



**Fig S.18.** (A) The center of mass separation distance between RNAPII within condensates containing 10 copies of RNAPII and 50, 70, 80, or 90 copies of RECQ5. The center of mass separation distance is also shown for condensates with 30, 50, and 60 copies of RNAPII, and 7 RECQ5 for each RNAPII. The black dotted line indicates the separation distance seen experimentally. (B) Autocorrelation function of three observables: IDR valency, CTD valency, and center of mass separation distance between RNAPII. When all three values are less than  $1/e$  ( $\sim 0.37$ ) away from 0, the condensate is considered equilibrated. This is an example from the first 10 microseconds of the simulation with 10 RNAPII and 50 RECQ5. (C) Average valency between RECQ5-IDRs in condensates with varying ratios (of RNAPII:RECQ5 with 10 copies of RNAPII) and with increasing size (30, 50 and 60 copies of RNAPII) using a 1:7 ratio. The shaded area represents the baseline valency of RECQ5 in homotypic condensates, providing a reference for comparison, calculated from the condensate in Fig S17E. Error-bars represent one standard deviation from the mean valency. (D) Average of binding between SRI and P-CTD in condensates with varying ratios (of RNAPII:RECQ5 with 10 copies of RNAPII) and number of RNAPII copies (condensates with 30, 50 or 60 RNAPIIs) using a 1:7 ratio. Error-bars represent one standard deviation from the mean valency.