

**Supplementary information, Figure S4** TTALE-based imaging of telomeres and centromeres during mitosis and in different human cell types. (A-B) Co-localization analysis of telomeric FISH (red) and Flag-TTALE<sup>telo</sup> (green) (A) or centromeric FISH (red) and Flag-TTALE<sup>centro</sup> (green) (B) in HeLa cells at different mitotic stages. Scale bars, 5 μm. (C-D) Co-localization analysis of telomeric FISH (red) and Flag-TTALE<sup>centro</sup> (green) (D) in U2OS, HepG2, MCF7, and HEK293 cells. Scale bars, 5 μm. (E-F) TTALE-mediated imaging of telomeres (E) and centromeres (F) in live human oocytes. Dashed lines indicate cellular boundaries. Scale bars, 10 μm.