Supplemental:

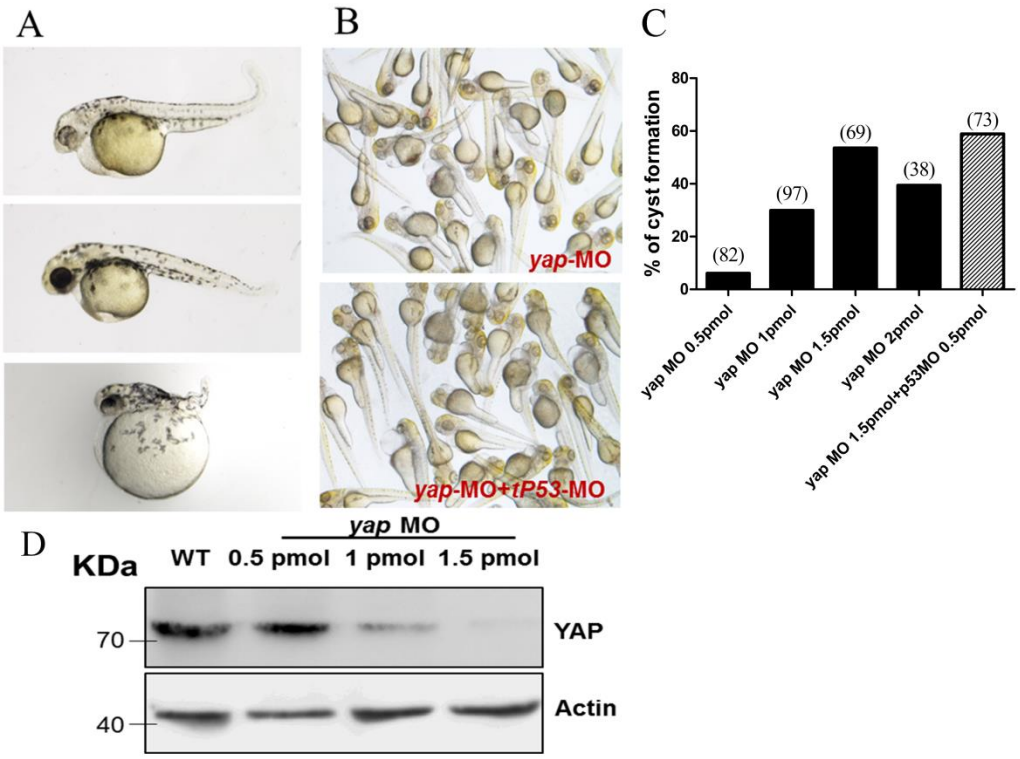

Figure S1. Phenotypes in *yap* MO embryos are dose-dependent and not nonsepcific effects of the p53 apoptosis pathway. (A) *yap* morphants show randomization of tail curvature and exhibit short axis with high concentration of MO injection. (B) Coinjection of *tP53* MO with *yap* MO exhibits similar phenotypes with *yap* morphants and even more serious heart edema. (C) Quantification of embryos with pronephric cysts. Number above the column is counted embryos each group. (D) Western blot of 1 d.p.f embryos sees the efficiency of Yap knockdown with different MO dosages.

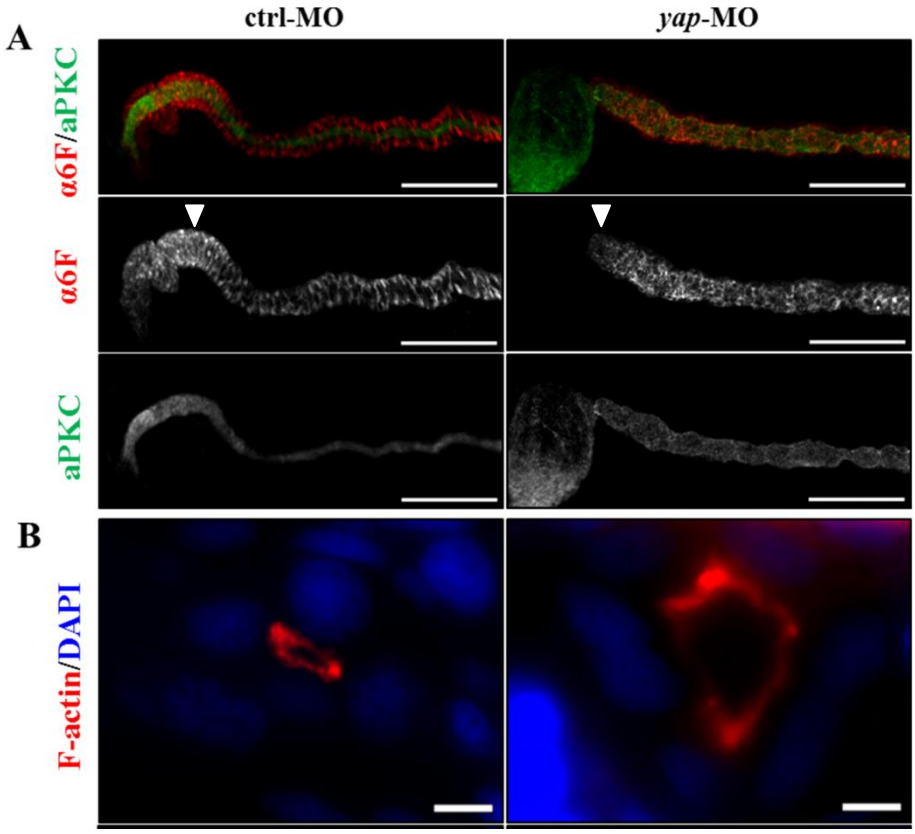

Figure S2. (A) Pronephric duct of the Yap knockdown embryo enlarges in almost all segments, and dilation of the inner diameter with aPKC staining is much more evident. Alternatively, the "hairpin" convolution of the proximal segment disappears with α6F staining (arrowheads). Bar: 100 μm. (B) F-actin staining of the expanded tubule remains unaffected. Bar: 5 μm.

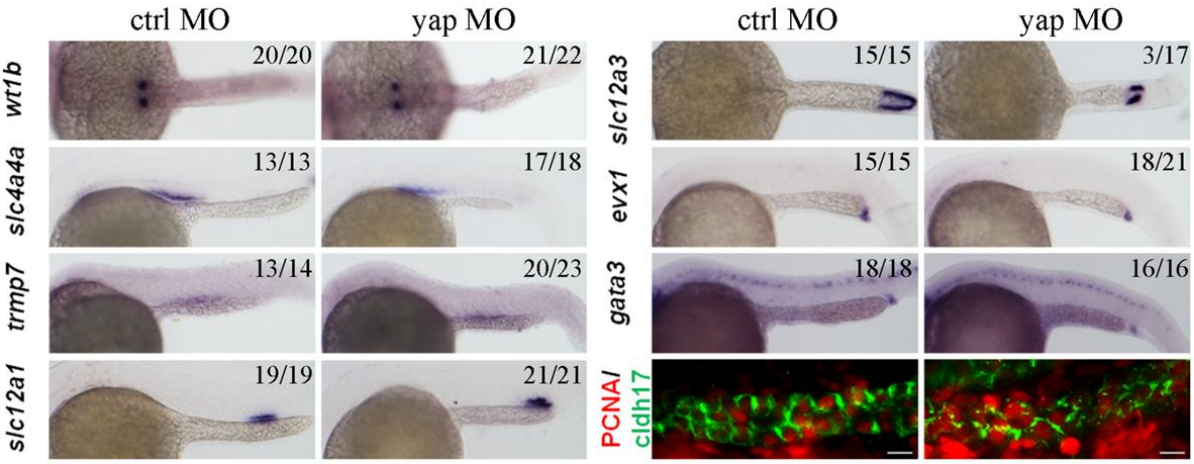

Figure S3. Examination of segment-restricted probes in 24 h.p.f embryos demonstrates no obvious change between morphants and control except for lack of fusion in *slc12a3*$^{+}$ cells near cloaca. Double staining of cldh17 and PCNA revealed normal cell proliferation in distal segment of 24 h.p.f embryos. Bar: 10 μm.

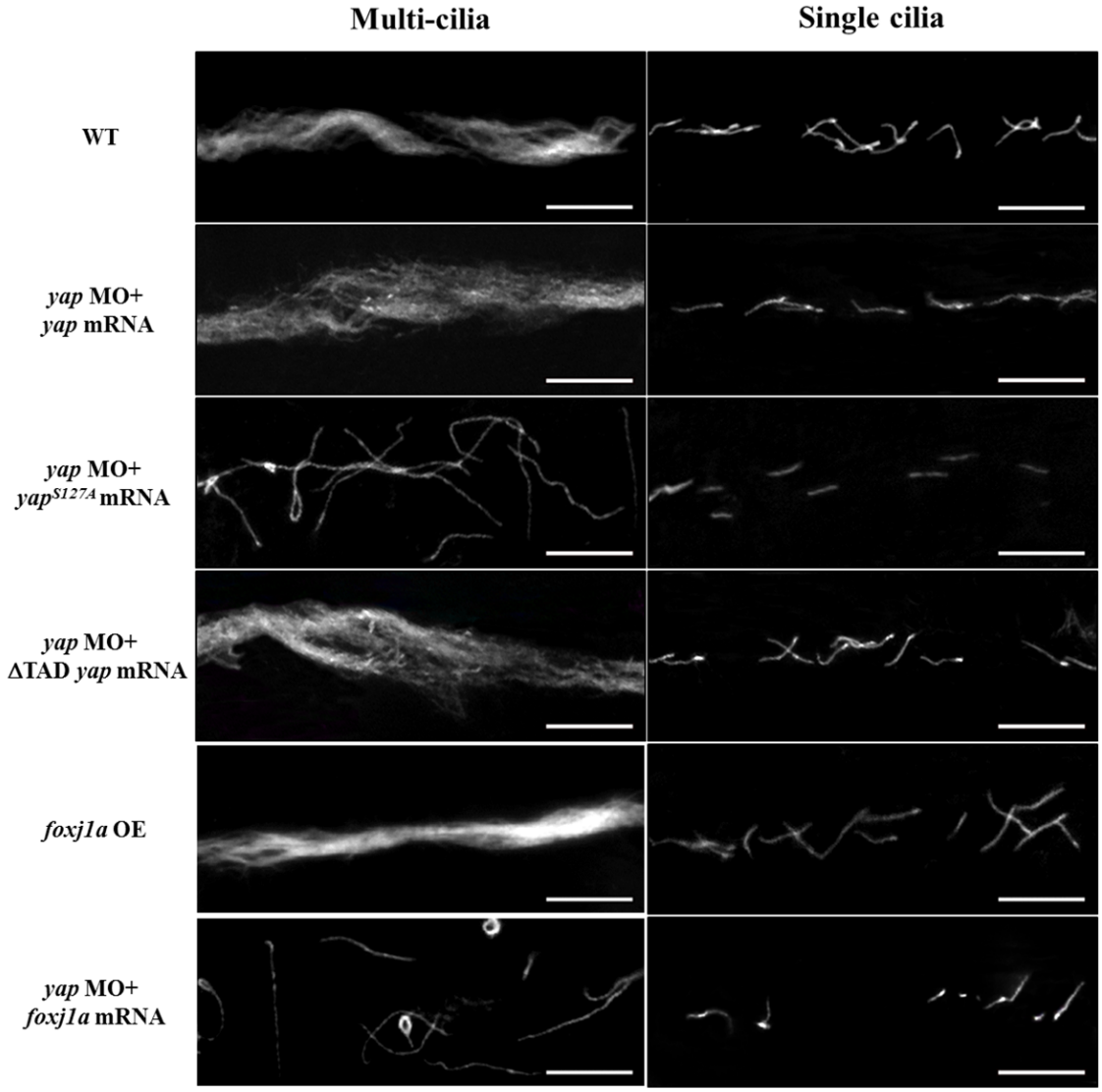

Figure S4. Compared with the wild-type embryos, full length and ΔTAD *yap* mRNA can rescue the cilia defects of *yap* morphants, while coinjection with yap^{S127A} mRNA doesn't have similar effect. In addition, over-expression of *foxj1a* mRNA in wild-type and *yap* morphant embryo has no obvious influence in ciliogenesis.