

**Plastid signaling under multiple conditions is accompanied by a common defect in
RNA editing in plastids**

Tomohiro Kakizaki, Fumiko Yazu, Katsuhiro Nakayama, Yasuko Ito-Inaba and Takehito
Inaba

Supplementary materials

Table S1 and S2, and Figs S1, S2 and S3

Table S1. Gene-Specific Primers Used in Real-time PCR

Gene Name	AGI code	Forward Primer	Reverse Primer
<i>ACTIN2</i>	At3g18780	5'-GCACCCTGTTCTTCTTACCG-3'	5'-AACCCCTCGTAGATTGGCACA-3'
<i>LHCB1</i>	At1g29930	5'-AGCTCAAGAACCGAAGATTGG-3'	5'-GCCAAATGGTCAGCAAGGTT-3'
<i>SSU1A</i>	At1g67090	5'-CCTCAAAACTTTATCCCCATC-3'	5'-AATATGTCTCGCAAACCGGAAA-3'
<i>OE23</i>	At1g06680	5'-TGTGTTGACAAGAACGGCTGAT-3'	5'-CTTGTCTCCAGCTTGTGCTTTG-3'
<i>GUN4</i>	At3g59400	5'-TCAAGTGGGAGCTTAACGATGA-3'	5'-TACTCCTGCCTGTTCCCTTAGCC-3'
<i>CA1</i>	At3g01500	5'-CCCTTAGATGGAAACAACCTCCACTGACTTC-3'	5'-GGCCACATTGATCTTCAAAGGCTGAATC-3'
<i>psbO1</i>	At5g66570	5'-AACGGCTAACCCAGTGCCCTA-3'	5'-CTGGAGGAGCGTTCCTTGCTT-3'
<i>psaF</i>	At1g31330	5'-CTGAATCTGCCCTGCTCTT-3'	5'-AACCGTCTGACCCGCATAAC-3'
<i>peth2</i>	At5g66190	5'-ACTACCGAGGCACCACCAGT-3'	5'-CCGGTGTATCTTGGTGTTCAA-3'
<i>petE2</i>	At1g20340	5'-AGGGGATGGGTGCTTAGCTT-3'	5'-GCCACTTGGGATCTCGTCTT-3'
<i>LHCB2.1</i>	At2g05100	5'-AAGTCGTGAATGACTTATTGGTG-3'	5'-GGTGGTGTGGTTCAATAAGGT-3'
<i>PDH-E1α</i>	At1g01090	5'-TGCAAAGGAAGCAGAGCTAAAG-3'	5'-CCTCACATCTGTACCGTCCATC-3'
<i>Hsp93</i>	At5g50920	5'-AGGAAGATTCTCTCCCTGTTGCT-3'	5'-TTAAGAAAGCCCCATGTATCTC-3'
<i>IEP37</i>	At3g63410	5'-GTTCAAGAATGCCGTTTCAAG-3'	5'-ACCAAGCTGGAGAGGAGAGTCA-3'
<i>atTIC110</i>	At1g06950	5'-CTGCTTCTCCGACCAACTA-3'	5'-CTGAAGTCGCTAGCCTCACC-3'
<i>CM1</i>	At3g29200	5'-GAAGAAGGAATGAATCTCATGTT-3'	5'-CCAAAGCCATATTGTTTATTTTGT-3'
<i>COL6</i>	At1g68520	5'-AGGCCTCGCATGAAAGGAAGGT-3'	5'-ACATACGTAGCTCACAAAAACGTGCA-3'
<i>COL16</i>	At1g25440	5'-TGGGGAGGTCAAGGTCCACCG-3'	5'-GGAAAAGGCTGGCCAACCGC-3'
<i>RD26</i>	At4g27410	5'-AGCACGAATGGGTGCTCATCGT-3'	5'-AGACCTGCCAAGCTAGCCCA-3'
<i>HFR</i>	At1g02340	5'-TGATGTCAACAGTGGGGTGAATCC-3'	5'-GGCCGTGAGCCGAAGCCATT-3'
<i>ZnFinger</i>	At5g44260	5'-GTTTAGCCGTCACGGTGATT-3'	5'-CTGACGTGGAGAATGAGCAA-3'
<i>SIG6</i>	At2g36990	5'-AGAAGCAGCCGGGAAAAGTT-3'	5'-CCATGCTTCTTCTCGCAAT-3'
<i>COL4</i>	At5g24930	5'-CGAAGCGGACGGATACAAAT-3'	5'-CAAACCACCCACCATTCTCC-3'
<i>bHLH-II</i>	At2g18300	5'-CATGGGTTTTGGTCTCCAC-3'	5'-TTCTTCAAGCAACGGCTCT-3'
<i>COL13</i>	At2g47890	5'-GCGACTCCTGCAACGAATCT-3'	5'-GGGACAGCCGGTAAATCCTT-3'
<i>BES1</i>	At1g19350	5'-TCATTCCCAGTCTTCTCG-3'	5'-CTGGTGGAGTGACAGGAGCA-3'
<i>COL5</i>	At5g57660	5'-TAGCTCGACGACTGGTGGTG-3'	5'-TGGCCGTGACTCTGCATAAG-3'
<i>IDD4</i>	At2g02080	5'-AACGCGGGTCTAACGTGTC-3'	5'-CAGATGGGTGCTTGTG-3'
<i>BHLH071</i>	At5g46690	5'-CTCGTCGATCTCGAGCCATT-3'	5'-TTCGTAGCTGGTGGTTGTCG-3'
<i>OBP4</i>	At5g60850	5'-AGATCGAACGGCTCAGGTTG-3'	5'-GTTTGATCTCCACCGCCACT-3'
<i>GLK1</i>	At2g20570	5'-TTGGGTCTCCGATTCTCCCTAT-3'	5'-GCAACTGGCGGTGCTCTAAAT-3'
<i>BBX27</i>	At1g68190	5'-TCATGGTGGTGGCTCTCTG-3'	5'-CCGCGAAATCTTTAGCAGGA-3'
<i>PIF3</i>	At1g09530	5'-AATGGGCTTGCTGATTTGA-3'	5'-ATACCCATCGCCACTGGTTG-3'
<i>bHLH-I</i>	At1g10585	5'-AGTCGGATTGGCATTGATCC-3'	5'-TCATTTGGGATTTTCATGCTTCA-3'
<i>SEP3</i>	At1g24260	5'-CGGTCGTCATCATCAACA-3'	5'-CACTTGGTCTGCTCCCAT-3'
<i>jmjC</i>	At3g20810	5'-GACGAAACCGAGTTCCAAA-3'	5'-TTCATTGCTCCACCAGAAGC-3'
<i>ERF6</i>	At4g17490	5'-TGACGGCGATAGTAGCTGG-3'	5'-CAAACGGTGGGTGTGGAGAT-3'
<i>CIR7</i>	At5g37260	5'-TGGCTCAGATGGATTAGTTCC-3'	5'-GGCTCTGTTTGGTCTCTGCTTC-3'
<i>OTP86</i>	At3g63370	5'-CCGGGAAATCTTGTGCTTGT-3'	5'-GCCGTCCATCTCAATCCAAC-3'
<i>ECB2</i>	At1g15510	5'-TGCTGATTGTGAAAATGGA-3'	5'-ATCGCTAAGAAAGGCGTGAA-3'
<i>RARE1</i>	At5g13270	5'-CCTGGGCTGAAAATGGGAAGAAGC-3'	5'-ACCCTTTTCTTGATCCAGCTGCA-3'
<i>CRR22</i>	At1g11290	5'-GGTGCCATGTTAGGTGCTTGCCA-3'	5'-TGCGCAGACCCTGTCTCAACA-3'
<i>CRR28</i>	At1g59720	5'-CGCAGGAGACACGTCGCATCC-3'	5'-AGGTGCTTGAGAGCGATCCGGT-3'
<i>OTP85</i>	At2g02980	5'-GATTCACACGGTGGCGATTA-3'	5'-AACCGCCTTTCGATCTTTCA-3'
<i>OTP84</i>	At3g57430	5'-ATCAGCAGGCCTCTGGGATA-3'	5'-TTGCGGGTGAGATGAGTCAC-3'
<i>OTP82</i>	At1g08070	5'-GAATGTCGAGTTGGGCGAAT-3'	5'-TCGTTCCATCTTCTGCTGA-3'
<i>LPA66</i>	At5g48910	5'-TTGCAGAATGCAGGAAATG-3'	5'-GAGGGCGACATAAGCTCCAC-3'
<i>CRR21</i>	At5g55740	5'-TGCTGCTGCACGTAAGTGA-3'	5'-AACAAATGCTGCCACACTTGG-3'
<i>CRR4</i>	At2g45350	5'-CTCAGCTTGGCCGATTATCC-3'	5'-TTGTATGCTTCCGATTTCCG-3'

*:Primer set for *ACTIN2* is described in Vazquez et al. (2004).

Table S2. Primers Used in RNA editing analysis

Primer Set	Forward Primer	Reverse Primer
<i>ndhA</i>	5'-GGAATCATAACAGGTGTAAGTAG-3'	5'-GTACTTAAACTGTTAGATAGTAG-3'
<i>ndhB</i>	5'-TGCTTCTCTTCGATGGAAG-3'	5'-TCCTTCGTATACGTCAGG-3'
<i>ndhB2</i>	5'-TCCCCTCCAGTCGTTG-3'	5'-TGAGCAATCGCAATAATCG-3'
<i>ndhD</i>	5'-AGTACGCGTTCTTTGGAC-3'	5'-TAGCTCCATTAAGTCCAGG-3'
<i>ndhF</i>	5'-CATTCCACTTCCAGTACC-3'	5'-ATTCGCTGCAATAGGTGCG-3'
<i>ndhG</i>	5'-TGCCTGGACCAATACATG-3'	5'-ATTCCCAATGGTCCACAG-3'
<i>accD</i>	5'-ATTCAATGCGACAATTGTTATG-3'	5'-CATCCATAGGATTCCAAGTAC-3'
<i>atpF</i>	5'-CCGATTCTTTGTTTTACTTG-3'	5'-CACTCCCTTTCCAAAAAAG-3'
<i>clpP</i>	5'-AATGATCCATCAACCCGC-3'	5'-ATTGAACCGCTACAAGATC-3'
<i>matK</i>	5'-TACCTTACCCATCCATC-3'	5'-CAGAATGCATCTTCCGTG-3'
<i>petL</i>	5'-ATATTTTATTGAGTCCCTTC-3'	5'-TCAAATAAGTCGTATTTTGC-3'
<i>psbE</i>	5'-TATGTCTGGAAGCACAGG-3'	5'-TAAATTCATCGAGTTGTTCC-3'
<i>psbF</i>	5'-TTTACAGTGCCTGGTTG-3'	5'-TTATCGTTGGATGAACTGC-3'
<i>rpoB</i>	5'-TCAATTGGTAGAACCTCTG-3'	5'-TATTTGCGGCACCAATCC-3'
<i>rpoB2</i>	5'-TTAACACCTCAAGTGGCG-3'	5'-TCTCTCATCAAAGGGGC-3'
<i>rps14</i>	5'-ATAGGGAGAAGAAGAGGC-3'	5'-TGGCAACAAACATGCCTG-3'

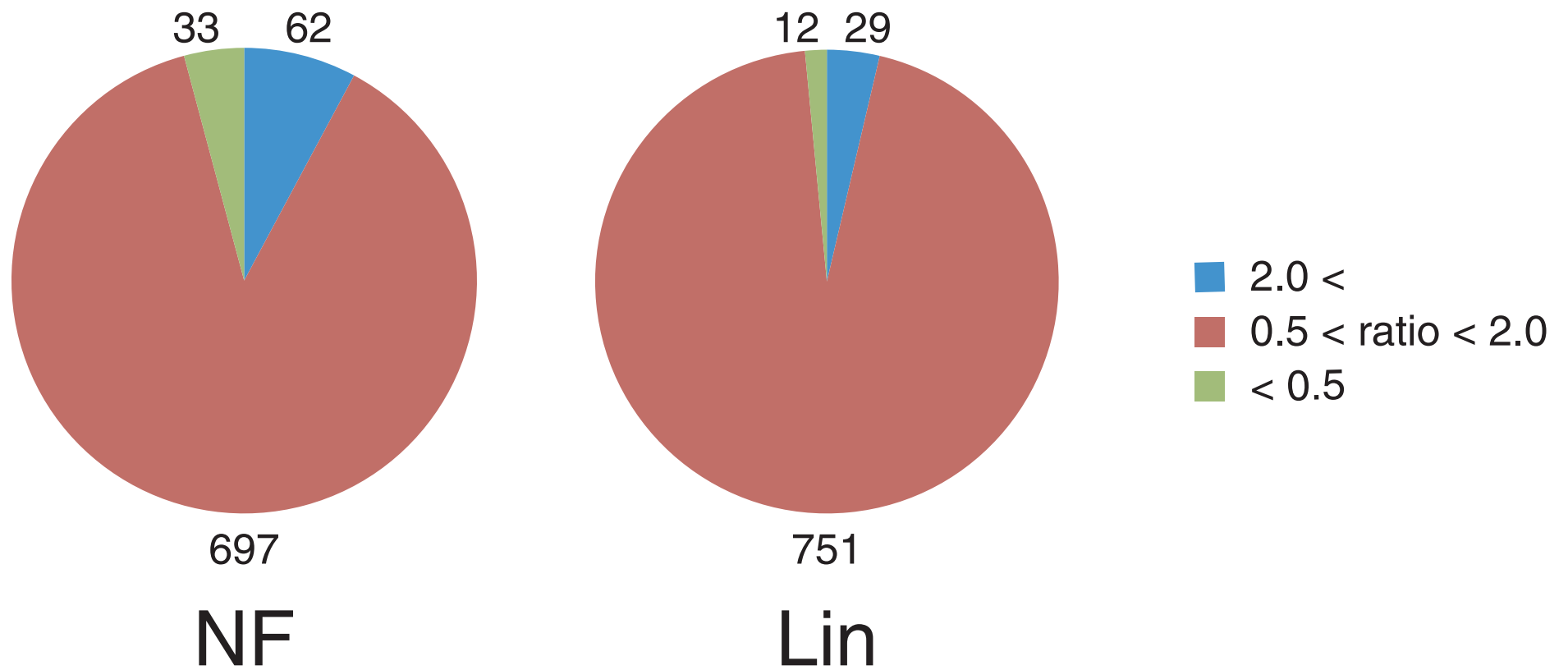


Fig. S1. Comparison of gene expression profile in *ppi2-1* mutant with those in Norflurazon (NF) and lincomycin (Lin) treated wild-type plants.

The 1000 most up-regulated genes in the *ppi2-1* mutant (Kakizaki et al., 2009) were chosen for the analysis. Response of these 1000 genes to NF or Lin treatment in wild-type plants was investigated *in silico* using existing microarray dataset (NASCARRAYS-51 and NASCARRAYS-336). Blue, genes up-regulated by inhibitor treatment; Red, genes unchanged by inhibitor treatment; green, genes down-regulated by inhibitor treatment. Note that all of these genes are up-regulated by *ppi2-1* mutation.

	Col-0	<i>gun1-101</i>
<i>accD</i> (794)	CTTTGATT	CTTTGATT
<i>rps14-1</i> (80)	TCCTAAAA	TCCTAAAA
<i>rps14-2</i> (148)	TCCCTACCG	TCCCTACCG

Fig. S2. Analysis of chloroplast RNA editing in *gun1-101* mutant.

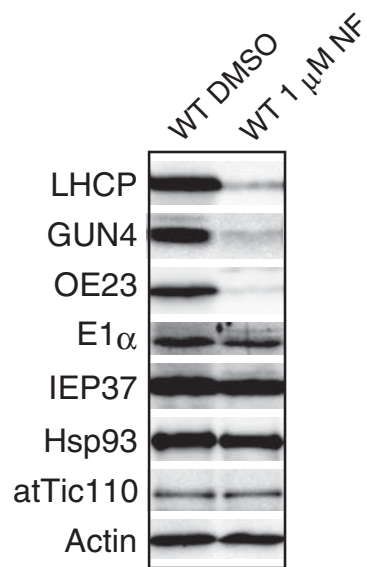


Fig. S3. Effects of NF treatment on the accumulation of plastid proteins.

Total protein extracts were resolved by SDS-PAGE and probed with antisera against the proteins indicated to the left of the panel.