

**Supplementary Table S1. Histone genes sequences analyzed in this paper****S1A. Human Histone Genes**

Histone Sequence Name	Sequence surrounding the first codon (-10/+10)
>GI 21071025 REF NM_005319.3  HOMO SAPIENS HISTONE 1, H1C (HIST1H1C), MRNA	GATTCTCAACATGTCCGAGA
>GI 20544164 REF NM_005321.2  HOMO SAPIENS HISTONE 1, H1E (HIST1H1E), MRNA	TGCCTTCAACATGTCCGAGA
>GI 20336759 REF NM_006026.2  HOMO SAPIENS H1 HISTONE FAMILY, MEMBER X (H1FX), MRNA	TCTTGCTACCATGTCCGTGG
>GI 15718716 REF NM_005322.2  HOMO SAPIENS HISTONE 1, H1B (HIST1H1B), MRNA	TCTTGCCACCATGTCCGAAA
>GI 24475862 REF NM_153833.1  HOMO SAPIENS H1 HISTONE FAMILY, MEMBER O, OOCYTE-SPECIFIC (H1FOO), MRNA	TGTCGGTCTCATGGCTCCTG
>GI 21264571 REF NM_005325.2  HOMO SAPIENS HISTONE 1, H1A (HIST1H1A), MRNA	GTTACTCACCATGTCTGAAA
>GI 20544167 REF NM_005323.3  HOMO SAPIENS HISTONE 1, H1T (HIST1H1T), MRNA	CTCTGTTGTTATGTCTGAAA
>GI 20544161 REF NM_005320.2  HOMO SAPIENS HISTONE 1, H1D (HIST1H1D), MRNA	AGACAAAACATGTCCGAGA
>GI 20336758 REF NM_005318.2  HOMO SAPIENS H1 HISTONE FAMILY, MEMBER O (H1FO), MRNA	ACAGGCCACCATGACCGAGA
>GI 27436923 REF NM_003517.2  HOMO SAPIENS HISTONE 2, H2AC (HIST2H2AC), MRNA	GATTTCAGTCATGTCTGGTC
>GI 15718714 REF NM_003510.2  HOMO SAPIENS HISTONE 1, H2AK (HIST1H2AK), MRNA	TTTTTACGTCATGTCCGGAC
>GI 15718715 REF NM_021066.2  HOMO SAPIENS HISTONE 1, H2AJ (HIST1H2AJ), MRNA	ACCTTTTGCCATGTCTGGGC
>GI 41406072 REF NM_138635.2  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER V (H2AFV), TRANSCRIPT VARIANT 2, MRNA	CGCCGAGAACATGGCTGGAG
>GI 41406070 REF NM_201517.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER V (H2AFV), TRANSCRIPT VARIANT 5, MRNA	CGCCGAGAACATGGCTGGAG
>GI 41406068 REF NM_201516.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER V (H2AFV), TRANSCRIPT VARIANT 4, MRNA	CGCCGAGAACATGGCTGGAG
>GI 41406066 REF NM_201436.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER V (H2AFV), TRANSCRIPT VARIANT 3, MRNA	CGCCGAGAACATGTTTCCTG
>GI 41406065 REF NM_012412.3  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER V (H2AFV), TRANSCRIPT VARIANT 1, MRNA	CGCCGAGAACATGGCTGGAG
>GI 38570130 REF NM_021064.3  HOMO SAPIENS HISTONE 1, H2AG (HIST1H2AG), MRNA	TGCGCTCGCTATGTCTGGAC
>GI 29553976 REF NM_018267.2  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER J (H2AFJ), TRANSCRIPT VARIANT 1, MRNA	AGAGGTGATCATGTCCGGTC
>GI 29553969 REF NM_177925.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER J (H2AFJ), TRANSCRIPT VARIANT 2, MRNA	AGAGGTGATCATGTCCGGTC
>GI 29171728 REF NM_175065.2  HOMO SAPIENS HISTONE 2, H2AB (HIST2H2AB), MRNA	TTTAGCCGTAATGTCAGGAC
>GI 29171724 REF NM_170745.2  HOMO SAPIENS HISTONE 1, H2AA (HIST1H2AA), MRNA	ATGCGAGGAGATGTCTGGAC
>GI 21396481 REF NM_003512.3  HOMO SAPIENS HISTONE 1, H2AC (HIST1H2AC), MRNA	TCTGATTGCAATGTCTGGAC
>GI 21328454 REF NM_003516.2  HOMO SAPIENS HISTONE 2, H2AA (HIST2H2AA), MRNA	TATCGCTGTCATGTCTGGTC
>GI 20336749 REF NM_002106.2  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER Z (H2AFZ), MRNA	GGAATTCGAAATGGCTGGCG
>GI 20336747 REF NM_138610.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER Y (H2AFY), TRANSCRIPT VARIANT 3, MRNA	GGCCACCGCCATGTCCGAGCC
>GI 20336745 REF NM_138609.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER Y (H2AFY), TRANSCRIPT VARIANT 1, MRNA	GGCCACCGCCATGTCCGAGCC

>GI 20336744 REF NM_004893.2  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER Y (H2AFY), TRANSCRIPT VARIANT 2, MRNA	GGCCACCGCCATGTCGAGCC
>GI 15718717 REF NM_003511.2  HOMO SAPIENS HISTONE 1, H2AL (HIST1H2AL), MRNA	TTTCTTCGTCATGTCGGGAC
>GI 8923919 REF NM_018649.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER Y2 (H2AFY2), MRNA	CTGAAGCAAGATGTCGGGCC
>GI 41151667 REF XM_373381.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER B (H2AFB), MRNA	AACGCCCAGCATGCCGAGGA
>GI 28872747 REF NM_033445.2  HOMO SAPIENS HISTONE 3, H2A (HIST3H2A), MRNA	TGACTCGGAAATGTCGGGTC
>GI 19557655 REF NM_003513.2  HOMO SAPIENS HISTONE 1, H2AB (HIST1H2AB), MRNA	AGAAGTAGTTATGTCTGGTC
>GI 18105044 REF NM_080596.1  HOMO SAPIENS HISTONE 1, H2AH (HIST1H2AH), MRNA	TGTGACCAGTATGTCTGGAC
>GI 15718713 REF NM_003509.2  HOMO SAPIENS HISTONE 1, H2AI (HIST1H2AI), MRNA	GCCTTTTGCCATGTCTGGGC
>GI 4504252 REF NM_002105.1  HOMO SAPIENS H2A HISTONE FAMILY, MEMBER X (H2AFX), MRNA	CCTCGCTAGCATGTCGGGCC
>GI 19557652 REF NM_021065.2  HOMO SAPIENS HISTONE 1, H2AD (HIST1H2AD), MRNA	AGAATTCAAAATGTCGGGAC
>GI 19557649 REF NM_021052.2  HOMO SAPIENS HISTONE 1, H2AE (HIST1H2AE), MRNA	GGAAGCCACTATGTCTGGAC
>GI 15718718 REF NM_003514.2  HOMO SAPIENS HISTONE 1, H2AM (HIST1H2AM), MRNA	TCGTTTTACCATGTCTGGAC
>GI 28558999 REF NM_170610.2  HOMO SAPIENS HISTONE 1, H2BA (HIST1H2BA), MRNA	TGTGGTAGCTATGCCGAGG
>GI 21396483 REF NM_003523.2  HOMO SAPIENS HISTONE 1, H2BE (HIST1H2BE), MRNA	CAAAGATAGCATGCCTGAGC
>GI 21396482 REF NM_003522.3  HOMO SAPIENS HISTONE 1, H2BF (HIST1H2BF), MRNA	TTTATTTATCATGCCTGAAC
>GI 20336751 REF NM_138720.1  HOMO SAPIENS HISTONE 1, H2BD (HIST1H2BD), TRANSCRIPT VARIANT 2, MRNA	TAACGCTACGATGCCTGAAC
>GI 20336750 REF NM_021063.2  HOMO SAPIENS HISTONE 1, H2BD (HIST1H2BD), TRANSCRIPT VARIANT 1, MRNA	TAACGCTACGATGCCTGAAC
>GI 19924303 REF NM_021062.2  HOMO SAPIENS HISTONE 1, H2BB (HIST1H2BB), MRNA	AGGAATAGCAATGCCTGAAC
>GI 18105047 REF NM_080593.1  HOMO SAPIENS HISTONE 1, H2BK (HIST1H2BK), MRNA	CGCCTTCAACATGCCGGAAC
>GI 16306565 REF NM_003527.4  HOMO SAPIENS HISTONE 1, H2BO (HIST1H2BO), MRNA	CTCCTCCGCCATGCCGACC
>GI 11036645 REF NM_017445.1  HOMO SAPIENS H2B HISTONE FAMILY, MEMBER S (H2BFS), MRNA	CGCCTTCAACATGCCGAGC
>GI 22027639 REF NM_003528.2  HOMO SAPIENS HISTONE 2, H2BE (HIST2H2BE), MRNA	GTGTCTTACCATGCCTGAAC
>GI 21166388 REF NM_003526.2  HOMO SAPIENS HISTONE 1, H2BC (HIST1H2BC), MRNA	GTGTTTTAAGATGCCTGAGC
>GI 20336753 REF NM_021058.3  HOMO SAPIENS HISTONE 1, H2BJ (HIST1H2BJ), MRNA	ACACAGTGCTATGCCAGAGC
>GI 15718720 REF NM_003520.3  HOMO SAPIENS HISTONE 1, H2BN (HIST1H2BN), MRNA	ACTCCCAGTCATGCCGAGC
>GI 15718719 REF NM_003519.3  HOMO SAPIENS HISTONE 1, H2BL (HIST1H2BL), MRNA	TTGTTTCATTATGCCGAGC
>GI 28872748 REF NM_175055.2  HOMO SAPIENS HISTONE 3, H2BB (HIST3H2BB), MRNA	CTCAGCCATCATGCCAGACC
>GI 21536482 REF NM_003518.3  HOMO SAPIENS HISTONE 1, H2BG (HIST1H2BG), MRNA	TTCTGACAGCATGCCTGAAC
>GI 21166387 REF NM_003525.2  HOMO SAPIENS HISTONE 1, H2BI (HIST1H2BI), MRNA	GGCTGCGAACATGCCTGAAC
>GI 21166386 REF NM_003524.2  HOMO SAPIENS HISTONE 1, H2BH (HIST1H2BH), MRNA	TC'TTGTTGCAATGCCTGATC
>GI 15718721 REF NM_003521.2  HOMO SAPIENS HISTONE 1, H2BM (HIST1H2BM), MRNA	GTTTTCCACCATGCCTGAAC
>GI 38373691 REF NM_005324.3  HOMO SAPIENS H3 HISTONE, FAMILY 3B (H3.3B) (H3F3B), MRNA	GTGAAAGAAAATGGCCCGAA
>GI 39812261 REF NM_003530.3  HOMO SAPIENS HISTONE	GAAGTTCGCAATGGCTCGTA

1, H3D (HIST1H3D), MRNA	>GI 31742502 REF NM_021059.2  HOMO SAPIENS HISTONE 2, H3C (HIST2H3C), MRNA	TTGGTTCGCTATGGCCCGTA
>GI 22027640 REF NM_002107.2  HOMO SAPIENS H3 HISTONE, FAMILY 3A (H3F3A), MRNA	TCTCTGTACCATGGCTCGTA	
>GI 21396498 REF NM_003537.3  HOMO SAPIENS HISTONE 1, H3B (HIST1H3B), MRNA	TGGT'TTTGCCATGGCTCGTA	
>GI 21264570 REF NM_003534.2  HOMO SAPIENS HISTONE 1, H3G (HIST1H3G), MRNA	GTAGTCTGAGATGGCCCGCA	
>GI 21264566 REF NM_003532.2  HOMO SAPIENS HISTONE 1, H3E (HIST1H3E), MRNA	CAGATGAACTATGGCGCGTA	
>GI 21071022 REF NM_003531.2  HOMO SAPIENS HISTONE 1, H3C (HIST1H3C), MRNA	CTCAT'TGCAAATGGCTCGTA	
>GI 19743834 REF NM_003493.2  HOMO SAPIENS HISTONE 3, H3 (HIST3H3), MRNA	T'TTCGGATT'CATGGCCCGAA	
>GI 19743828 REF NM_003529.2  HOMO SAPIENS HISTONE 1, H3A (HIST1H3A), MRNA	T'TTTTCCGTCATGGCTCGCA	
>GI 15718725 REF NM_003536.2  HOMO SAPIENS HISTONE 1, H3H (HIST1H3H), MRNA	CTCTGAAGGCATGGCGCGTA	
>GI 15718724 REF NM_003535.2  HOMO SAPIENS HISTONE 1, H3J (HIST1H3J), MRNA	T'TTCTCAACTATGGCCCGGA	
>GI 15718723 REF NM_003533.2  HOMO SAPIENS HISTONE 1, H3I (HIST1H3I), MRNA	CTACTTAGCCATGGCACGAA	
>GI 21396497 REF NM_021018.2  HOMO SAPIENS HISTONE 1, H3F (HIST1H3F), MRNA	ACCCAT'TCCTATGGCACGCA	
>GI 29553982 REF NM_003548.2  HOMO SAPIENS HISTONE 2, H4 (HIST2H4), MRNA	TCCAGCGGTCATG'TCCGGCA	
>GI 21264599 REF NM_003543.3  HOMO SAPIENS HISTONE 1, H4H (HIST1H4H), MRNA	TTGCTTAGTCATGTCTGGCC	
>GI 21166392 REF NM_003544.2  HOMO SAPIENS HISTONE 1, H4B (HIST1H4B), MRNA	CTGGTTAGACATGTCTGGTC	
>GI 21071024 REF NM_003542.3  HOMO SAPIENS HISTONE 1, H4C (HIST1H4C), MRNA	GATAGGAATCATGTCTGGTC	
>GI 16306592 REF NM_021968.3  HOMO SAPIENS HISTONE 1, H4J (HIST1H4J), MRNA	CTTGCTCGTCATGTCTGGCC	
>GI 15718726 REF NM_003541.2  HOMO SAPIENS HISTONE 1, H4K (HIST1H4K), MRNA	CTTGCTCGTCATGTCTGGCC	
>GI 21166390 REF NM_003538.3  HOMO SAPIENS HISTONE 1, H4A (HIST1H4A), MRNA	TTGGGAAGTCATGTCTGGAC	
>GI 28416433 REF NM_175054.2  HOMO SAPIENS HISTONE 4, H4 (HIST4H4), MRNA	TGAT'TTCAGAATGTCTGGGC	
>GI 21264600 REF NM_003545.3  HOMO SAPIENS HISTONE 1, H4E (HIST1H4E), MRNA	TGTGTTGGTCATGTCTGGTC	
>GI 21166393 REF NM_003547.2  HOMO SAPIENS HISTONE 1, H4G (HIST1H4G), MRNA	CTTGTTTATCATGTCTGTTC	
>GI 21166391 REF NM_003540.3  HOMO SAPIENS HISTONE 1, H4F (HIST1H4F), MRNA	GTCTTCGATCATGTCTGGTA	
>GI 21071023 REF NM_003539.3  HOMO SAPIENS HISTONE 1, H4D (HIST1H4D), MRNA	GTGGTTTCAAGATGTCTGGC	
>GI 18105065 REF NM_003495.2  HOMO SAPIENS HISTONE 1, H4I (HIST1H4I), MRNA	CCACTTGATAATGTCAGGAC	
>GI 15718728 REF NM_003546.2  HOMO SAPIENS HISTONE 1, H4L (HIST1H4L), MRNA	AGTACAAGACATGTCTGGGC	

#### S1B. Mouse Histone Genes

Histone Sequence Name	Sequence (-10/10)
>GI 19923864 REF NM_138311.1  MUS MUSCULUS H1 HISTONE FAMILY, MEMBER O, OOCYTE-SPECIFIC (H1FOO), MRNA	TGCCTGTGCCATGGCTCCTG
>GI 34328364 REF NM_145713.2  MUS MUSCULUS HISTONE 1, H1D (HIST1H1D), MRNA	AGCTTAGAACATGTCCGAGA
>GI 31560696 REF NM_008197.2  MUS MUSCULUS H1 HISTONE FAMILY, MEMBER O (H1F0), MRNA	GCCGGCCACCATGACCGAGA
>GI 21426892 REF NM_020034.1  MUS MUSCULUS HISTONE 1, H1B (HIST1H1B), MRNA	TGT'TCTCGCCATGTCTGAGA
>GI 21426822 REF NM_030609.1  MUS MUSCULUS HISTONE 1, H1A (HIST1H1A), MRNA	ATCAGCGACCATGTCGGAGA
>GI 13430889 REF NM_015787.1  MUS MUSCULUS HISTONE	ACGCTTCGCCATGTCCGAGA

1, H1E (HIST1H1E), MRNA	
>GI 9845256 REF NM_015786.1  MUS MUSCULUS HISTONE 1, H1C (HIST1H1C), MRNA	GAGACTCATCATGTCTGAGG
>GI 6754113 REF NM_010377.1  MUS MUSCULUS HISTONE 1, H1T (HIST1H1T), MRNA	GCTCTTGACCATGTCCGAAA
>GI 20892698 REF XM_147155.1  MUS MUSCULUS H1 HISTONE FAMILY, MEMBER 4 (H1F4), MRNA	GGCCCGAGTCCTGGCCAGTC
>GI 13385733 REF NM_026230.1  MUS MUSCULUS H2A HISTONE FAMILY, MEMBER Y2 (H2AFY2), MRNA	TCGAGGCAAGATGTCAGGCC
>GI 46250737 REF NM_207000.1  MUS MUSCULUS H2A HISTONE FAMILY, MEMBER Y3 (H2AFY3), MRNA	TCGAGGCAAGATGTCAGGCC
>GI 46048349 REF NM_178218.2  MUS MUSCULUS HISTONE 3, H2A (HIST3H2A), MRNA	TCAGTGAAGATGTCTGGTC
>GI 41152516 REF NM_012015.1  MUS MUSCULUS H2A HISTONE FAMILY, MEMBER Y (H2AFY), MRNA	GGCTGTCGCCATGTCGAGCC
>GI 37059773 REF NM_178213.2  MUS MUSCULUS HISTONE 2, H2AB (HIST2H2AB), MRNA	ACTCTAAGTTATGTCTGGCC
>GI 31982205 REF NM_178187.2  MUS MUSCULUS HISTONE 1, H2AE (HIST1H2AE), MRNA	TCTTGCGTCAATGCTCTGGAC
>GI 31981698 REF NM_010436.2  MUS MUSCULUS H2A HISTONE FAMILY, MEMBER X (H2AFX), MRNA	CTCGTACACTATGTCGGAC
>GI 31542957 REF NM_178189.2  MUS MUSCULUS HISTONE 1, H2AC (HIST1H2AC), MRNA	CACTATTACTATGTCTGGAC
>GI 30089709 REF NM_175662.1  MUS MUSCULUS HISTONE 2, H2AC (HIST2H2AC), MRNA	ACTCTAAGTTATGTCTGGCC
>GI 30061398 REF NM_178212.1  MUS MUSCULUS HISTONE 2, H2AA2 (HIST2H2AA2), MRNA	CGCTTTCGTGATGTCGGTC
>GI 30061392 REF NM_178182.1  MUS MUSCULUS HISTONE 1, H2AI (HIST1H2AI), MRNA	CAGCTGAGTTATGTCTGGAC
>GI 30061378 REF NM_175661.1  MUS MUSCULUS HISTONE 1, H2AF (HIST1H2AF), MRNA	GGTACCTACAATGTCTGGAC
>GI 30061374 REF NM_178185.1  MUS MUSCULUS HISTONE 1, H2AO (HIST1H2AO), MRNA	ACTTCTACCATGTCTGGAC
>GI 30061370 REF NM_178183.1  MUS MUSCULUS HISTONE 1, H2AK (HIST1H2AK), MRNA	AGGTCTACCATGTCAGGAA
>GI 30061368 REF NM_175660.1  MUS MUSCULUS HISTONE 1, H2AB (HIST1H2AB), MRNA	AAACGCATACATGCTCTGGAC
>GI 30061364 REF NM_178184.1  MUS MUSCULUS HISTONE 1, H2AN (HIST1H2AN), MRNA	TTTGTTTAGAATGTCTGGAC
>GI 30061360 REF NM_178186.1  MUS MUSCULUS HISTONE 1, H2AG (HIST1H2AG), MRNA	AATCTTTACAATGTCTGGAC
>GI 30061356 REF NM_178188.1  MUS MUSCULUS HISTONE 1, H2AD (HIST1H2AD), MRNA	AATCTGTACAATGTCTGGAC
>GI 30061326 REF NM_175659.1  MUS MUSCULUS HISTONE 1, H2AH (HIST1H2AH), MRNA	GTTGTACAATATGTCTGGAC
>GI 28316755 REF NM_175658.1  MUS MUSCULUS HISTONE 1, H2AA (HIST1H2AA), MRNA	TTGAAGAATCATGTCTGGTC
>GI 7949044 REF NM_016750.1  MUS MUSCULUS H2A HISTONE FAMILY, MEMBER Z (H2AFZ), MRNA	ACGGTCCGAGATGGCTGGCG
>GI 20799906 REF NM_013549.1  MUS MUSCULUS HISTONE 2, H2AA1 (HIST2H2AA1), MRNA	CGCTTTCGTGATGTCGGTC
>GI 38091295 REF XM_126043.3  MUS MUSCULUS HISTONE H2A.F/Z VARIANT (H2AV-PENDING), MRNA	CTTGCCCTACATGATGTCT
>GI 46049028 REF NM_206882.1  MUS MUSCULUS HISTONE 3, H2BB (HIST3H2BB), MRNA	AAAGGGAGTGATGCCTGATC
>GI 31542958 REF NM_178194.2  MUS MUSCULUS HISTONE 1, H2BE (HIST1H2BE), MRNA	AGATCTGAAGATGCCTGAGC
>GI 30089703 REF NM_175665.1  MUS MUSCULUS HISTONE 1, H2BK (HIST1H2BK), MRNA	TTTCTACGCCATGCCTGAGC
>GI 30061396 REF NM_178214.1  MUS MUSCULUS HISTONE 2, H2BE (HIST2H2BE), MRNA	TCGCAAAAATATGGCCCGTA
>GI 30061394 REF NM_178201.1  MUS MUSCULUS HISTONE 1, H2BN (HIST1H2BN), MRNA	GGTTCAGGCATGGTAGGAAC
>GI 30061390 REF NM_178202.1  MUS MUSCULUS HISTONE 1, H2BP (HIST1H2BP), MRNA	CTGACCTAACATGCCTGAGC

>GI 30061388 REF NM_178199.1  MUS MUSCULUS HISTONE 1, H2BL (HIST1H2BL), MRNA	TCCTCTCAGTATGCCTGAGC
>GI 30061386 REF NM_178197.1  MUS MUSCULUS HISTONE 1, H2BH (HIST1H2BH), MRNA	TCTGTTCACATGCCTGAGC
>GI 30061384 REF NM_178200.1  MUS MUSCULUS HISTONE 1, H2BM (HIST1H2BM), MRNA	GTGTGTGAACATGCCTGAGC
>GI 30061382 REF NM_178195.1  MUS MUSCULUS HISTONE 1, H2BF (HIST1H2BF), MRNA	CTCACCAACCATGCCTGAGC
>GI 30061380 REF NM_178198.1  MUS MUSCULUS HISTONE 1, H2BJ (HIST1H2BJ), MRNA	CTGTCTCACTATGCCTGAGC
>GI 28316759 REF NM_175664.1  MUS MUSCULUS HISTONE 1, H2BB (HIST1H2BB), MRNA	TTTGAACAGAATGCCAGAGC
>GI 28316753 REF NM_175666.1  MUS MUSCULUS HISTONE 2, H2BB (HIST2H2BB), MRNA	GCTTTTAATCATGCCTGAAC
>GI 28316749 REF NM_175663.1  MUS MUSCULUS HISTONE 1, H2BA (HIST1H2BA), MRNA	TACTTGAGCCATGCCGAGG
>GI 17505203 REF NM_023422.1  MUS MUSCULUS HISTONE 1, H2BC (HIST1H2BC), MRNA	AAATCCGAAGATGCCTGAGC
>GI 13386451 REF NM_030082.1  MUS MUSCULUS HISTONE 3, H2BA (HIST3H2BA), MRNA	GTGCAGCAGGATGCCGAGC
>GI 40254304 REF NM_178196.2  MUS MUSCULUS HISTONE 1, H2BG (HIST1H2BG), MRNA	TGTTTCTACCATGCCCGAGC
>GI 34328342 REF NM_054045.2  MUS MUSCULUS HISTONE 2, H3C2 (HIST2H3C2), MRNA	CGTCTTCGCCATGGCCCGTA
>GI 34328214 REF NM_013550.3  MUS MUSCULUS HISTONE 1, H3A (HIST1H3A), MRNA	AGTTTTTGCTATGGCTCGTA
>GI 31982294 REF NM_008210.2  MUS MUSCULUS H3 HISTONE, FAMILY 3A (H3F3A), MRNA	TGTCCTTACCATGGCTCGTA
>GI 31542930 REF NM_008211.2  MUS MUSCULUS H3 HISTONE, FAMILY 3B (H3F3B), MRNA	GTGAAAAAAAAATGGCCCGAA
>GI 30102949 REF NM_013548.2  MUS MUSCULUS HISTONE 1, H3F (HIST1H3F), MRNA	CTTTGTAGAAATGGCTCGTA
>GI 30061400 REF NM_178216.1  MUS MUSCULUS HISTONE 2, H3C1 (HIST2H3C1), MRNA	GCCACGGCCAATGGCGCGC
>GI 30061346 REF NM_178215.1  MUS MUSCULUS HISTONE 2, H3B (HIST2H3B), MRNA	TCGCAAAAATATGGCCCGTA
>GI 30061344 REF NM_178207.1  MUS MUSCULUS HISTONE 1, H3I (HIST1H3I), MRNA	GGGTGTTACCATGGCTCGTA
>GI 30061342 REF NM_178206.1  MUS MUSCULUS HISTONE 1, H3H (HIST1H3H), MRNA	GTGTACTGAGATGGCTCGTA
>GI 30061340 REF NM_178205.1  MUS MUSCULUS HISTONE 1, H3E (HIST1H3E), MRNA	GTGTACTGAGATGGCTCGTA
>GI 30061338 REF NM_178203.1  MUS MUSCULUS HISTONE 1, H3B (HIST1H3B), MRNA	TGTTAAAGTCATGGCTCGTA
>GI 21489954 REF NM_145073.1  MUS MUSCULUS HISTONE 1, H3G (HIST1H3G), MRNA	GTTACTTGCCATGGCTCGTA
>GI 9506766 REF NM_019469.1  MUS MUSCULUS HISTONE 2, H3C1 (HIST2H3C1), MRNA	TCGCAAAAATATGGCCCGTA
>GI 20913710 REF XM_122348.1  MUS MUSCULUS H3 HISTONE, FAMILY 3B (H3F3B), MRNA	GTGAAAAAAAAATGGCCCGAA
>GI 20897549 REF XM_147791.1  MUS MUSCULUS H3 HISTONE, FAMILY 3A (H3F3A), MRNA	GTAGTTC <b>T</b> GAATG <b>T</b> TAGATA
>GI 46430492 REF NM_175656.1  MUS MUSCULUS HISTONE 1, H4I (HIST1H4I), MRNA	TGTCTTCATCATGTCTGGTC
>GI 30089713 REF NM_175654.1  MUS MUSCULUS HISTONE 1, H4D (HIST1H4D), MRNA	GT'TTGCTAACATGTCTGGAC
>GI 30089707 REF NM_175657.1  MUS MUSCULUS HISTONE 1, H4M (HIST1H4M), MRNA	TGTCTTCATCATGTCTGGTC
>GI 30061404 REF NM_178193.1  MUS MUSCULUS HISTONE 1, H4B (HIST1H4B), MRNA	GAATTTAACTATGTCTGGTC
>GI 30061402 REF NM_178192.1  MUS MUSCULUS HISTONE 1, H4A (HIST1H4A), MRNA	TTCCTAAGACATGTCTGGTC
>GI 30061358 REF NM_178211.1  MUS MUSCULUS HISTONE 1, H4K (HIST1H4K), MRNA	GAGTGCAGTCATGTCTGGCA
>GI 30061354 REF NM_175655.1  MUS MUSCULUS HISTONE 1, H4F (HIST1H4F), MRNA	CTCCATAGCCATGTCTGGTC

>GI 30061350 REF NM_178210.1  MUS MUSCULUS HISTONE 1, H4J (HIST1H4J), MRNA	GAGTGCAGTCATGTCTGGCA
>GI 30061348 REF NM_178208.1  MUS MUSCULUS HISTONE 1, H4C (HIST1H4C), MRNA	TGTCATAACCATGTCTGGAC
>GI 28316745 REF NM_175652.1  MUS MUSCULUS HISTONE 4, H4 (HIST4H4), MRNA	GTTTACTAATATGTCAGGAC
>GI 23943921 REF NM_153173.1  MUS MUSCULUS HISTONE 1, H4H (HIST1H4H), MRNA	CAAGTACACCATGTCTGGTC
>GI 21361208 REF NM_033596.1  MUS MUSCULUS HISTONE 2, H4 (HIST2H4), MRNA	TACATTAGCTATGTCTGGCA
>GI 38074378 REF XM_110064.3  MUS MUSCULUS HISTONE 1, H4I (HIST1H4I), MRNA	TGTCTTCATCATGTCTGGTC

**Supplementary Table S2. Putative alternative translational products of histone genes**

Each human and each mouse histone gene that lack either R<sub>3</sub> or G<sub>4</sub> was screened for the presence of potential alternative ORFs coding at least 16 amino acids. '← →' indicates similar alternative translation products derived from pairs of human and mouse genes.

	Human histones	Alt. ORF (nt)	Positions -6/+4 alt ORF	In Frame?	Homology	Mouse histones	Alt. ORF (nt)	Positions -6/+4 alt ORF	In Frame?
						Hist1h1b	215-265	GCTACGATGT	No
1	HIST1H1C	212-265	CCGGCTATGA	No					
		215-265	GCTATGATGT	No					
2	HIST1H1E	212-265	CTGGCTATGA	No					
3	HIST1H1T	49-624	GCCGCTATGG	Yes		Hist1h1t	175-627	GCAGGAATGT	Yes
							397-627	AAGAAGATGG	Yes
4	H1F0	91-585	TCAGACATGA	Yes	← →	H1f0	91-585	TCAGACATGA	Yes
							296-538	AGGGCGATGA	No
5	H1FOO	172-1041	CTACGCATGG	Yes					
		313-1041	ACTGGCATGC	Yes					
		418-1041	AGGAAGATGG	Yes					
6	H1FX	49-642	GAGGGAATGG	Yes					
7	HIST1H2AA	206-259	CAGGCAATGC	No					
8	HIST1H2AB	206-304	CGGGCAATGC	No	← →	Hist1h2ab	206-304	CGGGCAATGC	No
9	HIST1H2AG	119-178	GCAACTATGC	No					
10	HIST1H2AH	119-178	GTAATTATGC	No					
11	HIST1H2AI	119-178	GCAACTATGC	No					
		272-406	GCAACGATGA	No					
12	HIST1H2AJ	119-178	GCAACTATGC	No					
13	HIST1H2AL	119-178	GCAACTATGC	No					
14	HIST2H2AA	154-393	GTCTACATGG	Yes	← →	Hist2h2aa1	154-393	GTATACATGG	Yes
A						Hist2h2aa2	154-393	GTATACATGG	Yes
15	HIST2H2AB	269-397	TGAGGAATGA	No		Hist2h2ab	154-390	GTATACATGG	Yes
16	HIST2H2AC	154-390	GTCTACATGG	Yes	← →	Hist2h2ac	154-390	GTATACATGG	Yes
17	H2AFB	268-348	CTGGACATGG	Yes					
18	H2AFJ	387-539	GAGCAAATGA	No					
19	H2AFV	53-160	CAAGCCATGG	No					
20	H2AFX	206-304	CGGGCAATGC	No					
21	H2AFY Transcript Variance 1	82-1119	GGGCGGATGC	Yes	← →	H2afy	82-1119	GGACGCATGC	Yes
		145-1119	GTGTACATGG	Yes	← →		145-1119	GTGTACATGG	Yes

		197-274	CTGGCAATGC	No	← →		197-250	CTGGCAATGC	No
22	H2AFY Transcript Variance 2	82-1110	GGGCGGATGC	Yes					
		145-1110	GTGTACATGG	Yes					
		197-274	CTGGCAATGC	No					
23	H2AFY Transcript Variance 3	82-1116	GGGCGGATGC	Yes					
		145-1116	GTGTACATGG	Yes					
		197-274	CTGGCAATGC	No					
24	H2AFY2	28-1119	AAGAAAATGT	Yes	← →	H2afy2	28-1149	AAGAAAATGT	Yes
		85-1119	AGGCTGATGC	Yes	← →		85-1149	CGGTTGATGC	Yes
		145-1119	GTCTACATGG	Yes	← →		145-1149	GTCTACATGG	Yes
		530-598	CTGAAGATGG	No	← →		527-595	CGGAGGATGT	No
A						539-595	CGGGGGATGG	No	
B					H2afy3	28-1119	AAGAAAATGT	Yes	
C				85-1119		CGGTTGATGC	Yes		
D				145-1119		GTCTACATGG	Yes		
E				530-598		CGGAGGATGG	No		
F					H2av- pending	5-121	ACATGTATGT	No	
G				18-203		TGCAGCATGT	No		
H				82-396		TCACACATGT	Yes		
I				140-217		CAAGCCATGG	No		
25	HIST1H2BA	181-384	AAAGCTATGA	Yes	← →	Hist1h2ba	181-384	AAGGCCATGA	Yes
		190-384	AGCATTATGA	Yes	← →		190-384	AGCATCATGA	Yes
		332-397	CTAAACATGC	No					
26	HIST1H2BB	77-139	AGAAGGATGG	No	← →	Hist1h2bb	77-139	AGAAGGATGG	No
27	HIST1H2BC	77-139	AGAAAGATGG	No		Hist1h2bc	179-382	AAGGCCATGG	No
28	HIST1H2BD	178-381	AAGGCAATGG	Yes					
29	HIST1H2BE	178-381	AAAGCCATGG	Yes	← →	Hist1h2be	178-381	AAGGCCATGG	Yes
30	HIST1H2BF	77-139	AGAAGGATGG	No		Hist1h2bf	178-381	AAGGCCATGG	Yes
31	HIST1H2BG	77-139	AGAAGGATGG	No		Hist1h2bg	178-381	AAGGCCATGG	Yes
32	HIST1H2BH	77-139	AGAAGGATGG	No		Hist1h2bh	178-381	AAAGCCATGG	Yes
33	HIST1H2BI	77-139	AGAAGGATGG	No					
34	HIST1H2BJ	178-381	AAGGCCATGG	Yes	← →	Hist1h2bj	178-381	AAGGCCATGG	Yes
35	HIST1H2BK	178-381	AAGGCCATGG	Yes	← →	Hist1h2bk	178-381	AAGGCCATGG	Yes
36	HIST1H2BL	77-139	AGAAGGATGG	No		Hist1h2bl	178-381	AAGGCCATGG	Yes



37	HIST1H2BM	77-139	AGAAGGATGG	No	← →	Hist1h2bm	77-139	AGAAGGATGG	No
38	HIST1H2BN	178-381	AAGGCCATGG	Yes	← →	Hist1h2bn	178-381	AAGGCCATGG	Yes
39	HIST1H2BO	178-381	AAGGCCATGG	Yes					
A						Hist1h2bp	77-139	AGAAGGATGG	No
B						Hist2h2bb	77-139	AGAAAGATGG	No
40	HIST2H2BE	178-381	AAGGCCATGG	Yes					
A						Hist3h2ba	77-139	AAAAGGATGG	No
41	HIST3H2BB	178-381	AAGGCCATGG	Yes			21-92	ATTTGAATGC	No
A						Hist3h2bb	85-465	GACATTATGC	Yes
B							161-223	AAAAGGATGG	No
42	H2BFS	178-381	AAGGCCATGG	Yes					
43	HIST1H3C	271-411	GCGGTGATGG	Yes					
A						H3f3a	19-111	TTTTCCATGG	Yes
B							43-111	AAGTATATGA	Yes
C						Hist2h3c1	136-546	TTCGCCATGG	Yes
44	HIST1H3F	271-411	GCTGTGATGG	Yes					
45	HIST3H3	214-411	CGGCTGATGC	Yes					
		271-411	GCCGTGATGG	Yes					
46	HIST1H4A	253-312	ACTGCCATGG	Yes	← →	Hist1h4a	253-312	ACCGCCATGG	Yes
47	HIST1H4B	253-312	ACTGCCATGG	Yes	← →	Hist1h4b	253-312	ACCGCCATGG	Yes
48	HIST1H4C	253-312	ACAGCCATGG	Yes	← →	Hist1h4c	253-312	ACCGCCATGG	Yes
A						Hist1h4d	253-312	ACCGCCATGG	Yes
49	HIST1H4E	253-312	ACAGCGATGG	Yes					
50	HIST1H4F	253-312	ACTGCAATGG	Yes	← →	Hist1h4f	253-312	ACCGCCATGG	Yes
51	HIST1H4G	122-199	CCCGGCATGG	No					
52	HIST1H4H	253-312	ACAGCAATGG	Yes	← →	Hist1h4h	253-312	ACCGCCATGG	Yes
53	HIST1H4I	253-312	ACCGCCATGG	Yes	← →	Hist1h4i	253-312	ACCGCCATGG	Yes
54	HIST1H4J	253-312	ACCGCCATGG	Yes	← →	Hist1h4j	253-312	ACCGCCATGG	Yes
55	HIST1H4K	253-312	ACCGCCATGG	Yes	← →	Hist1h4k	253-312	ACCGCCATGG	Yes
A						Hist1h4m	253-312	ACCGCCATGG	Yes
56	HIST2H4	253-312	ACAGCCATGG	Yes	← →	Hist2h4	253-312	ACCGCTATGG	Yes
57	HIST4H4	253-312	ACGGCCATGG	Yes	← →	Hist4h4	253-312	ACGGCTATGG	Yes

**Supplementary Table S3. Femoral diaphyseal parameters in *H4tTG1* transgenic mice**

Age (weeks)	Gender	<b>Sht.Dia (mm)</b>		<b>Med.Dia (mm)</b>		<b>Ct.Th (mm)</b>	
		WT	<b>H4tTG1</b>	WT	<b>H4tTG1</b>	WT	<b>H4tTG1</b>
8		1.347±0.017	1.404±0.020	1.021±0.027	1.063±0.031	0.163±0.008	0.171±0.007
17	F	1.374±0.013	1.376±0.024	0.950±0.016	0.943±0.018	0.210±0.004	0.213±0.005
34		1.422±0.019	1.423±0.027	0.970±0.022	0.974±0.032	0.228±0.007	0.225±0.008
8		1.453±0.026	1.457±0.033	1.061±0.029	1.056±0.030	0.195±0.006	0.197±0.006
17	M	1.462±0.047	1.483±0.028	1.036±0.046	1.026±0.022	0.214±0.007	0.227±0.005
34		1.468±0.033	1.495±0.025	0.988±0.027	1.025±0.022	0.240±0.007	0.232±0.006

Data are mean±SEM. Differences between *H4tTG1* and WT mice are not statistically significant ( $p>0.05$ ).

Abbreviations: Sht.Dia, diaphyseal shaft diameter; Med.Dia, medullary cavity diameter; Ct.Th, cortical thickness.

**Supplementary Table S4. Femoral length\* of *H4tTG1* transgenic mice**

Age (weeks)	Gender	WT	<b>H4tTG1</b>
8	F	14.956±0.234	15.340±0.245
17		16.250±0.196	16.068±0.155
8	M	15.655±0.093	15.804±0.138
17		15.987±0.235	16.449±0.094

\*mm; data are mean±SEM. Differences between *H4tTG1* and WT mice are not statistically significant (p>0.05).