

**Supplementary Fig. 1**

Comparison of RGEN-ISL using Knob 1, 2 and 3-specific gRNAs on interphase nuclei from maize. Scale bars represent 20 µm.

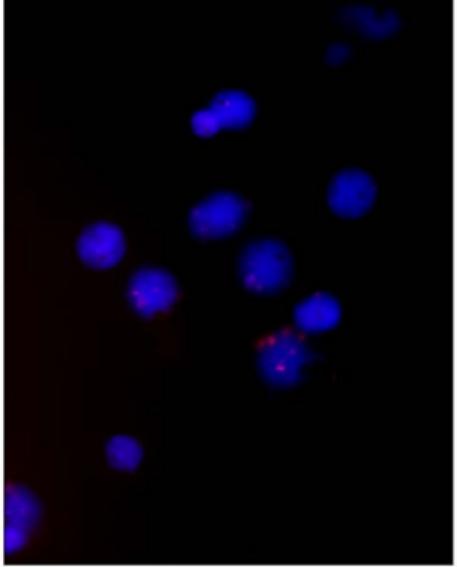
**Supplementary Fig. 2**

Comparison of different fixation conditions (2–4% formaldehyde (FA)) and signal intensities of RGEN-ISL with Knob 2-specific gRNA on interphase nuclei from maize root meristem. Scale bars represent 20 µm.

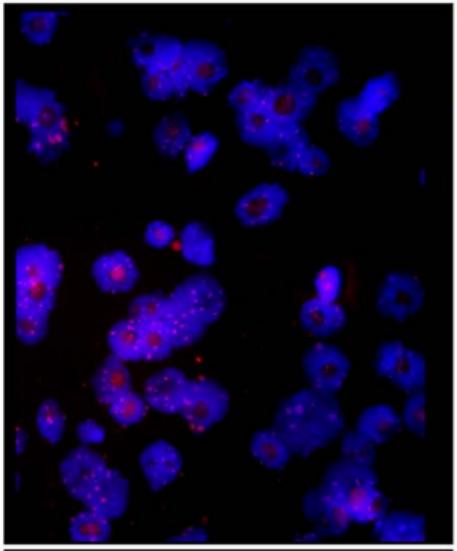
**Supplementary Fig. 3**

Nucleus of *S. multiflorus* after RGEN-ISL in combination with an *Arabidopsis*-type telomere-specific gRNA. No labeling of telomere-repeats is detectable.

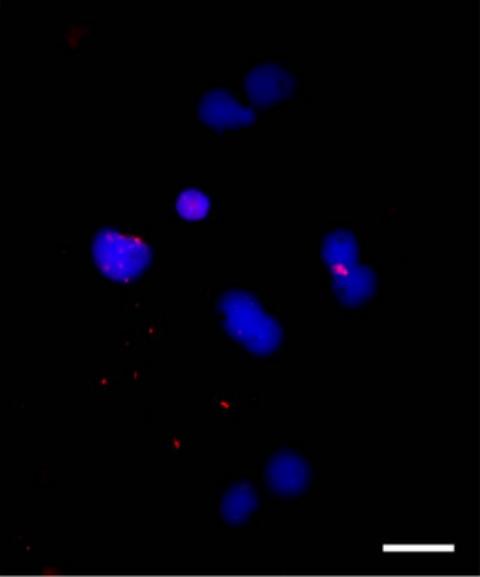
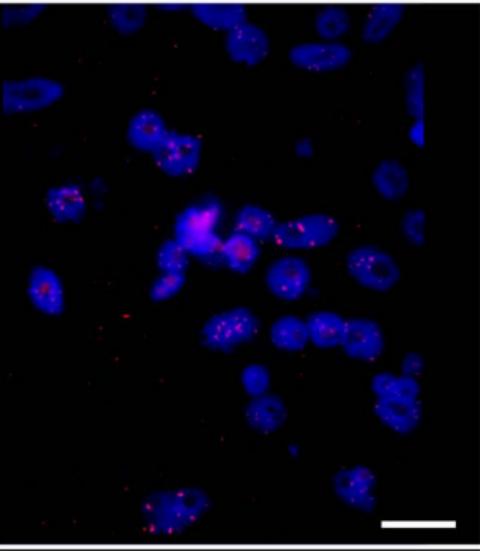
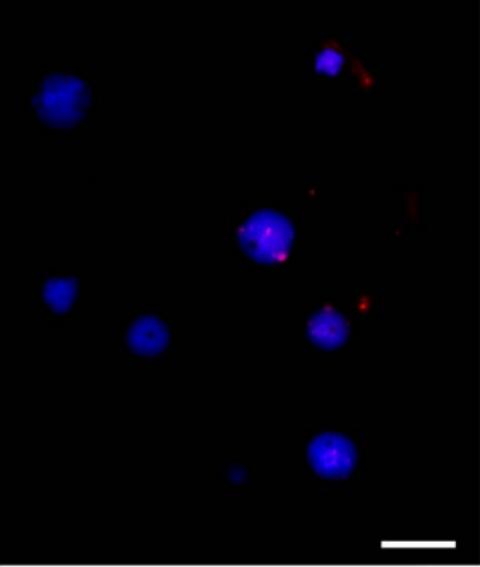
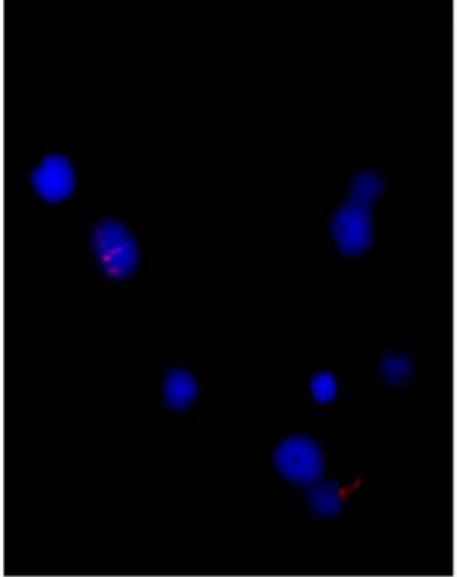
Knob 1



Knob 2

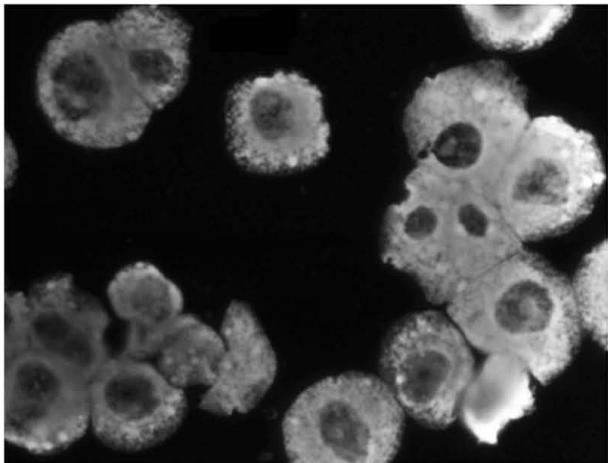


Knob 3

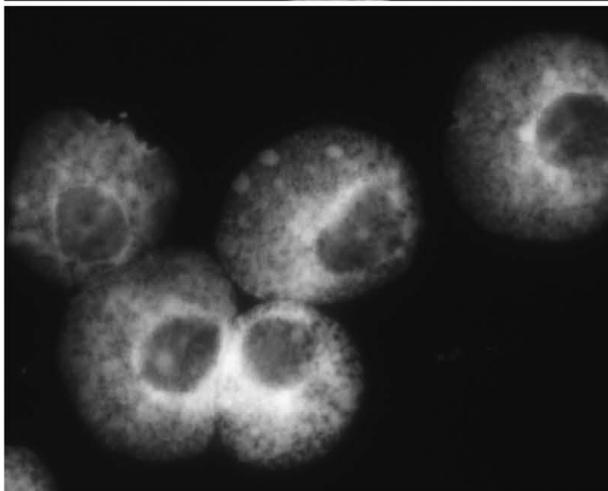


Chromatin

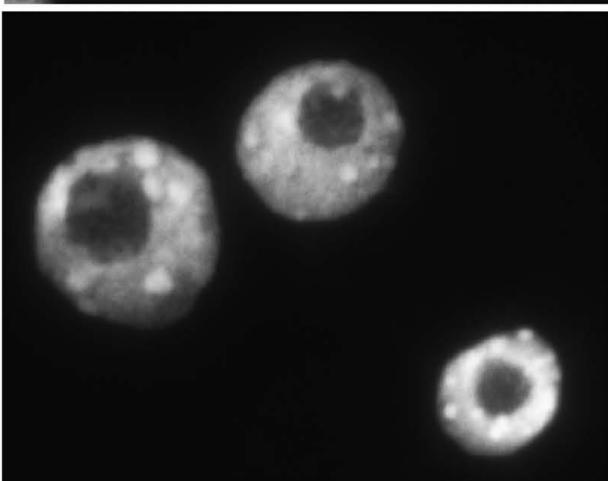
2% FA



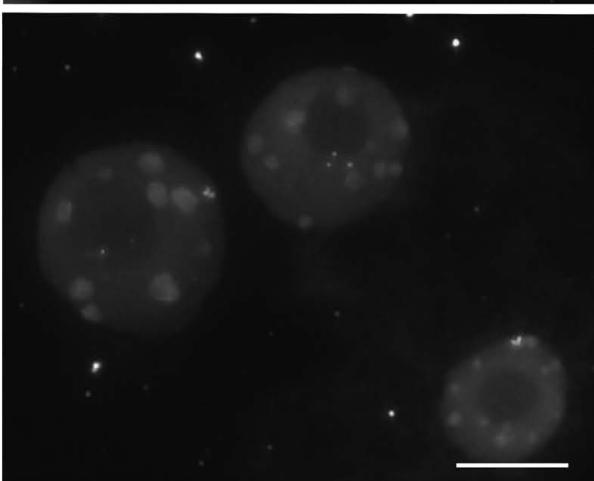
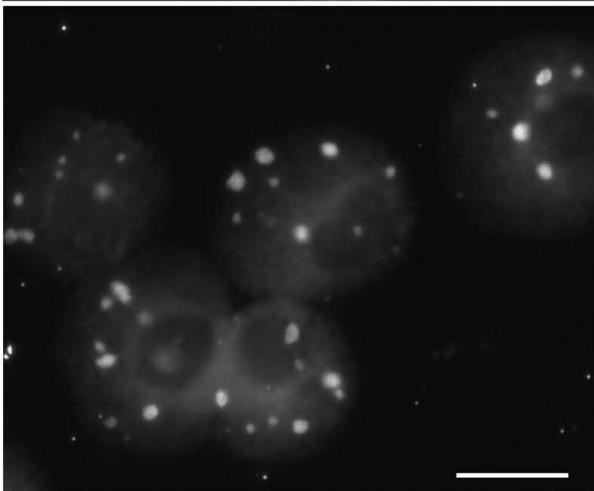
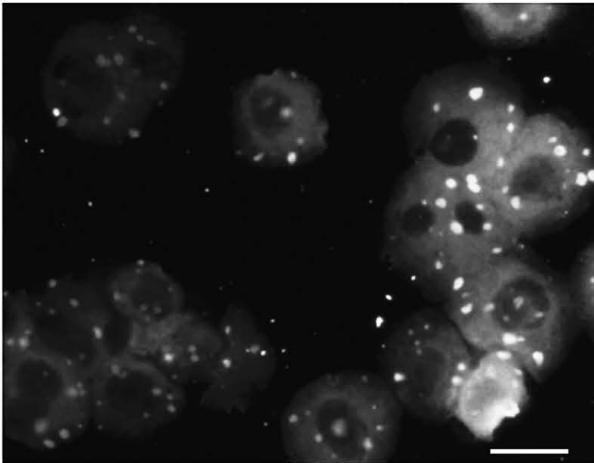
3% FA



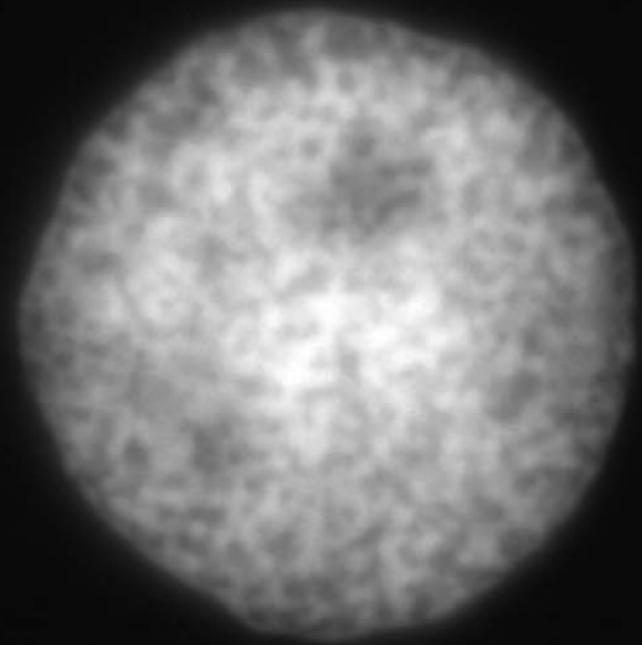
4% FA



RGEN-ISL of Knob 2



DAPI



2 μm

RGEN-ISL



*Arabidopsis*-type telomere