57±0.27bc | -5.90±0.35bc | 5.40±0.21bc | 5.87±0.28bc | 5.97±0.28f | 6.00±0.15g |
| KCS2 | 0.00±0.00a | -0.31±0.02a | -0.44±0.07a | -1.10±0.07b | -3.43±0.19c | -4.13±0.18bc | -2.41±0.21b | -4.27±0.28bc | 1.57±0.12b | 2.53±0.18d | 1.47±0.18b | 2.20±0.06b | 5.80±0.23bc | 6.07±0.19bc | 5.90±0.25b | 4.40±0.12c |
| CRK11 | 0.00±0.00a | 1.37±0.13b | 0.70±0.08a | 2.01±0.21c | -1.41±0.13d | 0.15±0.01a | -2.18±0.06e | -2.16±0.43e | -1.58±0.26e | 0.39±0.02a | -2.73±0.19e | -1.85±0.17de | 5.14±0.21f | 9.81±0.10g | 5.74±0.28f | 7.27±0.30fg |
| YLS9 | 0.00±0.00a | -0.57±0.03a | -1.20±0.07b | -0.89±0.05a | -2.97±0.35c | -3.87±0.18c | -4.53±0.18d | -4.57±0.15d | -2.10±0.17bc | -3.07±0.15c | -3.17±0.09bc | -4.10±0.32d | 5.07±0.39e | 4.83±0.20f | 5.30±0.29e | 3.85±0.19ef |
| RD29A | 0.00±0.00a | 0.44±0.03a | 0.48±0.03a | 1.11±0.06b | 7.67±0.29c | 7.49±0.32c | 7.28±0.45bc | 8.61±0.27bc | 2.23±0.16b | 2.78±0.23b | 2.84±0.20bc | 5.54±0.30c | 5.89±0.18d | 5.14±0.31cd | 5.15±0.20d | 6.87±0.31e |
| AT-PP2A5 | 0.00±0.00a | 1.92±0.11a | 1.13±0.06b | 2.04±0.16a | 7.73±0.33c | 9.51±0.29bc | 8.90±0.34d | 10.07±0.11bd | -3.80±0.23e | -1.99±0.16f | -1.31±0.09a | -1.79±0.28ef | 2.61±0.32a | 4.19±0.24ab | 5.06±0.17c | 5.97±0.38cd |
| LOX4 | 0.00±0.00a | 1.33±0.06b | 0.58±0.03a | 1.57±0.09b | 5.10±0.12c | 7.03±0.12bc | 5.47±0.18c | 5.97±0.28c | -2.20±0.15d | -2.90±0.25d | -2.63±0.28bd | -2.97±0.19 | 6.90±0.26bc | 7.93±0.24c | 5.03±0.22b | 9.83±0.14bd |
| ELIP1 | 0.00±0.00a | 0.09±0.04a | -0.44±0.06a | -1.03±0.04b | 4.37±0.15c | 4.20±0.06c | 2.10±0.12d | 2.87±0.22d | 3.63±0.30cd | 3.63±0.30d | 2.97±0.28c | 2.73±0.29cd | 4.73±0.62c | 4.93±0.17c | 5.00±0.42cd | 4.40±0.12d |
| CML38 | 0.00±0.00a | 1.29±0.04b | 1.35±0.06b | 1.65±0.07c | 7.53±0.48d | 7.89±0.39d | 7.92±0.17c | 9.26±0.34bd | -4.36±0.42e | -4.23±0.32f | -2.68±0.28ef | -2.04±0.41e | 1.89±0.21b | 3.67±0.29d | 4.17±0.23bd | 1.65±0.07bc |
| LDOX | 0.00±0.00a | -0.43±0.06a | -2.65±0.24b | -1.95±0.08b | -2.63±0.38b | -3.53±0.18c | -5.03±0.19d | -4.19±0.22bc | -4.70±0.26bc | -5.43±0.19d | -5.94±0.24b | -4.09±0.12bd | 3.07±0.20e | 1.89±0.14f | 4.03±0.33g | 4.11±0.25g |
| CNI1 | 0.00±0.00a | 1.26±0.11b | 0.71±0.08a | 1.25±0.12b | 1.90±0.21b | 2.45±0.10c | 2.92±0.24c | 4.15±0.26bc | 2.06±0.18c | 3.87±0.38bc | 1.77±0.26d | 5.97±0.31cd | 3.30±0.15cd | 4.09±0.33d | 3.79±0.24d | 5.29±0.22cd |
| At1g55450 | 0.00±0.00 | 1.24± 0.06b | 0.65± 0.03a | 1.29± 0.01b | 3.03± 0.27c | 3.93± 0.37c | 3.13± 0.03d | 5.07± 0.19bc | -2.50± 0.40e | -4.87± 0.34f | -2.93± 0.23e | -2.83± 0.19 | 3.67± 0.29bd | 5.07± 0.19bd | 3.70± 0.26d | 6.10± 0.25c |
| ZAT11 | 0.00±0.00a | 2.22± 0.20b | 1.33± 0.04c | 2.31± 0.06b | 2.40± 0.32b | 5.20± 0.26bc | 3.93± 0.27d | 5.07± 0.19bd | -3.10± 0.20e | -1.60± 0.35f | -3.90± 0.25d | -2.07± 0.19g | 6.43± 0.46d | 8.23± 0.26bd | 3.60± 0.12b | 6.87± 0.18bc |
| CMPG1 | 0.00±0.00a | 1.39± 0.11b | 0.82± 0.06a | 0.70± 0.03a | 3.84± 0.26c | 5.09± 0.11d | 5.10± 0.06d | 4.13± 0.03c | -1.52± 0.14e | -2.27± 0.09f | -2.17± 0.03f | -2.73± 0.20ef | 2.93± 0.24c | 5.79± 0.22cd | 3.07± 0.14d | 3.07± 0.24d |
| MLO12 | 0.00±0.00a | 2.21± 0.06b | 0.89± 0.05a | 1.10± 0.06b | 1.50± 0.05c | 4.37± 0.12d | 1.83± 0.15b | 2.35± 0.04b | 1.15± 0.05c | 5.53± 0.28cd | 1.43± 0.12bc | 1.63± 0.12bc | 3.75± 0.16d | 6.97± 0.28e | 2.90± 0.25b | 3.17± 0.28cd |
| VSP2 | 0.00±0.00a | -0.02± 0.01a | -1.19± 0.21b | -1.17± 0.05b | -2.03± 0.15c | -2.10± 0.21c | -3.03± 0.23d | -3.03± 0.32d | -2.37± 0.29 | -2.40± 0.38c | -3.33± 0.22cd | -3.03± 0.18bd | 2.17± 0.19e | 2.10± 0.21e | 1.73± 0.20f | 1.97± 0.19e |
| NRT2 | 0.00±0.00a | 1.07± 0.08b | 2.00± 0.07b | 0.16± 0.01a | -2.87± 0.24c | -3.89± 0.17d | -2.14± 0.09c | -2.97± 0.34c | -5.13± 0.58e | -5.06± 0.43e | -2.99± 0.17cd | -4.74± 0.29d | -3.00± 0.38cd | -4.02± 0.20bd | 0.15± 0.02a | -2.88± 0.29e |
| SPX1 | 0.00±0.00a | -1.19± 0.10b | -0.54± 0.03a | -0.42± 0.04a | 3.23± 0.20c | 2.03± 0.23d | 2.77± 0.23d | 2.90± 0.21cd | -2.10± 0.21ab | -2.77± 0.23b | -2.70± 0.21bc | -2.83± 0.15b | -1.10± 0.15e | -2.37± 0.18be | -1.60± 0.12e | -1.70± 0.15be |
| PDF1.2 | 0.00±0.00a | 1.53± 0.05b | 0.37± 0.03a | -0.56± 0.03c | -1.73± 0.28d | -3.93± 0.32e | -1.87± 0.12d | -2.07± 0.15bd | -3.87± 0.29de | -5.80± 0.23f | -4.13± 0.20ef | -4.07± 0.19f | -2.13± 0.26d | -3.67± 0.29f | -2.09± 0.12d | -2.37± 0.15d |
| ASN1 | 0.00±0.00a | -0.72± 0.05a | 1.24± 0.05b | 1.79± 0.03b | -3.67± 0.29c | -4.20± 0.06d | -2.09± 0.10e | -4.17± 0.26d | 2.47± 0.18b | 3.00± 0.20c | 2.27± 0.19bc | 3.90± 0.25e | -2.43± 0.27c | -2.63± 0.23cd | -3.37± 0.22d | -3.07± 0.20f |
| At4g30170 | 0.00±0.00a | 0.14± 0.03a | 1.59± 0.03b | 0.88± 0.05c | -2.73± 0.20d | -2.70± 0.21d | -2.80± 0.35d | -2.77± 0.18d | -3.20± 0.25e | -3.17± 0.38de | -4.33± 0.33e | -3.07± 0.26d | -2.83± 0.23c | -3.13± 0.26b | -3.87± 0.23de | -3.03± 0.18bd |
| At5g19890 | 0.00±0.00a | 0.83± 0.05a | 0.77± 0.06a | 1.19± 0.10b | -1.50± 0.06c | -2.23± 0.09d | -2.00± 0.15d | -2.33± 0.09c | -1.53± 0.30c | -2.37± 0.12cd | -1.50± 0.15d | -2.53± 0.13d | -4.50± 0.36e | -4.53± 0.18f | -4.97± 0.28g | -4.97± 0.19g |