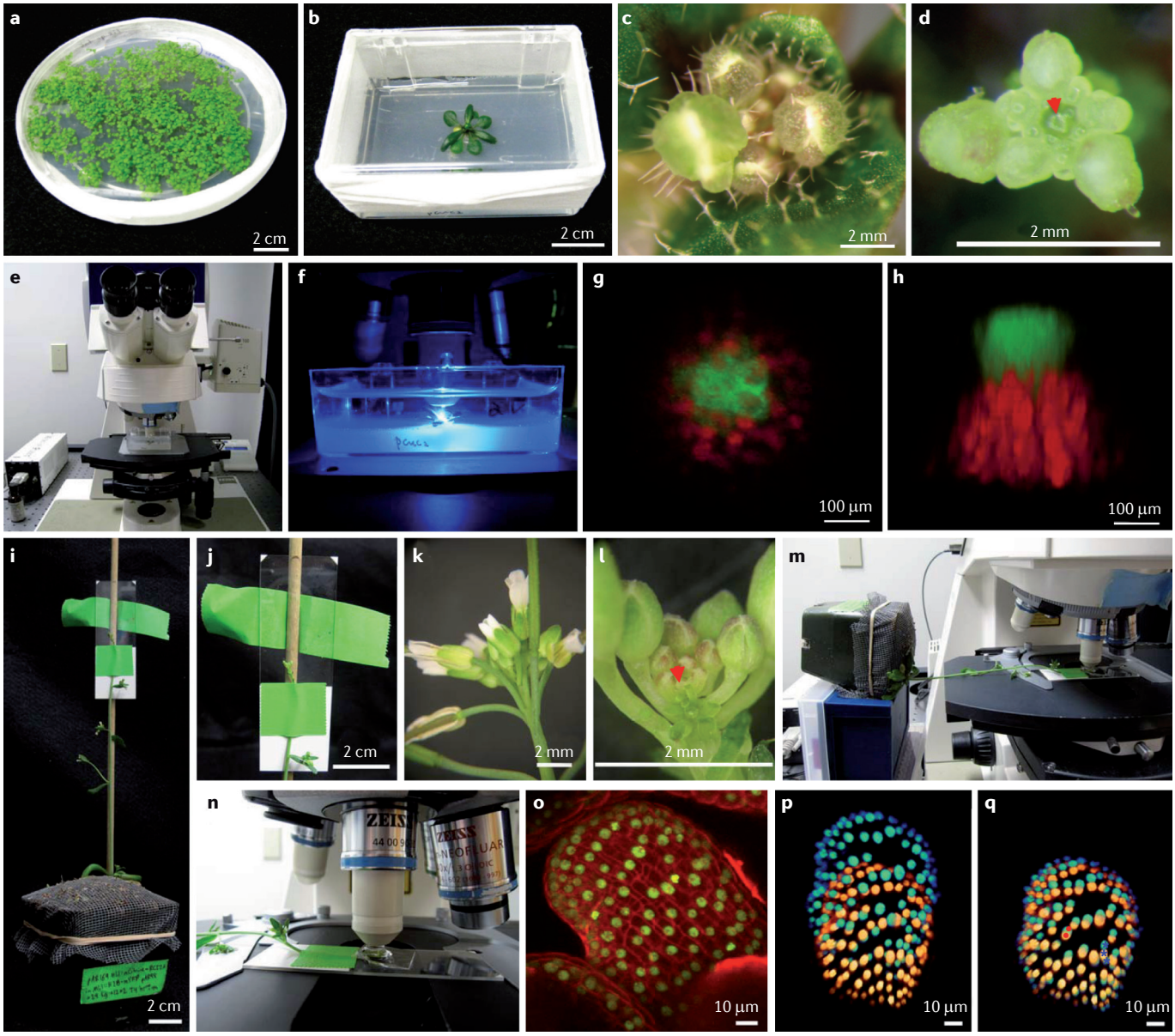
In format provided by Meyerowitz *et al.* (APRIL 2011)



Supplementary information S1 (figure) | **The live-imaging technique.**
Live imaging of Arabidopsis meristems (**a**-**h**) and sepals (**i**-**q**).

Meristem

a-**b**| First, plants are grown in conditions devised for imaging. For the Arabidopsis shoot meristem, 10-day seedlings germinated on MS-agar plates (**a**) are transferred to small plastic boxes containing MS-agar where the plant grows until bolting (**b**). **c**-**d**| Second, the overlying flowers (**c**) are removed to expose the meristem (arrow d). **e**-**f**| Third, the plants are placed on an upright confocal microscope stage for imaging. The meristem is stabilized with 1% agarose, the plastic box is filled with distilled water and placed on the microscope (**e**), and the meristem is imaged with a water-dipping lens (**f**). **g**| Fourth, plants are imaged at fixed time intervals. An image section taken from the meristem with fluorescent markers: pCLV3::GFP-ER (green) and pWUS-dsRED-N7 (red). After imaging, the water is removed and plants are returned to the growth room until the next imaging time point. **h**| Fifth, the confocal images are cropped, volume rendered, and aligned using Amira software (Visage Imaging). A volume rendered side-view of the 3D meristem from (**g**) after image registration and alignment using AMIRA software.

Sepals

i-**j**| To image the sepals, plants are grown in mesh-covered pots (**i**) and the inflorescence is taped to a slide exposing the lateral side of the sepal (**j**). **k**-**l**| Overlying flowers (**k**) are removed to expose a sepal primordium on a young flower primordium close to the meristem (red arrow in **l**). **m**-**n**| The living plant in the pot is propped on the side of the microscope (**m**) while the slide attached to the inflorescence is mounted under the objective (**n**). **o**| The same developing sepal is imaged every 6 hours. Sepal epidermal nuclei are shown in green and cell walls in red. The plant is staked upright and returned to the growth room between imaging time points. **p**-**q**| Sepal nuclei at 12 hours are shown in yellow and 18 hours in green after cropping and volume rendering in Amira (**p**). After alignment using Amira affine registration (**q**) corresponding nuclei are observed (two lineages marked: red dots, blue asterisks).