Description of Additional Supplementary Files Document

Supplementary Movie 1: Z-scan view of Fig. 1. The nuclear lamina is stained by AF647 and appears in red. Scale bars 10 μm.

Supplementary Movie 2: Three unstressed cells with NELFA-GFP. Scale bars 10 μm.

Supplementary Movie 3: Machine-learningbased tracking of NELFA-GFP regions (unstressed cells).

Supplementary Movie 4: Nine cells (stressed, with arsenic exposure) showing NELFA-GFP phase separation at low expression levels. Scale bars 10 μm. Orange rectangles mark regions of interest for the tracking of NELFAGFP regions.

Supplementary Movie 5: Machine-learningbased tracking of NELFA-GFP regions (stressed, with arsenic exposure).

Supplementary Movie 6: Time-resolved cluster size probability distribution in stressed and unstressed cells.

Supplementary Movie 7: Cluster formation in the presence of p38 inhibitor. Scale bars 10 μm.

Supplementary Movie 8: Dissolution of condensates when stress is released (the medium is exchanged) and p38 inhibitor is added. Scale bars 10 μm.