Supplemental Data

Supplemental Materials and Methods

Microarray analysis

Total RNAs were prepared from control embryos (40-50 embryos injected with 8ng control MO), *mll*-MO1-injected embryos (40-50 embryos injected with 8ng *mll*-MO1) and *mll*-MO2-injected embryos (40-50 embryos injected with 8ng *mll*-MO2) at the 10-somite stage using Trizol reagent (Invitrogen). The microarray was conducted using the commercially available Agilent 4x44 K Zebrafish Microarray Chip.

Apoptosis assay

The Acridine Orange staining was used for apoptotic cell staining in embryos. Briefly, the embryos were incubated in 0.05mg/ml Acridine Orange (diluted in 1xPBS) for 2 minutes at room temperature, washed twice with 1xPBS, then observed and photographed under a Leica M205 FA inverted fluorescent microscope.

Immunofluorescent staining

Embryos at 24hpf stage were fixed in 4% paraformaldehyde at 4^{o}C overnight, washed with PBST (phosphatebuffered saline containing 0.1% Triton X-100) extensively, incubated in blocking buffer(PBST, 1%BSA, 5% FBS), and then incubated in primary phospho-histone H3 antibody(Santa Cruz) (1:500) at 4^{o}C overnight. Embryos were then washed and incubated in FITC-conjugated secondary antibody and observed under a fluorescence microscope.

Supplemental Figure Legends

Supplemental Figure 1. Alignment of human, mouse and zebrafish mll. Zebrafish *mll* (GenBank accession number NM_001110279) encodes a 4218- amino acid protein with human (GenBank accession number NP_005924) and mouse (GenBank accession number NP_001074518.1) orthologs.

Supplemental Figure 2. Apoptosis staining and proliferation staining for embryos without morpholino injection or injected with either *mll*-MO1 or *mll*-MO2. A. Apoptosis staining. B. Phospho-H3 staining.

Supplemental Figure 3. The pronephric marker pax2a and pre-cardiac marker were not obviously affected by *mll*-knockdown; and embryonic hematopoietic markers *scl* and *lmo2* were reduced after mll-knockdown at 5-somite stage. A. A1, *pax2a* expression in embryos without morpholino injection; A2, pax2a expression in embryos injected with *mll*-MO1; A3, *nkx2.5* expression in embryos without morpholino injection; A4, *nkx2.5* expression in embryos injected with *mll*-MO1. B. *scl* expression was reduced in *mll* morphants (B1, B2); lmo2 expression was reduced in *mll* morphants (B3, B4).

Supplemental Figure 4. The blood vessel development of zebrafish was not seriously affected by *mll*-knockdown. A. The effect of mll-knockdown on aorta marker *ephB2a* expression in embryos at 32 hpf stage. B. The effect of *mll*-knockdown on endothelial cell development marked by *flk1*-GFP in embryos at 24-hpf, 36-hpf and 48hpf stages.

Supplemental Figure 5. The effect of *mll*-MO2 mediated mll-knockdown on hematopoietic makers (*scl, gata1, pu.1, ephB2a, runx1, c-myb, mpo* and *l-plastin*), myogenic marker (*myoD*), pronephric marker (*pax2a*) and precardiac marker (*nkx2.5*).

Supplemental Figure 6. A**.** The genes were not affected by *mll*-knockdown. A1, A2, *cdx4*; A3, A4, *hoxb5a*; A5, A6, *hoxb7a*; A7, A8, *hoxc8*. B. The injection of *hoxb7a, hoxb6b* and *hoxb4a* mRNA could not rescue hematopoietic marker *scl* expression in *mll*-MO1 morphants.

Supplemental Figure 7. A. *gadd45αa* expression was not altered after either *hoxa9a* knockdown (A2) or *hoxd3a* knockdown (A3). B. The expression of both *hoxoa9a* (B1, B2) and *hoxd3a* (B3, B4) were not altered in embryos with ectopic expression of

gadd45αa.

Supplemental Table S1. Summary of the primer sequences used in cDNA cloning, promoter cloning, probe cloning and PT-PCR.

Supplemental Table S2. Summary of microarray analysis data.