Supplementary information for the article: Coupling water fluxes with cell wall mechanics in a multicellular model of plant development.

**Calculations for a chain of connected cells**

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Let $N$ be an positive integer, we consider a chain of $2N + 1$ cells in series, that are connected two-by-two by their lateral faces, through which water can flow. It is a straightforward extension of the two cells model presented above, and the evolution of the cells is prescribed by the following equations:

$$
\phi^a(P^M - P_i) + \frac{\phi^s}{2}(P_{i+1} + P_{i-1} - 2P_i) - \phi^w(P_i - P_{Y_i})_+ = 0, \forall i = 2, \ldots, 2N,
$$

and

$$
\phi^a(P^M - P_1) + \frac{\phi^s}{2}(P_2 - P_1) - \phi^w(P_1 - P_{Y_1})_+ = 0,
$$

$$
\phi^a(P^M - P_{2N+1}) + \frac{\phi^s}{2}(P_{2N} - P_{2N+1}) - \phi^w(P_{2N+1} - P_{Y_{2N+1}})_+ = 0.
$$

As before, we have considered the case where only the yield turgor $P_{Y_i}$ varies between cells.

This set of differential equations is numerically solved with the `odeint` routine from the Python library `scipy`. The simulations are performed with a twice lower value of $P_{Y_{N+1}}$ compared to the values for other cells, so that the cell at the center of the chain benefits of a mechanically favorable configuration, and we study its ability to inhibit the growth of its neighbors.

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**Figure A:** Results for a chain of $2N + 1$ cells with $N = 50$, where the central cell has twice softer walls; a) number $N_i$ of cells that are inhibited on each side of the central cell, for different values of $L^a$; the line is a fit with a square root function, in the form $c\sqrt{L^a}$. b) Values of the prefactor $c$ in the space $(\alpha^a, P^M)$. 

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