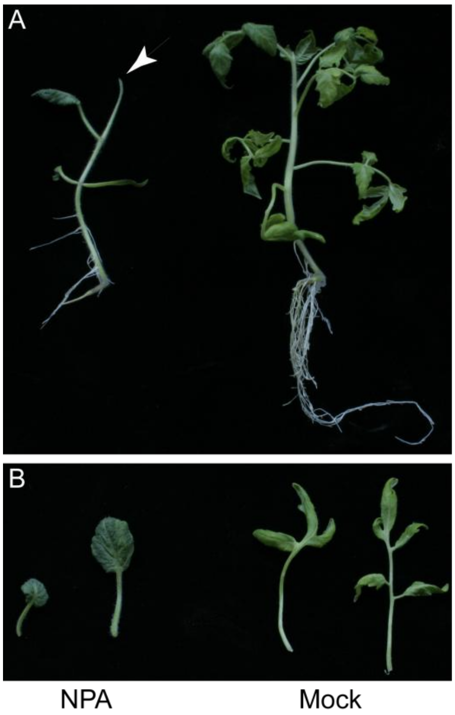
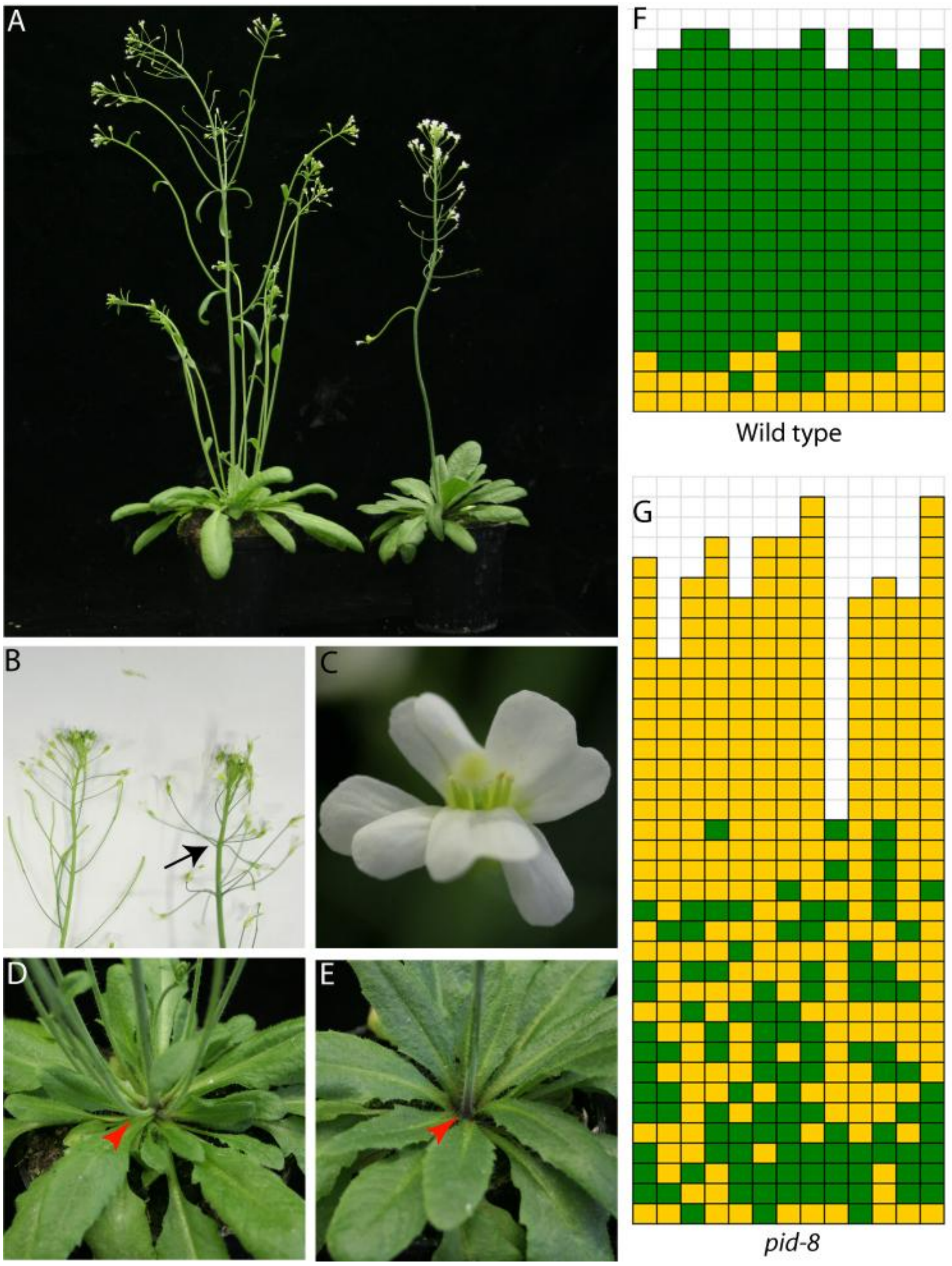
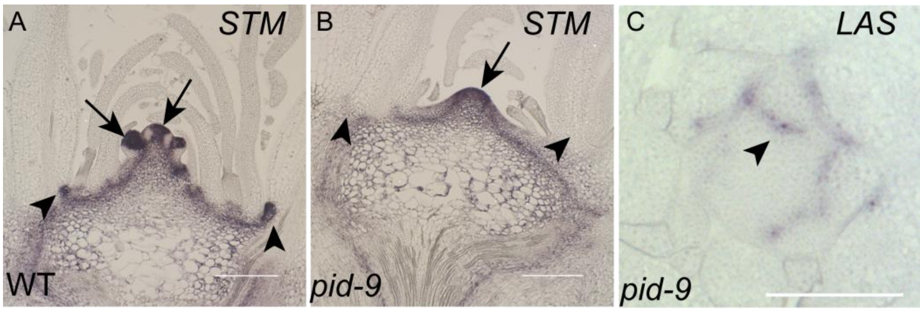


Supplemental Figure1: Mock and NPA-treated tomato plants.
(A) NPA treated tomato (cv. Moneymaker) developed a pin-like inflorescence (arrowhead). (B) Comparison of first and second leaves from mock and NPA treated tomato plants. NPA-treated plants had simpler leaves.

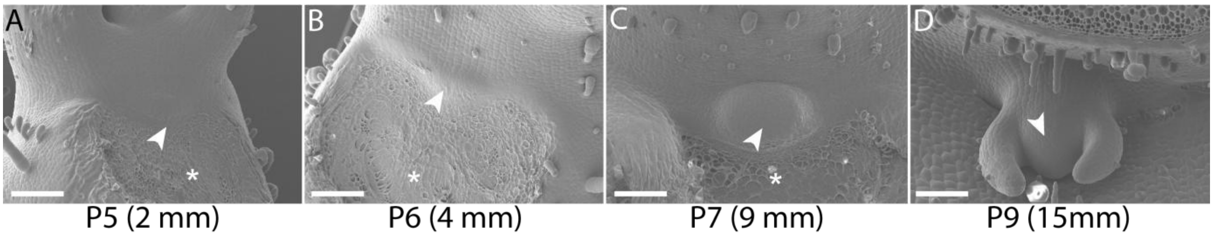


Supplemental Figure 2: Phenotype of *pid-8* mutant plants.
(A) Habitus of a Ws wild type plant (left) and a *pid-8* mutant (right). Plants were grown for 28 days under SD conditions and then shifted to LD to induce flowering. (B) Comparison of an inflorescence between Ws (left) and *pid-8* (right), arrow points to a cluster of flowers. (D) Close-up view of a *pid-8* flower. (D, E) Close-up view of a Ws and a *pid-8* rosette. In Ws, side shoots are formed (D, arrowhead) while in *pid-8* most leaf axils are empty (E, arrowhead). (F-G) Schematic representation of axillary bud formation in rosette leaf axils of *pid-8* (G) in comparison to the Ws wild type (F, n=13). Plants were grown for 28 days under SD conditions and then shifted to LD to induce flowering. Each column represents a single plant and each square within a column representing an individual leaf axil. The bottom row represents the oldest rosette leaf axils, with positions of progressively younger rosette leaves on top of it. Green denotes the presence of an axillary bud and yellow the absence of an axillary bud in any particular leaf axil.

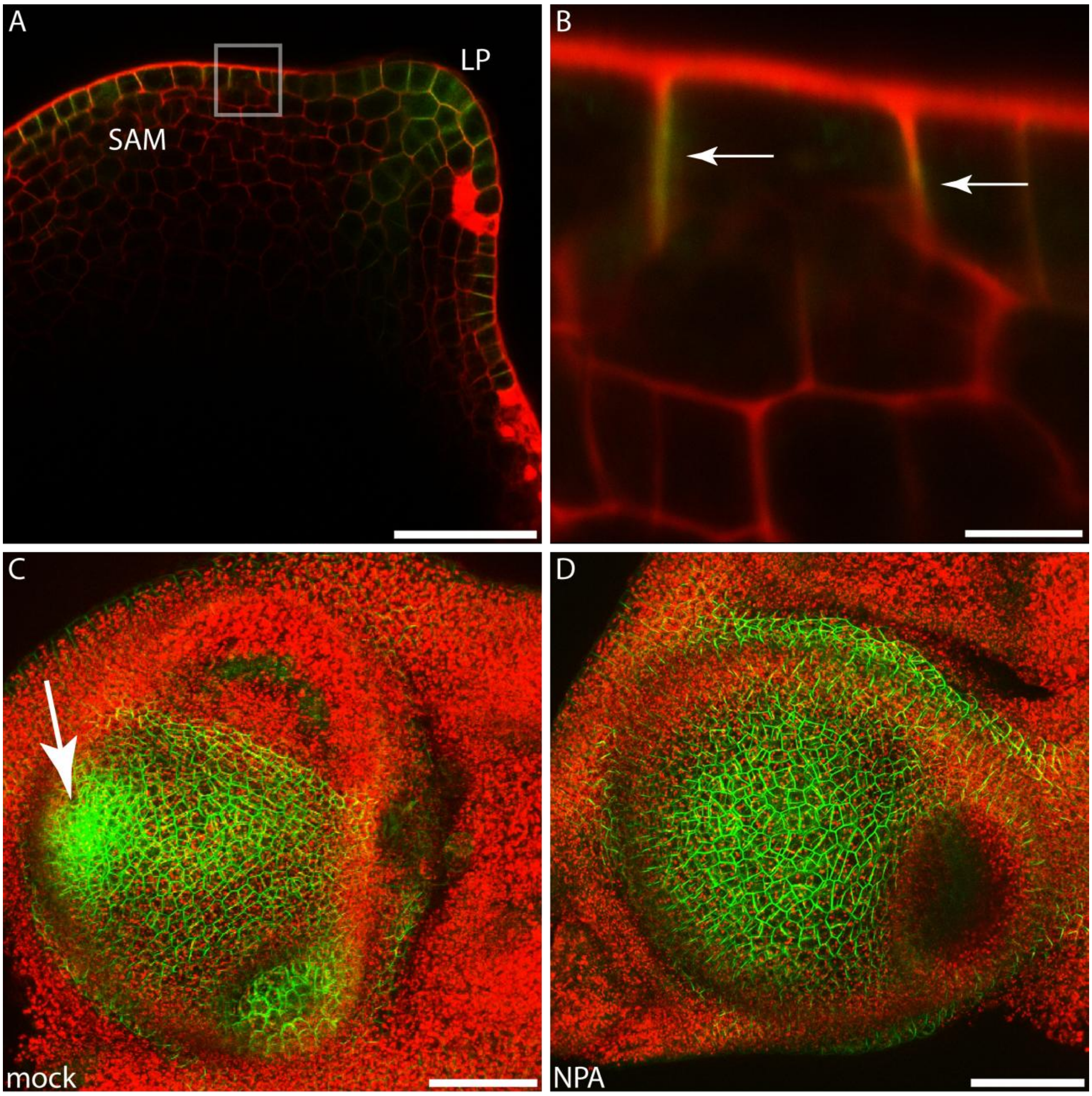


Supplemental Figure 3: *STM* and *LAS* transcript accumulation in apices of Arabidopsis wild type and *pid-9* mutant plants.

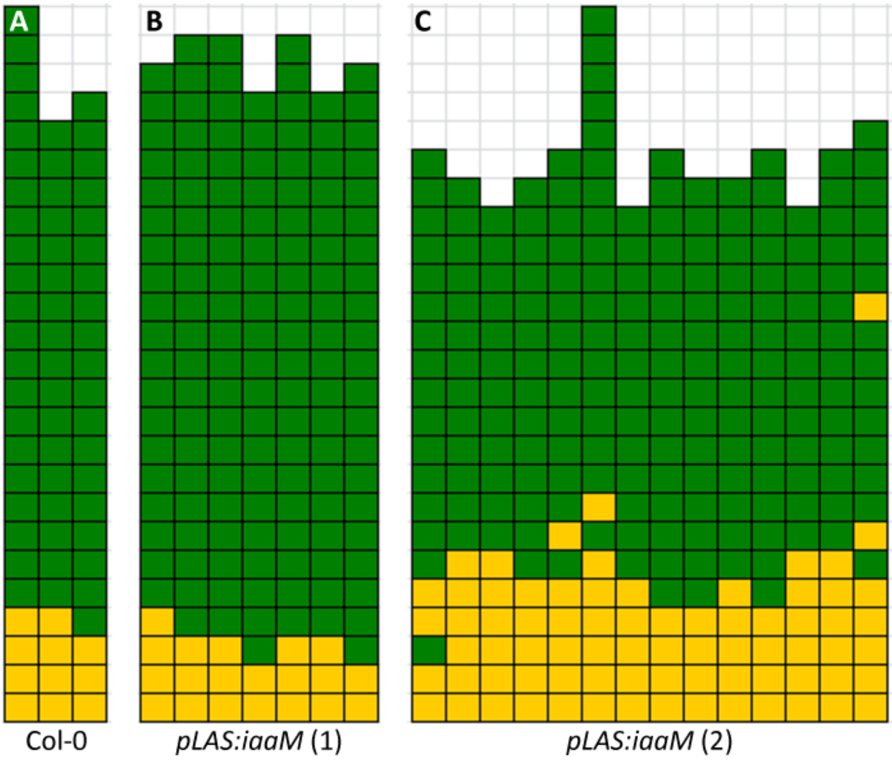
(A, B) Longitudinal sections through shoot apices of Col-0 wild type (A) and *pid-9* (B) plants were hybridized with a *STM* antisense probe. Sections were prepared from plants grown under SD conditions for 28 days and shift to LD for 7 days before fixation. In both wild type and *pid-9* plants, *STM* mRNA is detected in the inflorescence meristem and interprimodial regions (A and B, arrows). Focused *STM* expression domains in older leaf axils was present in wild type but absent in *pid-9* (A and B, arrowheads). In addition, *pid-9* plants did not form any floral meristems and the main meristem was naked (B). (C) Transverse section through the shoot tip of *pid-9* plant was hybridized with a probe from the *LAS* gene, arrowhead indicates that *LAS* was expressed at the boundary between the SAM and leaf primordia. Probes are indicated in the upper right corner, genotypes are indicated in the bottom left corner. Scale bars: A and B 200 µm; C 100 µm.



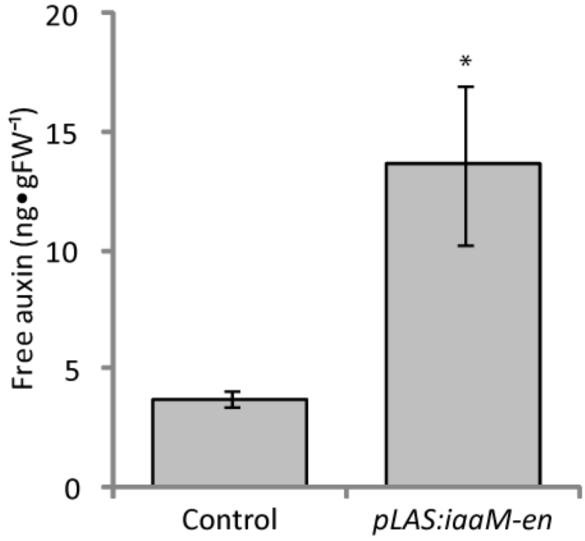
Supplemental Figure 4: Axillary meristem development in tomato.
(A-D) AM initiation was studied by SEM micrographs of young leaf axils from wild type tomato plants (cv. Moneymaker). Primordia of different sizes (2-9 mm) were removed from two-week-old tomato seedlings (marked with asterisks (*)) to monitor morphological changes. Arrowheads point to an empty leaf axil (A), developing AMs (B and C) and to an axillary bud (D). Scale bars: 100 µm.



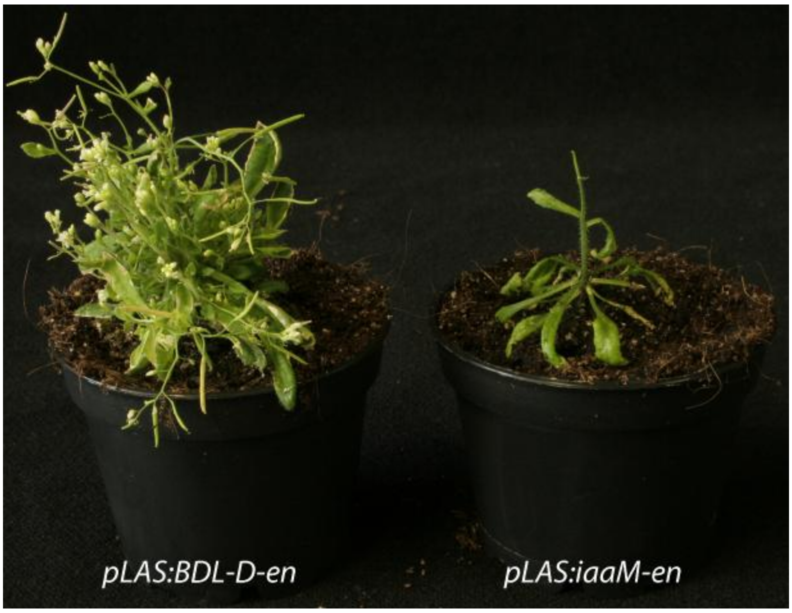
Supplemental Figure 5: PIN1 localization in the tomato apex.
(A) Confocal image of a tomato apex with PIN1-GFP construct. LP (leaf primordium), SAM (shoot apical meristem). (B) Close-up view of region marked in A, arrow indicate polarity of auxin flux. (C, D) 3D reconstruction of PIN1-GFP tomato apex with mock (C) and NPA (D) treatment. In C the arrow points to the incipient leaf primordium. Scale bars: A 50 µm, B 5 µm, C and D 100 µm. Green indicates GFP signal, red indicates Propidium Iodide (PI, Sigma-Aldrich, USA) stained cell walls (A, B) or chlorophyll auto fluorescence (C, D).



Supplemental Figure 6: *pLAS:iaaM* plants do not exhibit strong branching defects.
(A-C) Schematic representation of axillary bud formation in rosette leaf axils of Col-0 wild type (A, n=3) in comparison to two different *pLAS:iaaM* transgenic lines (B, n=7; C, n=14). Plants were grown under SD conditions for 28 days and then shifted to LD to induce flowering. Each column represents a single plant, with each square within a column representing an individual leaf axil. The bottom row represents the oldest rosette leaf axils, with positions of progressively younger rosette leaves on top of it. Green denotes the presence of an axillary bud and yellow the absence of an axillary bud in any particular leaf axil.



Supplemental Figure 7: IAA concentration in control and *pLAS:iaaM-en* plants.
Bars indicate average level of free auxin in 2-week-old seedlings (± SE, n=6). Asterisk (*) indicates statistically significant differences relative to control ($p < 0.05$).



Supplemental Figure 8: Habitus of a *pLAS:BDL-D-en* plant (left) and a *pLAS:iaaM-en* plant (right). Plants were grown for 28 days under SD conditions and then shifted to LD to induce flowering. Images are representative of multiple plants (n>10).

Supplemental Table 1. Primers

pid-ish 5'	ACCAACCCGTCTCTTTGTTG	*PID* probe
pid-ish 3'-T7	TAATACGACTCACTATAGGGAGAGCGCATGAAGCTCAAACATA	*PID* probe
pid-ish 3'	GCGCATGAAGCTCAAACATA	*PID* probe
pid phenotype R	ACTAGAACTTCGGCGGCATA	*pid-9* genotype
GABI left	ATATTGACCATCATACTCATTGC	*pid-9* genotype
LB b1	GCGTGGACCGCTTGCTGCAACT	*pin1*genotype
pin1 47613 R	AGCATGCTTTCTGCTGTGAA	*pin1*genotype
pin1 47613 F	TAAGGTGATGCCACCAACAA	*pin1*genotype
BDLfor1Acc65I	CGTGGTACCATGCGTGGTGTGTCAGAA	*BDL* cloning
BDLRev1AvrII	CGTCCTAGGCTAAACAGGGTTGTTTCT	*BDL* cloning
BDLrev2mut	TGGTGACCATCCTACCACTTG	*BDL* mutation
BDLfor2mut	CAAGTGGTAGGATGGTCACCA	*BDL* mutation
iM1f-iaaMfor1Acc65I	CGTGGTACCATGTATGACCATTTTAATTCA	*iaaM* cloning
iM1r-iaaMrev1AvrII	CGTCCTAGGTTAATAGCGATAGGAGGCGTT	*iaaM* cloning
pid-EcoRI F	TAAGAATTCATGTTACGAGAATCAGAC	*pid-9* genotype
PlasmidF	CACGACGTTGTAAAACGACGGCCAG	*LAS* promoter cloning
AE42-1522R	CATCCTAGGCATGGTACCTTGAAACGATAGAAAAAGATG	*LAS* promoter cloning
35enhan-NotIF	CATGCGGCCGCATCACATCAATCCACTTG	2x35S enhancer cloning
35enhan-NotIR	CATGCGGCCGCAACATGGTGGAGCACGAC	2x35S enhancer cloning

Supplemental Table 2. Cloning strategies

Use	Construct	Plasmid name	Insert or PCR product	Primers	Template	Plasmid backbone	Cloning method
Cloning vector	*LAS* 5' and 3' promoter (*LAS*)	pSR40	1447 bp of 5' and 4564 bp of 3' promoter	PlasmidF + AE42-1522R	pAE421[1]	pGEM	aa site
Cloning vector	*pLAS:iaaM*	pQW17	*iaaM* ORF	iM1f-iaaMfor1Acc65I + iM1r-iaaMrev1AvrII	*iaaM* construct kindly provided by Csaba Koncz	pSR40	Acc65I / AvrII
Cloning vector	*pLAS:BDL-D*	pQW19	C200 to T200 mutated *BDL* ORF	Two-step PCR:		pSR40	Acc65I / AvrII
				(1) (a) BDLfor1Acc65I + BDLrev2mut (b) BDLfor2mut + BDLRev1AvrII	Arabidopsis cDNA		
				(2) BDLfor1Acc65I + BDLRev1AvrII	Purified PCR products pooled from (1)		
for Arabidopsis transformation	*pLAS:iaaM*	pQW22	pQW17	-	-	pGPTV-Bar-AscI[2]	AscI
for Arabidopsis transformation	*pLAS:BDL-D*	pQW24	pQW19	-	-	pGPTV-Bar-AscI[2]	AscI
Cloning vector	*pLAS:iaaM-en*	pQW58	2x35s enhancer	35enhan-NotIF + 35enhan-NotIR	described in Busch et al. (2011)	pQW17	NotI
for Arabidopsis transformation	*pLAS:iaaM-en*	pQW62	pQW58	-	-	pGPTV-Bar-AscI[2]	AscI
Cloning vector	*pLAS:BDL-D-en*	pQW59	2x35s enhancer	35enhan-NotIF + 35enhan-NotIR	described in Busch et al. (2011)	pQW19	NotI
for Arabidopsis transformation	*pLAS:BDL-D-en*	pQW63	pQW59	-	-	pGPTV-Bar-AscI[2]	AscI

[1] Eicker (2005)
[2] Überlacker and Werr (1996)

Supplemental References:

Busch, B.L., Schmitz, G., Rossmann, S., Piron, F., Ding, J., Bendahmane, A., and Theres, K. (2011). Shoot branching and leaf dissection in tomato are regulated by homologous gene modules. Plant Cell **23,** 3595-3609.

Eicker, A. (2005). Studien zur Charakterisierung der regulatorischen Elemente des LATERAL SUPPRESSOR Gens in Arabidopsis thaliana. Inaugural-Dissertation, Universität zu Köln.

Überlacker, B., and Werr, W. (1996). Vectors with rare-cutter restriction enzyme sites for expression of open reading frames in transgenic plants. Mol Breeding **2,** 293-295.