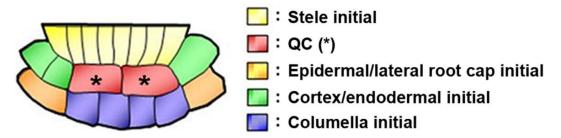
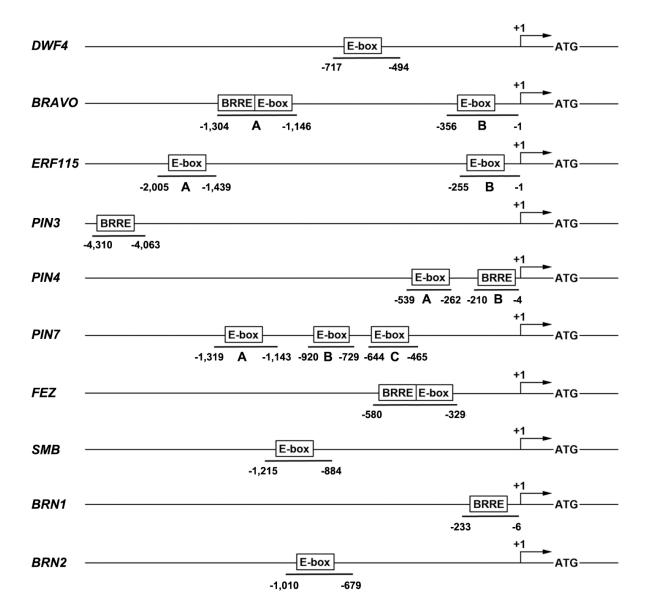
BZR1-dependent brassinosteroid signaling pathway leads to ectopic activation of quiescent cell division and suppresses columella stem cell differentiation

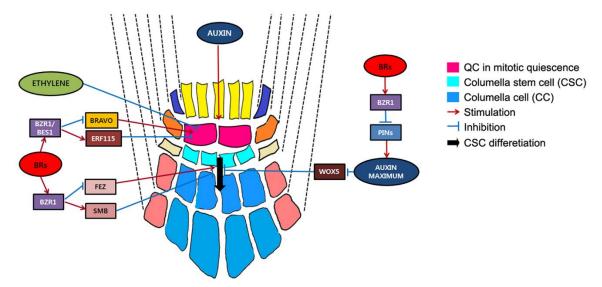
Hak-Soo Lee, Yoon Kim, Giang Pham, Ju Won Kim, Ji-Hye Song, Yew Lee, Yong-Sic Hwang, Stanley J. Roux, Soo-Hwan Kim



Supplementary Figure S1. Schematic diagram of the root SCN area.



**Supplemental Figure S2.** Schematic diagram of potential BZR1- and BES1- binding sites (BRRE and E-box) and the PCR-amplified DNA fragments used for ChIP-qPCR analysis. 5' and 3' position of each fragment is indicated by numbers. +1 represents the transcriptional initiation site of the corresponding gene. Nucleotide positions and fragments lengths are not in scale.



**Supplemental Figure S3.** A schematic model explaining brassinosteroid regulation of the QC maintenance and the columella stem cell (CSC) differentiation. Both BZR1-/BES1-mediated brassinosteroid signaling pathways promote mitotic reactivation of QC cells by inhibiting *BRAVO* (a negative regulator of QC division) and stimulating *ERF115* (a positive regulator of QC division) gene expression. In contrast, BRs regulate CSC differentiaion into columella cells (CCs) in a BZR1-/BES1-dependent manner. BZR1-mediated inhibitory BR action on PINs expression and activities provoke proximal movement of auxin maximum leading to WOX5-mediated CSC differentiation into CCs. In other hand, BZR1 down-regulates gene expression of FEZ (encoding a protein promoting periclinal root cap-forming cell division), and this may result in another level of suppression for CSC differentiation into CCs. Ethylene pathway and BZR1-mediated BR signaling pathway acts independently on the QC reactivation.

Gene name         Locus         Primer set (5' to 3')           WOX5         At3g11260         TCCAACTCCAAGGTGGACAAAATGA           ATGGCGGTGGATGTTCCATTTCAG         ATGGCGGTGGATGTTCCATTCAG           SCR         At3g54220         TTCTCACCCCCTCACTGAGTTTTTG           GTTGTTGGTCGTGAGATTGCATGG         GTTGTTGGTCGTAGAGTTGCATGG           SHR         At4g37650         TGGGAAGAGAGTTTTCCAAGGACGA           ERAVO         At5g17800         CGAGGACACTGAGACCAACAGAAG           CAG CGT TAT CGG TAC GAC CTG GA         CAGATCCGCAGACTAATCCGCAAAC           AGGAGGTGAAGAATCCCCAAAACG         AGGAGGTGAAGAATCCCCAAAACG           PIN3         At1g70940         GGAGCACCTGACAACGATCAAGG           CTCGGCTCTTTTGGTCTCTTG         ATGTGCATCCCACGATTCTAAGCAC           CAATCTCCGAGGCTCTCAAAAGC         CAATCTCCGAGGCTCTTCAAAAGC           PIN7         At1g23080         TTGGGCTTTGTTGCTTTCAGGT           CCGCTGGTCCAGTAAAGAATCCAC         CACTTCCGAGCACTTTCCAC           CUL3         At1g26830         TCCCGATCATCCGTCTTTCCTCT           GCAGGACCATGTTGACGCATTC         TTTCTGGGCTTGTTGGTAAGCTTGT           ETO1         At3g51770         TGCTGGATGCAGCTGATGATCGTT           ETO         At1g26870         TCAGTTTGCAGCACCTTCATGTTTC           ETO         At1g26870         TCAGGTTGCAGCAGCCTTACTT <t< th=""><th colspan="7">Supplemental Table S1. Primers used in quantitative real time RT-PCR analysis</th></t<>	Supplemental Table S1. Primers used in quantitative real time RT-PCR analysis						
SCR         At3g54220         TTCTCACCCCTCACTGAGTTTTTG           SCR         At3g54220         TTCTCACCCCTCACTGAGTTTTTG           GTTGTTGGTCGTGAGATTGCATGG         SHR         At4g37650         TGGGAAGAGAGTTTTCCAAGGACGA           BRAVO         At5g17800         CGAGGACACTGGAGACCAACAGAAG           CAG CGT TAT CGG TAC GAC CTG GA         CAG CGT TAT CGG TAC GAC CTG GA           ERF115         At5g07310         CAAATCCGCAGACTAATCCGCAAAC           AGGAGGTGAAGAATCCCCAAAAC         AGGAGGTGAAGAATCAACG           PIN3         At1g70940         GGAGCACCTGACAACGATCAAGG           CTCGGCGTCTTTTGGTCTCTG         CTCGGCGTCTTTTGGTCTCTCG           PIN4         At2g01420         ATGTGCATCCCACGATTCTAAGCAC           CAATCTCCGAGGCTCTCTCAAAAGC         CAATCTCCGAGGCTCTTCCAAAAGC           PIN7         At1g23080         TTGGGCTCTTGTTGCTTTCAGGT           CCGCTGGTCCAGTAAAGAATCTCAC         CCCCTGGTCCAGTAAAGAATCTCAC           CUL3         At1g26830         TCCCGATCATCCGTCTTTCCTCT           GCAGGACCATGTTGTACGCATTTC         TTCTGGGCTTGTTGGTAAGCTTGT           ETO1         At3g51770         TGCTGGATGCAGCTGTATGATCGTT           GCTGCCTTTTGCAGCACCTTCATGTTTC         CACCGTGGATGACGACCTTACT           SMB         At1g26870         TCAGTTTGCAGCACCTTCATGTTT           CACGTGGAAGGCAGTAAGTGAACACG <t< td=""><td>Gene name</td><td>Locus</td><td colspan="4">Primer set (5' to 3')</td></t<>	Gene name	Locus	Primer set (5' to 3')				
SCR         At3g54220         TTCTCACCCCCTCACTGAGTTTTTG           GTTGTTGGTCGTGAGAITGCATGG         GTTGTTGGTCGTGAGAITGCATGG           SHR         At4g37650         TGGGAAGAGAGTTTTCCAAGGACGA           TCATCCGCCACCTCATCACTATACC         TCATCCGCCACCTCATCACTATACC           BRAVO         At5g17800         CGAGGACACTGAGACCAACAGAAG           CAG CGT TAT CGG TAC GAC CTG GA         CAG CGT TAT CGG TAC GAC CTG GA           ERF115         At5g07310         CAAATCCGCAGACTAATCCGCAAAC           AGGAGGTGAAGAATCCCCAAAACG         AGGAGCACCTGACAACGATCAAGG           CTCGGCGTCTTTTGGTCTCTCTG         CTCGGCGTCTTTTGGTCTCTCTG           PIN3         At1g201420         ATGTGCATCCCACGATTCTAAGCAC           CAATCTCCGAGGCTCTCTCAAAAGC         CAATCTCCGAGGCTCTTCAAAAGC           PIN7         At1g23080         TTGGGCTCTTGTTGCTTTCAGGT           CCGCTGGTCCAGTAAAGAAATCCAC         CCGCTGGTCCAGTAAAGAAATCCAC           CUL3         At1g26830         TCCCGATCATCCGTCTTTCCTCT           GCAGGACCATGTTGTACGCATTC         TTTCTGGGCTTGTTGGTAAGCTTGT           ETO1         At3g51770         TGCTGGATGCAGCTGTATGATCGTT           GCTGCCTTTTGACAATTGAGCCGTA         TCACCGTGGATGACACCTTCATCT           SMB         At1g26870         TCAGTTTGCAGCACCTTCATGTTTC           CACCGTGGAATGAGAAACAACG         TTGGAAGATCCCAGGGGTCATATTT	WOX5	At3g11260	TCCAACTCCAAGGTGGACAAAATGA				
SHR         At4g37650         TGGGAAGAGAGTTTTCCAAGGACGA           TCATCCGCCACCTCATCACTATACC         TCATCCGCCACCTCATCACTATACC           BRAVO         At5g17800         CGAGGACACTGGAGACCAACAGAAG           CAG CGT TAT CGG TAC GAC CTG GA         CAG CGT TAT CGG TAC GAC CTG GA           ERF115         At5g07310         CAAATCCGCAGACTAATCCGCAAAC           AGGAGGTGAAGAATCCCCAAAACG         AGGAGGTGAAGAATCAAGG           CTCGGCGTCTTTTGGTCTCTG         CTCGGCGTCTTTTGGTCTCTG           PINA         At2g01420         ATGTGCATCCCACGATTCTAAGCAC           CAATCTCCGAGGCTCTCTCAAAAGC         CAATCTCCGAGGCTCTCTCAAAAGC           PIN7         At1g23080         TTGGGCTCTTTGCTTTCAGGT           CCGCTGGTCCAGTAAAGAATCTCAC         CCGCTGGTCCAGTAAAGAATCTCAC           CUL3         At1g26830         TCCCGATCATCCGTCTTTCCTCT           GCAGGACCATGTTGTACGCATTTC         GCAGGACCATGTTGAAGCATTC           ACS5         At5g65800         GCGATGCTTTCCTTTTGCTACTC           TTTCTGGGCTTGTTGGTAAGCTTGT         TCCTGGATGACAGCTGTATGATCGTT           ETO1         At3g51770         TGCTGGATGACACCTTCATGTTTC           CACCGTGGATGACACCCTATCT         CACCGTGGATGACACCCTATCT           SMB         At1g26870         TCGGAAATGGAGACCCTATCT           TGGAAATGGAGAGAACAGGATAATTT         TGAAGCCAACCCTAGTGAAGTGAATGGA			ATGGCGGTGGATGTTCCATTTCAG				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	SCR	At3g54220	TTCTCACCCCTCACTGAGTTTTTG				
$ \begin{array}{c} TCATCCGCCACCTCATCACTATACC \\ BRAVO \\ At5g17800 \\ CGAGGACACTGGAGACCAACAGAAG \\ CAG CGT TAT CGG TAC GAC CTG GA \\ CAG CGT TAT CGG TAC GAC CTG GA \\ ERFII5 \\ At5g07310 \\ CAAATCCGCAGACTAATCCGCAAAC \\ AGGAGGTGAAGAATCCCCAAAACG \\ AGGAGGTGAAGAATCCCCAAAACG \\ PIN3 \\ At1g70940 \\ GGAGCACCTGACAACGATCAAGG \\ CTCGGCGTCTTTTGGTCTCTCTG \\ PIN4 \\ At2g01420 \\ ATGTGCATCCCACGATTCTAAGCAC \\ CAATCTCCGAGGCTCTTCAAAAGC \\ PIN7 \\ At1g23080 \\ TTGGGCTCTTGTTGCTTTCAGGT \\ CCGCTGGTCCAGTAAAGAATCTCAC \\ CUL3 \\ At1g26830 \\ TCCCGATCATCCGTCTTTCCTCT \\ GCAGGACCATGTTGACGCATTC \\ ACS5 \\ At5g65800 \\ GCGATGCTTTCCTTTTGCCTACTC \\ TTTCTGGGCTTGTTGGTAAGCTTGT \\ ETO1 \\ At3g51770 \\ TGCTGGATGCAGCTGTATGATCGTT \\ GCTGCCTTTTGACAATTGAGCCGTA \\ FEZ \\ At1g26870 \\ TCAGTTTGCAGCACCTTCATGTTTC \\ CACCGTGGATGACGACCCTATCT \\ SMB \\ At1g26870 \\ TCGGAAATGGAGACCCTATCT \\ TTGGAAGATCCCAGGGGTCATATTT \\ BRN1 \\ At1g33280 \\ CACGTGCAAGGCAGTAAGTGAATGG \\ TCACCGCGCAATGAAAGCAGATTAG \\ BRN2 \\ At4g10350 \\ TCAAGCCAACCCTAGTGAAGATGGA \\ TGGACTGTCTCGGTGCAAT \\ CPD \\ At5g05690 \\ GCGTGTTTTCAGACGTGCAAT \\ \\ CGGGTGTTTTCAGACGTGCAAT \\ \\ CCGCTGCATGCAAGCCTACTC \\ CCCGCGCAATAAAGCTA \\ CCCCACGTGCAAAACCAACCCTACTGCAAT \\ CCCCACGCGCCAATCAAAACCTA \\ CCCCACGTGCAACCCTACTCAATCCCAACCTACCTACTACCCAACCCTACTCAACCTACCTACCTACCCAACCCTACTCAACCCTACTA$			GTTGTTGGTCGTGAGATTGCATGG				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	SHR	At4g37650	TGGGAAGAGTTTTCCAAGGACGA				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			TCATCCGCCACCTCATCACTATACC				
ERF115       At5g07310       CAAATCCGCAGACTAATCCGCAAAC         AGGAGGTGAAGAATCCCCAAAACG       AGGAGGTGAAGAATCCCCAAAACG         PIN3       At1g70940       GGAGCACCTGACAACGATCAAGG         CTCGGCGTCTTTTGGTCTCTCTG       CTCGGCGTCTCTCTAAGCAC         PIN4       At2g01420       ATGTGCATCCCACGATTCTAAGCAC         CAATCTCCGAGGCTCTCTCAAAAGC       CAATCTCCGAGGTAAAGAATCTCAC         CUL3       At1g26830       TCCCGATCATCCGTCTTTCCTCT         GCAGGACCATGTTGTACGCATTTC       GCAGGACCATGTTGTACGCATTTC         ACS5       At5g65800       GCGATGCTTTCCTTTTGCCTACTC         TTTCTGGGCTTGTTGGTAAGCTTGT       TTCTTTTGGCAGCACTTGT         ETO1       At3g51770       TGCTGGATGCAGCTGTATGATCGTT         GCTGCCTTTTGACAATTGAGCCGTA       TCACCGTGGATGACGACCCTTCATGTTTC         CACCGTGGATGACGACCCTTCATGTTTC       CACCGTGGATGACGACCCTACTT         SMB       At1g26870       TCAGGAAATGGGAGATAGAAACAACG         TTGGAAGATCCCAGGGGTCATATTT       TCACCGCGCAATGAAGCAGATTAG         BRN1       At4g10350       TCACGCGCAATGAAAGCAGATTAG         BRN2       At4g10350       TCAAGCCAACCCTAGTGAAGCTA         CPD       At5g05690       GCGGTGTTTTCAGACGTGCAAT	BRAVO	At5g17800	CGAGGACACTGGAGACCAACAGAAG				
AGGAGGTGAAGAATCCCCAAAACG  PIN3 At1g70940 GGAGCACCTGACAACGATCAAGG CTCGGCGTCTTTTGGTCTCTCTG  PIN4 At2g01420 ATGTGCATCCCACGATTCTAAGCAC CAATCTCCGAGGCTCTTCAAAAGC  PIN7 At1g23080 TTGGGCTCTTGTTGCTTTCAGGT CCGCTGGTCCAGTAAAGAATCTCAC  CUL3 At1g26830 TCCCGATCATCCGTCTTTCCTCT GCAGGACCATGTTGTACGCATTCC  ACS5 At5g65800 GCGATGCTTCCTTTGCTACTC TTTCTGGGCTTGTTGGTAAGCTTGT  ETO1 At3g51770 TGCTGGATGCAGCTGTTGTACGCTACTC GCTGCCTTTTGACAATTGAGCCGTA  FEZ At1g26870 TCAGTTTGCAGCACCTTCATGTTTC CACCGTGGATGACGACCCTACTC  SMB At1g26870 TCGGAAATGGGAGATAGAAACAACG TTGGAAGATCCCAGGGGTCATATTT  BRN1 At1g33280 CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAG  BRN2 At4g10350 TCAAGCCAACCCTAGTGAAGAACACG TTGGACTGTCTCGGTGCATAAAGCTA  CPD At5g05690 GCGGTGTTTTCAGACGTGCAAT			CAG CGT TAT CGG TAC GAC CTG GA				
PIN3At1g70940GGAGCACCTGACAACGATCAAGG CTCGGCGTCTTTTGGTCTCTTGPIN4At2g01420ATGTGCATCCCACGATTCTAAGCAC CAATCTCCGAGGCTCTCTCAAAAGCPIN7At1g23080TTGGGCTCTTGTTGCTTTCAGGT CCGCTGGTCCAGTAAAGAATCTCACCUL3At1g26830TCCCGATCATCCGTCTTTCCTCT GCAGGACCATGTTGTACGCATTTCACS5At5g65800GCGATGCTTTCCTTTTGCCTACTC TTTCTGGGCTTGTTGGTAAGCTTGTET01At3g51770TGCTGGATGCAGCTGTATGATCGTT GCTGCCTTTTGACAATTGAGCCGTAFEZAt1g26870TCAGTTTGCAGCACCTTCATGTTC CACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACG TTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	ERF115	At5g07310	CAAATCCGCAGACTAATCCGCAAAC				
$PIN4 \qquad \text{At2g01420} \qquad \text{ATGTGCATCCCACGATTCTAAGCAC} \\ CAATCTCCGAGGCTCTCTCAAAAGC} \\ PIN7 \qquad \text{At1g23080} \qquad \text{TTGGGCTCTTGTTGCTTCAGGT} \\ CCGCTGGTCCAGTAAAGAATCTCAC} \\ CUL3 \qquad \text{At1g26830} \qquad \text{TCCCGATCATCCGTCTTTCCTCT} \\ GCAGGACCATGTTGTACGCATTTC} \\ ACS5 \qquad \text{At5g65800} \qquad \text{GCGATGCTTTCCTTTTGCTACTC} \\ TTTCTGGGCTTGTTGGTAAGCTTGT} \\ ET01 \qquad \text{At3g51770} \qquad \text{TGCTGGATGCAGCTGTATGATCGTT} \\ GCTGCCTTTTGACAATTGAGCCGTA} \\ FEZ \qquad \text{At1g26870} \qquad \text{TCAGTTTGCAGCACCTTCATGTTTC} \\ CACCGTGGATGACGACCCTATCT} \\ SMB \qquad \text{At1g26870} \qquad \text{TCGGAAATGGAGACACCTATCT} \\ BRN1 \qquad \text{At1g33280} \qquad \text{CACGTGCAAGGCAGTAAGTGAATGG} \\ TCACCGCGCAATGAAAGCAGATTAG} \\ BRN2 \qquad \text{At4g10350} \qquad \text{TCAAGCCAACCCTAGTGAAGATGGA} \\ TGGACTGTCTCGGTGCATAAAGCTA} \\ CPD \qquad \text{At5g05690} \qquad \text{GCGGTGTTTTCAGACGTGCAAT} \\ \end{tabular}$			AGGAGGTGAAGAATCCCCAAAACG				
PIN4At2g01420ATGTGCATCCCACGATTCTAAGCAC CAATCTCCGAGGCTCTCTCAAAAGCPIN7At1g23080TTGGGCTCTTGTTGCTTTCAGGT CCGCTGGTCCAGTAAAGAATCTCACCUL3At1g26830TCCCGATCATCCGTCTTTCCTCT GCAGGACCATGTTGTACGCATTTCACS5At5g65800GCGATGCTTTCCTTTTGCCTACTC TTTCTGGGCTTGTTGGTAAGCTTGTET01At3g51770TGCTGGATGCAGCTGTATGATCGTT GCTGCCTTTTGACAATTGAGCCGTAFEZAt1g26870TCAGTTTGCAGCACCTTCATGTTTC CACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACG TTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	PIN3	At1g70940	GGAGCACCTGACAACGATCAAGG				
$PIN7 \qquad \text{At1g23080} \qquad \text{TTGGGCTCTTGTTGCTTTCAGGT} \\ \text{CCGCTGGTCCAGTAAAGAATCTCAC} \\ \text{CUL3} \qquad \text{At1g26830} \qquad \text{TCCCGATCATCCGTCTTTCCTCT} \\ \text{GCAGGACCATGTTGTACGCATTTC} \\ \text{ACS5} \qquad \text{At5g65800} \qquad \text{GCGATGCTTTCCTTTTGCCTACTC} \\ \text{TTTCTGGGCTTGTTGGTAAGCTTGT} \\ \text{ETO1} \qquad \text{At3g51770} \qquad \text{TGCTGGATGCAGCTGTATGATCGTT} \\ \text{GCTGCCTTTTGACAATTGAGCCGTA} \\ \text{FEZ} \qquad \text{At1g26870} \qquad \text{TCAGTTTGCAGCACCTTCATGTTCC} \\ \text{CACCGTGGATGACGACCCTATCT} \\ \text{SMB} \qquad \text{At1g26870} \qquad \text{TCGGAAATGGGAGAAACAACGG} \\ \text{TTGGAAGATCCCAGGGGTCATATTT} \\ \text{BRN1} \qquad \text{At1g33280} \qquad \text{CACGTGCAAGGCAGTAAGTGAATGG} \\ \text{TCACCGCGCAATGAAAGCAGATTAG} \\ \text{BRN2} \qquad \text{At4g10350} \qquad \text{TCAAGCCAACCCTAGTGAAGATGGA} \\ \text{TGGACTGTCTCGGTGCATAAAGCTA} \\ \text{CPD} \qquad \text{At5g05690} \qquad \text{GCGGTGTTTTCAGACGTGCAAT} \\ \end{array}$			CTCGGCGTCTTTTGGTCTCTCTG				
PIN7At1g23080TTGGGCTCTTGTTGCTTTCAGGT CCGCTGGTCCAGTAAAGAATCTCACCUL3At1g26830TCCCGATCATCCGTCTTTCCTCT GCAGGACCATGTTGTACGCATTTCACS5At5g65800GCGATGCTTTCCTTTTGCCTACTC TTTCTGGGCTTGTTGGTAAGCTTGTETO1At3g51770TGCTGGATGCAGCTGTATGATCGTT GCTGCCTTTTGACAATTGAGCCGTAFEZAt1g26870TCAGTTTGCAGCACCTTCATGTTTC CACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACG TTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	PIN4	At2g01420	ATGTGCATCCCACGATTCTAAGCAC				
CCGCTGGTCCAGTAAAGAATCTCAC $CUL3$			CAATCTCCGAGGCTCTCTCAAAAGC				
CUL3At1g26830TCCCGATCATCCGTCTTTCCTCTGCAGGACCATGTTGTACGCATTTCGCAGGACCATGTTGTACGCATTTCACS5At5g65800GCGATGCTTTCCTTTTGCCTACTCTTTCTGGGCTTGTTGGTAAGCTTGTTTTCTGGGCTGTATGATCGTTET01At3g51770TGCTGGATGCAGCTGTATGATCGTTGCTGCCTTTTGACAATTGAGCCGTATCAGTTTGCAGCACCTTCATGTTTCCACCGTGGATGACGACCCTATCTCACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACGTTGGAAGATCCCAGGGGTCATATTTTTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGGTCACCGCGCAATGAAAGCAGATTAGTCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGATGGACTGTCTCGGTGCATAAAGCTATGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	PIN7	At1g23080	TTGGGCTCTTGTTGCTTTCAGGT				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			CCGCTGGTCCAGTAAAGAATCTCAC				
ACS5At5g65800GCGATGCTTTCCTTTTGCCTACTCTTTCTGGGCTTGTTGGTAAGCTTGTTTTCTGGGATGCAGCTGTATGATCGTTET01At3g51770TGCTGGATGCAGCTGTATGATCGTTGCTGCCTTTTGACAATTGAGCCGTATCAGTTTGCAGCACCTTCATGTTTCCACCGTGGATGACGACCCTATCTCACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACGTTGGAAGATCCCAGGGGTCATATTTTTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGGTCACCGCGCAATGAAAGCAGATTAGTCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGATGGACTGTCTCGGTGCATAAAGCTATGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	CUL3	At1g26830	TCCCGATCATCCGTCTTTCCTCT				
$ETO1 \qquad \text{At3g51770} \qquad \text{TGCTGGATGCAGCTGTATGATCGTT} \\ GCTGCCTTTTGACAATTGAGCCGTA} \\ FEZ \qquad \text{At1g26870} \qquad \text{TCAGTTTGCAGCACCTTCATGTTC} \\ CACCGTGGATGACGACCCTATCT} \\ SMB \qquad \text{At1g26870} \qquad \text{TCGGAAATGGGAGATAGAAACAACG} \\ \hline TTGGAAGATCCCAGGGGTCATATTT} \\ BRN1 \qquad \text{At1g33280} \qquad \text{CACGTGCAAGGCAGTAAGTGAATGG} \\ TCACCGCGCAATGAAAGCAGATTAG} \\ BRN2 \qquad \text{At4g10350} \qquad \text{TCAAGCCAACCCTAGTGAAGATGGA} \\ \hline TGGACTGTCTCGGTGCATAAAGCTA} \\ CPD \qquad \text{At5g05690} \qquad \text{GCGGTGTTTTCAGACGTGCAAT} \\ \\ \end{tabular}$			GCAGGACCATGTTGTACGCATTTC				
ETO1At3g51770TGCTGGATGCAGCTGTATGATCGTT GCTGCCTTTTGACAATTGAGCCGTAFEZAt1g26870TCAGTTTGCAGCACCTTCATGTTTC CACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACG TTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	ACS5	At5g65800	GCGATGCTTTCCTTTTGCCTACTC				
GCTGCCTTTTGACAATTGAGCCGTA $FEZ$			TTTCTGGGCTTGTTGGTAAGCTTGT				
FEZAt1g26870TCAGTTTGCAGCACCTTCATGTTTC CACCGTGGATGACGACCCTATCTSMBAt1g26870TCGGAAATGGGAGATAGAAACAACG TTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	ETO1	At3g51770	TGCTGGATGCAGCTGTATGATCGTT				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			GCTGCCTTTTGACAATTGAGCCGTA				
SMBAt1g26870TCGGAAATGGGAGATAGAAACAACGTTGGAAGATCCCAGGGGTCATATTTBRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGGTCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGATGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	FEZ	At1g26870	TCAGTTTGCAGCACCTTCATGTTTC				
TTGGAAGATCCCAGGGGTCATATTT  BRN1 At1g33280 CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAG  BRN2 At4g10350 TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTA  CPD At5g05690 GCGGTGTTTTCAGACGTGCAAT			CACCGTGGATGACGACCCTATCT				
BRN1At1g33280CACGTGCAAGGCAGTAAGTGAATGG TCACCGCGCAATGAAAGCAGATTAGBRN2At4g10350TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTACPDAt5g05690GCGGTGTTTTCAGACGTGCAAT	SMB	At1g26870	TCGGAAATGGGAGATAGAAACAACG				
TCACCGCGCAATGAAAGCAGATTAG  BRN2 At4g10350 TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTA  CPD At5g05690 GCGGTGTTTTCAGACGTGCAAT			TTGGAAGATCCCAGGGGTCATATTT				
BRN2 At4g10350 TCAAGCCAACCCTAGTGAAGATGGA TGGACTGTCTCGGTGCATAAAGCTA CPD At5g05690 GCGGTGTTTTCAGACGTGCAAT	BRN1	At1g33280	CACGTGCAAGGCAGTAAGTGAATGG				
TGGACTGTCTCGGTGCATAAAGCTA  CPD At5g05690 GCGGTGTTTTCAGACGTGCAAT			TCACCGCGCAATGAAAGCAGATTAG				
CPD At5g05690 GCGGTGTTTTCAGACGTGCAAT	BRN2	At4g10350	TCAAGCCAACCCTAGTGAAGATGGA				
			TGGACTGTCTCGGTGCATAAAGCTA				
GAAAGTGCGAGCATCTTTGAAGTGG	CPD	At5g05690	GCGGTGTTTTCAGACGTGCAAT				
· · · · · · · · · · · · · · · · · · ·			GAAAGTGCGAGCATCTTTGAAGTGG				

Supplementa	Supplemental Table S2. Primers used in ChIP-qPCR analysis							
Gene name	Locus	Primer set (5' to 3')						
UBC30	At5g56150	CAAATCCAAAACCCTAGAAACCGA						
		AACGACGAAGATCAAGAACTGGGAA						
PP2A At1g69960		AGCAGCACAACCCTCAACAG						
		CCAGATGTGCTAAAGACGGAG						
DWF4	At3g50660	GTGTTTTCTGACTATTGAGGGG						
		CGGTACGGTCTCAATCGGTTTA						
BRAVO A	At5g17800	AAAATTTAAACTAGTAGCAAAAAAT						
		TTTTACTTATATACTATATTCAGTG						
BRAVO B	At5g17800	AAAAAAAAAAAATGATAAATAAAA						
		GAGAGCACTTGAATGGCTTTTCACTG						
ERF115 A	At5g07310	CGTTCTCGTCAACAAATCTGAAAATAC						
		CAATCGAGAAACTGTTGTCTTTTTT						
<i>ERF115</i> B	At5g07310	TATGCAAAACTTCTGCTTGACGTTAA						
		CTTTGCTAAAATCTTTAAACCTCTTT						
PIN3	At1g70940	CTCCAATACTCGATCGTGAAGA						
		GGATGATAGAGTGTGGATTGG						
PIN4 A	At2g01420	CAAAAACAAAAAATAT						
		AAAGTTGCAAAAGGAACTTTG						
PIN4 B	At2g01420	GCACGACTATTCCATAAAACTGT						
		GGATTCGGTGAAGAGGACTA						
PIN7 A	At1g23080	CCAAACCATGAGCAGAATTGT						
		CGTTTACACAATTATAATAGCAG						
PIN7 B	At1g23080	CGGTCGCGGAAAGATCTTGA						
		CCCAAGAAATCTCACTTTTAAG						
PIN7 C	At1g23080	CGGCGAATATGATCTTGCATT						
		GGGCCACTTAACGTATTACTAG						
FEZ	At1g26870	CGATCGGCCCTTGTATCCTTTTAT						
		AAAAATGCACTATCATCATATCGT						
SMB	At1g26870	TAAGGAGCAAATATGGAACTTTA						
		AGGATTAACTATACTAAGCAGTAA						
BRN1	At1g33280	CTCCGGCGGCGTTGTCACCGGCCG						
		GTTAATAAATGATCAATGTTTGTTTG						
BRN2	At4g10350	TACATTAATATAACACATATTATT						
		AGAAACACAAAAAGAAAAACCTTT						

<b>Supplemental Table S3.</b> Division of QC in various brassinosteroid mutants										
	Col	bri1-116	bzr1-1D	bri1-116	En-2	bes1-D				
				/bzr1-1D						
DAG 3	0/25 (0) <sup>a</sup>	0/32 (0)	0/24 (0)	0/28 (0)	0/25 (0)	0/31 (0)				
DAG 7	2/38 (5)	0/26 (0)	14/28 (50)	10/27 (37)	0/23 (0)	21/25 (84)				
DAG 14	5/28 (18)	2/22 (9)	24/32 (75)	20/29 (69)	2/21 (10)	33/33 (100)				

<sup>&</sup>lt;sup>a</sup>: Number of plants with periclinal division of QC / number of plants observed (percentage of plants with the reactivated QC). DAG: Day after germination.