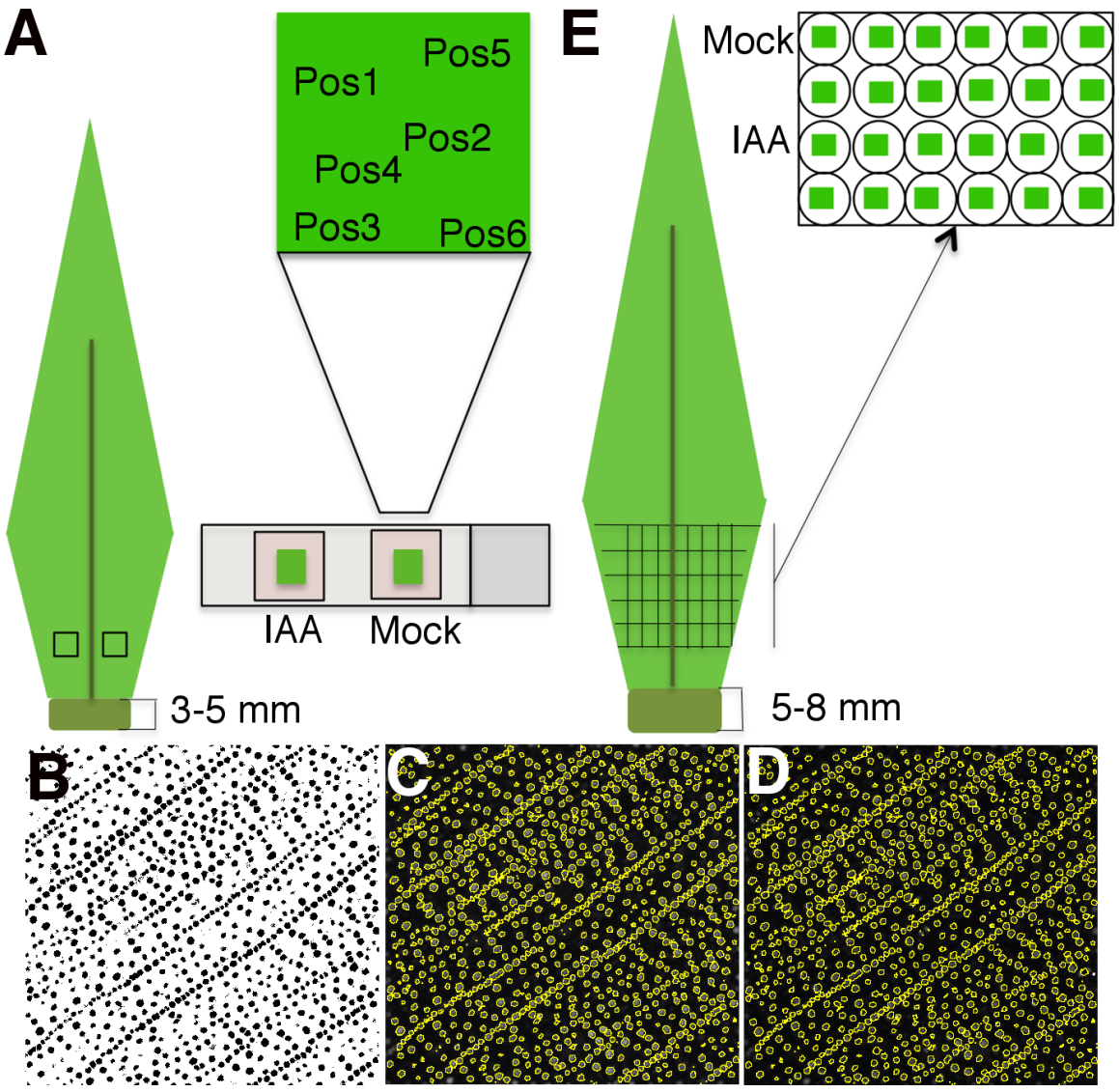
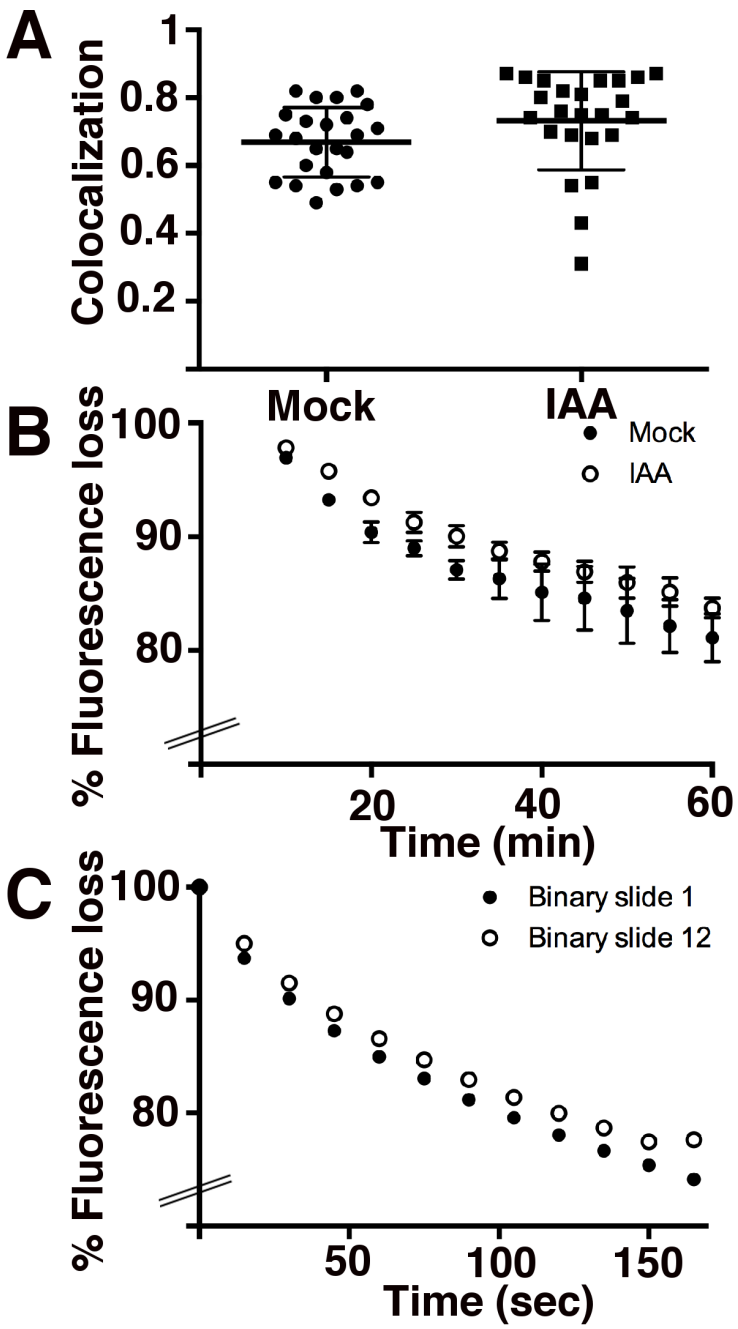
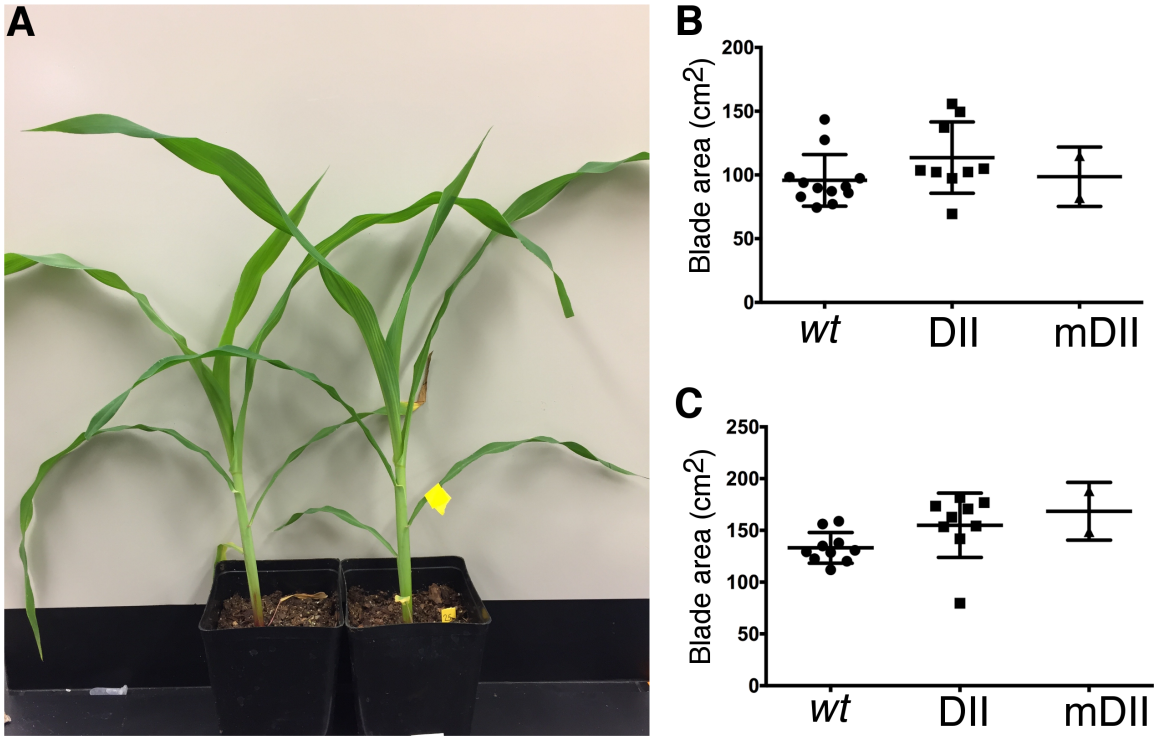


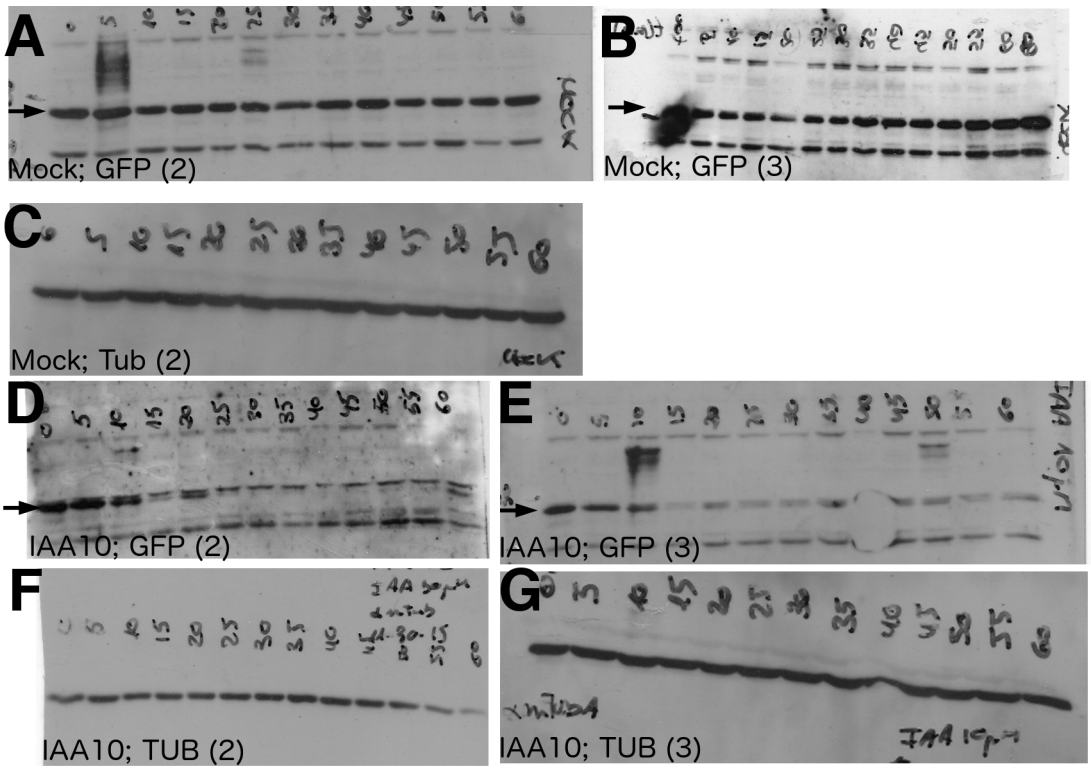
Supplementary Figure1. **Procedure for sample collection, drug treatment and image analysis. (A)** 4-week-old plants were dissected to reveal a leaf with a 3-5 mm ligule and corresponding leaf blades within one centimeter of the ligule were used to harvest 0.5 cm^2 pieces. Mirror image samples from each side of the midrib were used in mock and auxin-treated samples for time-lapse (Figure 2A and B) and dose-dependent DII degradation (Figure 2J). Six randomly selected positions within the leaf piece were imaged every 5 minutes during one hour. Each position contained between 731-921 nuclei to measure >4,200 nuclear fluorescence signals per treatment. This experiment was done with five independent biological samples. **(B-D)** Procedure for data analysis using FIJI, (ImageJ software, http://fiji.sc/). **(B)** Binary masks were generated to select nuclei as particles from the **(C)** time 0 micrograph. Particle selection was maintained throughout the time lapse until the last **(D)** time 60-minute micrograph. **(E)** Sampling procedure for immunoblot experiments (Figure 1H-I). 4-week-old plants were dissected to reveal a leaf with a 5-8 mm ligule. A leaf region between the 2^{nd} and 3^{rd} centimeters above the ligule was dissected into 0.5 cm^2 square pieces, incubated with 0.05% DMSO or 10 µM IAA. Samples were harvested every 5 minutes for 1 hour.



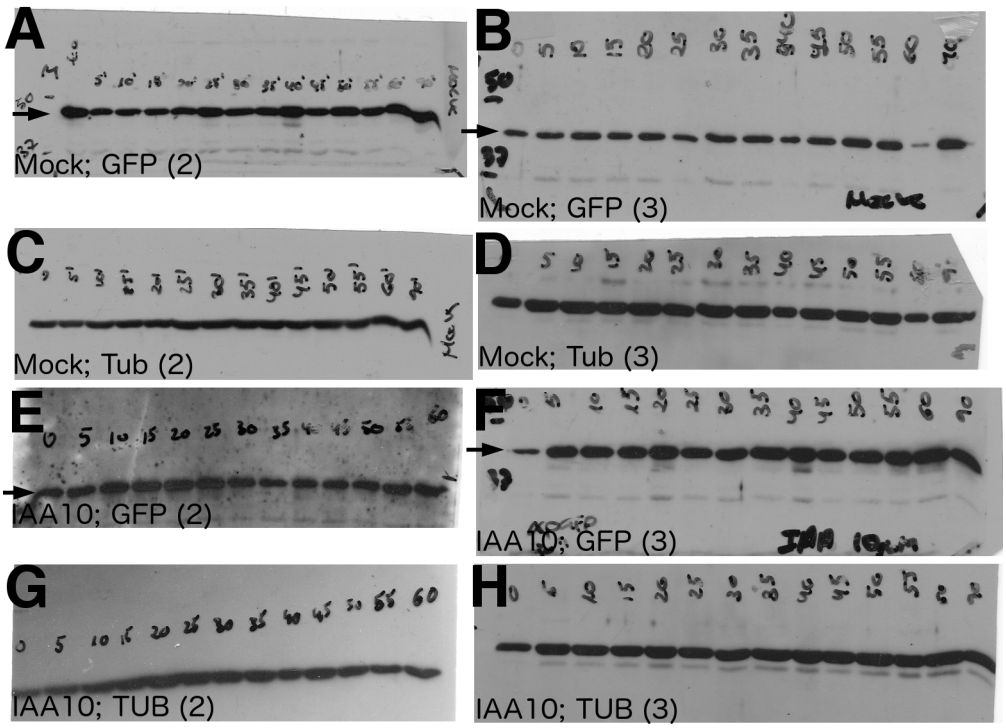
Suplementary Figure 2. **Nuclear fluorescence loss due to nuclear movement and photobleaching during time-lapse experiment**. **(A)** Co-localization of nuclei at time 0 and time 60 minutes in mock- and auxin-treated samples measured using Pearson coefficient. **(B)** Relative fluorescence loss due to nuclear movement in mock and IAA-treated samples, as calculated using the first (Binary slide 1) and the last (Binary slide 12) micrograph of the time-lapse as reference for analyzing particles. **(C)** Relative fluorescence loss due to photobleaching using the maximum exposure time of 400 ms. Nuclear movement during the 165-second time-lapse is minimal (Pearson coefficient from 0-165 seconds is 0.95).



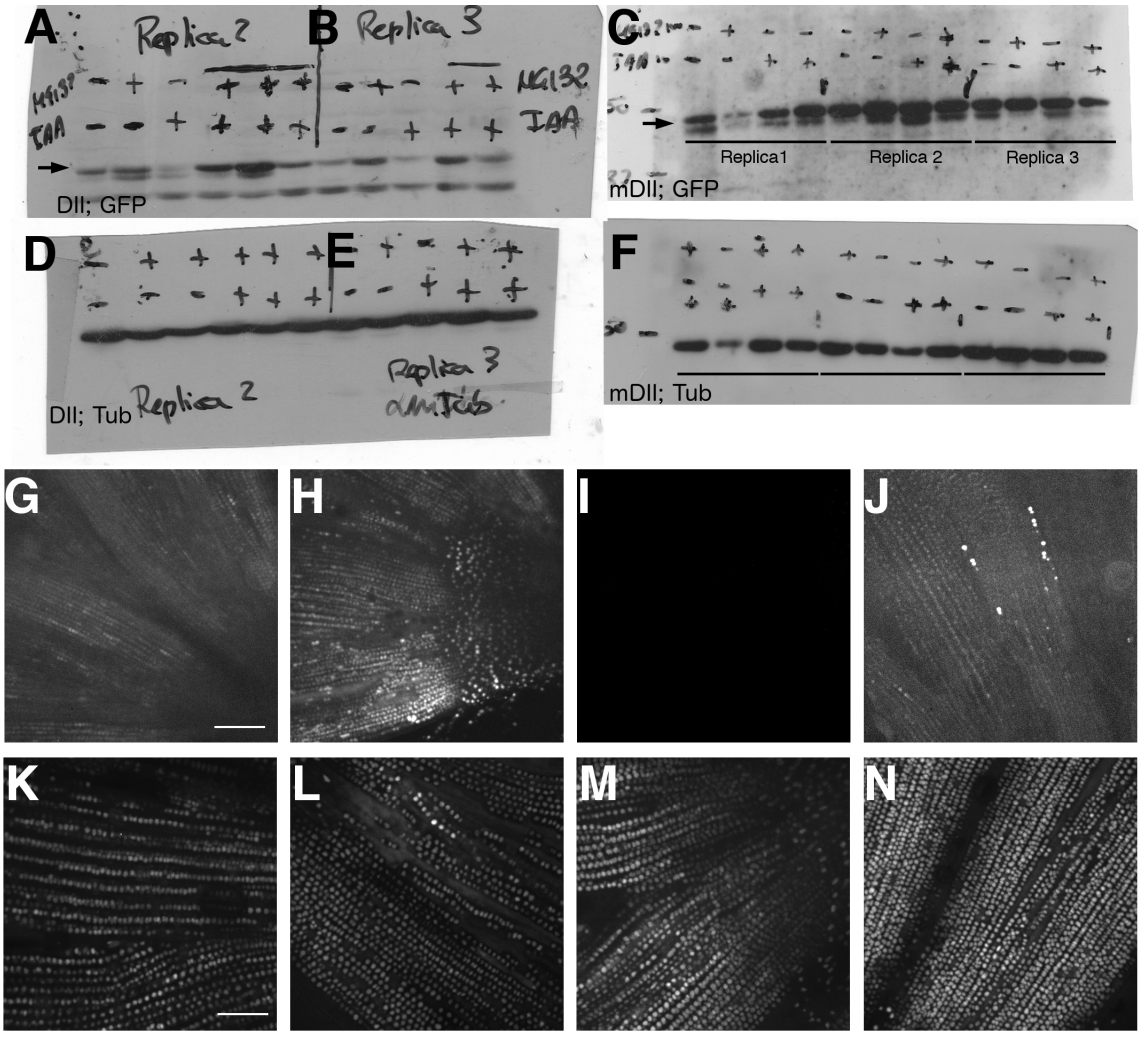
Supplementary Figure 3. **Growth of plants expressing the DII or mDII transgene. (A)** Photograph shows the overall growth of sibling non-transgenic (left) and DII transgenic (right) plants grown under standard greenhouse conditions for 4 weeks. **(B)** Leaf four area measurements. **(C)** Leaf five area measurements. (wt, n=12), DII (n=9) and mDII (n=2).



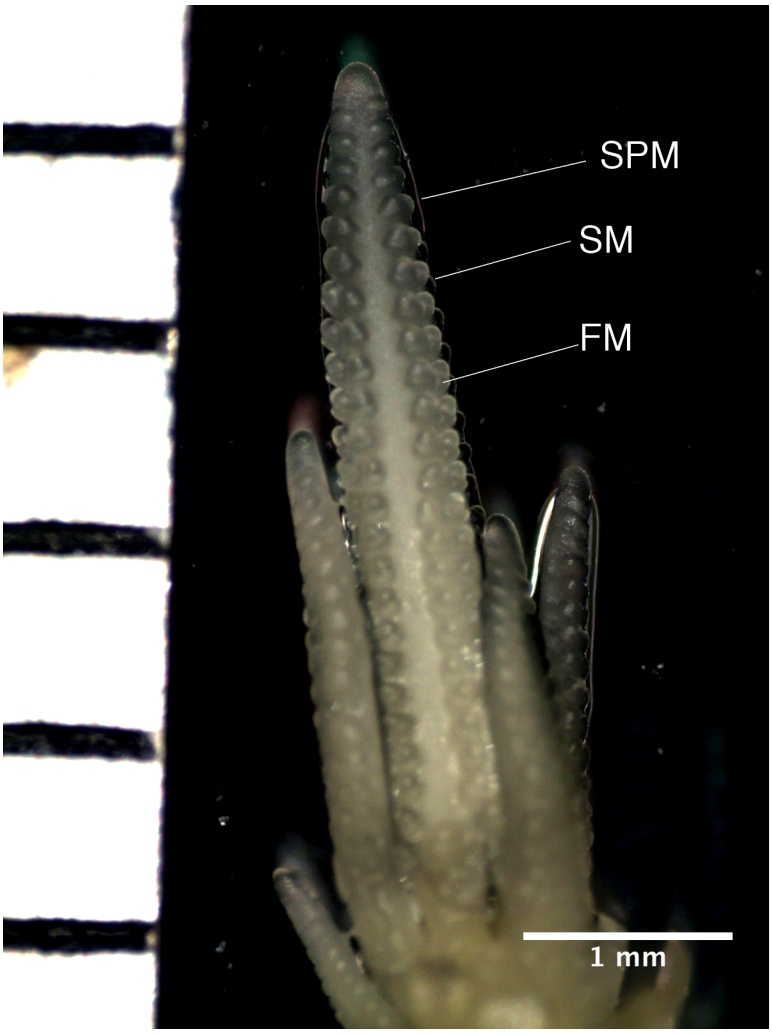
Supplementary Figure 4. **Other biological replicas related to the experiment shown in Figure 1H**. Immunoblot corresponding to two biological replicas of **(A-C)** mock-treated samples and **(D-G)** 10μM IAA-treated samples of leaf pieces expressing DII harvested every 5 minutes during 60 minutes time-lapse. Inmunoblots are incubated with (A,B,D,E) polyclonal GFP antibody or (C,F,G) monoclonal αTubulin antibody as a loading control. C, F, and G correspond to the loading control of A,D, and E, respectively.



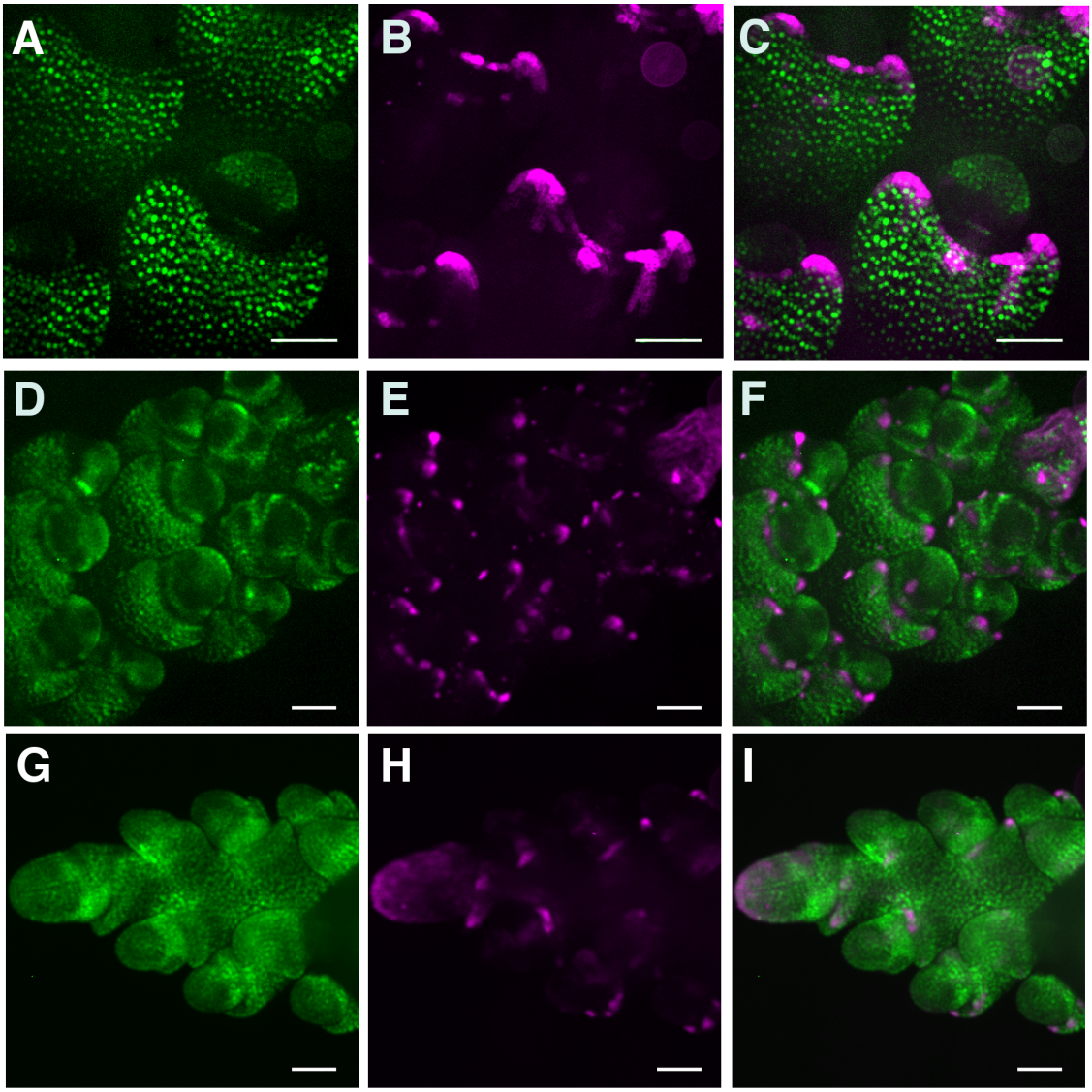
Supplementary Figure 5.**Other biological replicas related to the experiment shown in Figure 1I**. Immunoblot corresponding to two biological replicas of **(A-D)** mock-treated samples and **(E-H)** 10μM IAA-treated samples of leaf pieces expressing mDII harvested every 5 minutes during 60 minutes time-lapse. Inmunoblots are incubated with (A,B,E,F) polyclonal GFP antibody or (C,D,G,H) monoclonal αTubulin antibody as a loading control. C,D,G and H correspond to the loading control of A,B,E and F, respectively.



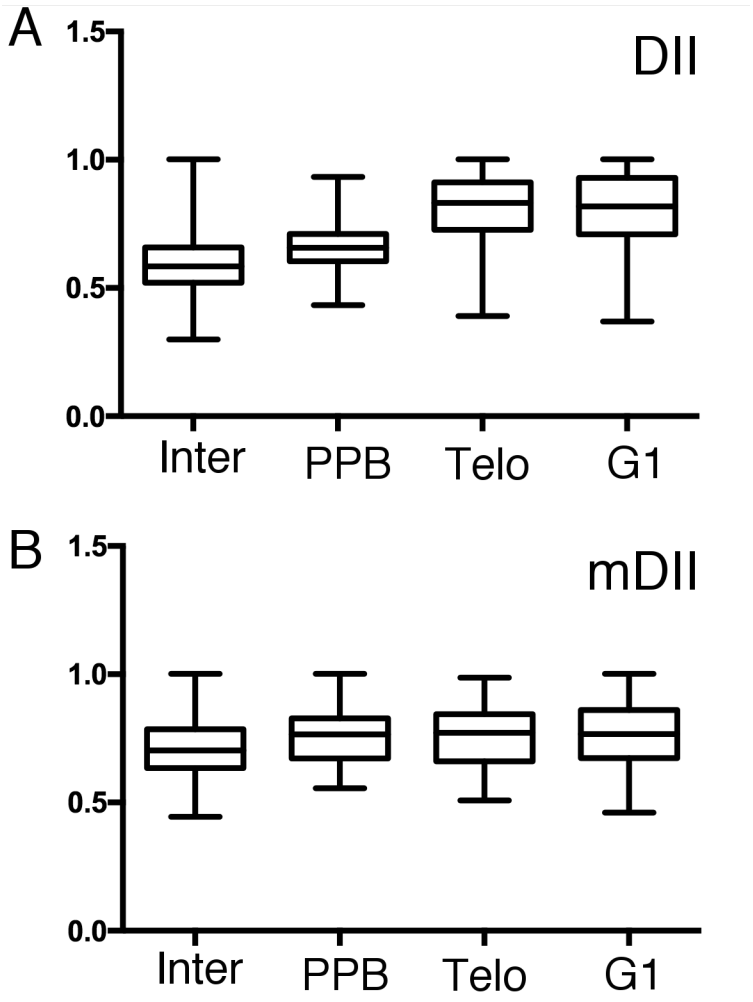
Supplementary Figure 6. **Degradation of DII depends on functional proteasome. (A-F)** Biological replicas relative to the experiment shown in Figure 1K. Immunoblot using **(A,B)** polyclonal GFP antibody and **(D,E)** monoclonal αTubulin antibody as loading control corresponding to two biological replicas of mock-, MG132, IAA and MG132/IAA-treated samples, as indicated, of root protein extracts expressing DII. Note there are 3 (A,D) and 2 (B,E) samples, as indicated, treated with both MG132 and IAA. Immunoblot using **(C)** polyclonal GFP antibody and **(F)** monoclonal αTubulin antibody as loading control corresponding to three biological replicas of mock-, MG132, IAA and MG132 with IAA-treated samples, as indicated, of root protein extracts expressing mDII. **(G-N).** Maximum projection micrographs of roots expressing DII **(G-J)** and mDII **(K-N)** treated with **(G,K)** mock, **(H,L)** MG132, **(I,M)** IAA and **(J,N)** MG132 with IAA. Bar = 100 μm.



Supplementary Figure 7. **Photograph of a developing tassel of 5-6 old maize plants grown under greenhouse conditions.** Spikelet Pair Meristems (SPM), Spikelet Meristems (SM) and Floral Meristems (FM) of tassels were imaged for DII or mDII and DR5 specific signal by using confocal microscopy, as shown in Figure 3, and Supplementary Figure 9.



Supplementary Figure 8. **DII and mDII signal in floral meristems belonging to developing tassels.** Fluorescence observed in tassels excised from 5-6 week old plants expressing **(A,D)** DII-VENUS-NLS (DII) **(B,E,H)** DR5, **(G)** mDII-VENUS-NLS (mDII), **(C,F)** merged DII and DR5 and **(I)** merged mDII and DR5. Bar = 100 µm.



Supplementary Figure 9. **Distribution of ratios for DII and mDII-specific fluorescence intensity values at different cell-cycle stages.** Ratio intensity values are calculated by dividing the fluorescence intensity value of each nucleus by the highest fluorescent value per micrograph. The ratio value of the brightest nucleus per micrograph is 1. These ratio values are grouped by the different cell cycle stages analyzed, which are Interphase (Inter), cells with PPB (PPB), telophase (Telo) and G1, as indicated. Specific fluorescent correspond to cells expressing DII **(A)** or mDII **(B).** Kruskal-Wallis test indicates significant differences ($p<0.001$) between cells with PPB, telophase and G1 for cells expressing DII, but not for cells expressing mDII (p value =0.952). Cells in interphase were excluded from the statistical analysis.