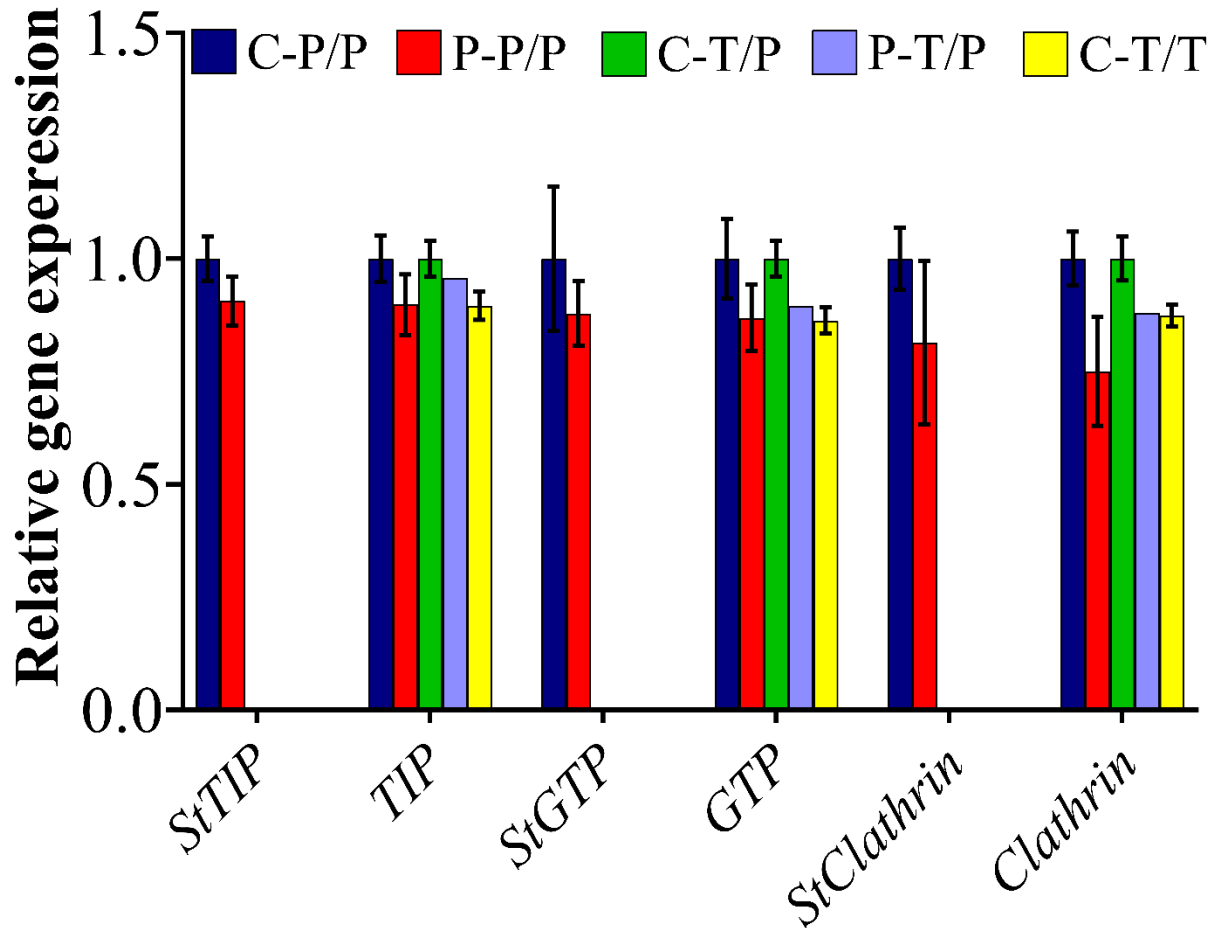
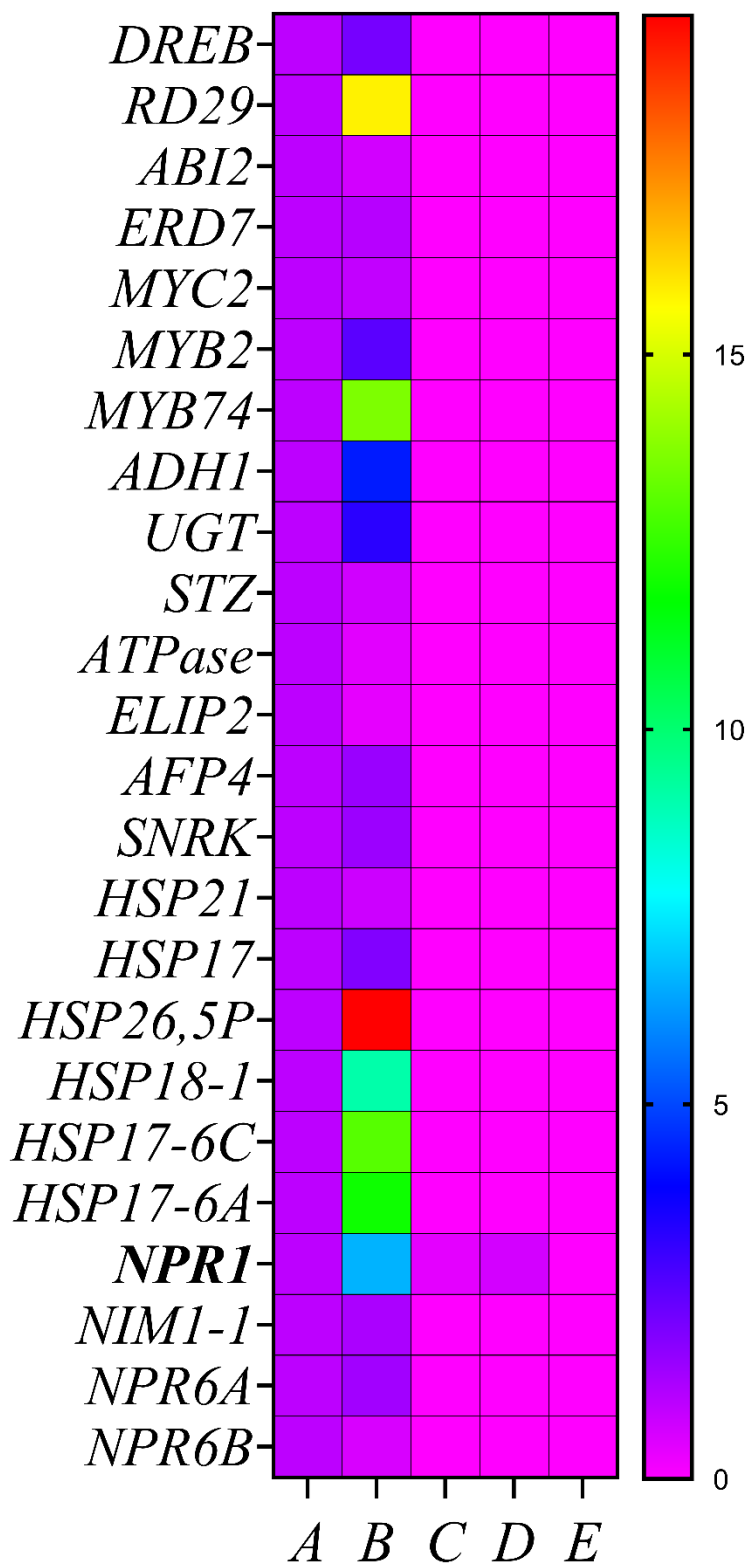


# Rootstocks Overexpressing *StNPR1* and *StDREB1* Improve Osmotic Stress Tolerance of Wild-Type Scion in Transgrafted Tobacco Plants

## Supplementary materials



**Figure S1. Transport of housekeeping mRNAs from the potato rootstock to the tomato scion 6 h after exposure to osmotic stress.** Control-potato homograft (C-P/P), PEG-potato homograft (P-P/P), control-tomato/potato heterograft (C-T/P), PEG-tomato/potato heterograft (P-T/P) and control tomato homograft (C-T/T). The relative expression of potato genes in P-P/P was calculated relative to the control (C-P/P). The relative expression of tomato genes in tomato scions was calculated relative to the control (C-T/T). The values are the mean of three biological replicates. *StGTP* – *StTIP* – *StClathrin* are results of specific potato primers used to test the transport of the housekeeping genes' transcripts and *GTP* – *TIP* – *Clathrin* results of primers used to amplify both potato and tomato transcripts to select the most consistent reference gene.



**Figure S2. Heat map shows the transport of ORG mRNAs from the potato rootstock to the tomato scion 6 h after exposure to osmotic stress, assessed by qRT-PCR.** Plants were osmotically stressed by watering with 30% PEG (6000) four weeks after graft establishment. Tissues samples located 5 cm above the graft union were collected from untreated plants (control) and 6 h of PEG-treated plants. A represents control-potato homograft (C-P/P), B represents PEG-potato homograft (P-P/P), C represents control-tomato/potato heterograft (C-T/P), D represents PEG-tomato/potato heterograft (P-T/P) and E represents control tomato homograft (C-T/T). The relative expression of potato genes was calculated relative to the control (C-P/P), and normalized to TIP. The bars show the normalized relative expression of potato ORG. Values were obtained from the means  $\pm$  SEM, n = 3. The purple color means that the transcripts were not detected in the scion of C, D and E for all tested ORG except for NPR1, potato transcripts were not detected in control tomato homograft only.

**Table S1. Sequence of primers used to assess expression of osmotic related genes in potato and tomato homo and heterografts.**

Accession #	Gene Name	Primer sequence
<b>Primers used for qRT-PCR</b>		
PGSC0003DMT400068136	<i>Vacuolar H<sup>+</sup>-ATPase A2 - F</i>	AAATGGGAAGGTGCTTGG
PGSC0003DMT400068136	<i>Vacuolar H<sup>+</sup>-ATPase A2 - R</i>	TCGAGGACAACAAATTCCAG
PGSC0003DMT400037083	<i>LTI65 - F</i>	GGGAAAAGTGATCAGGATGC
PGSC0003DMT400037083	<i>LTI65 - R</i>	TTTGAAGGGACGGACTCAA
PGSC0003DMT40003201	<i>DREB - F</i>	CCCCTGAAATGGCTGCAAG
PGSC0003DMT40003201	<i>DREB - R</i>	CGAGGCAACGATTCAACGA
PGSC0003DMT400045204	<i>MYC2 - F</i>	CGTCGAGGGCTTTGAATTA
PGSC0003DMT400045204	<i>MYC2 - R</i>	GGCGTACGTAGCTGCAAAT
PGSC0003DMT400022600	<i>MYB2 - F</i>	AGCTTTTGGGGAGAGAGACA
PGSC0003DMT400022600	<i>MYB2 - R</i>	TTAACCCAACCCAATTCCA
PGSC0003DMT400057690	<i>MYB 74 - F</i>	GTAACCAAATTCAAGCCCCTA
PGSC0003DMT400057690	<i>MYB 74 -R</i>	AAATGTTGAACCATCGGATGT
PGSC0003DMT400066189	<i>St-TIP4 1 -F</i>	CTTGGAAGAGGTTGCTGGT
PGSC0003DMT400066189	<i>St-TIP4 1 - R</i>	TGGGTTCTGTGTCGTTTCATT
PGSC0003DMT400052825	<i>St-Clathrin - F</i>	GTTTGGAATGAGGCAAAG
PGSC0003DMT400052825	<i>St-Clathrin - R</i>	CATTTCAGGAACCAGACAA

PGSC0003DMT400023327	<i>St-GTPase – F</i>	TTCCCGTCTGGAAAAGATGG
PGSC0003DMT400023327	<i>St-GTPase – R</i>	TGCTGAAGAAGAAGCGGATAA
PGSC0003DMT400066189	<i>Sl &amp; St-TIP4 1 -F</i>	GTTGGGAGATCGAGTGTCTG
PGSC0003DMT400066189	<i>Sl &amp; St-TIP4 1 – R</i>	CATCTCCGGCAAGTGAGTT
PGSC0003DMT400052825	<i>Sl &amp; St-Clathrin – F</i>	TGCTTCCTTTCTGGAATGC
PGSC0003DMT400052825	<i>Sl &amp; St-Clathrin – R</i>	GGACGGGACTTGAGTTGTG
PGSC0003DMT400023327	<i>Sl &amp; St-GTPase – F</i>	AGCGACTGTTCCCTTCCTC
PGSC0003DMT400023327	<i>Sl &amp; St-GTPase – R</i>	CCCAAGGTGATAACGCAAC
PGSC0003DMT400037120	<i>CRT binding factor 2A – F</i>	CTTCCGACCATCATCATCAGA
PGSC0003DMT400037120	<i>CRT binding factor 2A – R</i>	GGAGGAGGTAGCATGAGTCC
PGSC0003DMT400061367	<i>ERD7 – F</i>	CACTGAAC TTGTAAACTGGTA
PGSC0003DMT400061367	<i>ERD7 – R</i>	AAACTATGACTGACGTGAAC
PGSC0003DMT400002412	<i>NPR1 – F</i>	TCCACCAGCTCACTCCTCTG
PGSC0003DMT400002412	<i>NPR1 – R</i>	ACAAATCACCAAAGCCACAA
PGSC0003DMT400075333	<i>ABI1B – F</i>	GGTTCTTGCTGTTGTGGCTA
PGSC0003DMT400075333	<i>ABI1B – R</i>	CGCCCCATTAATCAGGATAC
PGSC0003DMT400045362	<i>UGT73E2 – F</i>	GACTAACAATGGGTGTTCTTA
PGSC0003DMT400045362	<i>UGT73E2 – R</i>	AGTAATCGCGCAATGTCAA
PGSC0003DMT400016494	<i>ELIP2 – F</i>	GCCAAACCAAGTGATGGAA
PGSC0003DMT400016494	<i>ELIP2 – R</i>	AACCCAGAAGACTACGCTGT
PGSC0003DMT400063937	<i>ADH1 – F</i>	TGCGTATTTGGCATAATTGC
PGSC0003DMT400063937	<i>ADH1 – R</i>	GCACCGTCAGTATTGTGTGA
PGSC0003DMT400008351	<i>HSP21 – F</i>	AATACTCCATCCCAGTTCCAA
PGSC0003DMT400008351	<i>HSP21 – R</i>	AAGCAATCTTCACACTGGAG
PGSC0003DMT400078007	<i>HSP17,6 – F</i>	AAGGAATTAGGCTTTCCAGGTT
PGSC0003DMT400078007	<i>HSP17,6 – R</i>	CCATTAAGCAGAAACAGAGCA
PGSC0003DMT400055958	<i>HSP17,6A – F</i>	GAAGCTCCTCGAAACTTTCCT
PGSC0003DMT400055958	<i>HSP17,6A – R</i>	CTTGATGTTGTGATTTTCGTG
PGSC0003DMT400078007	<i>HSP17,6C -+ F</i>	CTTCAAGGAATTAGGCTTTCC

PGSC0003DMT400078007	<i>HSP17,6C – R</i>	GCAGAAACAGAGCAGACTCAAG
PGSC0003DMT400054660	<i>NIM1-1 – F</i>	ACACGTGGGTCCACTTTGT
PGSC0003DMT400054660	<i>NIM1-1 – R</i>	GAACAACATTCATTCCAGTC
PGSC0003DMT400021076	<i>NPR6A – F</i>	GGTGCAAATGTAGCAACGACT
PGSC0003DMT400021076	<i>NPR6A – R</i>	TCAAAAAGGGGTAGAGGCAA
PGSC0003DMT400027591	<i>NPR6B – F</i>	TCCATATTGCTCCACCCTCT
PGSC0003DMT400027591	<i>NPR6B – R</i>	CGGCCCACAAAAGAATTTCC

#### Primers used for RT- PCR

PGSC0003DMT400002412	<i>RT-PCR-NPR1-F</i>	GGATTTGCTTTGCTTGCTG
PGSC0003DMT400002412	<i>RT-PCR-NPR1-R</i>	ACCTCGACCGGATCATTG
PGSC0003DMT400060953	<i>RT-PCR-Actin2-F</i>	GGCAGAAGGTGAGGATATT
PGSC0003DMT400060953	<i>RT-PCR-Actin2-R</i>	TGTGGTGGTGAAAGAGTAG

**Table S2. Sequence of used primers in tobacco experiment.**

Primers used for qRTPCR		
Accession #	Gene Name	Forward primer
AF234297.1	<i>GUS-F</i>	GCTGATAGCGCGTGACAAA
AF234297.1	<i>GUS-R</i>	CGCGAAATATTCCCGTGCA
NM_001326165.1	<i>NtEF1-F</i>	GGACGTTTTGCTGTGAGGG
NM_001326165.1	<i>NtEF1-R</i>	GTGACCTTGGCACCAGTTG
EU580435.1	<i>NtSOD-F</i>	AGCTACATGACGCCATTTCC
EU580435.1	<i>NtSOD-R</i>	CCCTGTAAAGCAGCACCTTC
U07627.1	<i>NtCAT-F</i>	TGCCATTGATGCCAGTTGG
U07627.1	<i>NtCAT-R</i>	CAGGGTTAAACGCGAGCTG
<i>D85912</i>	<i>NtAPX-F</i>	CAAATGTAAGAGGAACTCAGAGGA
<i>D85912</i>	<i>NtAPX-R</i>	CAGCCTTGAGCCTCATGGTACCG
JX682668.1	<i>NtERF-F</i>	TTGGCACCTTTGACACTGC
JX682668.1	<i>NtERF-R</i>	GATGGGGGAAGTTGAGCCT

GU144573.1	<i>NtERD1-F</i>	GGTGTCAATGGAATTCCGCA
GU144573.1	<i>NtERD1-R</i>	ACGGGGGATCTTGGTGAAC
HE653924.1	<i>NtMYC-F</i>	ATGGGGTGCAGATGACCAA
HE653924.1	<i>NtMYC-R</i>	GGCAGGGCTTTGGTGTTAC
AB689673.1	<i>NtHSP70-F</i>	GACTGTGTTGATCCCCGA
AB689673.1	<i>NtHSP70-R</i>	CAGGCTGGTTGTCCGAGTA
AB006042.1	<i>NtHSP26-F</i>	CAGGAAGCAACAGGGCATC
AB006042.1	<i>NtHSP26-R</i>	CGGCATGTCAAAACGCATC
<b>Primers used for RT- PCR</b>		
PGSC0003DMT400002412	<i>StNPR1-F</i>	GGATTTGCTTTGCTTGCTG
PGSC0003DMT400002412	<i>StNPR1-R</i>	ACCTCGACCGGATCATTG
PGSC0003DMT40003201	<i>StDREB1-F</i>	TCGAATGCGAAGTTGGGGA
PGSC0003DMT40003201	<i>StDREB1-R</i>	AACCCATCCTTCACCGGAG
AF234297.1	<i>GUS-F</i>	CAACGTCTGGTATCAGCGC
AF234297.1	<i>GUS-R</i>	GCGGATTCACCACTTGCAA
AB158612.1	<i>NtActin-F</i>	TACGCCCTTCCTCATGCAA
AB158612.1	<i>NtActin-R</i>	ACGATCTGCAATGCCAGGA