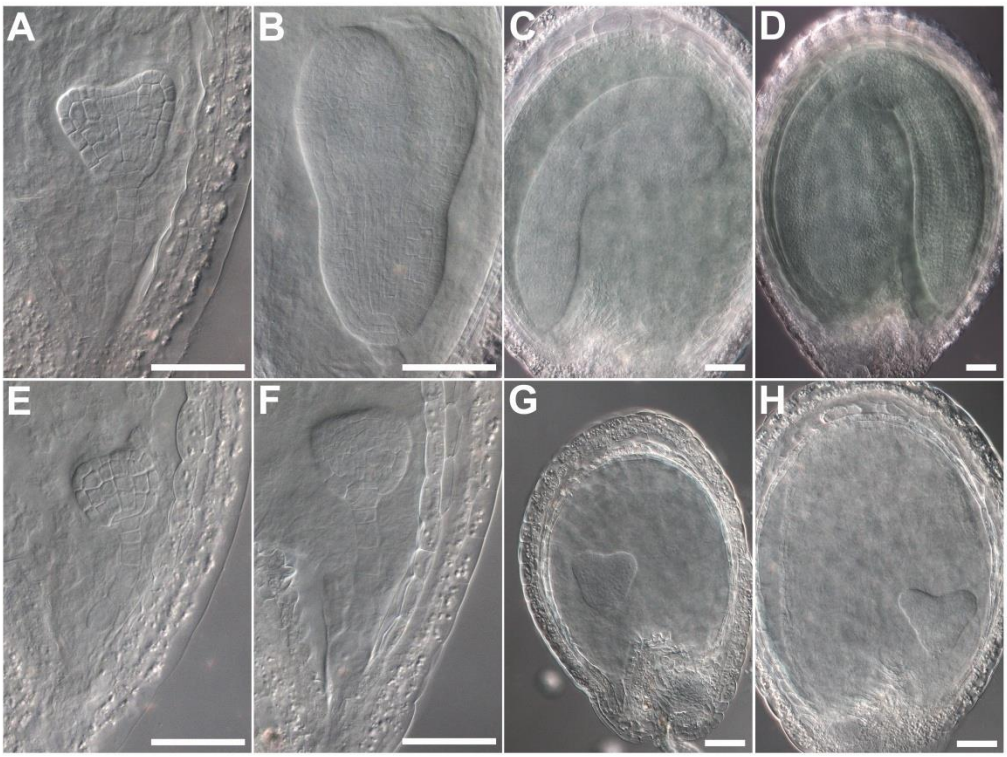
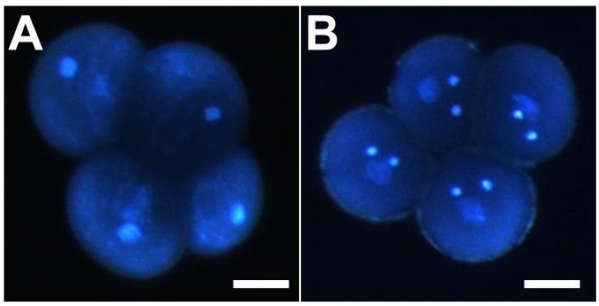
Supplemetanl Figure 1



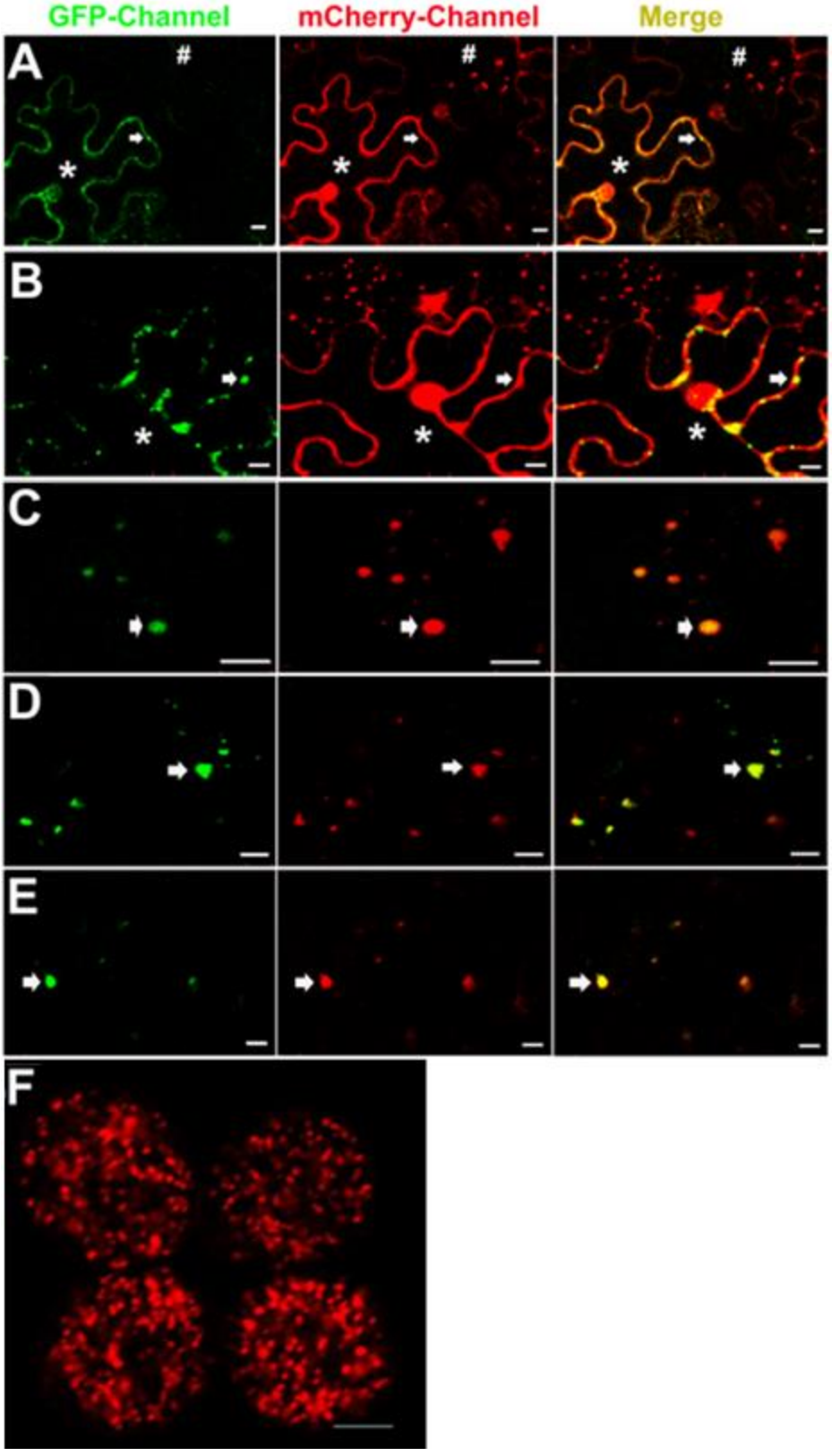
Supplemental Figure 1. Mutant Embryos Were Arrested before the Heart Stage.
(A) to **(D)** Whole-mount, cleared embryos from wild-type siliques.
(E) to **(H)** Cleared *dau* mutant embryos from *dau* heterozygous plants.
(A) and **(E)** are in the same silique representing wild-type embryo at the heart stage and *dau* embryo at the globular stage.
(B) and **(F)** show wild-type embryo at the torpedo stage and *dau* embryo at the transition stage in the same silique.
(C) and **(G)** are in the same silique representing wild-type embryo at the early-cotyledon stage and *dau* embryo at the heart stage.
(D) and **(H)** show wild-type embryo at the cotyledon stage and *dau* embryo at the late heart stage in the same silique. Bars=100 μm.

Supplemental Figure 2



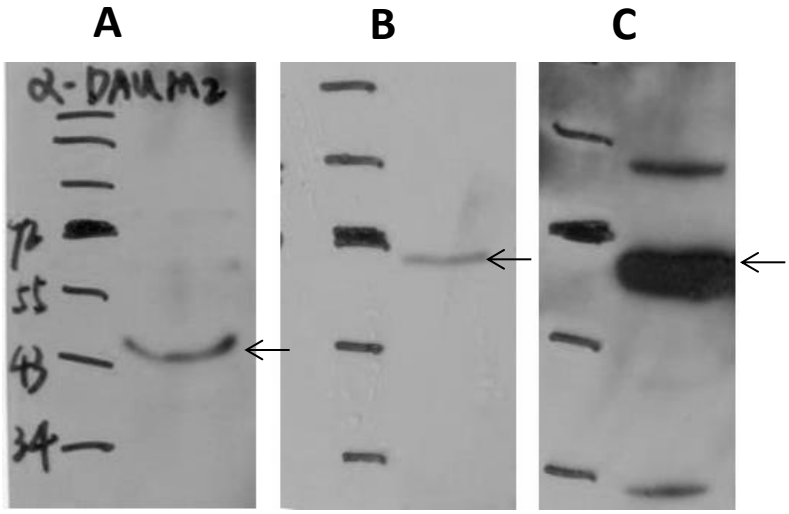
Supplemental Figure 2. DAPI Staining of *dau/DAU qrt/qrt* Quartet Pollen.
(A) Bicellular grains at the stage of pollen mitosis I.
(B) Tricellular grains at the stage of pollen mitosis II. Bars=50 μm.

Supplemental Figure 3



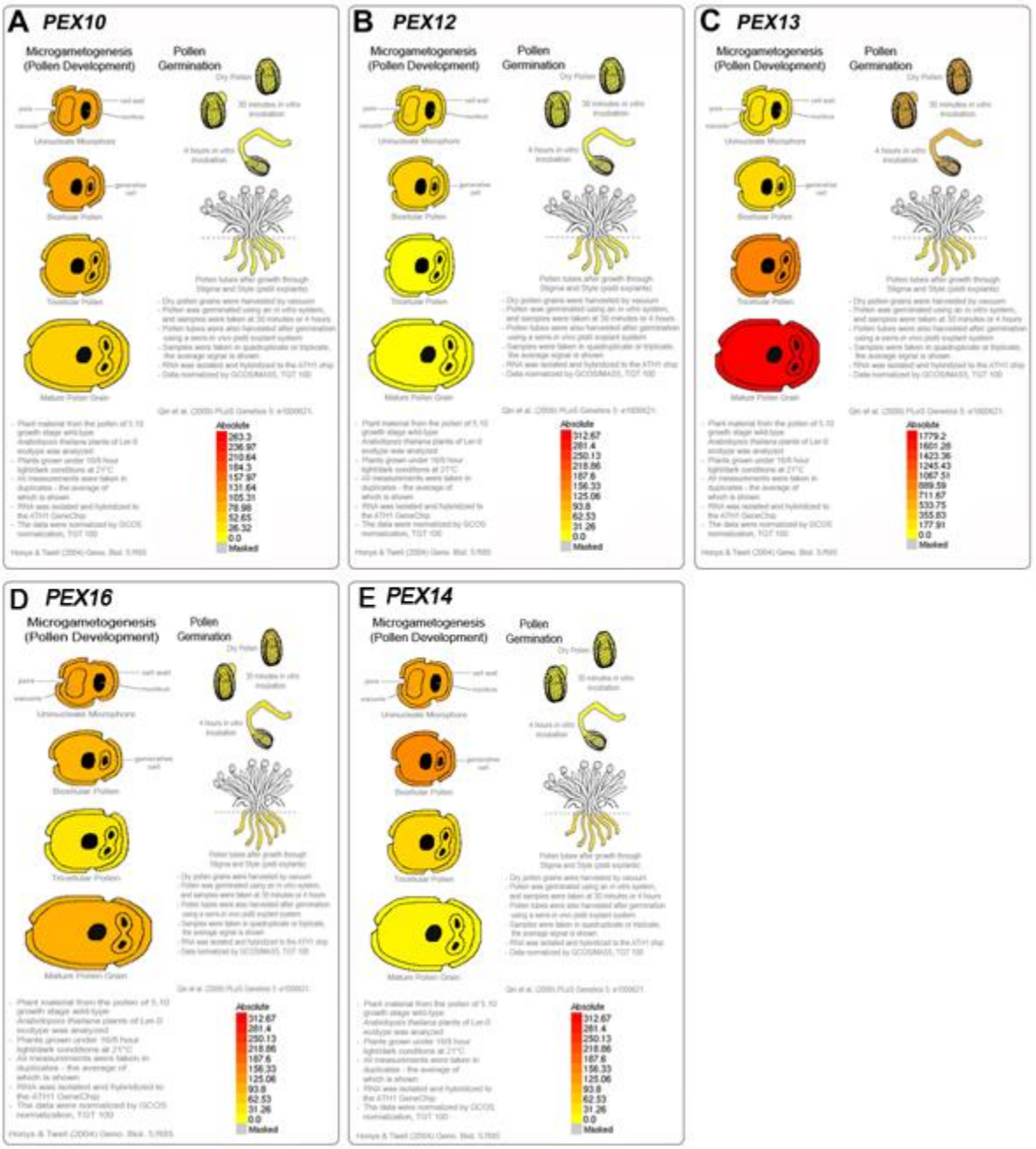
Supplemental Figure 3. Peroxisomal Localization of DAU-EGFP.
Constructs in pairs as indicated were co-transformed into *N. benthamiana* leaf cells and viewed with confocal microscopy after three days.
(A) Coexpression of DAU-EGFP and mCherry-PTS1. Note peroxisomal localization (#) and cytosolic localization (*) of mCherry-PTS1.DAU-EGFP was occasionally colocalized with mCherry-PTS1 (arrow).
(B) Coexpression of DAU-EGFP and PTS2-mCherry. Note cytosolic localization of PTS2-mChery (*) and occasional colocalization of DAU-EGFP and mCherry- PTS1 (arrow).
(C) Colocalization of DAU-EGFP and PEX12-mCherry (arrow).
(D) Colocalization of DAU-EGFP and mCherry-PEX13 (arrow).
(E) Colocalization of DAU-EGFP and mCherry-PEX16 (arrow).
(F) Peroxisomal localization of mCherry-PTS1 in genomic *DAU*-complemented *dau/DAU qrt/qrt.*
Bars = 10 μm.

Supplemental Figure 4



Supplemental Figure 4. The Specificity Determination of DAU Antibody by Immunoblot.
(**A**). A specific band of 43 kD was detected by DAU antibody in samples from wild-type seedlings.
(**B**). One specific band of 70 kD was detected by GFP antibody in samples from tobacco transformed with DAU-GFP .
(**C**).The 70-kD band corresponding to the right band at (**B**) was detected by DAU antibody from the same sample as in (**B**).
The numbers drawn on the left of (A) indicate the molecular weight marker and the unit is kDa.

Supplemental Figure 5



Supplemental Figure 5. Expression Levels of *PEX10*, *PEX12*, *PEX13*, *PEX16* and *PEX14* in Pollen Development and Germination. The data were obtained by tools of *Arabidopsis* eFP Browsers in the website of The Bio-Array Resource for Plant Biology (http://bar.utoronto.ca/welcome.htm). The expression level of *PEX13* is much higher than that of other genes during pollen development and germination.

Supplemental Table 1

Complementation analysis of *ProDAU*:*DAU-EGFP* transgenic plants.

ProDAU:*DAU-EGFP* transgenic line	T2 generation		*Kan*^{R} /*Kan*^{S} ratio	Chi-square test
	Kan^R	*Kan*^{S}		
1	331	147	2.25	$\chi^2 = 20.11$, $P < 0.01$, n = 1
2	280	134	2.09	$\chi^2 = 14.05$, $P < 0.01$, n = 1
3	373	187	1.99	$\chi^2 = 13.92$, $P < 0.01$, n = 1
4	337	122	2.76	$\chi^2 = 34.73$, $P < 0.01$, n = 1
5	327	193	1.69	$\chi^2 = 5.46$, $0.01 < P < 0.05$, n = 1
7	273	135	2.02	$\chi^2 = 12.20$, $P < 0.01$, n = 1
8	326	103	2.51	$\chi^2 = 44.40$, $P < 0.01$, n = 1
dau/DAU	370	289	1.28	n.d.

n.d. not determined.

Supplemental Table 2

In vitro germination ratio of *apem9-2 and apem9-2***.**

	Pollen grains	Pollen tubes	Germination ratio (%)	Chi-square test
Col-0	1866	1561	83.65%	n.d.
apem9-2	1532	1256	81.99%	χ^2=1.65, P>0.05, n=1
apem9-3	1986	1685	84.84%	χ^2=1.03, P>0.05, n=1

n.d., not detected.

Supplemental Table 3

Sequences of primers used in this work.

DAU genomic	DAUg-F	5’-GGATCTAGATGGTTAAGCCAAGGGTCTAA-3’
	DAUg-R	5’-GGAGGTACCCCATATTAAAAAGGCAAGGAG-3’
DAUpro-GUS	DAUpro-F	5’-GGAGTCGACTGGTTAAGCCAAGGGTCTAA-3’
	DAUpro-R	5’-GGAGGATCCCAAATATCAGTTGCCTCCAT-3’
	DAU3T-F	5’-GGAGAGCTCAGATGGATCAAAATTTGGCA-3’
	DAU3T-R	5’-GGAGAGCTCCCATATTAAAAAGGCAAGGAG-3’
Localization	NOS-F	5’-CGAGCTCGATCGTTCAAACATTTGGC-3’
	NOS-R	5’-CGGAATTCATCGAATTCGATCTAGTAA-3’
	35S-F	5’-CCCAAGCTTCGACACTCTCGTCTACTCCA-3’
	35S-R	5’-AACTGCAGAGAGATAGATTTGTAGAGAGAGA-3’
	N-EGFP-F	5’-CCGCTCGAGATGGTGAGCAAGGGCGAG-3’
	N-EGFP-R	5’-ACGCGTCGACCTTGTACAGCTCGTCCATG-3’
	C-EGFP-F	5’-CGCGGATCCGTGAGCAAGGGCGAGGAG-3’
	C-EGFP-R	5’-CGAGCTCTTACTTGTACAGCTCGTC-3’
	N-DAU-Xba-F	5’-TGCTCTAGAATGGAGGCAACTGATATTTG-3’
	N-DAU-R	5’-CGGGGTACCTCATGTTGTGGTGCTTGGTA-3’
	N-DAU-Sal-F	5’-ACGCGTCGACATGGAGGCAACTGATATTT-3’
	DAU-115-R	5’-CGCGGATCCTCAATCACGTACACCCAAATAG-3’
	C-DAU-F	5’-AACTGCAGATGGAGGCAACTGATATTTG-3’
	C-DAU-Xba-R	5’-TGCTCTAGATGTTGTGGTGCTTGGTATGG-3’
	DAU-267-F	5’-AACTGCAGATGTCCAGGGGAAAGGTTG-3’
	C-DAU-BamH-R	5’-CGCGGATCCTGTTGTGGTGCTTGGTATG-3’
	N-mCherry-F	5’-CCGCTCGAGATGGTGAGCAAGGGCGAGGA-3’
	N-mCherry-R	5’-ACGCGTCGACCTTGTACAGCTCGTCCATG-3’
	C-mCherry-F	5’-GGGGTGAGCAAGGGCGAGGAGGA-3’
	C-mCherry-R	5’-TTACTTGTACAGCTCGTCCATG-3’
	PEX7-F	5’-TGCTCTAGAATGCCGGTGTTCAAAGCTCC-3’

	PEX7-R	5’-CGGGGTACCTCAACTGGCTCTAGGATCCA-3’
	PEX13-F	5’-ACGCGTCGACATGGCGTCTCAGCCTGCAGG-3’
	PEX13-R	5’-TGCTCTAGATTAGTTGCCCCATACATTGT-3’
	PEX16-F	5’-TGCTCTAGAATGGAAGCTTATAAGCAATGGG-3’
	PEX16-R	5’-CGGGGTACCTCACGATCCCGATATGTAAG-3’
	PTS2-F	5’-GCGTCGACAAAAAATGGAGAAAGCGATCGAG-3’
	PTS2-R	5’-GGGATAGAGAGAGGTCCTCTGATA-3’
	PEX12-F	5’-ACGCGTCGACATGTTGTTTCAGGTGGGAGG-3’
	PEX12-R	5’-GGGGTGTCCTGAAACAACCTCC-3’
	PEX14-F	5’-ACGCGTCGACATGGCAACTCATCAGCAAAC-3’
	PEX14-R	5’-GGGGTTCCCTTCCTGGCTGATA-3’
	Lat52pro-F	5’-CCCAAGCTTTCGACATACTCGACTCAG-3’
	Lat52pro-R	5’-AACTGCAGTTAAATTGGAATTTTTTTTT-3’
	PTS1-R	5’-TGCTCTAGATTACAGCTTCGATCTCTTGT-3’
luciferase complementation imaging assay	DAU-Luc-F	5’-CGGGGTACCATGGAGGCAACTGATATTT-3’
	DAU-NLuc-R	5’- ACGCGTCGACTGTTGTGGTGCTTGGTATG-3’
	DAU-CLuc-R	5’-ACGCGTCGACTCATGTTGTGGTGCTTGGT-3’
	PEX13-Luc-F	5’-CGGGGTACCATGGCGTCTCAGCCTGCAG-3’
	PEX13-NLuc-R	5’-ACGCGTCGACGTTGCCCCATACATTG-3’
	PEX13-CLuc-R	5’-ACGCGTCGACTTAGTTGCCCCATACATTG-3’
	PEX16-Luc-F	5’-CGGGGTACCATGGAAGCTTATAAGCAAT-3’
	PEX16-NLuc-R	5’-ACGCGTCGACCGATCCCGATATGTAA-3’
	PEX16-CLuc-R	5’-ACGCGTCGACTCACGATCCCGATATGTAA-3’
DAU antibody	DAU-BamH-F	CGCGGATCCATGGAGGCAACTGATATTTG
	DAU-268-Sal-R	ACGCGTCGACGGACATGCTAAATTGGGTAT
Confirmation of T-DNA insertion sites	LBa1	5’-TGGTTCACGTAGTGGGCCATCG-3’
	SALK_022380-RP	5’-TGACCAAAGTGACCAAGGTTC-3’
	SALK_132193-RP	5’-CATGTTGTGGTGCTTGGTATG-3’
	SALK_007838-RP	5’-TCGGTACAATTTTTCCGACAC-3’

	SALK_013612-RP	5’-TGCGATGAAAAATCTACCGAG-3’
	SALK_055083-RP	5’-TTTACTGCTGCTGTAGGTGGC-3’
	SALK_007441-RP	5’-GAGCTGCTATGGCAACTCATC-3’
	CS6000-RP	5’-ATGGAAGCTTATAAGCAATG-3’

The underlines indicate the enzyme digest sites.