1. Supplementary Information:

A. Flat Files

Complete the Inventory below for all additional textual information and any additional Supplementary Figures, which should be supplied in one combined PDF file.

- **Row 1:** A combined, flat PDF containing any Supplementary Text, Discussion, Notes, Additional Supplementary Figures, Supplementary Protocols, simple tables, and all associated legends. Only one such file is permitted.
- **Row 2:** Nature Research's Reporting Summary; if previously requested by the editor, please provide an updated Summary, fully completed, without any mark-ups or comments. **(Reporting Summaries are not required for all manuscripts.)**

Item	**Present?**	**Filename** **This should be the name the file is saved as when it is uploaded to our system, and should include the file extension. The extension must be .pdf**	**A brief, numerical description of file contents.** **i.e.:** ***Supplementary Figures 1-4, Supplementary Discussion, and Supplementary Tables 1-4.***
Supplementary Information	Yes	SupplementaryInformation.pdf	Supplementary Figures 1-3, Supplementary Tables 1-3, Supplementary Notes, Supplementary References
Reporting Summary	Yes	ReportingSummary.pdf	
Peer Review Information	Yes	*OFFICE USE ONLY*	

B. Additional Supplementary Files

Complete the Inventory below for all additional Supplementary Files that cannot be submitted as part of the Combined PDF.

- Do not list Supplementary Figures in this table (see section 2A)
- Where possible, include the title and description within the file itself
- Spreadsheet-based tables & data should be combined into a workbook with multiple tabs, not submitted as individual files.
- Compressed files are acceptable where necessary. ZIP files are preferred.
- Please note that the *ONLY* allowable types of additional Supplementary Files are:
    - Supplementary Tables ○ Supplementary Audio ○ Supplementary Videos ○ Supplementary Software
    - Supplementary Data, for example: raw NMR Data, Cryo-EM Data, Computational Data, Crystallographic Data, etc.

Type	**Number** If there are multiple files of the same type this should be the numerical indicator. i.e. "1" for Video 1, "2" for Video 2, etc.	**Filename** This should be the name the file is saved as when it is uploaded to our system, and should include the file extension. i.e.: *Smith_ Supplementary_Video_1.mov*	**Legend or Descriptive Caption** Describe the contents of the file
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			

Add rows as needed to accommodate the number of files.

2. Source Data

Complete the Inventory below for all Source Data files.

- Acceptable types of Source Data for Main Figures and Extended Data Figures are:
  - Statistical Source Data
    - Plain Text (ASCII, TXT) or Excel formats only
    - One file for each relevant Figure, containing all source data
  - Full-length, unprocessed Gels or Blots
    - JPG, TIF, or PDF formats only
    - One file for each relevant Figure, containing all supporting blots and/or gels
- 'Source Data' is only allowed for Main Figures and Extended Data Figures.
  - Include Unprocessed Gels or Blots for Supplementary Figures as additional Supplementary Figures.
  - Include Statistical Source Data for Supplementary Figures as 'Supplementary Data' files and list them in section 2B.
  - Please see this example of Source Data in a publication.

Parent Figure or Table	**Filename** **This should be the name the file is saved as when it is uploaded to our system, and should include the file extension. i.e.: *Smith_SourceData_Fig1.xls*, or *Smith_Unmodified_Gels_Fig1.pdf***	**Data description** **i.e.: Unprocessed Western Blots and/or gels, Statistical Source Data, etc.**
Source Data Fig. 1		
Source Data Fig. 2	SourceData_Fig2.xlsx	Quantification of condensates in living cells and quantification of dilute and dense phase based on different constructs.
Source Data Fig. 3	SourceData_Fig3.xlsx	Evaluations of the molecular dynamics and permeability of

		synthetic DNA condensates.
Source Data Fig. 4	SourceData_Fig4.xlsx	DNA sequestration performance based on percentage and fractions of cellular population.
Source Data Fig. 5	SourceData_Fig5.xlsx	Transcription amplification data based on fluorescence quantification.
Source Data Fig. 6	SourceData_Fig6.xlsx	Protein activity quantification based on fluorescence quantification.
Source Data Fig. 7		
Source Data Fig. 8		
Source Data Extended Data Fig. 1	SourceData_ExtendedDataFig1.xlsx	Estimation intracellular protein concentration using calibrated curve.
Source Data Extended Data Fig. 2		
Source Data Extended Data Fig. 3	SourceData_ExtendedDataFig3.xlsx	Evaluation of phase diagram using sedimentation assay.
Source Data Extended Data Fig. 4	SourceData_ExtendedDataFig4.xlsx	Component diffusion kinetics analysis.
Source Data Extended Data Fig. 5	SourceData_ExtendedDataFig5.xlsx	Effects of heterotypic driving forces on phase diagram.
Source Data Extended Data Fig. 6	SourceData_ExtendedDataFig6.xlsx	Plasmid partition fraction based on different components.
Source Data Extended Data Fig. 7	SourceData_ExtendedDataFig7.xlsx	Computational simulation data on plasmid sequestration.
Source Data Extended Data Fig. 8	SourceData_ExtendedDataFig8.xlsx	Cell viability data and quantification of fluorescence signals of synthetic condensates in mammalian cells.
Source Data Extended Data Fig. 9		
Source Data Extended Data Fig. 10		