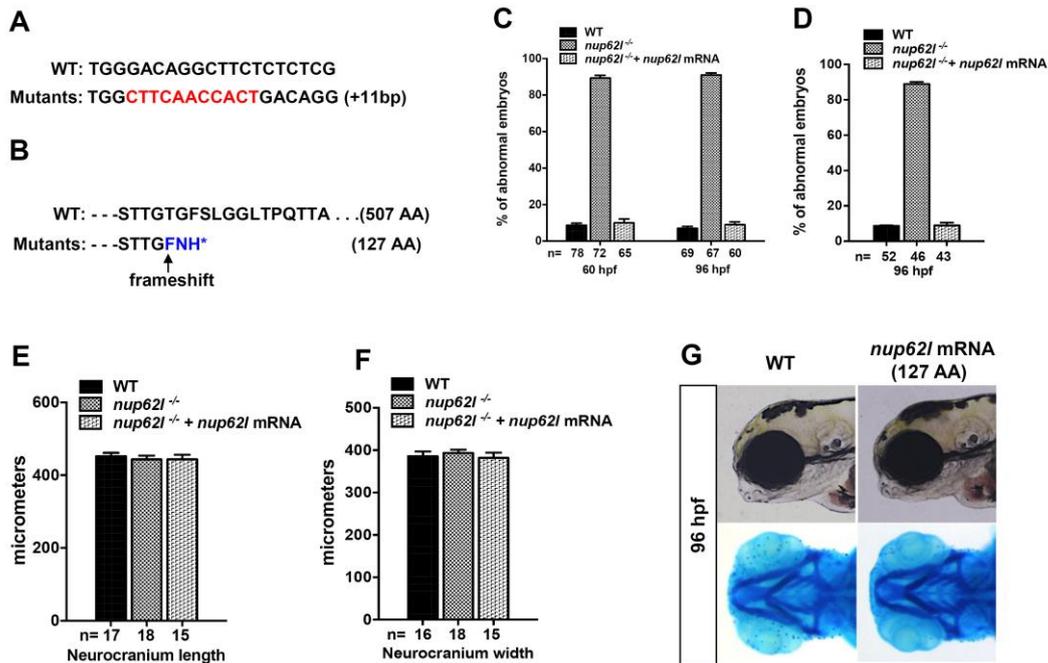


1 SUPPLEMENTARY MATERIALS

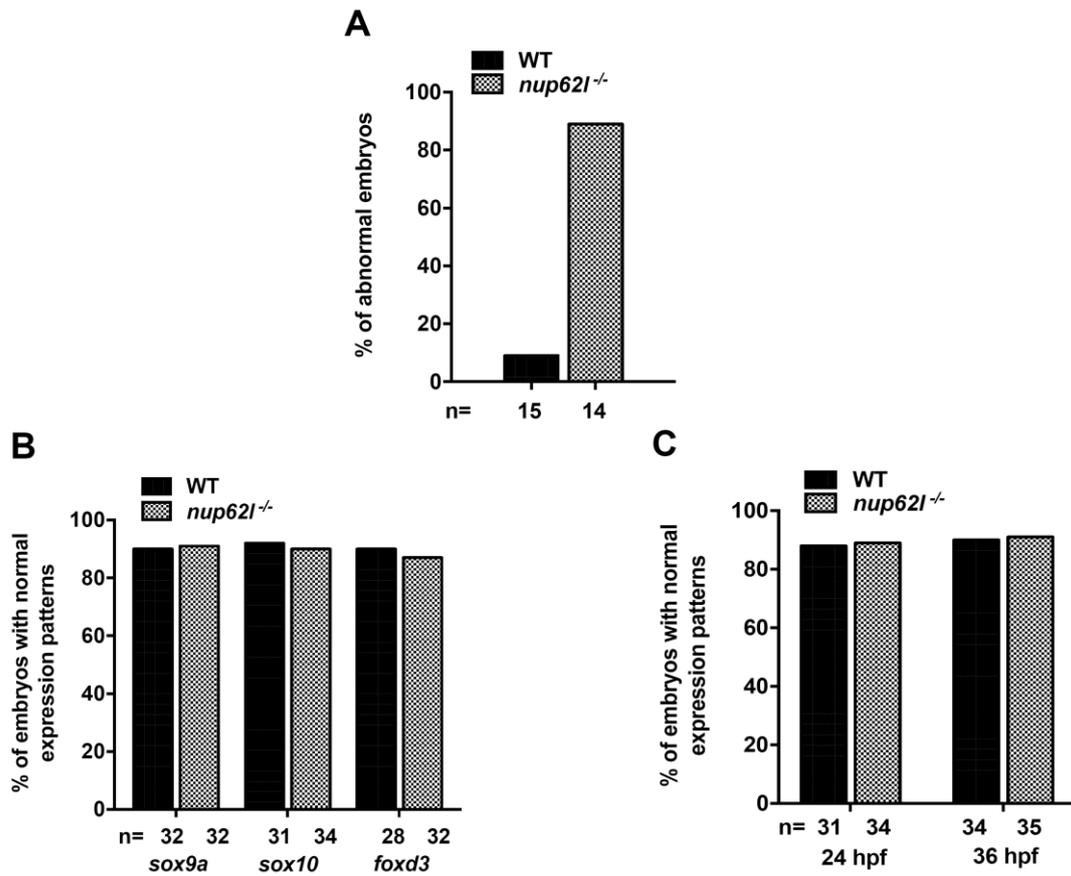
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4 **Figure S1.** (A) The 11- nucleotide insertion sequences in *nup62l*-mutants were shown  
 5 in red. (B) An alignment of the Nup62l sequences encoded in WT and *nup62l*-mutants.  
 6 The 11-nucleotide insertion caused a frame-shift of the open reading frame for  
 7 Nup62l, leading to a premature stop codon (marked as \*) in *nup62l*-mutants. (C, D)  
 8 The percentage of defective embryos as shown in Figure 1C and Figure 1D,  
 9 respectively. (E, F) Cartilage measurements of the length and width of neurocranium  
 10 in WT, *nup62l*-mutants or *nup62l*-mutants injected with 300 pg *nup62l* mRNA. Data  
 11 were representatives of three independent experiments. The total numbers detected (n)  
 12 were shown at the bottom. (G) The 96-hpf PA phenotype of WT siblings or WT  
 13 injected with 300 pg N-terminal 381bp (127AA) partial mRNA of *nup62l* coding  
 14 sequences.

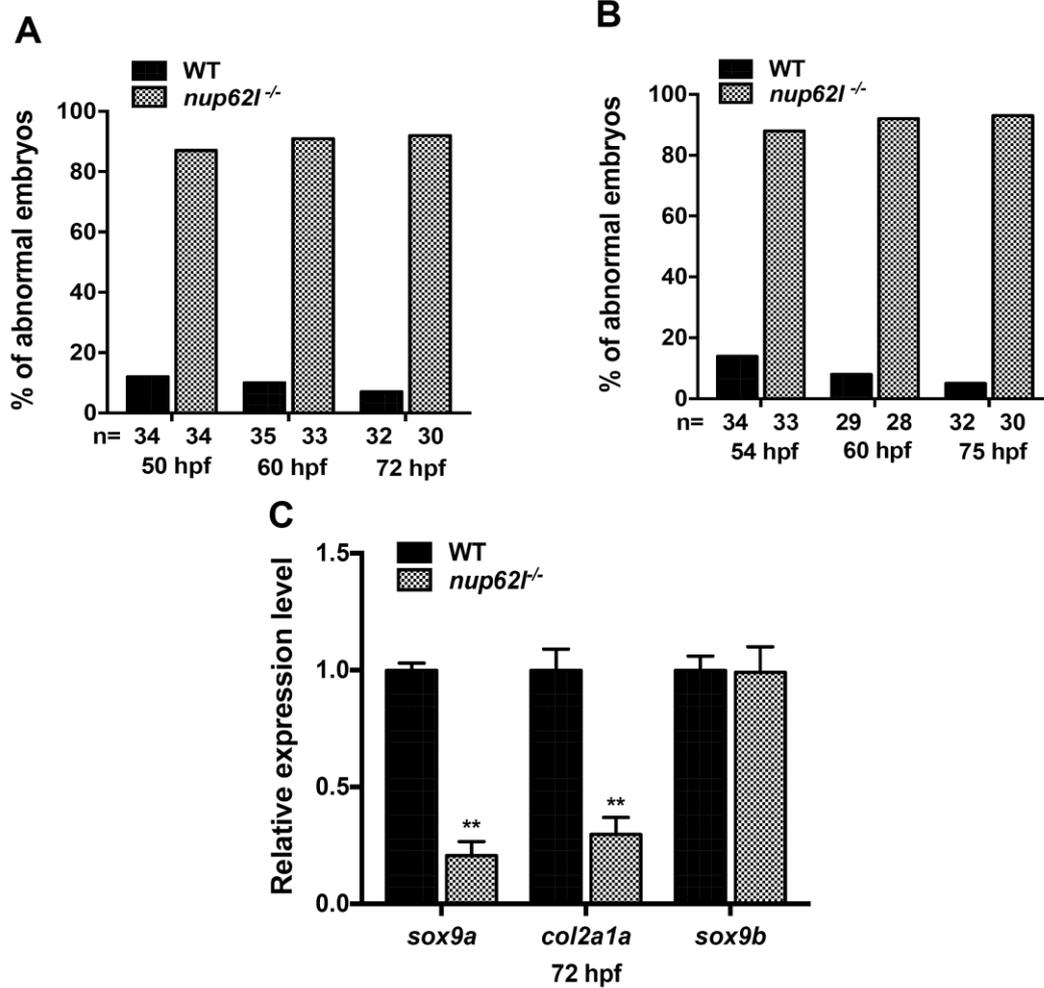
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16

17 **Figure S2.** (A) The percentage of defective embryos as displayed in Figure 2A. (B, C)  
 18 The percentage of embryos with representative expression patterns shown in Figure  
 19 2B and 2C, respectively. The number of embryos (n) and developing stages examined  
 20 were indicated below the bars.

21

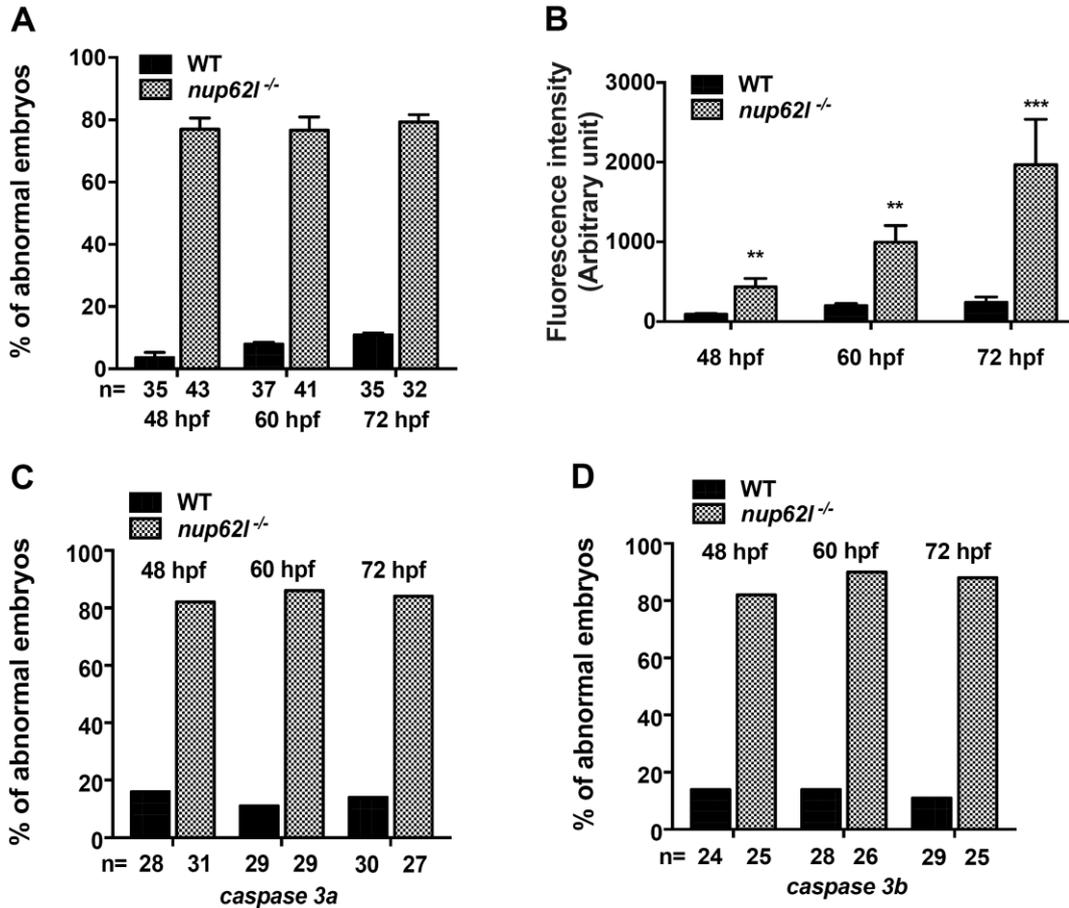


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23 **Figure S3.** The percentage of *nup62l*-mutants or WT siblings displaying impaired  
 24 expression patterns of genes *sox9a* (A) and *col2a1a* (B) as shown in Figure 3. (C) The  
 25 mRNA levels of genes *sox9a*, *sox9b* and *col2a1a* at 72 hpf. Expression levels were  
 26 normalized to WT. The data expressed as Mean  $\pm$  SD were representatives of three  
 27 independent experiments containing 50 embryos per sample. \*\*,  $p < 0.01$ .

28

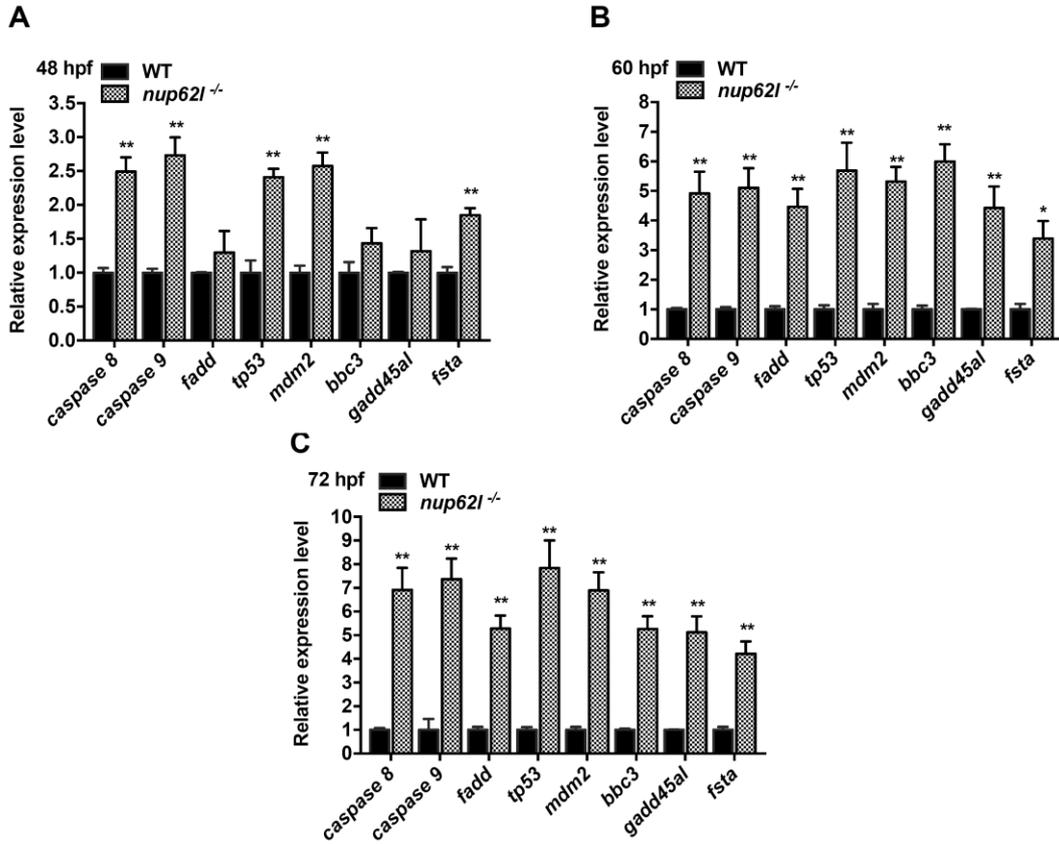
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31 **Figure S4.** (A) Quantification of *nup62l*-mutants showing increased apoptosis in PA  
 32 at 48 hpf, 60 hpf or 72 hpf as demonstrated in Figure 4A. (B) Immunofluorescence  
 33 intensities of approximately 20 WT or *nup62l*<sup>-/-</sup> embryos were determined using the  
 34 ImageJ software (National Institutes of Health, Bethesda, MD) and expressed as  
 35 arbitrary units. Values are expressed as Mean  $\pm$  SD from three independent  
 36 experiments. \*\*,  $p < 0.01$ ; \*\*\*,  $p < 0.001$ . (C, D) WT or *nup62l*-mutants were quantified  
 37 by abnormal expression of *caspase 3a* and *caspase 3b* at the indicated stages in Figure  
 38 4C. The data were representatives of three independent experiments.

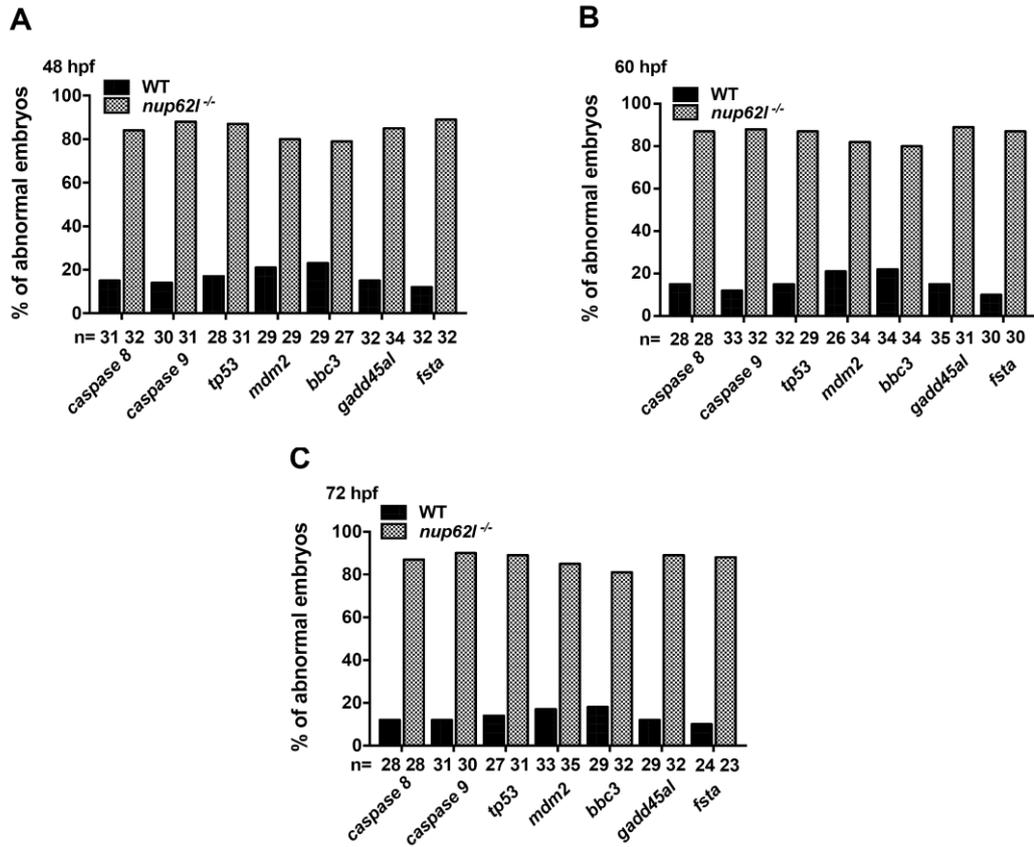
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41 **Figure S5.** (A-C) The mRNA levels of genes involved in intrinsic and extrinsic  
 42 apoptotic pathways were analyzed with qRT-PCR. Total mRNAs were extracted from  
 43 WT or *nup62l*-mutants at 48 hpf, 60 hpf or 72 hpf. Expression levels were normalized  
 44 to WT. The data expressed as Mean  $\pm$  SD were representatives of three independent  
 45 experiments containing 50 embryos per sample. \*,  $p < 0.05$ ; \*\*,  $p < 0.01$ .

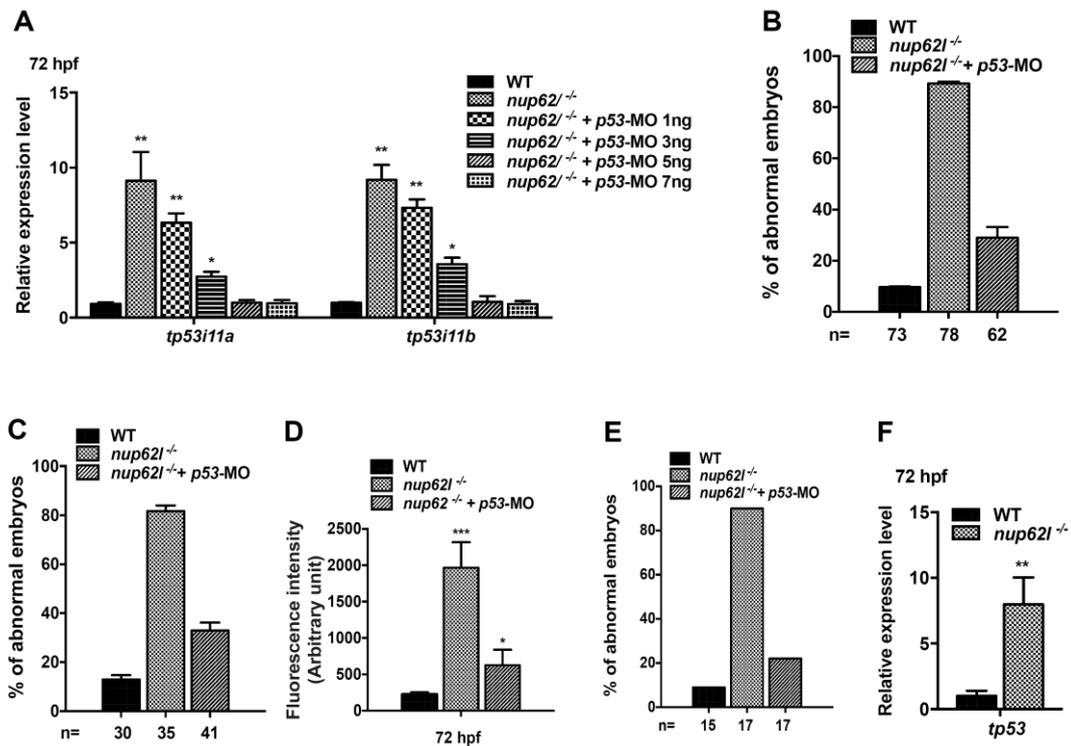
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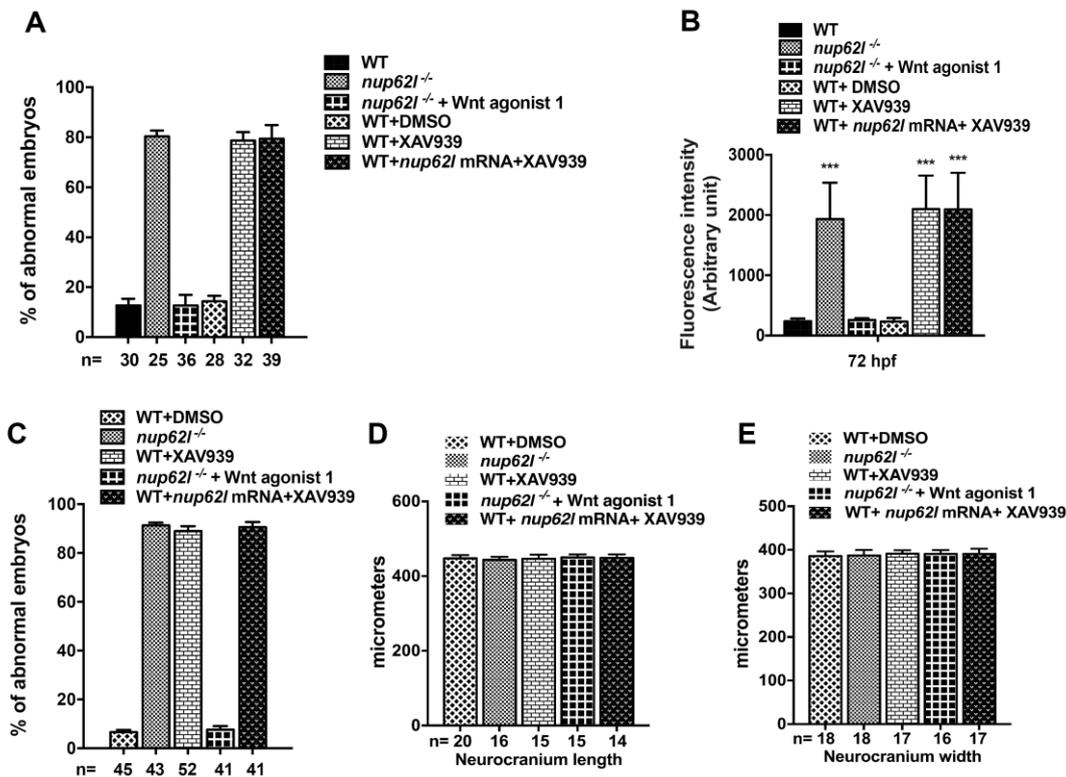
48 **Figure S6.** (A-C) The percentage of *nup62l*-mutants carrying affected patterns of  
 49 WISH assays for apoptosis-related genes as shown in Figure 5. The total numbers of  
 50 embryos detected were indicated at the bottom of the bars.

51



52

53 **Figure S7.** (A) The mRNA expression levels of *tp53i11a* and *tp53i11b* in WT or  
 54 *nup62l*<sup>-/-</sup> embryos injected with or without 1, 3, 5 or 7 ng *p53*-MO. (B) Quantification  
 55 of embryos showing abnormal pharyngeal morphology indicated in Figure 6A. (C)  
 56 The ratios of embryos showing the abnormal apoptosis in pharyngeal regions at 72  
 57 hpf as shown in Figure 6B. (D) Immunofluorescence intensities of approximately 20  
 58 WT, or *nup62l*<sup>-/-</sup> embryos injected without or with 5 ng *p53*-MO were expressed as  
 59 arbitrary units. (E) The ratios of 96-hpf WT, *nup62l*-mutants or *nup62l*-mutants  
 60 injected with 5 ng *p53*-MO and showing aberrant chondrocytes of PA in Figure 6C.  
 61 (F) The mRNA expression levels of *tp53* in WT or *nup62l*<sup>-/-</sup> embryos at 72 hpf.  
 62 Values are expressed as Mean ± SD from three independent experiments. \*, p<0.05;  
 63 \*\*, p<0.01; \*\*\*, p<0.001.  
 64



65 **Figure S8.** Embryos showing the aberrant apoptosis levels as imaged in Figure 7A,  
 66 were quantified in (A). (B) Immunofluorescence intensities of approximately 20  
 68 embryos showing in Figure 7A were expressed as arbitrary units. Values are  
 69 expressed as Mean ± SD from three independent experiments. \*\*\*, p<0.001. (C)  
 70 Statistical results of embryos showing defective pharyngeal cartilage patterns in  
 71 Figure 7B. (D, E) Cartilage measurements of the length and width of neurocranium in  
 72 embryos showing in Figure 7B. The total numbers of embryos examined were  
 73 displaced below the bars.