Expanded View Figures

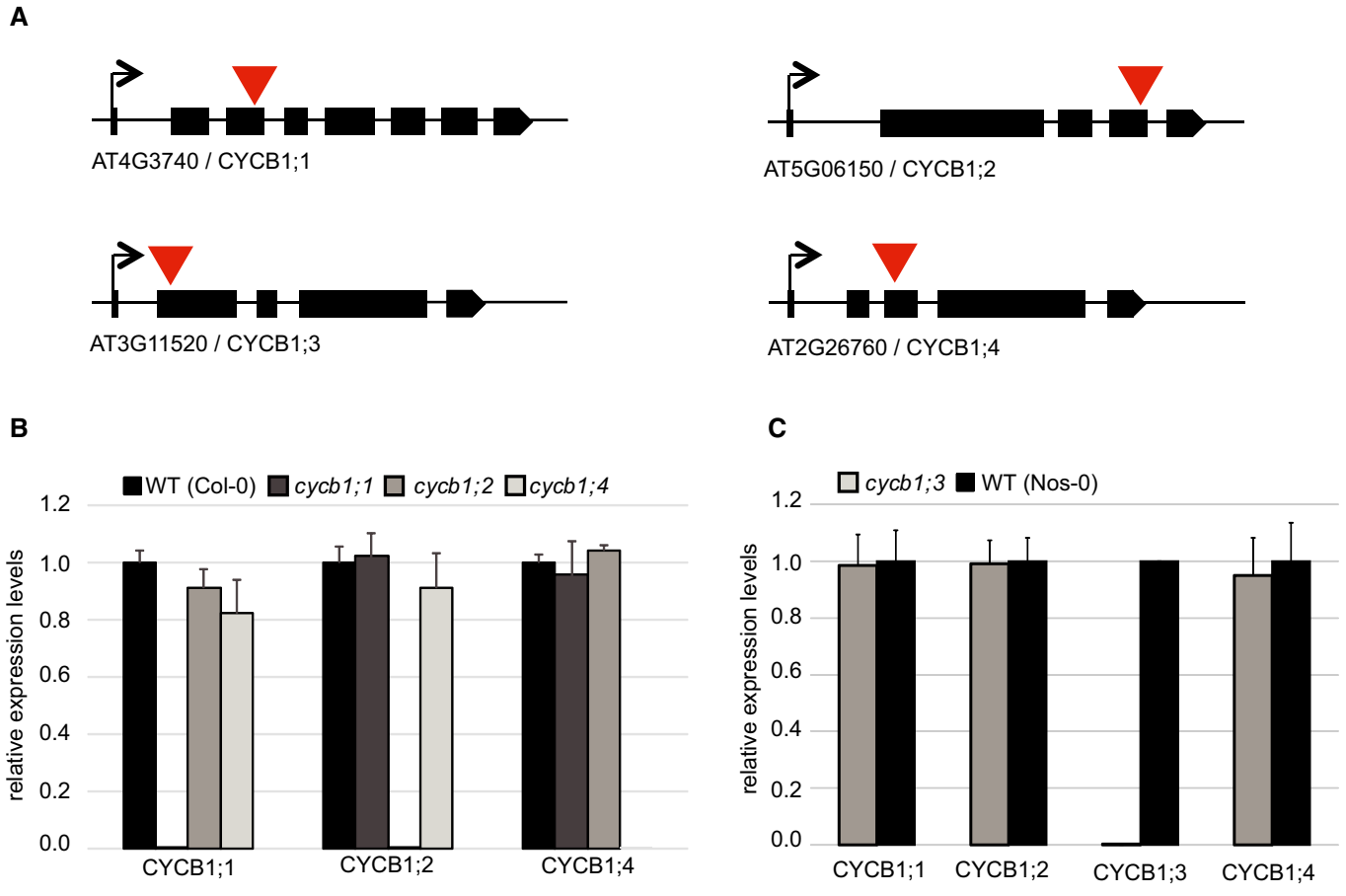

Figure EV1. T-DNA insertion mutants of the *Arabidopsis thaliana CYCB1* genes.

A Schematic overview of T-DNA insertions for *cycb1;1*, *cycb1;2*, *cycb1;3*, and *cycb1;4*. Black boxes display exons, and red arrowheads indicate the positions of the T-DNA insertion.

B Quantitative PCR for relative expression levels in the wild type (Col-0), *cycb1;1*, *cycb1;2* and *cycb1;4*. EXP, SAND, and ACT7 were used as reference genes for normalization. Each value represents the mean ± standard deviation of three independent experiments.

C Quantitative PCR for relative expression levels in the wild type (Nos-0) and *cycb1;3*. EXP, SAND, and ACT7 were used as reference genes for normalization. Each value represents the mean ± standard deviation of three independent experiments.

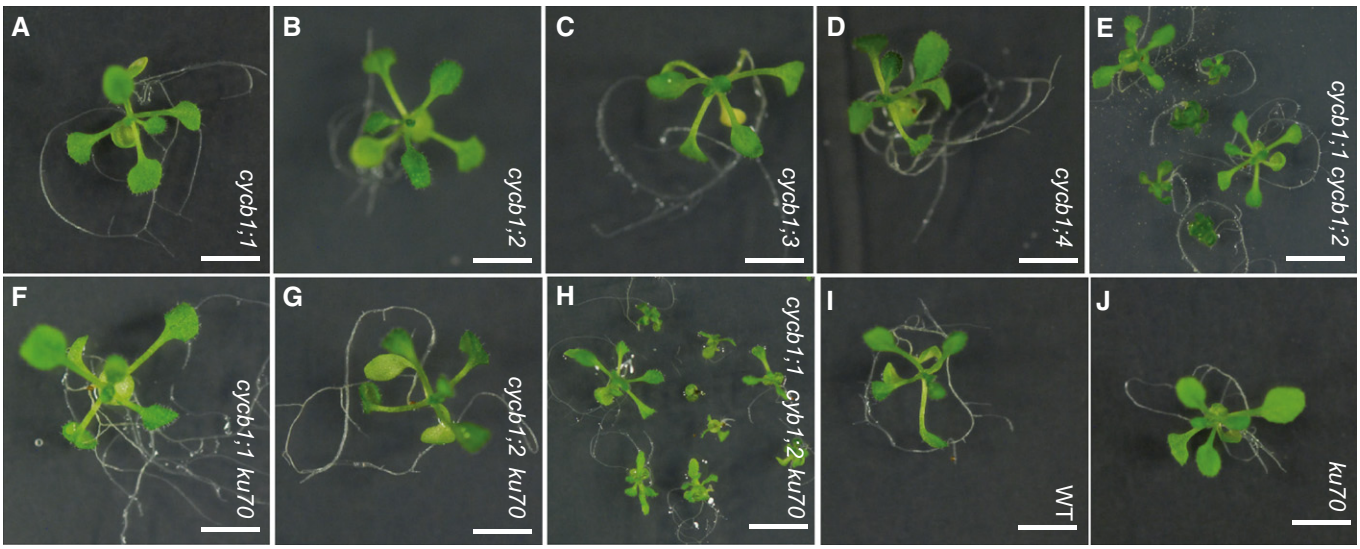

Figure EV2. Phenotype of *cycb1* mutants under greenhouse conditions.

A–D Single mutants *cycb1;1* (A), *cycb1;2* (B), *cycb1;3* (C), and *cycb1;4* (D).

E–G Double mutants *cycb1;1 cycb1;2* (E), *cycb1;1 ku70* (F), and *cycb1;2 ku70* (G). Seedlings of *cycb1;1 cycb1;2* are smaller and more diverse than wild-type plants.

H The triple mutant *cycb1;1 cycb1;2 ku70* displays a similar phenotype as the double mutant *cycb1;1 cycb1;2*.

I Wild type.

J Single mutant *ku70*.

Data information: All images were taken 14 days after germination. Scale bars: 1 cm.

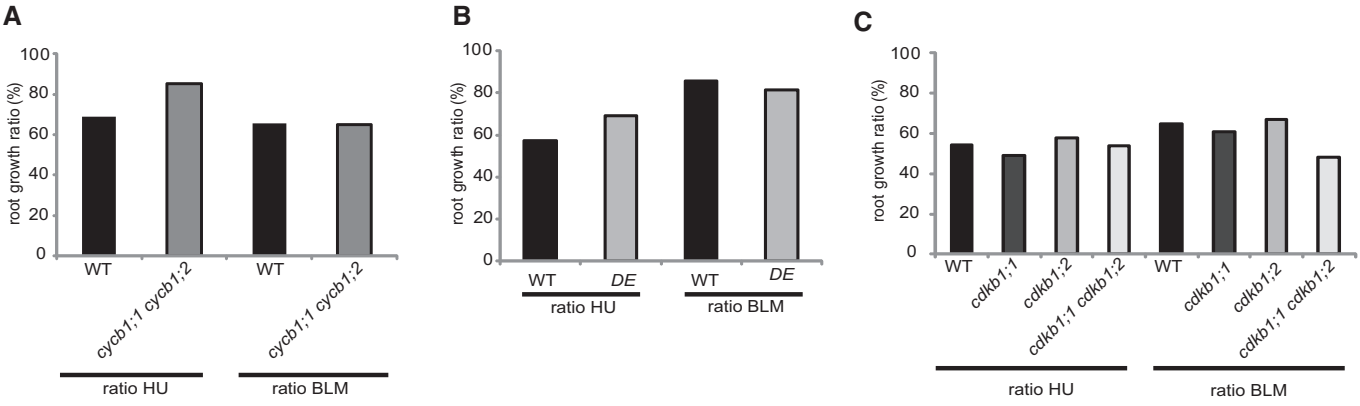

Figure EV3. Root growth ratios of *cycb1* and *cdkb1* mutants.

A, B Graphs represent the ratio of the mean growth rate on 1 mM hydroxyurea (HU) and 0.6 μg/ml bleomycin (BLM) compared to control experiments on plates lacking genotoxins for the wild type and the double mutant *cycb1;1 cycb1;2* (A) or the weak *CDKA;1* allele *DE* (*CDKA;1*$^{T15D;Y15E}$) (B).

C Graphs represent the ratio of the mean growth rate on 1 mM HU and 0.6 μg/ml BLM compared to control experiments on plates lacking genotoxins for the wild type, the single mutants *cdkb1;1* and *cdkb1;2*, and the double mutant *cdkb1;1 cdkb1;2*.

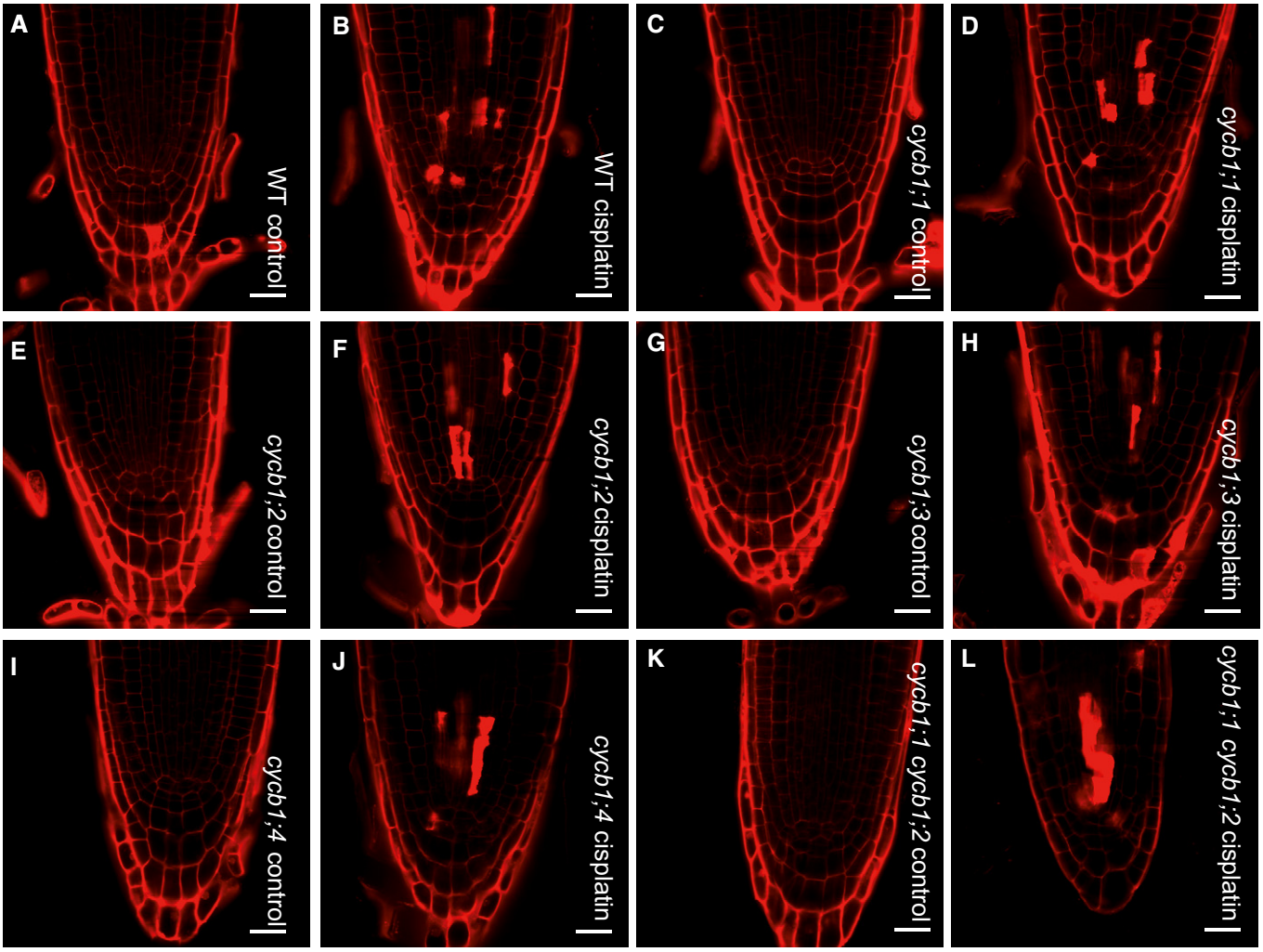

Figure EV4. Cell death in *cycb1* mutants after cisplatin treatment.

A–L Propidium iodide staining of the apical root meristem in wild type grown on control plates (A) or plates supplemented with 50 μM cisplatin for 24 h (B); *cycb1;1* grown on control plates (C) or plates supplemented with 50 μM cisplatin for 24 h (D); *cycb1;2* grown on control plates (E) or plates supplemented with 50 μM cisplatin for 24 h (F); *cycb1;3* grown on control plates (G) or plates supplemented with 50 μM cisplatin for 24 h (H); *cycb1;4* grown on control plates (I) or plates supplemented with 50 μM cisplatin for 24 h (J); *cycb1;1 cycb1;2* grown on control plates (K) or plates supplemented with 50 μM cisplatin for 24 h (L). Red spots show cell death. Scale bars: 20 μm.

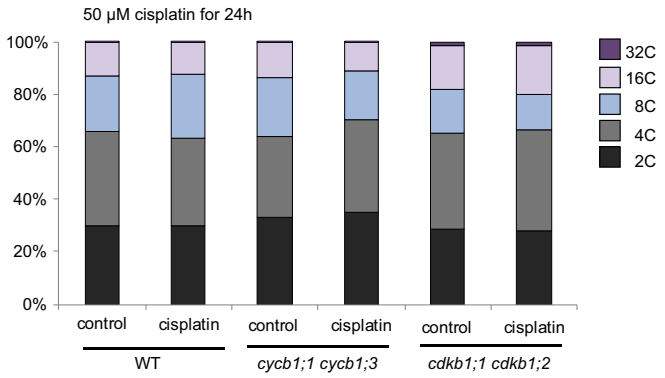

Figure EV5. Ploidy levels in the wild type, *cdkb1*, and *cycb1* mutants.
Flow cytometry analysis of root tips of the wild type and the double mutants *cdkb1;1 cdkb1;2* and *cycb1;1 cycb1;3* under control conditions without genotoxins and transferred 5 days after germination to plates supplemented with 50 μM cisplatin for 24 h.

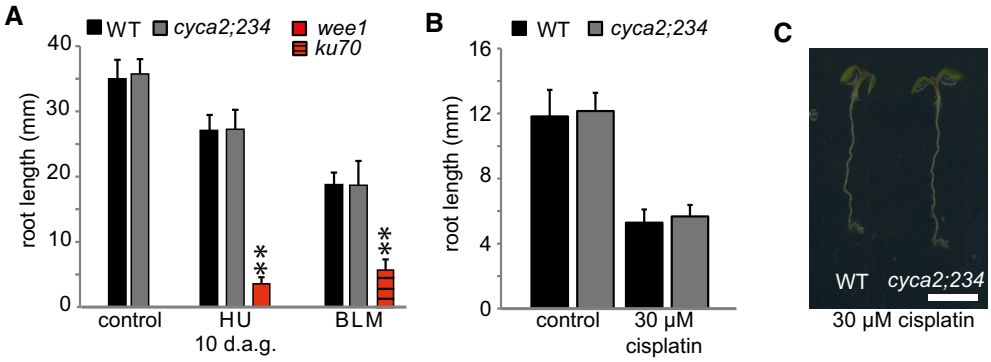

Figure EV6. The triple mutant *cyca2;2 cyca2;3 cyca2;4* is not hypersensitive to hydroxyurea, bleomycin, and cisplatin.

A The wild type and the triple mutant *cyca2;234* were grown on control plates or plates containing 1 mM hydroxyurea (HU) or 0.6 µg/ml bleomycin (BLM) for 10 days. Root lengths were measured 10 days after germination. The mutants *wee1* and *ku70* were used as positive controls for hydroxyurea and bleomycin sensitivity, respectively.

B The wild type and *cyca2;234* triple mutant germinated on control plates without cisplatin and were transferred to plates containing 30 µM cisplatin 3 days after germination. Roots were measured 3 days after transfer and the net growth of 3 days is shown in the graph.

C Images show the wild type and *cyca2;234* triple mutant on plates supplemented with 30 µM cisplatin. Images were taken 6 days after germination, that is, 3 days after transfer to cisplatin. Scale bar: 0.5 cm.

Data information: One or two asterisks indicate significant differences within a 5% and 1% confidence interval, respectively (Student's *t*-test). Three biological replicates, each containing at least 15 plants, were analyzed. The mean of the root length of each individual experiment was determined and again averaged for the three biological replicates. Graphs represent mean ± SD.

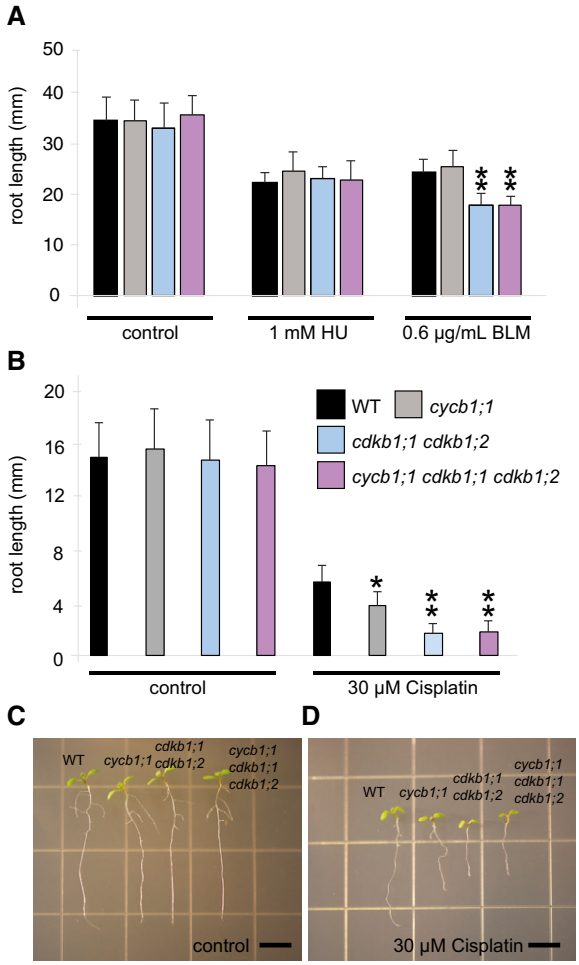

Figure EV7. The triple mutant *cycb1;1 cdkb1;1 cdkb1;2* shows no additive effect in DNA damage sensitivity.

A The wild type, the *cycb1;1* single mutant, the *cdkb1;1 cdkb1;2* double mutant, and the *cycb1;1 cdkb1;1 cdkb1;2* triple mutant were grown on control plates without genotoxins and plates supplemented with 1 mM hydroxyurea (HU) or 0.6 µg/ml bleomycin (BLM). Root lengths were measured 10 days after germination.

B The wild type, the *cycb1;1* single mutant, the *cdkb1;1 cdkb1;2* double mutant, and the *cycb1;1 cdkb1;1 cdkb1;2* triple mutant germinated on control plates and were transferred to plates supplemented with 30 µM cisplatin 3 days after germination. Root lengths were measured 3 days after transfer and the net root growth of 3 days is shown in the graphs.

C Images show the wild type, the *cycb1;1* single mutant, the *cdkb1;1 cdkb1;2* double mutant, and the *cycb1;1 cdkb1;1 cdkb1;2* triple mutant (from left to right) 6 days after germination (= 3 days after transfer to 30 µM cisplatin plates).

Data information: One or two asterisks indicate significant differences within a 5 and 1% confidence interval, respectively (Student's *t*-test). Scale bars: 1 cm. Three biological replicates, each containing at least 15 plants, were analyzed. The mean of the root length of each individual experiment was determined and again averaged for the three biological replicates. Graphs represent mean ± SD.

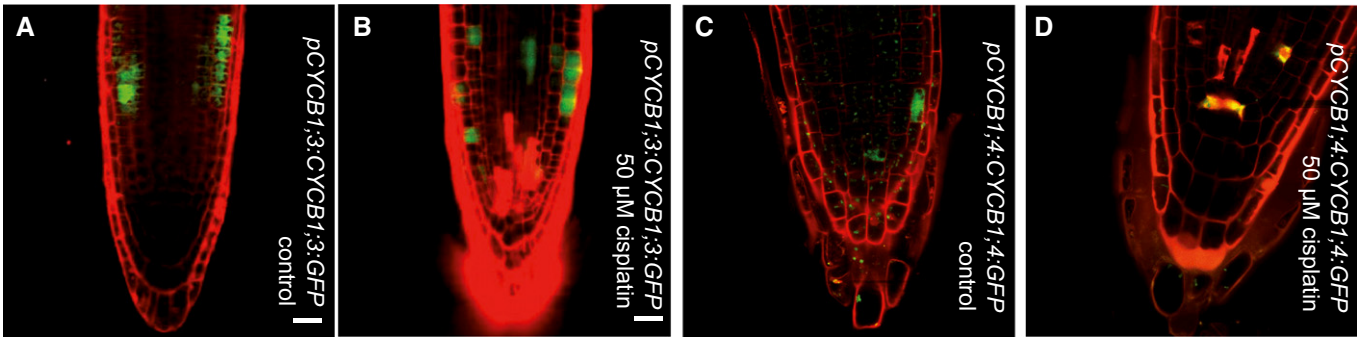

Figure EV8. *CYCB1;3:GFP* and *CYCB1;4:GFP* are not upregulated after cisplatin treatment.

A Transgenic *Arabidopsis* plants harboring the *CYCB1;3* promoter fused to GFP grown on control plates and imaged 4 days after germination.

B Transgenic *Arabidopsis* plants harboring the *CYCB1;3* promoter fused to GFP germinated on control plates and were transferred 3 days after germination to plates supplemented with 50 µM cisplatin and were imaged 24 h after drug application.

C Transgenic *Arabidopsis* plants harboring the *CYCB1;4* promoter fused to GFP grown on control plates and imaged 4 days after germination.

D Transgenic *Arabidopsis* plants harboring the *CYCB1;4* promoter fused to GFP germinated on control plates and were transferred 3 days after germination to plates supplemented with 50 µM cisplatin and were imaged 24 h after drug application.

Data information: Scale bars: 20 µm.