

Table S3: Tunica-specific parameters

Parameter name	Text ref.	Symbol	Hex grid <sup>a</sup>	Square grid <sup>b</sup>	Dimension <sup>c</sup>
<i>General parameters</i>					
Simulation start time	Sect. 4	$t_0$	960		$T$
Growth interval	Sect. 4	$t_{growth}$	240		$T$
Rate of distal auxin outflux (epidermal)	Sect. 4.2	$\mu_{epi}$	1.5		$T^{-1}$
Reduction interval for distal outflux (epidermal)	Sect. 4.2	$t_{epi}$	320		$T$
Rate of distal auxin outflux (subepidermal)	Sect. 4.2	$\mu_{sub}$	0.1		$T^{-1}$
Reduction interval for distal outflux (subepidermal)	Sect. 4.2	$t_{sub}$	100		$T$
Rate of auxin outflux to support rootward CPs	Sect. 4.2	$\mu_{CP}$	0.75		$T^{-1}$
<i>Transport parameters for the L1/L2 interface</i>					
Transport rate of SoPIN1	Eq. 3	$T_{SoPIN1}$	0.02		$M^{-1}T^{-1}$
Transport rate of PIN1a	Eq. 3	$T_{PIN1a}$	0.0425		$M^{-1}T^{-1}$
Transport rate of PIN1b	Eq. 3	$T_{PIN1b}$	0.008		$M^{-1}T^{-1}$
Transport rate of residual PIN	Eq. 3	$T$	0.12	0.09	$T^{-1}$
<i>L1-specific parameters</i>					
Rate of epidermal auxin biosynthesis	Eq. 1	$H_{epi}$	0.1	0.08	$M/T$
Rate of auxin based upregulation of SoPIN1 production	Eq. 10	$\rho_{IAA_{So1}}$	0.6		$T^{-1}$
Basal PIN1a production	Eq. 8	$\rho_{1a}$	0.000208		$M T^{-1}$
Rate of auxin based upregulation of PIN1a production	Eq. 8	$\rho_{IAA1a}$	1		$T^{-1}$
Basal PIN1b production	Eq. 7	$\rho_{1b}$	0.0333		$M T^{-1}$
Rate of auxin based upregulation of PIN1b production	Eq. 7	$\rho_{IAA1b}$	0.16		$T^{-1}$
<i>L2-specific parameters</i>					
Rate of auxin based upregulation of SoPIN1 production	Eq. 10	$\rho_{IAA_{So1}}$	0.6		$T^{-1}$
Basal PIN1b production	Eq. 7	$\rho_{1b}$	1.25		$M T^{-1}$
Rate of auxin based upregulation of PIN1b production	Eq. 7	$\rho_{IAA1b}$	8		$T^{-1}$
<i>Sub-epidermal parameters</i>					
Rate of sub-epidermal auxin biosynthesis	Eq. 1	$H_{sub}$	0.05	0.04	$M T^{-1}$
<i>Convergence point parameters</i>					
Auxin threshold for CPs	Sect. 4.3	$Th_{CP}$	0.18		$M$
Perceived auxin concentration	Sect. 4.3	$c_{CP}$	2		
Rate of CP auxin biosynthesis	Sect. 4.3	$H_{CP}$	2.5	2.48	$M T^{-1}$
Interval of biosynthesis increase at CPs	Sect. 4.3	$t_{CP}$	1000		$T$

<sup>a</sup> Omitted parameters take the same value as in the corpus (Table S2).

<sup>b</sup> Parameters for the simulation using a square grid (Fig. S12, Video S4) are the same as those used in the simulation on a hexagonal grid (Fig. 5, 6 and Videos S2, S3) except where shown otherwise.

<sup>c</sup> Dimensions are specified using  $M$  for mass and  $T$  for time (spatial dimensions are assumed to be unit and are thus omitted).