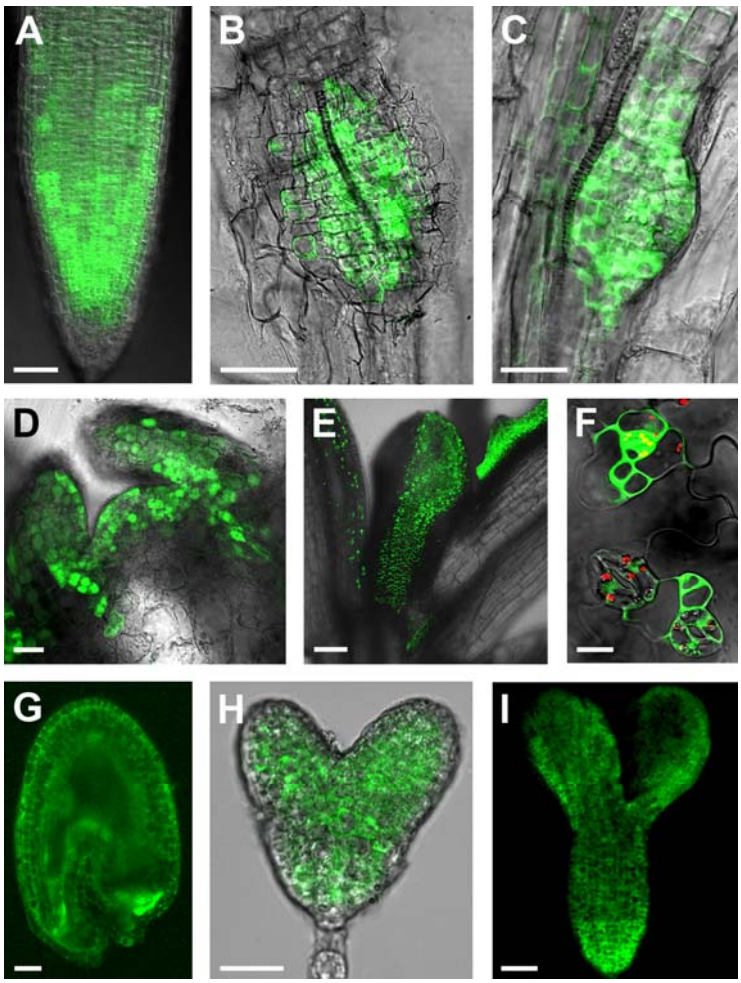
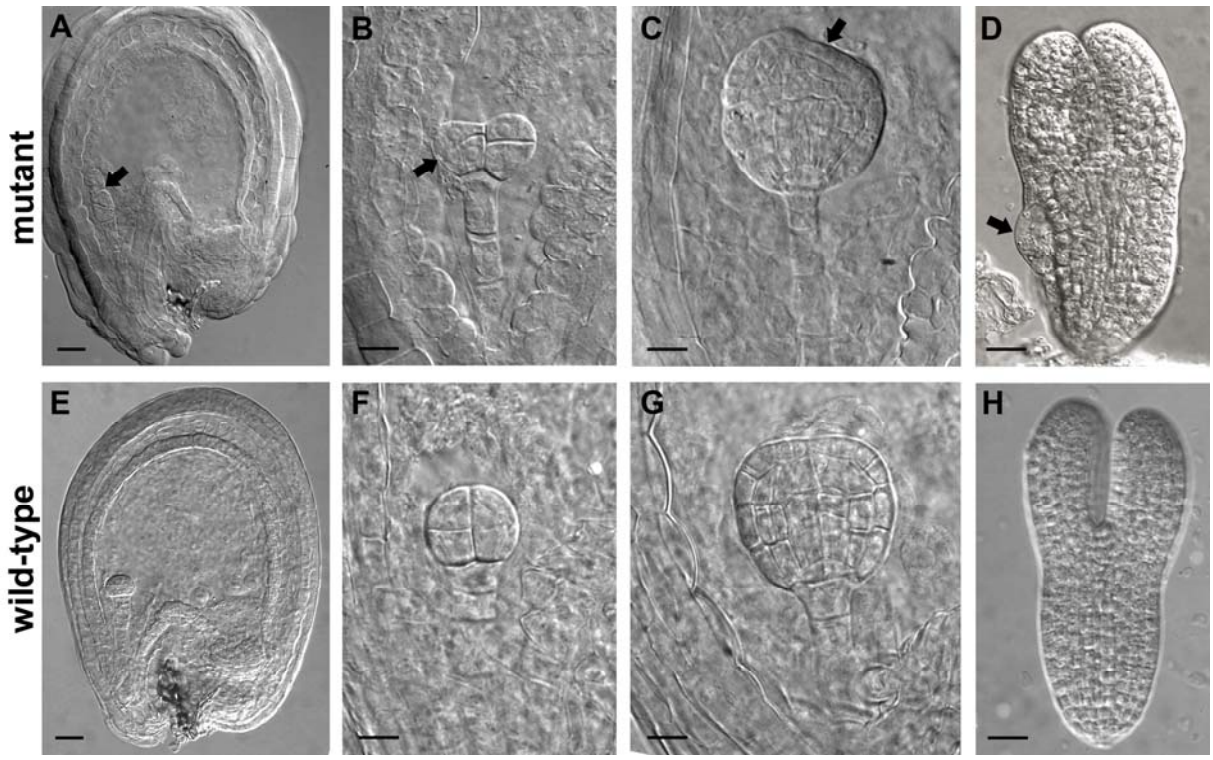



**Supplemental Figure 1**. MAP65-3 Expression Pattern During Plant Development Observed Using the *ProMAP65-3:GFP:GUS* Fusion.

**(A-C)** GFP expression in the root, in root meristem **(A)**, lateral root initiation **(B)** and lateral root meristem **(C)**.

**(D-F)** MAP65-3 expression in the aerial parts of the plant. *MAP65-3* was expressed in the shoot apical meristem **(D)**, foliar primordia and young leaves **(E)**. In mature leaves GFP signal is located in meristemoids, stomata in formation and in mature stomata **(F).** During embryogenesis, GFP was detected soon after fertilization, in the embryo and syncytial endosperm **(G).** The GFP signal was uniform at the torpedo stage **(H)**, but became more intense in the zone corresponding to the root meristem in the late torpedo stage **(I)**.

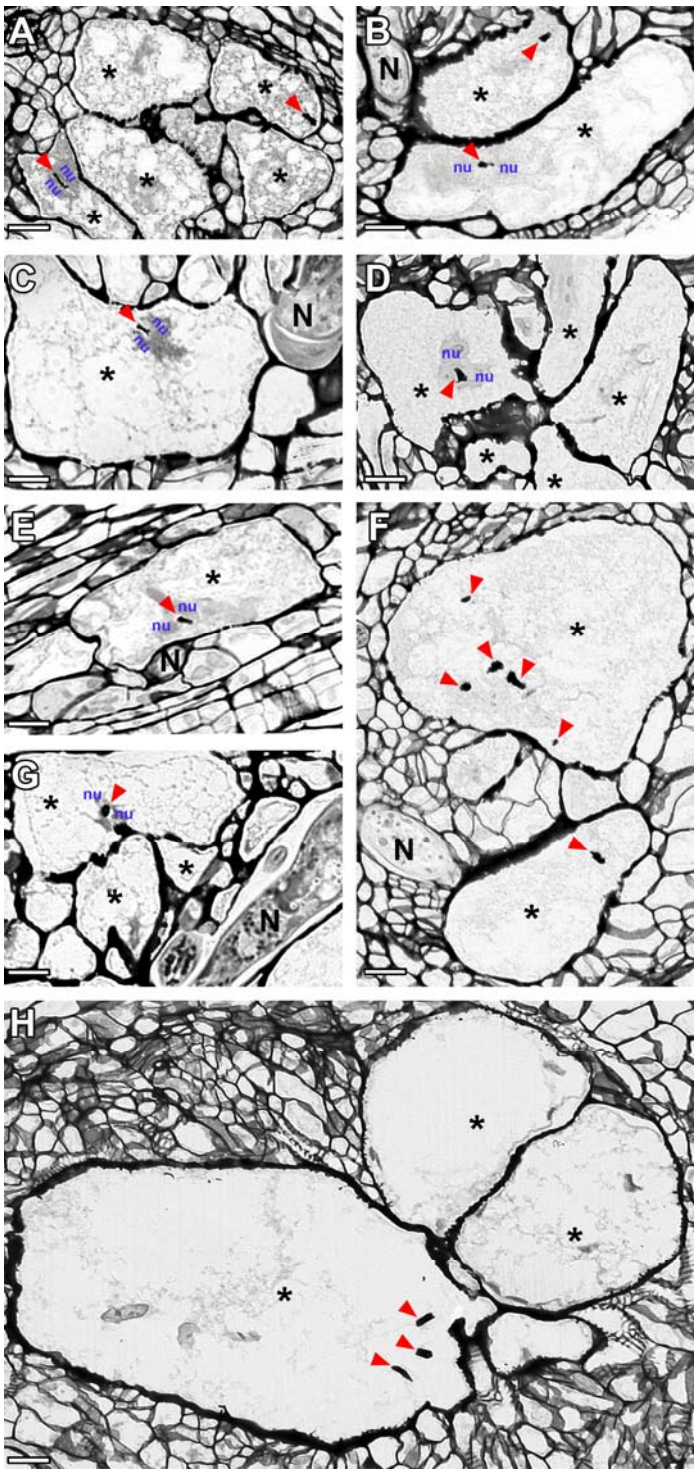
Bars in **(A) to (D)** and **(G) to (I)** = 50 µm, in **(E)** = 200 µm, in **(F)** = 10 µm.




**Supplemental Figure 2**. Cytokinetic Defects during Embryogenesis in the *dyc283* mutant. Embryogenesis is observed on whole-mount cleared seeds.

**(A-D)** Embryo development in *dyc*283 mutant. Developing *dyc283* mutant seed **(A)**; Surface view of *dyc283* mutant young octant stage embryo **(B)**; globular stage embryo **(C)**; torpedo stage embryo **(D)**. Arrows show cell wall stubs and hypertrophied cells observed during embryogenesis in *dyc283* mutant.

**(E-H)** Embryo development in wild type. Developing wild type seed **(E)**; Surface view of wild type young octant stage embryo **(F)**; globular stage embryo **(G)**; torpedo stage embryo **(H)**. Bars in **(A) and (E)** = 30 µm; in **(B) to (D)** and **(F) to (H)** = 15 µm.

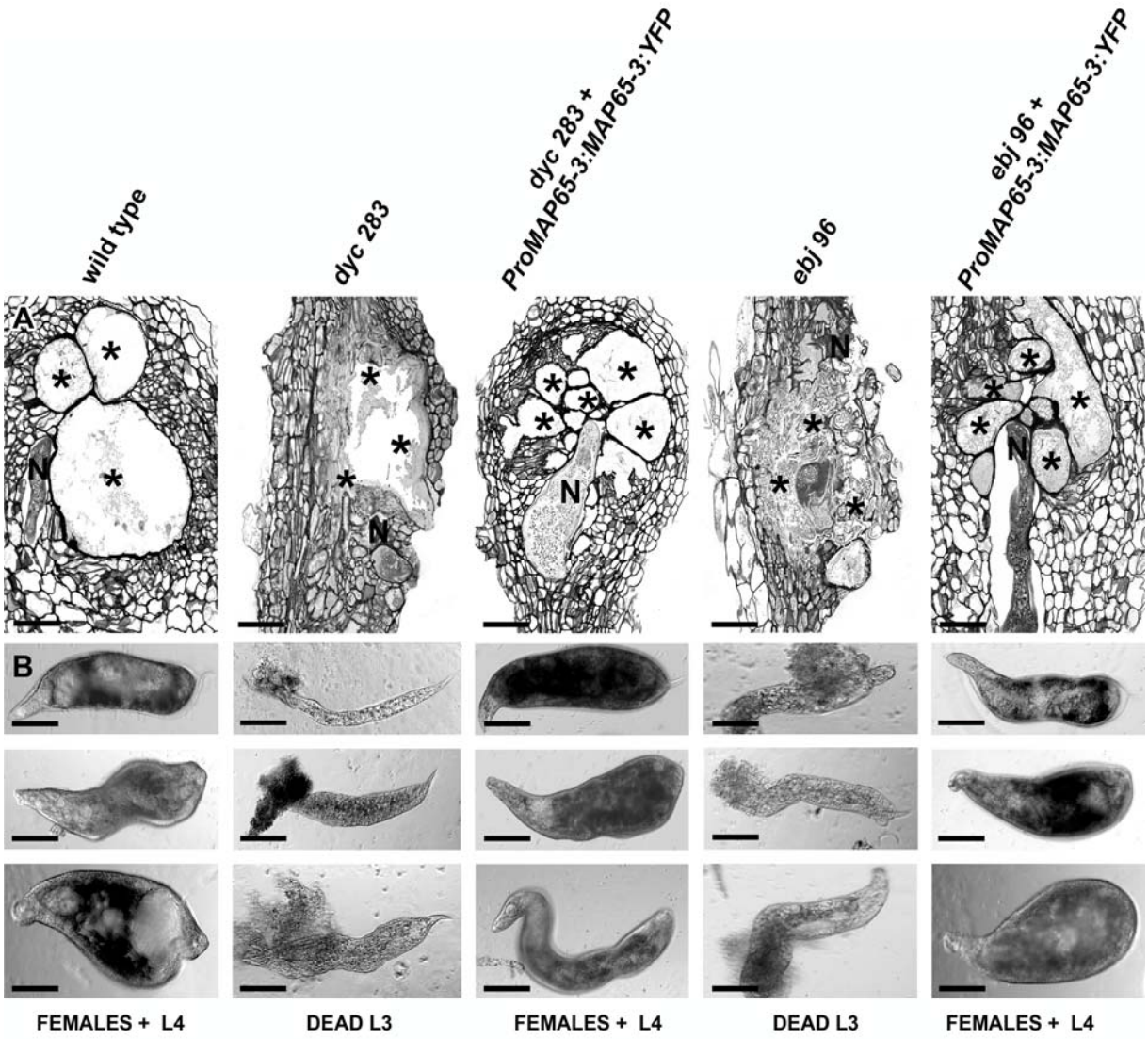



**Supplemental Figure 3**. Giant Cell Mini Cell Plates.

**(A-H)** Sections through gall of WT plant, 10 dpi with *M. incognita*. Giant cells presented mini cell plates (arrows) separating daughter nuclei.

Asterisks, giant cells; N, nematode; nu, nucleus.

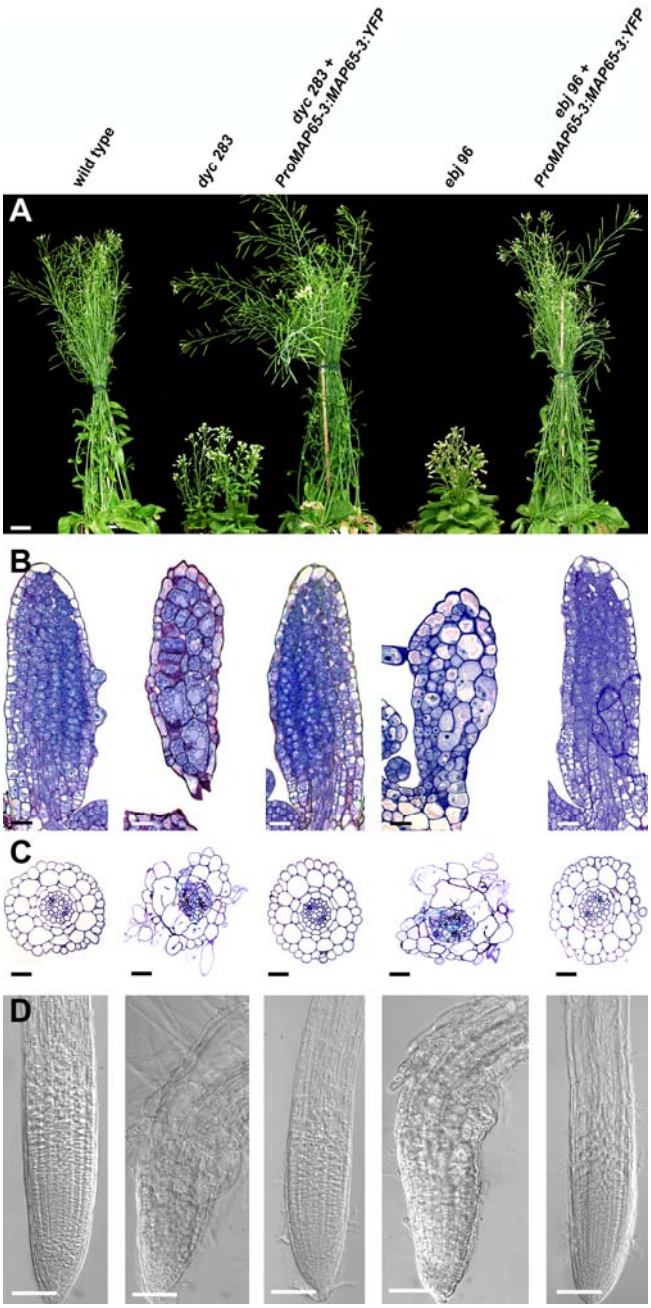
Bars in **(A) to (H)** = 20 µm.




**Supplemental Figure 4.** *dyc283* and *ebj96* Mutant Phenotype During Plant Nematode Interaction and Complementation by *MAP65-3:YFP* Under *ProMAP65-3* Control.

**(A)** Cross section through 21 dpi gall of WT plant, *ebj96* and *dyc283* mutant plant in comparison with WT plant, *dyc283* and *ebj96* transformed with *ProMAP65-3:MAP65-3:YFP*. In the *dyc283* and *ebj96* mutant plants, giant cells decayed and nematode development remained arrested at the third juvenile stage. When introduced into *dyc283* and *ebj96*, *ProMAP65-3:MAP65-3:YFP* construct restored the WT phenotype. In WT and *dyc283* and *ebj96* transformed with *ProMAP65-3:MAP65-3:YFP* plants, giant cells were mature and nematode developed into the fourth juvenile stage.

**(B)** Nematodes extracted from corresponding infected plants 5 weeks post infection (wpi). Nematodes extracted from WT, *dyc283* and *ebj96* transformed with *ProMAP65-3:MAP65-3:YFP* plants were old L4 larvae stage or young female nematodes. Nematodes extracted from *dyc283* and *ebj96* mutant plants were sedentary L2 larvae stage or L3 larvae stage.Asterisks, giant cells; N, nematode. Bars in **(A)** = 20 µm, in **(B)** = 100 µm.




**Supplemental Figure 5.** Complementation of the *dyc283* and *ebj96* root and shoot mutant phenotype by *MAP65-3:YFP* under *ProMAP65-3*.control.

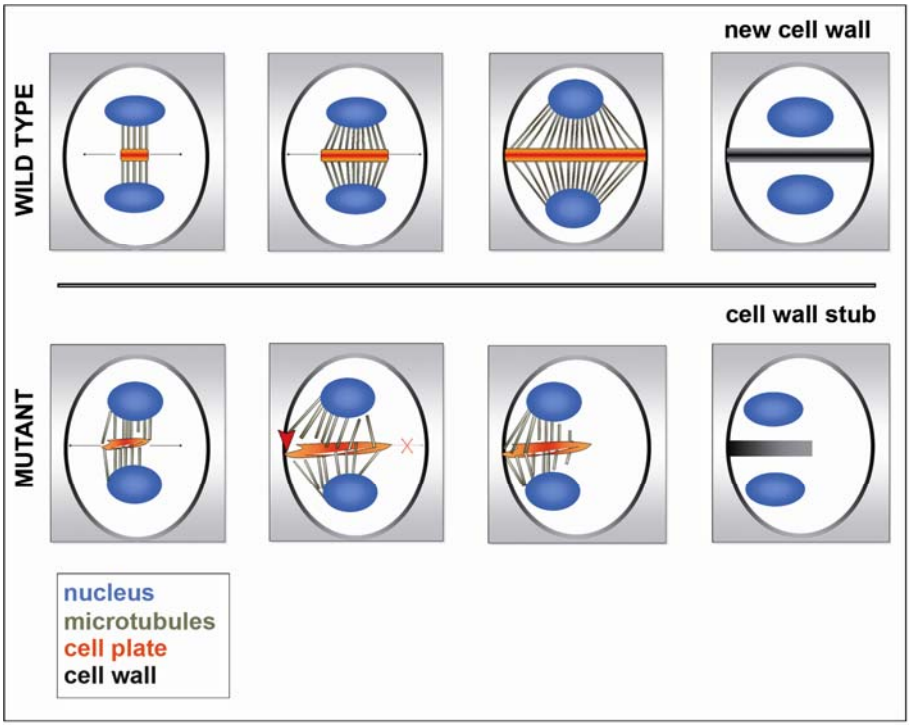
**(A-D**) *dyc283* and *ebj96* mutant plant in comparison with wild type plant, *dyc283* and *ebj96* transformed with *ProMAP65-3:MAP65-3:YFP*.

**(A)** Aerial parts of plant. **(B)** Longitudinal sections through leaf primordia.

**(C)** Root cross sections. **(D)** Root apex of *in vitro* cultured plants.

Both T-DNA *map65-3* mutants showed a similar mutant phenotype as revealed by multinucleate, hypertrophied cells and aberrant cell wall stubs. When introduced into *dyc283* and *ebj96*, *ProMAP65-3:MAP65-3:YFP* construct restored the WT phenotype.

Bars in **(A)** = 1 cm; in **(B)** and **(C)** = 20 µm, in **(D)** = 50 µm.




**Supplemental Figure 6.** Model for cell wall stub formation in the absence of MAP65-3 during cytokinesis in somatic cells.

In WT somatic cells, the phragmoplast expanded until it contacted the cell's perimeter. Therefore the nascent cell plate (red) led to the formation of the new cell wall between the two daughter cells. In the *map65-3* mutant, the phragmoplast MTs expanded until one side of the phragmoplast contacted the cell's perimeter. Hence the cell plate fused with the mother cell wall on one side of the cell only (arrowhead). On the opposite side, phragmoplast MTs collapsed, preventing complete fusion of the cell plate with the mother cell wall. Thus, during cytokinesis, MAP65-3 is required for phragmoplast expansion and in its absence expansion ceases prematurely resulting in the formation of cell wall stubs.