

**Supplementary Figure S6.** The synergistic anti-cancer efficiency of the drug combinations is well correlated with the combinational impact on mitosis. **A**–**C**, A long-term live cell imaging (72 hrs) was performed to analyse the impact of drug treatments on the cell fate of individual cells. HeLa cells stably expressing -tubulin-GFP and H2B-mCherry were used. The time durations that mother cells treated with TR100 (**A**), VCR (**B**) or TR100+VCR (**C**) spent in prophase, prometa-metaphase and anaphase were measured. The cell death during metaphase or division was highlighted in red or orange, respectively. **D**, The time that treated mother cells spent in prometa-metaphase was plotted. **E**, The percentage of mother cells that underwent bipolar division, multi-polar division or cell death was determined. **F**, The polarity of cell division during the first cell cycle was measured. **G**, The cell fate of the first generation of progeny was determined. **H**, The percentage of mother cells that experienced cytokinesis failure during first mitosis was determined. **I**, The phenotypes of mitotic spindles upon drug treatments were visualized via a live-cell imaging experiment using HeLa cells that express -tubulin-GFP and H2B-mCherry. Cells were treated with TR100 (3 M), VCR (1.5 nM) or their combination for 15 hrs. **J**, The polarity degree of multi-polar spindles from S6I was determined.