

### **Legends for Supplementary Movie files:**

**Supplementary Movie 1.** Recruitment of GFP-FUS WT at laser ablation track by live cell imaging. HEK293 cells were subjected to laser ablation 48h after GFP-FUS WT plasmid transfection, and the recruitment of GFP fluorescence at laser tracks was monitored by live cell imaging every 15 seconds for a period of 5 min.

**Supplementary Movie 2.** Recruitment of GFP-FUS R521H at laser ablation track by live cell imaging. HEK293 cells were subjected to laser ablation 48h after GFP-FUS R521H plasmid transfection, and recruitment of GFP fluorescence at laser tracks was monitored by live cell imaging every 15 seconds for a period of 5 min.

**Supplementary Movie 3.** Recruitment of GFP-FUS R521C at laser ablation track by live cell imaging. HEK293 cells were subjected to laser ablation 48h after GFP-FUS R521C plasmid transfection, and the recruitment of GFP fluorescence at laser tracks was monitored by live cell imaging every 15 seconds for a period of 5 min.

**Supplementary Movie 4.** Recruitment of GFP-XRCC1 at laser ablation track by live cell imaging. HEK293 cells were subjected to laser ablation 48h after GFP-XRCC1 plasmid transfection, and the recruitment of GFP fluorescence at laser tracks was monitored by live cell imaging every 15 seconds for a period of 5 min.

**Supplementary Movie 5.** Recruitment of GFP-XRCC1 at laser ablation track by live cell imaging in FUS knockdown cells. HEK293 cells were subjected to laser ablation 48h after GFP-XRCC1 and FUS shRNA co-transfection, and the recruitment of GFP fluorescence at laser tracks was monitored by live cell imaging every 15 seconds for a period of 5 min.

### **Legends for Supplementary Data file:**

**Supplementary Data 1.** List of proteins isolated with FUS immunoprecipitates, identified by mass spectroscopy. SH-SY5Y cells were treated by GO (100ng/ml) for 1h, and the total lysate were extracted for co-IP by incubating with FUS antibody, followed by running 4–12% Bis-Tris gel. Gel bands were then excised and subjected to mass spectrometry analysis.