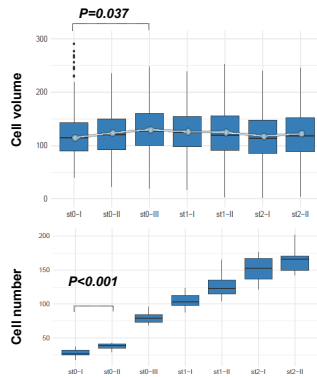
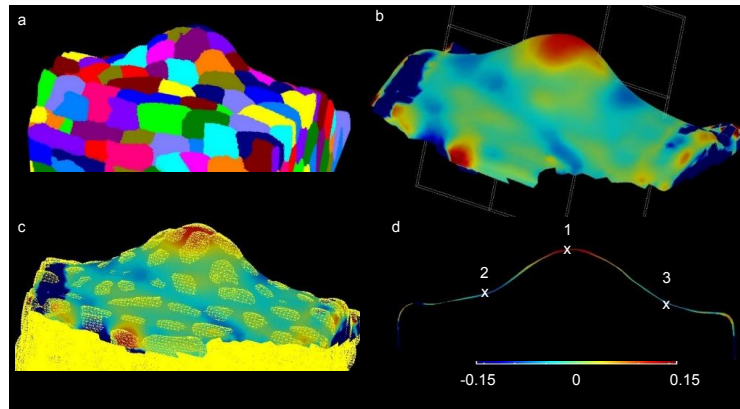


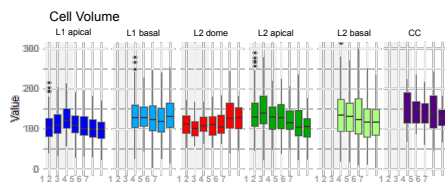
A Average cell number and volume per primordium



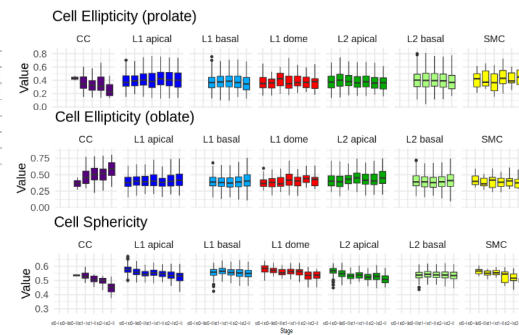
B. Extraction of overall ovule height and width w.r.t. base



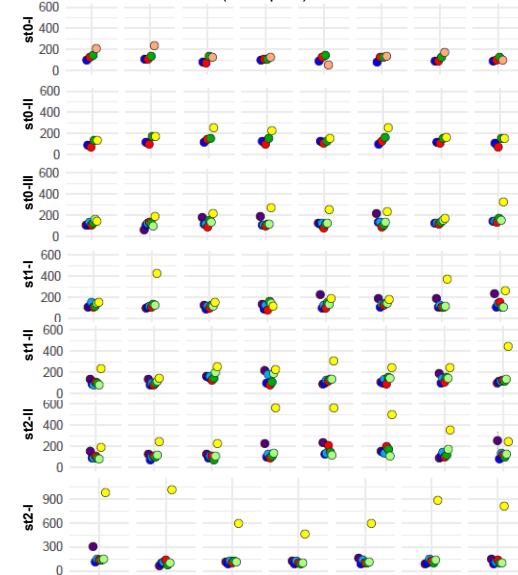
C Cell volume per cell label, all stages, WT (Col_0)



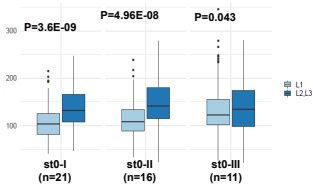
F Cell sphericity and ellipticity (all cell labels)



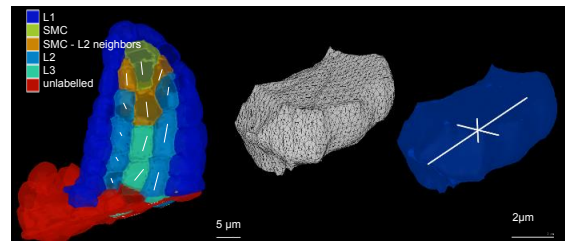
D Cell volume (mean) per label per stack (examples)



E Differential cell volume between L1 and L2,L3 cells in Phase I



G OvuleCellClassifier and 3D anisotropy eigenvalues



H SMC anisotropy index : Maximum, Medium and Minimum anisotropy indexes

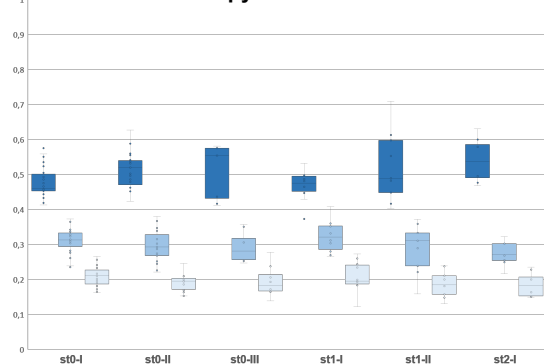


Figure 2- figure supplement 1. Related to Figure 2. Ovule primordium morphogenesis involves domain-specific cell division and anisotropic cell growth patterns.

Figure 2- figure supplement 1. Related to Figure 2. Ovule primordium morphogenesis involves domain-specific cell division and anisotropic cell growth patterns.

(A) Average cell number and cell volume in wild-type (Col) ovule primordium during development. Mann Whitney U test was used to assess the difference of each stage relative to the previous stage. Related to [Figure 2A](#).

(B) Extraction of overall ovule height and width used in Figure 2B,C. (a) segmented stack imported in MorphoGraphX, (b) continuous surface mesh created in MorphoGraphX with the minimal curvature projected, the clipping plane is shown (dashed grid), (c) comparison between cell-mesh and continuous mesh, (d) Longitudinal section of the mesh showing maximal (1) and minimal (2 and 3) curvature points. Heatmap: minimal curvature mm^{-1} . Related to [Figure 2B-C](#).

(C) Box plots and line plot (error bar is standard error of the mean) showing the mean cell volume in each ovule domain during all developmental time points. Mann Whitney U test was used to assess the difference between stages (L1 apical). Related to [Figure 2I](#).

(D) Scatter plots comparing the cell volume of SMC (yellow) to the average cell volume of other cells types (same color code as in Figure 1) *per* ovule primordium, per stage. Related to [Figure 2I](#). The color code follows that of the cell label in panel C.

(E) Comparison of cell volume between L1 and L2/L3 cells in Phase I ovule primordia (stages 0-I to 0-III). Wilcoxon Signed Rank test was used to assess the difference between domains. Related to [Figure 2J](#).

(F) Quantification of cell sphericity and ellipticity (prolate and oblate, see [Materials and Methods](#)) at all ovule primordium domains during development.

(G) Computation of covariance matrix eigenvalues for cell anisotropy analysis: Left: semi-automated cell type classification showing labelled cells along a longitudinal cut of an ovule. L2 SMC neighbors (orange) stands for all L2 cells sharing a portion of their wall with the SMC (yellow). Unlabelled cells (red) are not considered in the analysis. For the inner cells, the main anisotropy axis (the eigenvector of the covariance matrix corresponding to the biggest eigenvalue) is shown with a white line. Right: representation of eigenvectors of the covariance matrix (white lines) used for the PCA analysis on cell anisotropy on a random cell. The eigenvectors are scaled by their own eigenvalue normalized over the sum of the three eigenvalues. The longest eigenvector is aligned with the longest cell axis, the shortest with the shortest cell axis and the mid eigenvector with the cell axis orthogonal to the other two (and of intermediate length). Related to [Figure 2K](#). See also movie in [Supplemental File 1](#) and [Appendix 1](#).

(H) SMC anisotropy index calculated from Maximal (dark blue), Mid (mid blue) and Minimal (pale blue) eigenvalues, normalized by the sum of all, from stage 0-I to stage 2-I. Related to [Figure 2K](#). P values: * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$. See also [Figure 2 - Source Data 1](#).