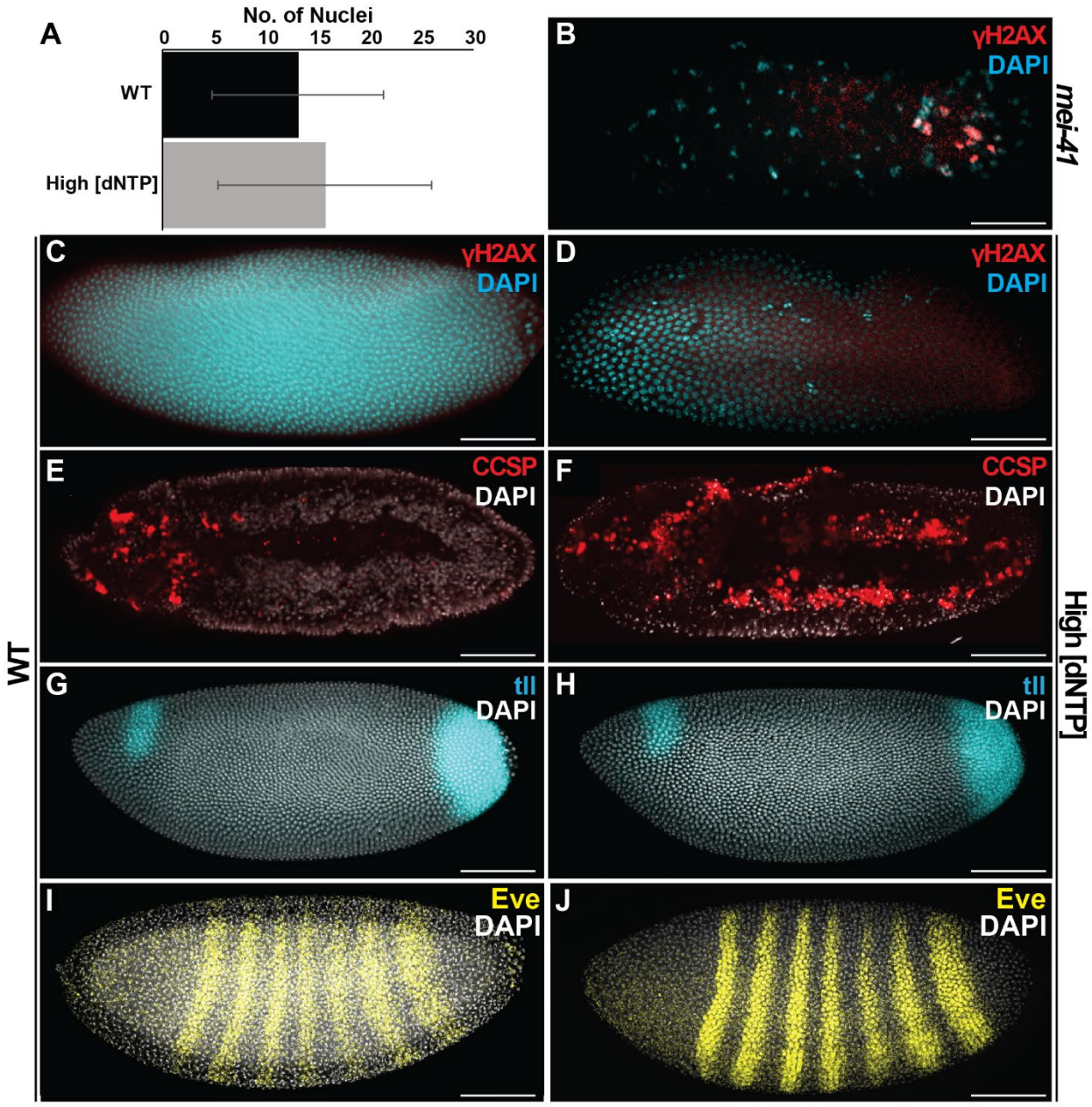

Figure S1: DNA damage and cell death. Related to figure 1.
(A) Quantification of nuclear fallout from live imaging. (B-D) Embryos from *mei-41* which serves as a positive control (B) OregonR (C) and with high dNTP levels (D) stained for the DNA damage marker γH2AX. (E, F) Visualization of programed cell death in late stage OregonR (E) and embryos with high dNTP levels (F) stained for Cleaved Caspase (CCSP). (G-J) wild type embryos (G, I) and embryos with high dNTP concentrations (H, J) embryo expressing tll (G, H) to visualize terminal patterning, which is normal in both genotypes and Eve (I, J) to visualize anterior-posterior patterning which is normal in both genotypes. Scale bars represent 30μm.

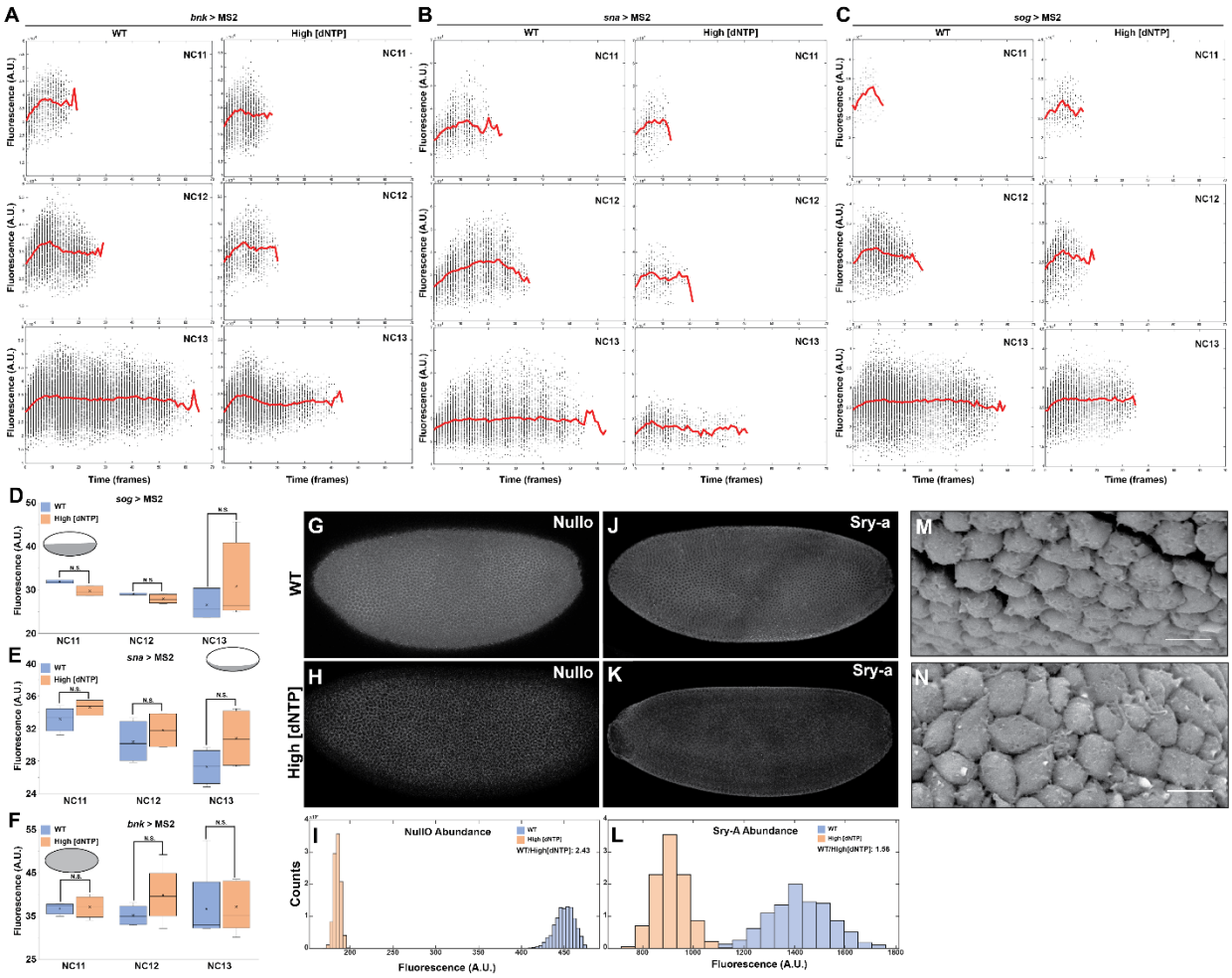

Figure S2: Transcriptional output and downstream consequences. Related to figure 2. (A-C) Plots showing the mean transcriptional output for example embryos expressing bnk>MS2 (A), sna>MS2 (B), and sog>MS2 (C) for interphases 11-13. (D-F) Box plots representing the time normalized output for NC11 NC12 and NC13 for *sog* (D), *sna* (E) and *bnk* (F). *t*-Test, NS = Not significant. (G, H) Representative images of WT (G) and embryos with high dNTP concentrations (H) stained for Nullo. (I) Histogram of bootstrapped means. Bootstrapped means of fluorescence intensity; based on 13 WT embryos and 6 embryos with high dNTP levels yield a ratio of 2.43 ± .08. (J, K) Representative images of WT (J) and embryos with high dNTP concentrations (K) stained for Sry-a. (L) Histogram of bootstrapped means. Bootstrapped means of fluorescence intensity; based on 6 WT embryos and 6 embryos with high dNTP levels yield a ratio of 1.56± .07. (M, N) Scanning electron micrographs of apical cell surfaces of cellular blastoderm stage wild type embryo (M) and an embryo with high dNTP concentrations (N). Scale bar represents 10µm.

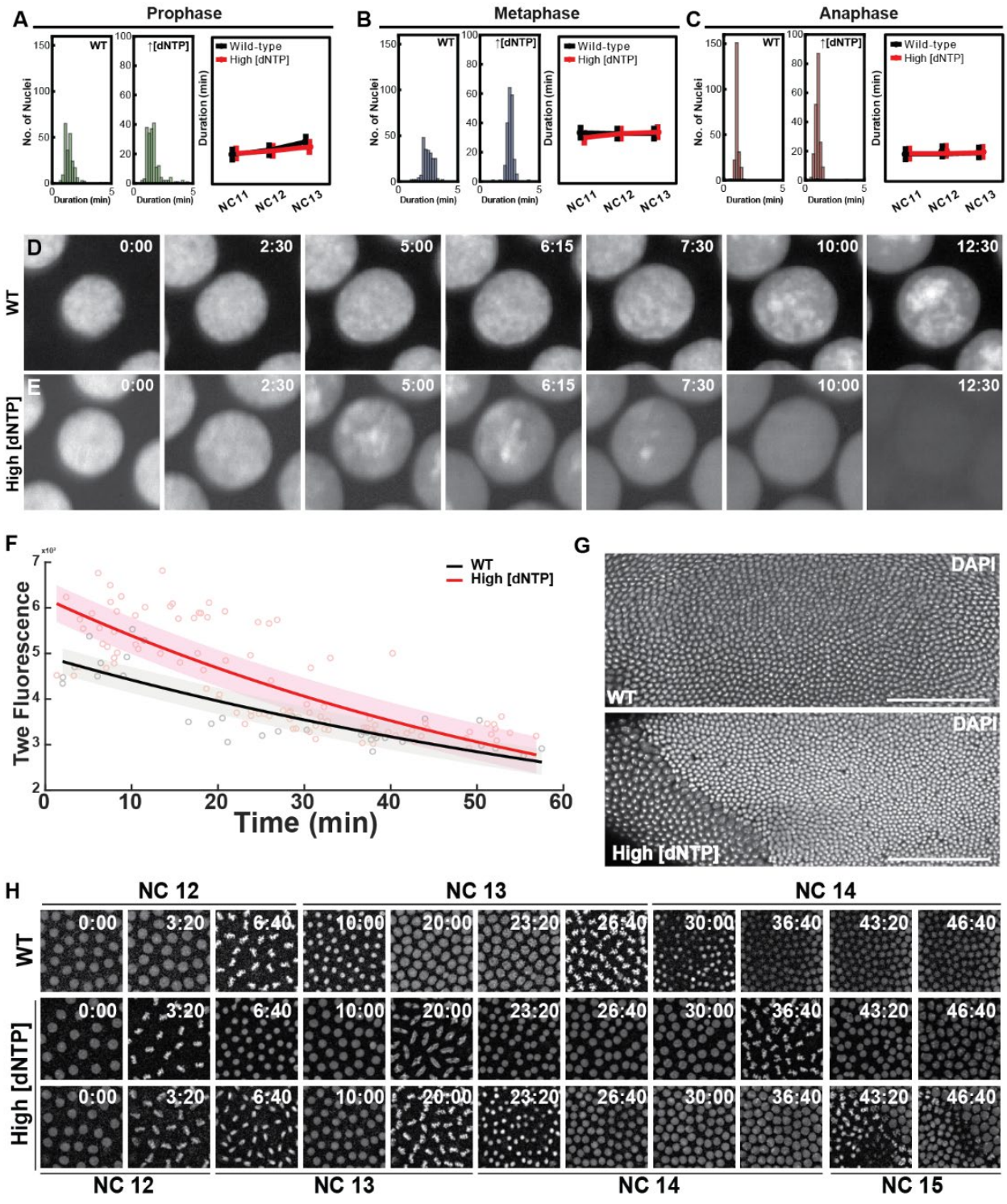

Figure S3: Cell cycle phases, DNA replication and extra divisions. Related to figure 3.
(A-C) Representative histograms and comparisons of median durations for Prophase (A) Metaphase (B) and Anaphase (C). (D, E) PCNA::GFP is used to visualize the progression of DNA replication. Snapshots from time series spanning Interphase of NC13 of a wild type embryo (D) and an embryo with high dNTP levels (E). (F) Quantification of Twe levels during NC 14 comparing

wild type and embryos with high dNTP concentrations. Circles represent individual data points. Solid lines represent exponential fit and shaded regions represent 95% confidence intervals. (G) Confocal micrograph of WT and an embryo with high dNTP levels stained with DAPI to visualize extra nuclei. (H) Snapshots from time-lapse showing wild type and embryos with high dNTP concentrations undergoing precocious mitoses.