

**Supplementary Figure S3- E2-induced DNA damage is dependent upon cell cycle progression.** (A/B) HCC-1428 and MDA-415/Luc cells were treated with HD x 3 d prior to seeding. All cell lines were then treated  $\pm$  E2 for 21 h, and labeled with BrdU in culture medium for another 3 h prior to harvest. Floating and attached cells were harvested and stained for  $\gamma$ H2AX, BrdU, and cleaved PARP, and with propidium iodide. Cells were analyzed by flow cytometry. Cleaved PARP-positive cells were considered apoptotic and excluded from analysis. Representative flow cytometry results are shown in (A). Proportions of cells with DNA breaks ( $\gamma$ H2AX-positive) that were or were not in S-phase (i.e., did or did not incorporate BrdU) were plotted in (B). Data are shown as mean of triplicates + SD. Proportions of  $\gamma$ H2AX+/BrdU+ cells were statistically compared between treatment groups as indicated with brackets. (C) T47D/pInd20-*ESR1* cells were pretreated with HD x 7 d, and then treated with HD + dox x 14 d prior to seeding. All cell lines were then treated  $\pm$ E2  $\pm$  abemaciclib as indicated x 24 h, fixed, and stained for  $\gamma$ H2AX and with DAPI.  $\gamma$ H2AX foci were counted in  $\geq 100$  nuclei per group. \* $p < 0.05$ , \*\* $p < 0.005$ , \*\*\*\* $p < 0.0001$ .

