Table S1:

The different morphological criteria used to identify *Arabidopsis* SAM cells at different stages of the cell cycle in TEM micrographs prior to to 3D reconstruction and modeling.

Criterium	Changes observed	References
For interphasic cells		
nuclear/cytoplasmic surface area ratio	progressively decreases from G1 to G2	(Seguí-Simarro and Staehelin, 2006)
nuclear size	increases as the nuclear genome replicates at the S phase	(Jovtchev et al., 2006; Seguí-Simarro and Staehelin, 2006)
nucleolar architecture	- - Reactivates after mitosis (G0-G1): small, mostly composed of dense fibrillar component (DFC) and few, large and heterogeneous fibrillar centers (FC). Neither granular component (GC) nor nucleolar vacuoles (NV) are present. - Progressively resumes activity and enlarges from G1 to G2: GC appears at the nucleolar periphery. Small and numerous homogeneous FC within the DFC. - At the G2/M transition, the largest and most active nucleoli are present. Abundant GC intermingled with the DFC. Many homogeneous CF. A central NV is present.	(Risueño and Medina, 1986; Risueño *et al.*, 1988)
cell wall thickness	after a new cell wall is formed, progressively increases from G1 o G2 as the cell grows	(Risueño et al., 1968; Seguí-Simarro and Staehelin, 2006)
For dividing cells		
Nuclear envelope	Dismantles at prometaphase and reassembles at telophase	(Seguí-Simarro and Staehelin, 2006)
Condensed chromosomes	- Condense at prophase - Arrange at metaphase (metaphasic plate) - Migrate to the poles at anaphase - Decondense at late telophase	(Seguí-Simarro and Staehelin, 2006)
Cell plate architecture	- Arises as phragmoplast initials at late anaphase - expands centrifugally at early telophase (solid phragmoplast stage) - Initiates central maturation while keeps expanding at the borders (transitional phragmoplast stage) - Fuses with the mother cell wall and matures at late telophase (ring phragmoplast stage)	(Seguí-Simarro et al., 2004; Seguí-Simarro and Staehelin, 2006; Seguí-Simarro et al., 2007)