A)

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A.limnaeus   MARTKQTARKSTGGKAPRKQLATKAARKSAPATGGVKKPHRYRPGTVALREIRRYQKSTE
N.furzeri    MARTKQTARKSTGGKAPRKQLATKAARKSAPATGGVKKPHRYRPGTVALREIRRYQKSTE
D.rerio      MARTKQTARKSTGGKAPRKQLATKAARKSAPATGGVKKPHRYRPGTVALREIRRYQKSTE
H.sapiens    MARTKQTARKSTGGKAPRKQLATKAARKSAPATGGVKKPHRYRPGTVALREIRRYQKSTE
             ****|*****|*********************|***************************

A.limnaeus   LLIRKLPFQRLVREIAQDFKTDLRFQSSAVMALQEASEAYLVGLFEDTNLCAIHAKRVTI
N.furzeri    LLIRKLPFQRLVREIAQDFKTDLRFQSSAVMALQEASEAYLVGLFEDTNLCAIHAKRVTI
D.rerio      LLIRKLPFQRLVREIAQDFKTDLRFQSSAVMALQEASEAYLVGLFEDTNLCAIHAKRVTI
H.sapiens    LLIRKLPFQRLVREIAQDFKTDLRFQSSAVMALQEACEATLVGLFEDTNLCAIHAKRVTI
             ************************************.**  *******************

A.limnaeus   MPKDIQLARRIRGERA
N.furzeri    MPKDIQLARRIRGERA
D.rerio      MPKDIQLARRIRGERA
H.sapiens    MPKDIQLARRIRGERA
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B)

Fig. S1. A) Alignment of histone H3 in the specified species. BLAST analysis was used to identify the known or predicted histone H3 primary sequence in the three fish using the human histone H3 primary sequence. Clustal W was used to align the primary sequences. Grey box outlines the amino acids that are subject to modification and that we assay in our studies. B) Western blot analysis of purified histones probed with anti-histone H3. Positive control is recombinant form of histone H3 (15.2 kDa).
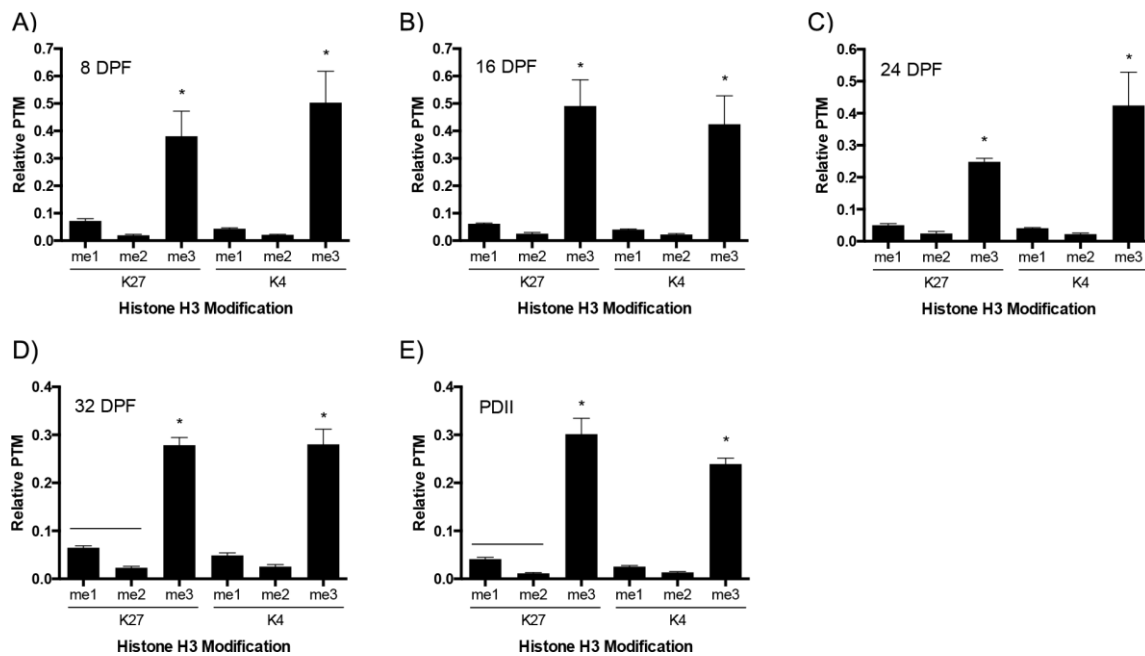
Fig. S2. The post-translational methylation of H3K27 or H3K4 relative to histone H3, was determined in A) preDII (8 dpf), B) preDII (16 dpf), C) DII (24 dpf), D) DII (32 dpf) and E) postDII embryos. ELISA was used to quantify the monomethylation (me1), dimethylation (me2) and trimethylation (me3) methylation for H3K27 or H3K4. The * indicates a significant difference between the me3 and me2/me1 PTM ($p < 0.005$). The line indicates a significant difference between the me1 and me2 PTM ($p < .005$). The p values were determined using one-way ANOVA followed by a Holm-Sidak's multiple comparison test. The values are mean ± s.e.m. The data is obtained from 80-100 embryos per trial (n=3) for each embryo stage.

Table S1. Statistical Data for ELISA experiments		
Holm-Sidak's multiple comparisons test	**Summary**	**Adjusted P Value**
H3K27me1 (Figure 5A)		
8 DPF vs. 16 DPF	ns	0.591
8 DPF vs. 24 DPF	*	0.0434
8 DPF vs. 32 DPF	ns	0.7151
8 DPF vs. PDII	**	0.0015
16 DPF vs. 24 DPF	ns	0.3778
16 DPF vs. 32 DPF	ns	0.7151
16 DPF vs. PDII	*	0.032
24 DPF vs. 32 DPF	ns	0.2069
24 DPF vs. PDII	ns	0.5825
32 DPF vs. PDII	*	0.0116
H3K27me2 (Figure 5B)		
8 DPF vs. 16 DPF	ns	0.8916
8 DPF vs. 24 DPF	ns	0.9318
8 DPF vs. 32 DPF	ns	0.8916
8 DPF vs. PDII	ns	0.8149
16 DPF vs. 24 DPF	ns	0.9829
16 DPF vs. 32 DPF	ns	0.9829
16 DPF vs. PDII	ns	0.2415
24 DPF vs. 32 DPF	ns	0.9829
24 DPF vs. PDII	ns	0.3742
32 DPF vs. PDII	ns	0.2669
H3K27me3 (Figure 5C)		
8 DPF vs. 16 DPF	ns	0.7337
8 DPF vs. 24 DPF	ns	0.7337
8 DPF vs. 32 DPF	ns	0.8379
8 DPF vs. PDII	ns	0.8813
16 DPF vs. 24 DPF	*	0.0361
16 DPF vs. 32 DPF	ns	0.0879
16 DPF vs. PDII	ns	0.1365
24 DPF vs. 32 DPF	ns	0.9078
24 DPF vs. PDII	ns	0.8976
32 DPF vs. PDII	ns	0.9078

The p values were determined using one-way ANOVA with Holm-Sidak's multiple comparison post-test.
N=3 trials per DPF (80-100 embryos/trial).

Table S2. Statistical Data for ELISA experiments		
Holm-Sidak's multiple comparisons test	**Summary**	**Adjusted P Value**
H3K4me1 (Figure 5D)		
8 DPF vs. 16 DPF	ns	0.9701
8 DPF vs. 24 DPF	ns	0.9701
8 DPF vs. 32 DPF	ns	0.7938
8 DPF vs. PDII	**	0.0038
16 DPF vs. 24 DPF	ns	0.9701
16 DPF vs. 32 DPF	ns	0.6737
16 DPF vs. PDII	**	0.0094
24 DPF vs. 32 DPF	ns	0.7903
24 DPF vs. PDII	**	0.0049
32 DPF vs. PDII	***	0.0002
H3K4me2 (Figure 5E)		
8 DPF vs. 16 DPF	ns	0.9901
8 DPF vs. 24 DPF	ns	0.9901
8 DPF vs. 32 DPF	ns	0.974
8 DPF vs. PDII	ns	0.2228
16 DPF vs. 24 DPF	ns	0.9901
16 DPF vs. 32 DPF	ns	0.974
16 DPF vs. PDII	ns	0.2228
24 DPF vs. 32 DPF	ns	0.9822
24 DPF vs. PDII	ns	0.1508
32 DPF vs. PDII	ns	0.0522
H3K4me3 (Figure 5F)		
8 DPF vs. 16 DPF	ns	0.8637
8 DPF vs. 24 DPF	*	0.0496
8 DPF vs. 32 DPF	ns	0.2535
8 DPF vs. PDII	ns	0.131
16 DPF vs. 24 DPF	ns	0.2595
16 DPF vs. 32 DPF	ns	0.6697
16 DPF vs. PDII	ns	0.482
24 DPF vs. 32 DPF	ns	0.8637
24 DPF vs. PDII	ns	0.8877
32 DPF vs. PDII	ns	0.8877

The p values were determined using one-way ANOVA with Holm-Sidak's multiple comparison post-test.
N=3 trials per DPF (80-100 embryos/trial).

Table S3. Statistical Data for ELISA experiments		
Holm-Sidak's multiple comparisons test	**Summary**	**Adjusted P Value**
HSP70 (Figure 6A)		
8 DPF vs. 16 DPF	ns	0.8116
8 DPF vs. 24 DPF	ns	0.7727
8 DPF vs. 32 DPF	ns	0.7804
8 DPF vs. PDII	****	< 0.0001
16 DPF vs. 24 DPF	ns	0.6695
16 DPF vs. 32 DPF	ns	0.8116
16 DPF vs. PDII	****	< 0.0001
24 DPF vs. 32 DPF	ns	0.3386
24 DPF vs. PDII	****	< 0.0001
32 DPF vs. PDII	****	< 0.0001
RNA Pol II S5P (Figure 6B)		
8 DPF vs. 16 DPF	ns	0.9144
8 DPF vs. 24 DPF	ns	0.5962
8 DPF vs. 32 DPF	ns	0.9809
8 DPF vs. PDII	ns	0.9809
16 DPF vs. 24 DPF	ns	0.9144
16 DPF vs. 32 DPF	ns	0.8891
16 DPF vs. PDII	ns	0.8891
24 DPF vs. 32 DPF	ns	0.4215
24 DPF vs. PDII	ns	0.4215
32 DPF vs. PDII	ns	0.9971

The p values were determined using one-way ANOVA with Holm-Sidak's multiple comparison post-test.
N=3 trials per DPF (80-100 embryos/trial).