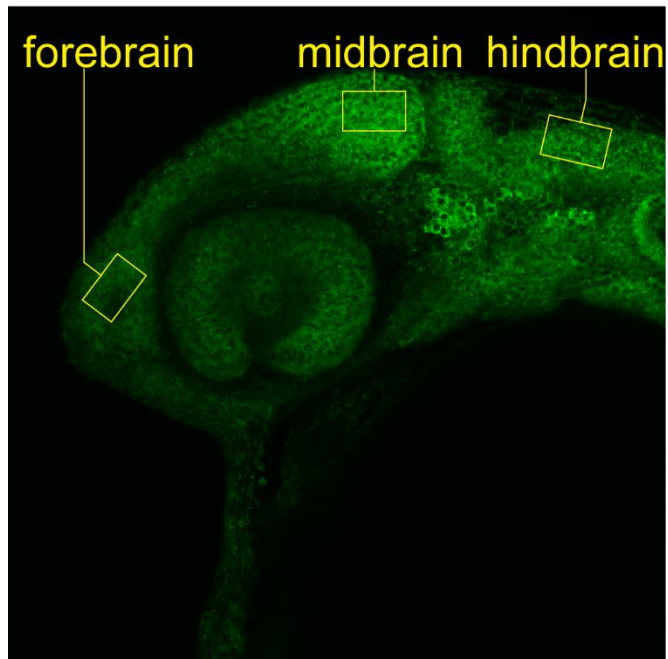


**Fig S1. Validation of GFP-G3BP1 KI zebrafish**

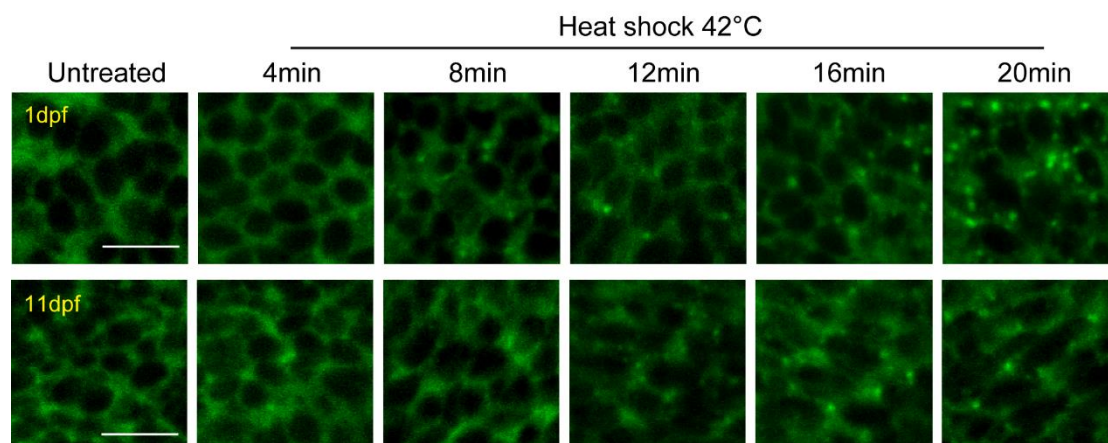
(A) Genotyping strategy and results from two sets of primers (*f1+r* and *f2+r*).

(B) Representative images showing the same response of 0AA-GFP-G3BP1 or 10AA-GFP-G3BP1 to heat shock stress (42°C for 30 minutes) in SH-SY5Y cells. (C) Stress granule formation in SH-SY5Y cells transfected with either 0AA-GFP-G3BP1 or

10AA-GFP-G3BP1 reporter plasmid after heat shock at 42°C for 30 minutes. Cells were fixed and immunolabeled at indicated time after removal of stress for stress granule imaging and quantification (mean  $\pm$  S.E.M.; n=10 fields for each time point, at least 10-15 GFP positive cells per field. (D) FRAP analysis of heat shocked SH-SY5Y cells expressing 0AA-GFP-G3BP1 or 10AA-GFP-G3BP1. Cells were heat shocked at 42°C for 30 minutes, and the stress granules dynamics were analyzed by FRAP after stress removal (mean  $\pm$  S.E.M.; n = 7-8 cells per sample, by unpaired Student's-*t*-test). (E) Representative images showing the same response of 0AA-GFP-G3BP1 or 10AA-GFP-G3BP1 to sodium arsenite stress (20 $\mu$ M for 30 minutes) in SH-SY5Y cells. (F) SH-SY5Y cells transfected with either reporter plasmid were stress shocked with 20 $\mu$ M sodium arsenite for 30 minutes and fixed at indicated time after removal of stress for stress granule imaging and quantification (mean  $\pm$  S.E.M.; n=10 fields for each time point, at least 10-15 GFP positive cells per field. (G) FRAP analysis of SH-SY5Y cells expressing 0AA-GFP-G3BP1 or 10AA-GFP-G3BP1. Cells were treated SA as described above. After stress was removed, stress granules dynamics were analyzed by FRAP. For FRAP the average fluorescence before photobleaching was designated as 1 (mean  $\pm$  S.E.M.; n = 8-9 cells per sample, by unpaired Student's-*t*-test). (Scale bar =10 $\mu$ m)

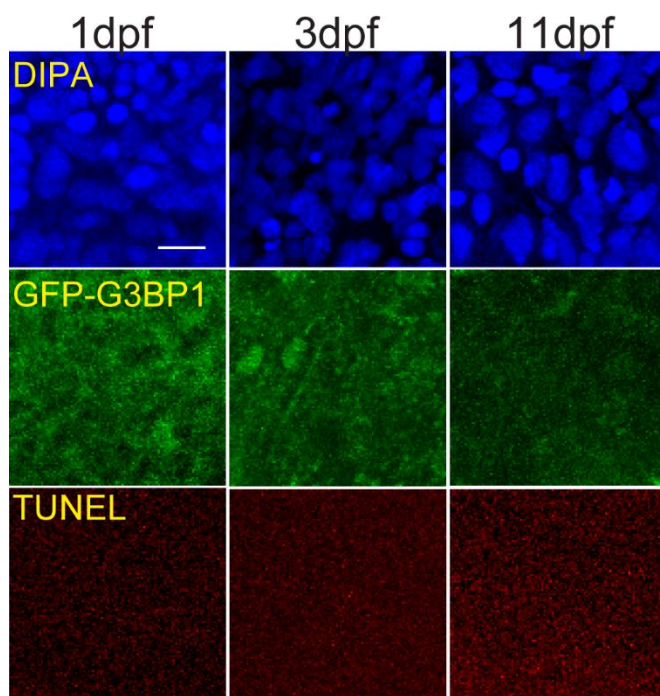


**Fig S2.** The forebrain, midbrain, hindbrain regions in 1dpf fish embryo selected for SG formation and dynamics analysis. 1dpf zebrafish at normal condition was fixed in 4% PFA for imaging.



**Fig S3. Delayed stress granule formation in zebrafish larvae**

Enlarged images of the midbrain region of 1dpf and 11dpf zebrafish at various time points after heat shock as shown in Fig 5A. Scale bar =10 $\mu$ m



**Fig S4. Absence of cell death in zebrafish kept at ambient condition.** Zebrafish of different age kept at 28 °C were fixed in 4% PFA for TUNEL assay.