

## **Description of Additional Supplementary Files**

### **File Name: Supplementary Movie 1**

Description: Immunofluorescence staining against MVI in HeLa cell cropped to the nucleus, as shown in Fig. 1b. Scale bar is 1  $\mu\text{m}$ .

### **File Name: Supplementary Movie 2**

Description: Immunofluorescence staining against MVI in isolated HeLa cell nuclei, as shown in Fig. 1b. Scale bar is 1  $\mu\text{m}$ .

### **File Name: Supplementary Movie 3**

Description: Nuclei stained with the DNA dye Hoechst 33342 and the lipophilic dye DID, as shown in Supplementary Fig. 1. Scale bar is 1  $\mu\text{m}$ .

### **File Name: Supplementary Movie 4**

Description: Second example of nuclei stained with the DNA dye Hoechst 33342 and the lipophilic dye DID, as shown in Supplementary Fig. 1. Scale bar is 1  $\mu\text{m}$ .

### **File Name: Supplementary Movie 5**

Description: 3D projection movie of the nucleus presented in Video 4.

### **File Name: Supplementary Movie 6**

Description: Fixed HeLa cells stained with Rhodamine-Phalloidin and Hoechst 33342. The image is cropped to the nucleus, as shown in Supplementary Fig. 2a. Scale bar is 1  $\mu\text{m}$ .

### **File Name: Supplementary Movie 7**

Description: Immunofluorescence staining against NDP52 in HeLa cell cropped to the nucleus, as shown in Fig. 4b. Scale bar is 1  $\mu\text{m}$ .

### **File Name: Supplementary Movie 8**

Description: Immunofluorescence staining against NDP52 in isolated HeLa cell nuclei, as shown in Fig. 4b. Scale bar is 1  $\mu\text{m}$ .