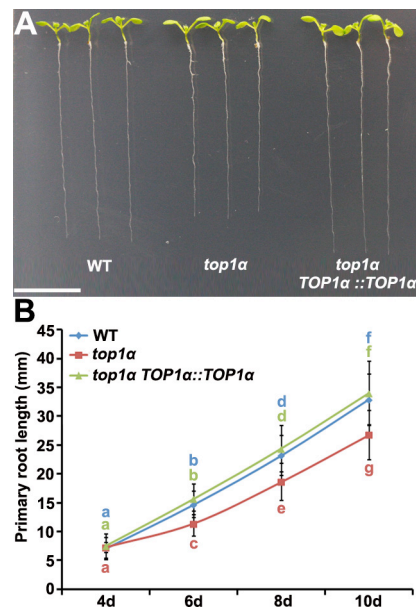
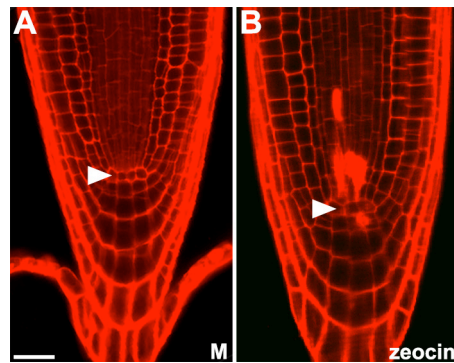


Supplemental Figure S1. *RCH1::TOP1β RNAi*-mediated down-regulation of *TOP1β* had no visible effect on WT but caused a rootless phenotype in *top1α*.

A, qRT-PCR analysis of *TOP1α* and *TOP1β* transcription in roots of WT and three different *RCH1::TOP1β RNAi* transgenic lines (R-1, R-2 and R-3). Note that the *RCH1::TOP1β RNAi* transgene specifically and significantly reduced the expression of endogenous *TOP1β* in the WT background. Transcript levels of *TOP1α* and *TOP1β* in WT roots were set to 1. Error bars represent standard deviation (SD) from three independent experiments. **, $P < 0.01$, t -test. B, Phenotype of 10-day-old WT and R-1 seedlings. No visible difference between WT and R-1 seedlings were observed, in agreement with the *top1β* null mutant phenotype. Scale bar, 1 cm. C, Root tip of an R-1 seedling. Root cells were counterstained (in red) with propidium iodide (PI) and imaged with confocal microscopy. PI is excluded from entering live cells but penetrated into dead cells. Arrowheads point to the quiescent center (QC). Scale bar, 25 μ m. D and E, Seedling phenotypes of two additional transgenic lines expressing the *RCH1::TOP1β RNAi* transgene in *top1α*. Scale bar, 1 cm.

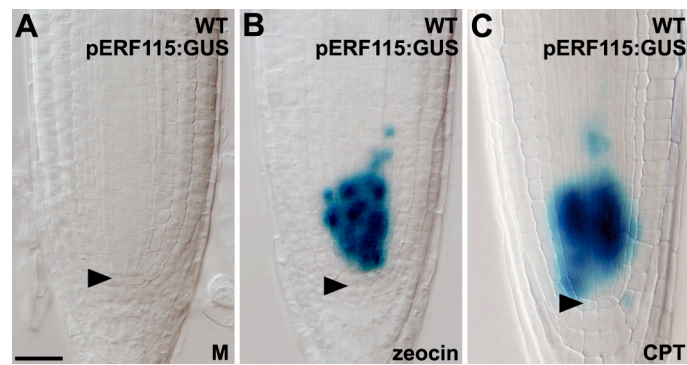


Supplemental Figure S2. Expression of WT *TOP1α* under the control of its native promoter (*TOP1α::TOP1α*) fully complemented the root growth defect of *top1α*. A, Phenotypes of 10-day-old WT, *top1α*, and *top1α TOP1α::TOP1α* seedlings. Scale bar, 1cm. B, Time-course analysis of root lengths of WT, *top1α*, and *top1α TOP1α::TOP1α* seedlings. Measurements were performed on the indicated days. Error bars represent SD (N > 20). Bars with different letters are significantly different at $P < 0.01$, *t*-test.



Supplemental Figure S3. Zeocin induces preferential death of SSCs in the Arabidopsis root.

A and B, Root tips of WT seedlings, which were mock-treated for 24 h (A) or treated with 13 μ M zeocin for 24 h (B). Root cells were counterstained (in red) with PI and imaged with confocal microscopy. PI outlined live cells but penetrated into dead cells. Arrowheads point to the quiescent center (QC). Scale bar, 25 μ m.



Supplemental Figure S4. Similar *ERF115* expression patterns were observed in a previously reported *pERF115:GUS* transgenic line. A to C, Expression (stained in blue) of *pERF115:GUS* (Heyman et al., 2013) in root tips of WT seedlings, which were treated for 24 h with mock (A), 13 μ M zeocin (B) or 100 nM CPT (C). Scale bar, 50 μ m.

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Experiments / Primer names	Sequences (5' to 3')	Materials
Genotyping		
top1α-LP	ACTGTGGAACCACTTGTATGC	
top1α-RP	ACGAAAACAAAACCCCTCAAGG	
top1β-LP	TTCCAGAGTGTITTTGCATC	
top1β-RP	GGTAAGAAATGGAAAGCAGG	
LBb1.3	ATTTTGCCGATTTTCGGAAC	
Cloning		
300CDS-PF	ATACTCGAGATGGGCACTGAAACAGTTTC	35S::TOP1α
300CDS-PR	GGGACGGCCGAGAAATCTGTACTC	
300LIC27-PF	TAGTTGGAATAGGTTTCATGGGCACTGAAACAGTTTC	TOP1α::TOP1α
300LIC27-PR	AGTATGGAGTTGGGTTCCATCTTACGACAAAACAGAGG	
300promoter-Acc65I-PF	TTGGGTACC GTTCTGTTGAGGCCAGTTTC	
300promoter-XhoI-PR	ATACTCGAGTCCCGAAAAGAACACGTTG	
SHR-PF	CATGGTACCAGAAGCAGAGCGGTGGGGTTTC	
SHR-PR	CATCTCGAGTTTTTTTTTAAATGAATAAGAAAATGAATAGAAGAAAAGG	SHR::TOP1α
SCR-PF	CATGGTACCGTCCGTGTCTCATCGCGTAG	
SCR-PR	CATCTCGAGGGAGATTGAAGGGTTGTTGGTC	SCR::TOP1α
300-3M-F	CACGTCTAAGATCAGCTACCTGGATCC	TOP1α N871S
300-3M-R	GGATCCAGGTAGCTGATCTTAGACGTG	
300promoterF	TTGGGTACC GTTCTGTTGAGGCCAGTTTC	TOP1α::GUS
300promoterR	ATACTCGAGTCCCGAAAAGAACACGTTG	
310promoterF	TTGGGTACTCGATTCCGTAGGGTTATTG	TOP1β::GUS
310promoterR	ATACTCGAGCCAACAAGGCCAAGTTATTACAC	
RCH-PF	GTAATACGACTCACTATAGGGCGAATTGGGTACCCGAGTTTCAGATGTTTCTATTAATAAG	
RCH-PR	TATTGTTCCAGGGAAAGCCTGTTGACTTACTCGAGAATCGGCATTTGCAAAGACATAAGAGT	RCH1::TOP1β RNAi
310RNAI-F	TTTCATTTGGAGAGGACACGGGGCCCCCTCGAGTAAGTCAACAGGCTTTCCC	
310RNAI-R	ACGATCGGGGATCGGATCCCCGGGCTGCAGAAATGGTCATGACGGGTACG	
310RNAI-2F	CTTCATCTTCTGACCCGTATGACCATTCTGCAGCCCATGTCTCAACGGTTTCCAG	
310RNAI-2R	GCCAAATGTTTGAACGATCGGGGATCGGATCCTAAGTCAACAGGCTTTCCCTG	
ERF115-PF-3K	CATGGTACCTCCACTCTCAACACTGTAC	ERF115::GUS
ERF115-PR	CATCTCGAGCTTTGCTAAATCTTTAAACC	
ERF115-odsLICPF	TAGTTGGAATAGGTTTCATGGCGAATTCAGGAAATTATGG	ERF115-SRDX
ERF115-SRDXPR	AGTATGGAGTTGGGTTCTTAAGCGAAACCCAAACGGAGTTCTAGATCCAGATCGAGAAAACAGAAATTAGGAGG	
qRT-PCR		
TOP1α-qPF	AATGGAACGAGACATGCATAC	
TOP1α-qPR	GCAAACCTCTCCAAAAGAGACT	
TOP1β-qPF	TACTTGGAAGAACCATATG	
TOP1β-qPR	TTCTCATACTTCTCTTTGTC	
RBR-qPF	GTTTTCCGACGCTTTATGT	
RBR-qPR	CCGGTCGTTTCTTACAGGAC	
EF1a-qPF	TGAGCACGCTCTTCTTGCTTTCA	
EF1a-qPR	GGTGGTGGCATCCATCTTGTTACA	

Supplemental Table S1. List of primers used in this study.