Supporting Information Legends

Figure S1. Examples of cells pairs from indented meristems extracted from snapshots taken at time zero, i.e. before compression (left cell), and at time 6 h 45, i.e. 15 mins after release of compression (right cell). (a-e) *GFP-MBD*, (f-h) *spr2-2 GFP-MBD*, (i-l) *bot1-7 GFP-MBD*.

Figure S2. Microtubule bundling persistence 16h after release of compression in two *spr2-2 GFP-MBD* meristems. (a) and (e) before compression, (b) and (f) 15 mins after release of compression, (c-d) and (g-h) 16h after release of compression. White asterisks point at identical cells in (a-d), resp. (e-h). (a-c) and (e-g) 2D projection of confocal images. (d) and (h) One slice through the epidermis from resp. (c) and (g) confocal stacks. Scale bar: 10µm.

Figure S3. Methods used to rescale green intensities values, when exposure was too low, illustrated with *GFP-MBD* images (see also Experimental procedures). (a) "focal" method (top: entire meristem, bottom: close-ups from region delineated by a white rectangle in (1)): (1) The green channel of the raw RGB image is used. (2) for each pixel, the maximum surrounding intensity is searched within a radius of 70 pixels (white disk). (3) The maximum surrounding intensity is recorded for each pixel, and (4) used to rescale to 255, the maximum green intensity of an 8 bits image, in order to create the normalised image. (b) "gam" method (top: entire meristem, bottom: close-ups from region delineated by a white rectangle in (1)): (1) The green channel of the raw RGB image is used. (1b) Green intensity can be seen as a topographic map (2) The topographic position index is used to extract bumps of intensities corresponding mainly to pixels near anticlinal cell walls. (3) A generalised additive model (GAM) smoothens the bump maximum values encountered on the image. (4) The normalised image is created by increasing green intensities areas where maximum (255) is not reached in the neighbourhood.

Figure S4. Examples of analyses performed on compressed meristems in (a) *spr2-2 GFP-MBD* and (b) *bot1-7 GFP-MBD.* The white asterisk points at the analysed cell. See also Fig. 5.

Table S1. Wilcoxon rank sum tests p-values. A one-sided Wilcoxon test was used to compare the effects of indentation (versus no indentation) on meristems for each index (Coefficient of Variation, Skewness, Kurtosis, Geary, Percentage of fibers and Fiber width), each genotype

(*GFP-MBD*, *GFP-TUA6*, *spr2-2 GFP-MBD*, and *bot1-7 GFP-MBD*) and each normalization procedure ("null", "focal" and "gam"). We considered the response of compressed meristems to be significantly greater than the response of control (non compressed) meristems when the one-sided Wilcoxon test p-value was lower than 5% for the three normalization procedures. Probabilities lower than 5% mean "changes towards more bundling", conversely, probabilities higher than 5% mean "no change towards more bundling". Probabilities too close to 1 were rounded to p-value = 1.