

**Supplementary Table 1.** List of ChIP-Seq data

| GEO accession | SRA        | Cell type    | Factor  | ID              |
|---------------|------------|--------------|---------|-----------------|
| GSM605311     | SRR067946  | H1 cell line | H3K4ac  | H1_H3K4ac_1_1   |
| GSM667624     | SRR179735  | H1 cell line | H3K4ac  | H1_H3K4ac_2_1   |
| GSM667624     | SRR179736  | H1 cell line | H3K4ac  | H1_H3K4ac_2_2   |
| GSM667624     | SRR179737  | H1 cell line | H3K4ac  | H1_H3K4ac_2_3   |
| GSM409307     | SRR018456  | H1 cell line | H3K4me1 | H1_H3K4me1_1_1  |
| GSM433177     | SRR020519  | H1 cell line | H3K4me1 | H1_H3K4me1_2_1  |
| GSM434762     | SRR019560  | H1 cell line | H3K4me1 | H1_H3K4me1_3_1  |
| GSM466739     | SRR029339  | H1 cell line | H3K4me1 | H1_H3K4me1_4_1  |
| GSM466739     | SRR029615  | H1 cell line | H3K4me1 | H1_H3K4me1_4_2  |
| GSM466739     | SRR029619  | H1 cell line | H3K4me1 | H1_H3K4me1_4_3  |
| GSM537679     | SRR1068412 | H1 cell line | H3K4me1 | H1_H3K4me1_5_1  |
| GSM605312     | SRR067947  | H1 cell line | H3K4me1 | H1_H3K4me1_6_1  |
| GSM602260     | SRR067768  | H1 cell line | H3K4me2 | H1_H3K4me2_1_1* |
| GSM602260     | SRR067948  | H1 cell line | H3K4me2 | H1_H3K4me2_1_2  |
| GSM602261     | SRR067769  | H1 cell line | H3K4me2 | H1_H3K4me2_2_1  |
| GSM409308     | SRR018455  | H1 cell line | H3K4me3 | H1_H3K4me3_1_1  |
| GSM410808     | SRR018232  | H1 cell line | H3K4me3 | H1_H3K4me3_2_1  |
| GSM432392     | SRR019222  | H1 cell line | H3K4me3 | H1_H3K4me3_3_1  |
| GSM433170     | SRR020515  | H1 cell line | H3K4me3 | H1_H3K4me3_4_1* |
| GSM469971     | SRR029609  | H1 cell line | H3K4me3 | H1_H3K4me3_5_1* |
| GSM469971     | SRR029620  | H1 cell line | H3K4me3 | H1_H3K4me3_5_2  |
| GSM537680     | SRR1068413 | H1 cell line | H3K4me3 | H1_H3K4me3_6_1* |
| GSM537681     | SRR1068414 | H1 cell line | H3K4me3 | H1_H3K4me3_7_1  |
| GSM605315     | SRR067950  | H1 cell line | H3K4me3 | H1_H3K4me3_8_1  |
| GSM410807     | SRR018231  | H1 cell line | H3K9ac  | H1_H3K9ac_1_1   |
| GSM433171     | SRR020516  | H1 cell line | H3K9ac  | H1_H3K9ac_2_1   |
| GSM434785     | SRR019562  | H1 cell line | H3K9ac  | H1_H3K9ac_3_1   |
| GSM537685     | SRR1068418 | H1 cell line | H3K9ac  | H1_H3K9ac_4_1   |
| GSM605323     | SRR067958  | H1 cell line | H3K9ac  | H1_H3K9ac_5_1   |
| GSM428291     | SRR018478  | H1 cell line | H3K9me3 | H1_H3K9me3_1_1  |
| GSM428291     | SRR018479  | H1 cell line | H3K9me3 | H1_H3K9me3_1_2  |
| GSM428291     | SRR018480  | H1 cell line | H3K9me3 | H1_H3K9me3_1_3  |
| GSM428291     | SRR018481  | H1 cell line | H3K9me3 | H1_H3K9me3_1_4  |
| GSM433174     | SRR020517  | H1 cell line | H3K9me3 | H1_H3K9me3_2_1  |
| GSM450266     | SRR026664  | H1 cell line | H3K9me3 | H1_H3K9me3_3_1  |
| GSM450266     | SRR026665  | H1 cell line | H3K9me3 | H1_H3K9me3_3_2  |

|            |            |              |          |                  |
|------------|------------|--------------|----------|------------------|
| GSM605325  | SRR018453  | H1 cell line | H3K9me3  | H1_H3K9me3_4_1   |
| GSM605325  | SRR067960  | H1 cell line | H3K9me3  | H1_H3K9me3_4_2   |
| GSM605325  | SRR067961  | H1 cell line | H3K9me3  | H1_H3K9me3_4_3   |
| GSM605325  | SRR067962  | H1 cell line | H3K9me3  | H1_H3K9me3_4_4   |
| GSM605325  | SRR067963  | H1 cell line | H3K9me3  | H1_H3K9me3_4_5   |
| GSM605327  | SRR067964  | H1 cell line | H3K9me3  | H1_H3K9me3_5_1   |
| GSM663427  | SRR179707  | H1 cell line | H3K27ac  | H1_H3K27ac       |
| GSM1185386 | SRR933992  | H1 cell line | H3K27me3 | H1_H3K27me3_1_1  |
| GSM1185386 | SRR933993  | H1 cell line | H3K27me3 | H1_H3K27me3_1_2  |
| GSM428295  | SRR018226  | H1 cell line | H3K27me3 | H1_H3K27me3_2_1  |
| GSM428295  | SRR018477  | H1 cell line | H3K27me3 | H1_H3K27me3_2_2  |
| GSM433167  | SRR020508  | H1 cell line | H3K27me3 | H1_H3K27me3_3_1* |
| GSM434776  | SRR019561  | H1 cell line | H3K27me3 | H1_H3K27me3_4_1  |
| GSM466734  | SRR029343  | H1 cell line | H3K27me3 | H1_H3K27me3_5_1* |
| GSM466734  | SRR029345  | H1 cell line | H3K27me3 | H1_H3K27me3_5_2  |
| GSM466734  | SRR029347  | H1 cell line | H3K27me3 | H1_H3K27me3_5_3  |
| GSM466734  | SRR029349  | H1 cell line | H3K27me3 | H1_H3K27me3_5_4* |
| GSM537683  | SRR1068416 | H1 cell line | H3K27me3 | H1_H3K27me3_6_1  |
| GSM605308  | SRR067943  | H1 cell line | H3K27me3 | H1_H3K27me3_7_1  |
| GSM409312  | SRR018454  | H1 cell line | H3K36me3 | H1_H3K36me3_1_1  |
| GSM428296  | SRR018485  | H1 cell line | H3K36me3 | H1_H3K36me3_2_1  |
| GSM428296  | SRR018486  | H1 cell line | H3K36me3 | H1_H3K36me3_2_2  |
| GSM433176  | SRR020518  | H1 cell line | H3K36me3 | H1_H3K36me3_3_1  |
| GSM450268  | SRR026666  | H1 cell line | H3K36me3 | H1_H3K36me3_4_1  |
| GSM450268  | SRR026667  | H1 cell line | H3K36me3 | H1_H3K36me3_4_2  |
| GSM466737  | SRR029340  | H1 cell line | H3K36me3 | H1_H3K36me3_5_1  |
| GSM466737  | SRR029341  | H1 cell line | H3K36me3 | H1_H3K36me3_5_2  |
| GSM466737  | SRR029342  | H1 cell line | H3K36me3 | H1_H3K36me3_5_3  |
| GSM466737  | SRR029344  | H1 cell line | H3K36me3 | H1_H3K36me3_5_4  |
| GSM466737  | SRR029346  | H1 cell line | H3K36me3 | H1_H3K36me3_5_5  |
| GSM537684  | SRR1068417 | H1 cell line | H3K36me3 | H1_H3K36me3_6_1  |
| GSM605309  | SRR067944  | H1 cell line | H3K36me3 | H1_H3K36me3_7_1  |
| GSM605317  | SRR067952  | H1 cell line | H3K56ac  | H1_H3K56ac_1_1   |
| GSM667627  | SRR179741  | H1 cell line | H3K56ac  | H1_H3K56ac_2_1   |
| GSM667627  | SRR179742  | H1 cell line | H3K56ac  | H1_H3K56ac_2_2   |
| GSM667627  | SRR179743  | H1 cell line | H3K56ac  | H1_H3K56ac_2_3   |
| GSM605318  | SRR067953  | H1 cell line | H3K79me1 | H1_H3K79me1_1_1  |
| GSM605319  | SRR067954  | H1 cell line | H3K79me1 | H1_H3K79me1_2_1  |
| GSM605320  | SRR067955  | H1 cell line | H3K79me1 | H1_H3K79me1_3_1  |

|           |            |              |          |                 |
|-----------|------------|--------------|----------|-----------------|
| GSM605321 | SRR067956  | H1 cell line | H3K79me2 | H1_H3K79me2_1_1 |
| GSM605322 | SRR067957  | H1 cell line | H3K79me2 | H1_H3K79me2_2_1 |
| GSM428289 | SRR018482  | H1 cell line | Input    | H1_Input_1_1    |
| GSM428289 | SRR018483  | H1 cell line | Input    | H1_Input_1_2*   |
| GSM428289 | SRR018484  | H1 cell line | Input    | H1_Input_1_3    |
| GSM433179 | SRR020520  | H1 cell line | Input    | H1_Input_2_1    |
| GSM450270 | SRR026668  | H1 cell line | Input    | H1_Input_3_1*   |
| GSM450270 | SRR026669  | H1 cell line | Input    | H1_Input_3_2    |
| GSM537682 | SRR1068415 | H1 cell line | Input    | H1_Input_4_1    |
| GSM605333 | SRR067970  | H1 cell line | Input    | H1_Input_5_1    |
| GSM605334 | SRR067971  | H1 cell line | Input    | H1_Input_6_1    |
| GSM605334 | SRR067972  | H1 cell line | Input    | H1_Input_6_2    |
| GSM605335 | SRR067973  | H1 cell line | Input    | H1_Input_7_1    |
| GSM605336 | SRR067974  | H1 cell line | Input    | H1_Input_8_1    |
| GSM605337 | SRR067975  | H1 cell line | Input    | H1_Input_9_1    |
| GSM605338 | SRR067976  | H1 cell line | Input    | H1_Input_10_1   |
| GSM667641 | SRR097976  | H1 cell line | Input    | H1_Input_12_3   |
| GSM605339 | SRR067977  | H1 cell line | Input    | H1_Input_11_1   |
| GSM667641 | SRR097974  | H1 cell line | Input    | H1_Input_12_1   |
| GSM667641 | SRR097975  | H1 cell line | Input    | H1_Input_12_2   |
| GSM667642 | SRR179764  | H1 cell line | Input    | H1_Input_13_1   |
| GSM667642 | SRR179765  | H1 cell line | Input    | H1_Input_13_2   |

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All datasets used in this study. The data marked by asterisk (\*) were not considered for further analysis because the filtered reads are under the 15% of total reads.

ChIP-Seq, chromatin immunoprecipitation coupled with high-throughput DNA sequencing.