

Table S3. P-values of overrepresentation for chromatin states, CpG islands, repetitive elements and palindromes for complete promoter set (CPS) and repeat-filtered promoter set (REFPS).

| Contingency table (protein-coding genes promoters vs lncRNA promoters) |                     |       |  |       |                                      | Contingency table (lncRNA promoters vs protein-coding genes promoters) |           |                                      |  |       |                                      |           |           |           |           |
|--|---------------------|-------|--|-------|--------------------------------------|--|-----------|--------------------------------------|--|-------|--------------------------------------|-----------|-----------|-----------|-----------|
| a: Total protein-coding genes promoters having this mark               |                     |       | b: Total protein-coding genes promoters NOT having this mark |       |                                      | a: Total lncRNA promoters having this mark                             |           |                                      | b: Total lncRNA promoters NOT having this mark               |       |                                      |           |           |           |           |
| c: Total lncRNA promoters having this mark                             |                     |       | d: Total lncRNA promoters NOT having this mark               |       |                                      | c: Total protein-coding genes promoters having this mark               |           |                                      | d: Total protein-coding genes promoters NOT having this mark |       |                                      |           |           |           |           |
| Complete promoter set (CPS)  |                     |       |  |       |                                      |  |           |                                      |  |       |                                      |           |           |           |           |
| Protein-coding gene promoters vs lncRNA promoters                      |                     |       |  |       |                                      | lncRNA promoters vs protein-coding gene promoters                      |           |                                      |  |       |                                      |           |           |           |           |
| Repeat Elements  | a                   | b     | c  | d     | pvalue_Codin<br>g_over_NonC<br>oding | Repeat Elements  | a         | b                                    | c  | d     | pvalue_NonC<br>oding_over_<br>Coding |           |           |           |           |
|  | 17462               | 1325  | 17530  | 957   | 1.00E+000                            |  | 17530     | 957                                  | 17462  | 1325  | 2.19E-014                            |           |           |           |           |
| CGI  | a                   | b     | c  | d     | pvalue_Codin<br>g_over_NonC<br>oding | CGI  | a         | b                                    | c  | d     | pvalue_NonC<br>oding_over_<br>Coding |           |           |           |           |
|  | 13179               | 5608  | 4354   | 14133 | 0.00E+000                            |  | 4354      | 14133                                | 13179  | 5608  | 1.00E+000                            |           |           |           |           |
| Palindromes  | a                   | b     | c  | d     | pvalue_Codin<br>g_over_NonC<br>oding | Palindromes  | a         | b                                    | c  | d     | pvalue_NonC<br>oding_over_<br>Coding |           |           |           |           |
|  | 18787               | 0     | 18487  | 0     | 1.00E+000                            |  | 18487     | 0                                    | 18787  | 0     | 1.00E+000                            |           |           |           |           |
| GM12878  | a                   | b     | c  | d     | pvalue_Codin<br>g_over_NonC<br>oding | GM12878  | a         | b                                    | c  | d     | pvalue_NonC<br>oding_over_<br>Coding |           |           |           |           |
|  | AP: Active Promoter | 9718  | 9069   | 2393  | 16094                                |  | 0.00E+000 | 3.33E-003                            | sign   | 11527 | 6960                                 | 6693      | 12094     | 0.00E+000 | 3.33E-003 |
| WP: Weak Promoter  | 7418                | 11369 | 2310   | 16177 | 0.00E+000                            | 6.67E-003  | sign      | 1198                                 | 17289  | 262   | 18525                                | 4.65E-152 | 6.67E-003 | sign      |           |
| WE: Weak Enhancer  | 5720                | 13067 | 2274   | 16213 | 0.00E+000                            | 1.00E-002  | sign      | I: Insulator                         | 867  | 17620 | 560                                  | 18227     | 4.00E-018 | 1.00E-002 | sign      |
| IP: Inactive Promoter  | 1954                | 16833 | 685  | 17802 | 8.34E-146                            | 1.33E-002  | sign      | WT: Weak Transcribed                 | 2977   | 15510 | 2554                                 | 16233     | 5.24E-012 | 1.33E-002 | sign      |
| SE: Strong Enhancer  | 2197                | 16590 | 989  | 17498 | 5.32E-109                            | 1.67E-002  | sign      | TT: Transcriptional Transition       | 301  | 18186 | 168                                  | 18619     | 1.09E-010 | 1.67E-002 | sign      |
| PR: Polycomb Repressed   | 3289                | 15498 | 1980   | 16507 | 5.05E-080                            | 2.00E-002  | sign      | RP: Repetitive/Copy number variation | 89   | 18398 | 41                                   | 18746     | 1.00E-005 | 2.00E-002 | sign      |
| SE: Strong Enhancer  | 675                 | 18112 | 682  | 17805 | 7.00E-001                            | 2.33E-002  | non-sign  | WE: Weak Enhancer                    | 1980   | 16507 | 1830                                 | 16957     | 1.06E-003 | 2.33E-002 | sign      |
| RP: Repetitive/Copy number variation                                   | 132                 | 18655 | 158  | 18329 | 9.58E-001                            | 2.67E-002  | non-sign  | RP: Repetitive/Copy number variation | 158  | 18329 | 132                                  | 18655     | 5.35E-002 | 2.67E-002 | non-sign  |
| WE: Weak Enhancer  | 1830                | 16957 | 1980   | 16507 | 9.99E-001                            | 3.00E-002  | non-sign  | SE: Strong Enhancer                  | 682  | 17805 | 675                                  | 18112     | 3.20E-001 | 3.00E-002 | non-sign  |
| RP: Repetitive/Copy number variation                                   | 41                  | 18746 | 89   | 18398 | 1.00E+000                            | 3.33E-002  | non-sign  | AP: Active Promoter                  | 2393   | 16094 | 9718                                 | 9069      | 1.00E+000 | 3.33E-002 | non-sign  |
| I: Insulator   | 560                 | 18227 | 867  | 17620 | 1.00E+000                            | 3.67E-002  | non-sign  | WP: Weak Promoter                    | 2310   | 16177 | 7418                                 | 11369     | 1.00E+000 | 3.67E-002 | non-sign  |
| TT: Transcriptional Transition   | 168                 | 18619 | 301  | 18186 | 1.00E+000                            | 4.00E-002  | non-sign  | IP: Inactive Promoter                | 685  | 17802 | 1954                                 | 16833     | 1.00E+000 | 4.00E-002 | non-sign  |
| TE: Transcriptional Elongation   | 262                 | 18525 | 1198   | 17289 | 1.00E+000                            | 4.33E-002  | non-sign  | SE: Strong Enhancer                  | 989  | 17498 | 2197                                 | 16590     | 1.00E+000 | 4.33E-002 | non-sign  |
| WT: Weak Transcribed   | 2554                | 16233 | 2977   | 15510 | 1.00E+000                            | 4.67E-002  | non-sign  | WE: Weak Enhancer                    | 2274   | 16213 | 5720                                 | 13067     | 1.00E+000 | 4.67E-002 | non-sign  |
| HC: Heterochromatin low signal   | 6693                | 12094 | 11527  | 6960  | 1.00E+000                            | 5.00E-002  | non-sign  | PR: Polycomb Repressed               | 1980   | 16507 | 3289                                 | 15498     | 1.00E+000 | 5.00E-002 | non-sign  |







Table S3. P-values of overrepresentation for chromatin states, CpG islands, repetitive elements and palindromes for complete promoter set (CPS) and repeat-filtered promoter set (REFPS).

| Contingency table (protein-coding genes promoters vs lncRNA promoters) |  | Contingency table (lncRNA promoters vs protein-coding genes promoters) |  |       |                               |  |                    |   |   |      |       |      |                               |  |                    |
|--|--|--|--|-------|-------------------------------|--|--------------------|---|---|------|-------|------|-------------------------------|--|--------------------|
| a: Total protein-coding genes promoters having this mark               | b: Total protein-coding genes promoters NOT having this mark | a: Total lncRNA promoters having this mark                             | b: Total lncRNA promoters NOT having this mark               |       |                               |  |                    |   |   |      |       |      |                               |  |                    |
| c: Total lncRNA promoters having this mark                             | d: Total lncRNA promoters NOT having this mark               | c: Total protein-coding genes promoters having this mark               | d: Total protein-coding genes promoters NOT having this mark |       |                               |  |                    |   |   |      |       |      |                               |  |                    |
| Repeat-filtered promoter set (REFPS)                                   |  |  |  |       |                               |  |                    |   |   |      |       |      |                               |  |                    |
| Protein-coding gene promoters vs lncRNA promoters                      |  |  |  |       | Repeat Elements               |  |                    | lncRNA promoters vs protein-coding gene promoters |   |      |       |      |                               |  |                    |
| Repeat Elements  | a  | b  | c  | d     | pvalue_Coding_ over_NonCoding |  |                    | Repeat Elements                                   | a | b    | c     | d    | pvalue_NonCoding_ over_Coding |  |                    |
|  |  | 6605   | 1325   | 9650  | 957                           | 1.00E+00                                 |                    |   |   |      | 9650  | 957  | 6605                          | 1325                                     | 1.81E-55           |
| CGI  | a  | b  | c  | d     | pvalue_Coding_ over_NonCoding |  |                    | CGI   | a | b    | c     | d    | pvalue_NonCoding_ over_Coding |  |                    |
|  |  | 4692   | 3238   | 1841  | 8766                          | 0.00E+00                                 |                    |   |   |      | 1841  | 8766 | 4692                          | 3238                                     | 1.00E+00           |
| Palindromes  | a  | b  | c  | d     | pvalue_Coding_ over_NonCoding |  |                    | Palindromes                                       | a | b    | c     | d    | pvalue_NonCoding_ over_Coding |  |                    |
|  |  | 7930   | 0  | 10607 | 0                             | 1.00E+00                                 |                    |   |   |      | 10607 | 0    | 7930                          | 0  | 1.00E+00           |
| GM12878  | a  | b  | c  | d     | pvalue_Coding_ over_NonCoding | Benjamini-Hochberg FDR correction (0.05) | FDR significance   | GM12878   | a | b    | c     | d    | pvalue_NonCoding_ over_Coding | Benjamini-Hochberg FDR correction (0.05) | FDR significance   |
|  |  |  |  |       |                               |  |                    |   |   |      |       |      |                               |  |                    |
| AP: Active Promoter  |  | 3967   | 3963   | 1016  | 9591                          | 0.00E+000                                | 3.33E-003 sign     | HC: Heterochromatin low signal                    |   | 6945 | 3762  | 3287 | 4643                          | 1.90E-215                                | 3.33E-003 sign     |
| WP: Weak Promoter  |  | 2929   | 5001   | 1022  | 9585                          | 0.00E+000                                | 6.67E-003 sian     | TE: Transcriptional Elongation                    |   | 823  | 9784  | 169  | 7761                          | 1.50E-070                                | 6.67E-003 sign     |
| WE: Weak Enhancer  |  | 2069   | 5861   | 1108  | 9499                          | 4.16E-171                                | 1.00E-002 sian     | I: Insulator                                      |   | 529  | 10078 | 246  | 7684                          | 7.82E-011                                | 1.00E-002 sian     |
| SE: Strong Enhancer  |  | 993  | 6937   | 546   | 10061                         | 6.44E-072                                | 1.33E-002 sign     | RP: Repetitive/Copy number variation              |   | 78   | 10529 | 25   | 7905                          | 6.79E-005                                | 1.33E-002 sign     |
| IP: Inactive Promoter  |  | 396  | 7534   | 217   | 10390                         | 1.73E-028                                | 1.67E-002 sign     | WT: Weak Transcribed                              |   | 1854 | 8753  | 1221 | 6709                          | 8.52E-005                                | 1.67E-002 sign     |
| PR: Polycomb Repressed   |  | 939  | 6991   | 950   | 9657                          | 9.41E-011                                | 2.00E-002 sign     | TT: Transcriptional Transition                    |   | 198  | 10409 | 93   | 7837                          | 8.80E-005                                | 2.00E-002 sign     |
| SE: Strong Enhancer  |  | 366  | 7564   | 431   | 10176                         | 3.65E-002                                | 2.33E-002 non-sian | RP: Repetitive/Copy number variation              |   | 42   | 10565 | 15   | 7915                          | 7.51E-003                                | 2.33E-002 sign     |
| WE: Weak Enhancer  |  | 845  | 7085   | 1198  | 9409                          | 9.19E-001                                | 2.67E-002 non-sian | WE: Weak Enhancer                                 |   | 1198 | 9409  | 845  | 7085                          | 8.84E-002                                | 2.67E-002 non-sian |
| RP: Repetitive/Copy number variation                                   |  | 15   | 7915   | 42    | 10565                         | 9.97E-001                                | 3.00E-002 non-sian | SE: Strong Enhancer                               |   | 431  | 10176 | 366  | 7564                          | 9.69E-001                                | 3.00E-002 non-sian |
| WT: Weak Transcribed   |  | 1221   | 6709   | 1854  | 8753                          | 1.00E+000                                | 3.33E-002 non-sian | AP: Active Promoter                               |   | 1016 | 9591  | 3967 | 3963                          | 1.00E+000                                | 3.33E-002 non-sian |
| TT: Transcriptional Transition   |  | 93   | 7837   | 198   | 10409                         | 1.00E+000                                | 3.67E-002 non-sian | WP: Weak Promoter                                 |   | 1022 | 9585  | 2929 | 5001                          | 1.00E+000                                | 3.67E-002 non-sian |
| RP: Repetitive/Copy number variation                                   |  | 25   | 7905   | 78    | 10529                         | 1.00E+000                                | 4.00E-002 non-sian | IP: Inactive Promoter                             |   | 217  | 10390 | 396  | 7534                          | 1.00E+000                                | 4.00E-002 non-sian |
| I: Insulator   |  | 246  | 7684   | 529   | 10078                         | 1.00E+000                                | 4.33E-002 non-sian | SE: Strong Enhancer                               |   | 546  | 10061 | 993  | 6937                          | 1.00E+000                                | 4.33E-002 non-sian |
| TE: Transcriptional Elongation   |  | 169  | 7761   | 823   | 9784                          | 1.00E+000                                | 4.67E-002 non-sian | WE: Weak Enhancer                                 |   | 1108 | 9499  | 2069 | 5861                          | 1.00E+000                                | 4.67E-002 non-sian |
| HC: Heterochromatin low signal   |  | 3287   | 4643   | 6845  | 3762                          | 1.00E+000                                | 5.00E-002 non-sian | PR: Polycomb Repressed                            |   | 950  | 9657  | 939  | 6991                          | 1.00E+000                                | 5.00E-002 non-sian |

Table S3. P-values of overrepresentation for chromatin states, CpG islands, repetitive elements and palindromes for complete promoter set (CPS) and repeat-filtered promoter set (REFPS).

| H1-hESC                              | a    | b    | c    | d     | pvalue_Coding_ over_NonCoding |  |                  | H1-hESC                              | a                              | b     | c    | d    | pvalue_NonCoding_ over_Coding |  |                  |      |
|--------------------------------------|------|------|------|-------|-------------------------------|--|------------------|--------------------------------------|--------------------------------|-------|------|------|-------------------------------|--|------------------|------|
|                                      |      |      |      |       | g                             | Benjamini-Hochberg FDR correction (0.05) | FDR significance |                                      |                                |       |      |      | ng                            | Benjamini-Hochberg FDR correction (0.05) | FDR significance |      |
| AP: Active Promoter                  |      | 3570 | 4360 | 849   | 9758                          | 0.00E+000                                | 3.33E-003        | sign                                 | HC: Heterochromatin low signal | 6567  | 4040 | 3389 | 4541                          | 1.15E-148                                | 3.33E-003        | sign |
| WP: Weak Promoter                    | 4125 | 3805 | 1195 | 9412  | 0.00E+000                     | 6.67E-003                                | sign             | TE: Transcriptional Elongation       | 533                            | 10074 | 88   | 7842 | 3.84E-055                     | 6.67E-003                                | sign             |      |
| WE: Weak Enhancer                    | 3091 | 4839 | 1580 | 9027  | 2.95E-305                     | 1.00E-002                                | sign             | I: Insulator                         | 853                            | 9754  | 370  | 7560 | 7.92E-021                     | 1.00E-002                                | sign             |      |
| IP: Inactive Promoter                | 977  | 6953 | 575  | 10032 | 1.17E-062                     | 1.33E-002                                | sign             | WT: Weak Transcribed                 | 2953                           | 7654  | 1750 | 6180 | 1.65E-019                     | 1.33E-002                                | sign             |      |
| SE: Strong Enhancer                  | 347  | 7583 | 188  | 10419 | 1.52E-025                     | 1.67E-002                                | sign             | WE: Weak Enhancer                    | 1694                           | 8913  | 1101 | 6829 | 4.45E-005                     | 1.67E-002                                | sign             |      |
| PR: Polycomb Repressed               | 774  | 7156 | 683  | 9924  | 8.75E-017                     | 2.00E-002                                | sign             | RP: Repetitive/Copy number variation | 56                             | 10551 | 18   | 7912 | 7.28E-004                     | 2.00E-002                                | sign             |      |
| SE: Strong Enhancer                  | 203  | 7727 | 242  | 10365 | 1.20E-001                     | 2.33E-002                                | non-sign         | RP: Repetitive/Copy number variation | 33                             | 10574 | 8    | 7922 | 1.51E-003                     | 2.33E-002                                | sign             |      |
| TT: Transcriptional Transition       | 128  | 7802 | 234  | 10373 | 9.98E-001                     | 2.67E-002                                | non-sign         | TT: Transcriptional Transition       | 234                            | 10373 | 128  | 7802 | 2.18E-003                     | 2.67E-002                                | sign             |      |
| RP: Repetitive/Copy number variation | 8    | 7922 | 33   | 10574 | 1.00E+000                     | 3.00E-002                                | non-sign         | SE: Strong Enhancer                  | 242                            | 10365 | 203  | 7727 | 8.98E-001                     | 3.00E-002                                | non-sign         |      |
| RP: Repetitive/Copy number variation | 18   | 7912 | 56   | 10551 | 1.00E+000                     | 3.33E-002                                | non-sign         | AP: Active Promoter                  | 849                            | 9758  | 3570 | 4360 | 1.00E+000                     | 3.33E-002                                | non-sign         |      |
| WE: Weak Enhancer                    | 1101 | 6829 | 1694 | 8913  | 1.00E+000                     | 3.67E-002                                | non-sign         | WP: Weak Promoter                    | 1195                           | 9412  | 4125 | 3805 | 1.00E+000                     | 3.67E-002                                | non-sign         |      |
| I: Insulator                         | 370  | 7560 | 853  | 9754  | 1.00E+000                     | 4.00E-002                                | non-sign         | IP: Inactive Promoter                | 575                            | 10032 | 977  | 6953 | 1.00E+000                     | 4.00E-002                                | non-sign         |      |
| TE: Transcriptional Elongation       | 88   | 7842 | 533  | 10074 | 1.00E+000                     | 4.33E-002                                | non-sign         | SE: Strong Enhancer                  | 188                            | 10419 | 347  | 7583 | 1.00E+000                     | 4.33E-002                                | non-sign         |      |
| WT: Weak Transcribed                 | 1750 | 6180 | 2953 | 7654  | 1.00E+000                     | 4.67E-002                                | non-sign         | WE: Weak Enhancer                    | 1580                           | 9027  | 3091 | 4839 | 1.00E+000                     | 4.67E-002                                | non-sign         |      |
| HC: Heterochromatin low signal       | 3389 | 4541 | 6567 | 4040  | 1.00E+000                     | 5.00E-002                                | non-sign         | PR: Polycomb Repressed               | 683                            | 9924  | 774  | 7156 | 1.00E+000                     | 5.00E-002                                | non-sign         |      |
| HMEC                                 | a    | b    | c    | d     | pvalue_Coding_ over_NonCoding |  |                  | HMEC                                 | a                              | b     | c    | d    | pvalue_NonCoding_ over_Coding |  |                  |      |
| AP: Active Promoter                  |      | 3863 | 4067 | 901   | 9706                          | 0.00E+000                                | 3.33E-003        | sign                                 | HC: Heterochromatin low signal | 6737  | 3870 | 3500 | 4430                          | 1.82E-152                                | 3.33E-003        | sign |
| WP: Weak Promoter                    | 2967 | 4963 | 939  | 9668  | 0.00E+000                     | 6.67E-003                                | sign             | TE: Transcriptional Elongation       | 680                            | 9927  | 107  | 7823 | 4.49E-073                     | 6.67E-003                                | sign             |      |
| WE: Weak Enhancer                    | 2524 | 5406 | 1338 | 9269  | 5.98E-222                     | 1.00E-002                                | sign             | I: Insulator                         | 425                            | 10182 | 201  | 7729 | 1.66E-008                     | 1.00E-002                                | sign             |      |
| SE: Strong Enhancer                  | 1788 | 6142 | 767  | 9840  | 1.08E-196                     | 1.33E-002                                | sign             | WT: Weak Transcribed                 | 2462                           | 8145  | 1577 | 6353 | 2.93E-008                     | 1.33E-002                                | sign             |      |
| IP: Inactive Promoter                | 344  | 7586 | 180  | 10427 | 9.50E-027                     | 1.67E-002                                | sign             | WE: Weak Enhancer                    | 1788                           | 8819  | 1166 | 6764 | 3.85E-005                     | 1.67E-002                                | sign             |      |
| PR: Polycomb Repressed               | 615  | 7315 | 661  | 9946  | 3.04E-005                     | 2.00E-002                                | sign             | TT: Transcriptional Transition       | 155                            | 10452 | 67   | 7863 | 6.89E-005                     | 2.00E-002                                | sign             |      |
| SE: Strong Enhancer                  | 727  | 7203 | 912  | 9695  | 9.26E-002                     | 2.33E-002                                | non-sign         | RP: Repetitive/Copy number variation | 27                             | 10580 | 7    | 7923 | 5.79E-003                     | 2.33E-002                                | sign             |      |
| RP: Repetitive/Copy number variation | 13   | 7917 | 38   | 10569 | 9.97E-001                     | 2.67E-002                                | non-sign         | RP: Repetitive/Copy number variation | 38                             | 10569 | 13   | 7917 | 7.98E-003                     | 2.67E-002                                | sign             |      |
| RP: Repetitive/Copy number variation | 7    | 7923 | 27   | 10580 | 9.98E-001                     | 3.00E-002                                | non-sign         | SE: Strong Enhancer                  | 912                            | 9695  | 727  | 7203 | 9.16E-001                     | 3.00E-002                                | non-sign         |      |
| TT: Transcriptional Transition       | 67   | 7863 | 155  | 10452 | 1.00E+000                     | 3.33E-002                                | non-sign         | PR: Polycomb Repressed               | 661                            | 9946  | 615  | 7315 | 1.00E+000                     | 3.33E-002                                | non-sign         |      |
| WE: Weak Enhancer                    | 1166 | 6764 | 1788 | 8819  | 1.00E+000                     | 3.67E-002                                | non-sign         | AP: Active Promoter                  | 901                            | 9706  | 3863 | 4067 | 1.00E+000                     | 3.67E-002                                | non-sign         |      |
| I: Insulator                         | 201  | 7729 | 425  | 10182 | 1.00E+000                     | 4.00E-002                                | non-sign         | WP: Weak Promoter                    | 939                            | 9668  | 2967 | 4963 | 1.00E+000                     | 4.00E-002                                | non-sign         |      |
| TE: Transcriptional Elongation       | 107  | 7823 | 680  | 9927  | 1.00E+000                     | 4.33E-002                                | non-sign         | IP: Inactive Promoter                | 180                            | 10427 | 344  | 7586 | 1.00E+000                     | 4.33E-002                                | non-sign         |      |
| WT: Weak Transcribed                 | 1577 | 6353 | 2462 | 8145  | 1.00E+000                     | 4.67E-002                                | non-sign         | SE: Strong Enhancer                  | 767                            | 9840  | 1788 | 6142 | 1.00E+000                     | 4.67E-002                                | non-sign         |      |
| HC: Heterochromatin low signal       | 3500 | 4430 | 6737 | 3870  | 1.00E+000                     | 5.00E-002                                | non-sign         | WE: Weak Enhancer                    | 1338                           | 9269  | 2524 | 5406 | 1.00E+000                     | 5.00E-002                                | non-sign         |      |

Table S3. P-values of overrepresentation for chromatin states, CpG islands, repetitive elements and palindromes for complete promoter set (CPS) and repeat-filtered promoter set (REFPS).

| HSMM                                 | a | b    | c    | d    | pvalue_Coding<br>over_NonCoding |           |           | Benjamini-Hochberg<br>FDR correction<br>(0.05) | FDR significance                     | HSMM  | a    | b     | c    | d    | pvalue_NonCoding<br>over_Coding |           |          | Benjamini-Hochberg<br>FDR correction (0.05) | FDR significance |
|--------------------------------------|---|------|------|------|---------------------------------|-----------|-----------|--|--------------------------------------|-------|------|-------|------|------|---------------------------------|-----------|----------|---|------------------|
|                                      |   |      |      |      | g                               | g         | g         |  |                                      |       |      |       |      |      | ng                              | ng        | ng       |   |                  |
| AP: Active Promoter                  |   | 3911 | 4019 | 967  | 9640                            | 0.00E+000 | 3.33E-003 | sign   | HC: Heterochromatin low signal       |       | 6102 | 4505  | 3416 | 4514 | 6.66E-085                       | 3.33E-003 | sign     |   |                  |
| WP: Weak Promoter                    |   | 3706 | 4224 | 1136 | 9471                            | 0.00E+000 | 6.67E-003 | sign   | TE: Transcriptional Elongation       |       | 1057 | 9550  | 257  | 7673 | 6.74E-076                       | 6.67E-003 | sign     |   |                  |
| WE: Weak Enhancer                    |   | 2233 | 5697 | 1377 | 9230                            | 6.73E-146 | 1.00E-002 | sign   | WE: Weak Enhancer                    |       | 1381 | 9226  | 677  | 7253 | 1.50E-022                       | 1.00E-002 | sign     |   |                  |
| SE: Strong Enhancer                  |   | 998  | 6932 | 700  | 9907                            | 5.02E-044 | 1.33E-002 | sign   | SE: Strong Enhancer                  |       | 799  | 9808  | 397  | 7533 | 1.49E-012                       | 1.33E-002 | sign     |   |                  |
| IP: Inactive Promoter                |   | 376  | 7554 | 206  | 10401                           | 4.21E-027 | 1.67E-002 | sign   | I: Insulator                         |       | 541  | 10066 | 286  | 7644 | 5.18E-007                       | 1.67E-002 | sign     |   |                  |
| PR: Polycomb Repressed               |   | 887  | 7043 | 1046 | 9561                            | 1.94E-003 | 2.00E-002 | sign   | WT: Weak Transcribed                 |       | 2486 | 8121  | 1670 | 6260 | 6.40E-005                       | 2.00E-002 | sign     |   |                  |
| RP: Repetitive/Copy number variation |   | 54   | 7876 | 71   | 10536                           | 4.96E-001 | 2.33E-002 | non-sign                                       | TT: Transcriptional Transition       |       | 345  | 10262 | 185  | 7745 | 1.05E-004                       | 2.33E-002 | sign     |   |                  |
| RP: Repetitive/Copy number variation |   | 22   | 7908 | 37   | 10570                           | 8.38E-001 | 2.67E-002 | non-sign                                       | RP: Repetitive/Copy number variation |       | 37   | 10570 | 22   | 7908 | 2.36E-001                       | 2.67E-002 | non-sign |   |                  |
| TT: Transcriptional Transition       |   | 185  | 7745 | 345  | 10262                           | 1.00E+000 | 3.00E-002 | non-sign                                       | RP: Polycomb Repressed               |       | 1046 | 9561  | 54   | 7876 | 5.75E-001                       | 3.00E-002 | non-sign |   |                  |
| WT: Weak Transcribed                 |   | 1670 | 6260 | 2486 | 8121                            | 1.00E+000 | 3.33E-002 | non-sign                                       | AP: Active Promoter                  |       | 967  | 9640  | 3911 | 4019 | 1.00E+000                       | 3.67E-002 | non-sign |   |                  |
| SE: Strong Enhancer                  |   | 397  | 7533 | 799  | 9808                            | 1.00E+000 | 3.67E-002 | non-sign                                       | WP: Weak Promoter                    |       | 1136 | 9471  | 3706 | 4224 | 1.00E+000                       | 4.00E-002 | non-sign |   |                  |
| WE: Weak Enhancer                    |   | 677  | 7253 | 1381 | 9226                            | 1.00E+000 | 4.00E-002 | non-sign                                       | IP: Inactive Promoter                |       | 206  | 10401 | 376  | 7554 | 1.00E+000                       | 4.33E-002 | non-sign |   |                  |
| I: Insulator                         |   | 286  | 7644 | 541  | 10066                           | 1.00E+000 | 4.33E-002 | non-sign                                       | SE: Strong Enhancer                  |       | 700  | 9907  | 998  | 6932 | 1.00E+000                       | 4.67E-002 | non-sign |   |                  |
| TE: Transcriptional Elongation       |   | 257  | 7673 | 1057 | 9550                            | 1.00E+000 | 4.67E-002 | non-sign                                       | WE: Weak Enhancer                    |       | 1377 | 9230  | 2233 | 5697 | 1.00E+000                       | 5.00E-002 | non-sign |   |                  |
| HC: Heterochromatin low signal       |   | 3416 | 4514 | 6102 | 4505                            | 1.00E+000 | 5.00E-002 | non-sign                                       |                                      |       |      |       |      |      |                                 |           |          |   |                  |
| HUVEC                                | a | b    | c    | d    | pvalue_Coding<br>over_NonCoding |           |           | Benjamini-Hochberg<br>FDR correction<br>(0.05) | FDR significance                     | HUVEC | a    | b     | c    | d    | pvalue_NonCoding<br>over_Coding |           |          | Benjamini-Hochberg<br>FDR correction (0.05) | FDR significance |
|                                      |   |      |      |      | g                               | g         | g         |  |                                      | ng    | ng   | ng    |      |      |                                 |           |          |   |                  |
| AP: Active Promoter                  |   | 3766 | 4164 | 858  | 9749                            | 0.00E+000 | 3.33E-003 | sign   | HC: Heterochromatin low signal       |       | 6643 | 3964  | 3438 | 4492 | 1.93E-150                       | 3.33E-003 | sign     |   |                  |
| WP: Weak Promoter                    |   | 2967 | 4963 | 878  | 9729                            | 0.00E+000 | 6.67E-003 | sign   | TE: Transcriptional Elongation       |       | 632  | 9975  | 120  | 7810 | 3.84E-058                       | 6.67E-003 | sign     |   |                  |
| SE: Strong Enhancer                  |   | 2340 | 5590 | 977  | 9630                            | 4.21E-279 | 1.00E-002 | sign   | WT: Weak Transcribed                 |       | 1929 | 8678  | 1200 | 6730 | 1.97E-008                       | 1.00E-002 | sign     |   |                  |
| WE: Weak Enhancer                    |   | 2126 | 5804 | 988  | 9619                            | 1.35E-217 | 1.33E-002 | sign   | TT: Transcriptional Transition       |       | 180  | 10427 | 67   | 7863 | 2.11E-007                       | 1.33E-002 | sign     |   |                  |
| IP: Inactive Promoter                |   | 505  | 7425 | 299  | 10308                           | 1.36E-031 | 1.67E-002 | sign   | I: Insulator                         |       | 522  | 10085 | 297  | 7633 | 6.01E-005                       | 1.67E-002 | sign     |   |                  |
| PR: Polycomb Repressed               |   | 1372 | 6558 | 1565 | 9042                            | 1.53E-006 | 2.00E-002 | sign   | RP: Repetitive/Copy number variation |       | 55   | 10552 | 27   | 7903 | 4.37E-002                       | 2.00E-002 | non-sign |   |                  |
| SE: Strong Enhancer                  |   | 589  | 7341 | 751  | 9856                            | 1.91E-001 | 2.33E-002 | non-sign                                       | WE: Weak Enhancer                    |       | 1196 | 9411  | 848  | 7082 | 1.10E-001                       | 2.33E-002 | non-sign |   |                  |
| WE: Weak Enhancer                    |   | 848  | 7082 | 1196 | 9411                            | 8.99E-001 | 2.67E-002 | non-sign                                       | RP: Repetitive/Copy number variation |       | 55   | 10552 | 31   | 7899 | 1.23E-001                       | 2.67E-002 | non-sign |   |                  |
| RP: Repetitive/Copy number variation |   | 31   | 7899 | 55   | 10552                           | 9.16E-001 | 3.00E-002 | non-sign                                       | SE: Strong Enhancer                  |       | 751  | 9856  | 589  | 7341 | 8.24E-001                       | 3.00E-002 | non-sign |   |                  |
| RP: Repetitive/Copy number variation |   | 27   | 7903 | 55   | 10552                           | 9.74E-001 | 3.33E-002 | non-sign                                       | PR: Polycomb Repressed               |       | 1565 | 9042  | 1372 | 6558 | 1.00E+000                       | 3.33E-002 | non-sign |   |                  |
| I: Insulator                         |   | 297  | 7633 | 522  | 10085                           | 1.00E+000 | 3.67E-002 | non-sign                                       | AP: Active Promoter                  |       | 858  | 9749  | 3766 | 4164 | 1.00E+000                       | 3.67E-002 | non-sign |   |                  |
| TT: Transcriptional Transition       |   | 67   | 7863 | 180  | 10427                           | 1.00E+000 | 4.00E-002 | non-sign                                       | WP: Weak Promoter                    |       | 878  | 9729  | 2967 | 4963 | 1.00E+000                       | 4.00E-002 | non-sign |   |                  |
| TE: Transcriptional Elongation       |   | 120  | 7810 | 632  | 9975                            | 1.00E+000 | 4.33E-002 | non-sign                                       | IP: Inactive Promoter                |       | 299  | 10308 | 505  | 7425 | 1.00E+000                       | 4.33E-002 | non-sign |   |                  |
| WT: Weak Transcribed                 |   | 1200 | 6730 | 1929 | 8678                            | 1.00E+000 | 4.67E-002 | non-sign                                       | SE: Strong Enhancer                  |       | 977  | 9630  | 2340 | 5590 | 1.00E+000                       | 4.67E-002 | non-sign |   |                  |
| HC: Heterochromatin low signal       |   | 3438 | 4492 | 6643 | 3964                            | 1.00E+000 | 5.00E-002 | non-sign                                       | WE: Weak Enhancer                    |       | 988  | 9619  | 2126 | 5804 | 1.00E+000                       | 5.00E-002 | non-sign |   |                  |

Table S3. P-values of overrepresentation for chromatin states, CpG islands, repetitive elements and palindromes for complete promoter set (CPS) and repeat-filtered promoter set (REFPS).

| NHEK                                 | a | b    | c    | d    | pvalue_Coding_ over_NonCodin g            |                  |   | NHEK     | a                                    | b    | c     | d    | pvalue_NonCo ding_ over_Codi ng |           |           |          |
|--------------------------------------|---|------|------|------|---|------------------|---|----------|--------------------------------------|------|-------|------|---------------------------------|-----------|-----------|----------|
|                                      |   |      |      |      | Benjamini-Hochber g FDR correction (0.05) | FDR significance | Benjamini-Hochber g FDR correction (0.05) |          |                                      |      |       |      | FDR significance                |           |           |          |
| AP: Active Promoter                  |   | 4039 | 3891 | 1024 | 9583                                      | 0.00E+000        | 3.33E-003                                 | sign     | HC: Heterochromatin low signal       | 6325 | 4282  | 3192 | 4738                            | 2.48E-151 | 3.33E-003 | sign     |
| WP: Weak Promoter                    |   | 2614 | 5316 | 893  | 9714                                      | 0.00E+000        | 6.67E-003                                 | sign     | TE: Transcriptional Elongation       | 813  | 9794  | 187  | 7743                            | 8.65E-062 | 6.67E-003 | sign     |
| SE: Strong Enhancer                  |   | 1838 | 6092 | 906  | 9701                                      | 7.08E-169        | 1.00E-002                                 | non-sign | I: Insulator                         | 639  | 9968  | 293  | 7637                            | 2.01E-013 | 1.00E-002 | non-sign |
| WE: Weak Enhancer                    |   | 2203 | 5727 | 1247 | 9360                                      | 3.14E-168        | 1.33E-002                                 | non-sign | WE: Weak Enhancer                    | 1414 | 9193  | 814  | 7116                            | 9.51E-011 | 1.33E-002 | non-sign |
| IP: Inactive Promoter                |   | 478  | 7452 | 329  | 10278                                     | 5.86E-022        | 1.67E-002                                 | non-sign | WT: Weak Transcribed                 | 2159 | 8448  | 1411 | 6519                            | 6.27E-006 | 1.67E-002 | non-sign |
| PR: Polycomb Repressed               |   | 1145 | 6785 | 1462 | 9145                                      | 1.06E-001        | 2.00E-002                                 | non-sign | TT: Transcriptional Transition       | 218  | 10389 | 124  | 7806                            | 7.74E-003 | 2.00E-002 | non-sign |
| SE: Strong Enhancer                  |   | 576  | 7354 | 799  | 9808                                      | 7.64E-001        | 2.33E-002                                 | non-sign | RP: Repetitive/Copy number variation | 40   | 10567 | 19   | 7911                            | 6.37E-002 | 2.33E-002 | non-sign |
| RP: Repetitive/Copy number variation |   | 8    | 7922 | 17   | 10590                                     | 9.04E-001        | 2.67E-002                                 | non-sign | RP: Repetitive/Copy number variation | 17   | 10590 | 8    | 7922                            | 1.88E-001 | 2.67E-002 | non-sign |
| RP: Repetitive/Copy number variation |   | 19   | 7911 | 40   | 10567                                     | 9.64E-001        | 3.00E-002                                 | non-sign | SE: Strong Enhancer                  | 799  | 9808  | 576  | 7354                            | 2.54E-001 | 3.00E-002 | non-sign |
| TT: Transcriptional Transition       |   | 124  | 7806 | 218  | 10389                                     | 9.94E-001        | 3.33E-002                                 | non-sign | PR: Polycomb Repressed               | 1462 | 9145  | 1145 | 6785                            | 9.02E-001 | 3.33E-002 | non-sign |
| WT: Weak Transcribed                 |   | 1411 | 6519 | 2159 | 8448                                      | 1.00E+000        | 3.67E-002                                 | non-sign | AP: Active Promoter                  | 1024 | 9583  | 4039 | 3891                            | 1.00E+000 | 3.67E-002 | non-sign |
| WE: Weak Enhancer                    |   | 814  | 7116 | 1414 | 9193                                      | 1.00E+000        | 4.00E-002                                 | non-sign | WP: Weak Promoter                    | 893  | 9714  | 2614 | 5316                            | 1.00E+000 | 4.00E-002 | non-sign |
| I: Insulator                         |   | 293  | 7637 | 639  | 9968                                      | 1.00E+000        | 4.33E-002                                 | non-sign | IP: Inactive Promoter                | 329  | 10278 | 478  | 7452                            | 1.00E+000 | 4.33E-002 | non-sign |
| TE: Transcriptional Elongation       |   | 187  | 7743 | 813  | 9794                                      | 1.00E+000        | 4.67E-002                                 | non-sign | SE: Strong Enhancer                  | 906  | 9701  | 1838 | 6092                            | 1.00E+000 | 4.67E-002 | non-sign |
| HC: Heterochromatin low signal       |   | 3192 | 4738 | 6325 | 4282                                      | 1.00E+000        | 5.00E-002                                 | non-sign | WE: Weak Enhancer                    | 1247 | 9360  | 2203 | 5727                            | 1.00E+000 | 5.00E-002 | non-sign |
|                                      |   |      |      |      |   |                  |   |          |                                      |      |       |      |                                 |           |           |          |
| NHLF                                 | a | b    | c    | d    | pvalue_Coding_ over_NonCodin g            |                  |   | NHLF     | a                                    | b    | c     | d    | pvalue_NonCo ding_ over_Codi ng |           |           |          |
|                                      |   |      |      |      | Benjamini-Hochber g FDR correction (0.05) | FDR significance | Benjamini-Hochber g FDR correction (0.05) |          |                                      |      |       |      | FDR significance                |           |           |          |
| AP: Active Promoter                  |   | 4097 | 3833 | 1014 | 9593                                      | 0.00E+000        | 3.33E-003                                 | sign     | HC: Heterochromatin low signal       | 6147 | 4460  | 3199 | 4731                            | 2.99E-125 | 3.33E-003 | sign     |
| WP: Weak Promoter                    |   | 3330 | 4600 | 1010 | 9597                                      | 0.00E+000        | 6.67E-003                                 | sign     | TE: Transcriptional Elongation       | 886  | 9721  | 236  | 7694                            | 2.83E-056 | 6.67E-003 | sign     |
| WE: Weak Enhancer                    |   | 2082 | 5848 | 1119 | 9488                                      | 2.15E-171        | 1.00E-002                                 | non-sign | WT: Weak Transcribed                 | 2210 | 8397  | 1352 | 6578                            | 4.54E-011 | 1.00E-002 | non-sign |
| SE: Strong Enhancer                  |   | 1096 | 6834 | 575  | 10032                                     | 2.67E-086        | 1.33E-002                                 | non-sign | WE: Weak Enhancer                    | 1258 | 9349  | 739  | 7191                            | 1.61E-008 | 1.33E-002 | non-sign |
| IP: Inactive Promoter                |   | 411  | 7519 | 218  | 10389                                     | 4.02E-031        | 1.67E-002                                 | non-sign | I: Insulator                         | 938  | 9669  | 539  | 7391                            | 1.73E-007 | 1.67E-002 | non-sign |
| PR: Polycomb Repressed               |   | 1323 | 6607 | 1584 | 9023                                      | 6.51E-004        | 2.00E-002                                 | sign     | RP: Repetitive/Copy number variation | 43   | 10564 | 13   | 7917                            | 1.80E-003 | 2.00E-002 | sign     |
| SE: Strong Enhancer                  |   | 583  | 7347 | 794  | 9813                                      | 6.45E-001        | 2.33E-002                                 | non-sign | TT: Transcriptional Transition       | 227  | 10380 | 132  | 7798                            | 1.12E-002 | 2.33E-002 | sign     |
| TT: Transcriptional Transition       |   | 132  | 7798 | 227  | 10380                                     | 9.92E-001        | 2.67E-002                                 | non-sign | RP: Repetitive/Copy number variation | 44   | 10563 | 17   | 7913                            | 1.17E-002 | 2.67E-002 | sign     |
| RP: Repetitive/Copy number variation |   | 17   | 7913 | 44   | 10563                                     | 9.94E-001        | 3.00E-002                                 | non-sign | SE: Strong Enhancer                  | 794  | 9813  | 583  | 7347                            | 3.77E-001 | 3.00E-002 | non-sign |
| RP: Repetitive/Copy number variation |   | 13   | 7917 | 43   | 10564                                     | 9.99E-001        | 3.33E-002                                 | non-sign | PR: Polycomb Repressed               | 1584 | 9023  | 1323 | 6607                            | 9.99E-001 | 3.33E-002 | non-sign |
| WE: Weak Enhancer                    |   | 739  | 7191 | 1258 | 9349                                      | 1.00E+000        | 3.67E-002                                 | non-sign | AP: Active Promoter                  | 1014 | 9593  | 4097 | 3833                            | 1.00E+000 | 3.67E-002 | non-sign |
| I: Insulator                         |   | 539  | 7391 | 938  | 9669                                      | 1.00E+000        | 4.00E-002                                 | non-sign | WP: Weak Promoter                    | 1010 | 9597  | 3330 | 4600                            | 1.00E+000 | 4.00E-002 | non-sign |
| TE: Transcriptional Elongation       |   | 236  | 7694 | 886  | 9721                                      | 1.00E+000        | 4.33E-002                                 | non-sign | IP: Inactive Promoter                | 218  | 10389 | 411  | 7519                            | 1.00E+000 | 4.33E-002 | non-sign |
| WT: Weak Transcribed                 |   | 1352 | 6578 | 2210 | 8397                                      | 1.00E+000        | 4.67E-002                                 | non-sign | SE: Strong Enhancer                  | 575  | 10032 | 1096 | 6834                            | 1.00E+000 | 4.67E-002 | non-sign |
| HC: Heterochromatin low signal       |   | 3199 | 4731 | 6147 | 4460                                      | 1.00E+000        | 5.00E-002                                 | non-sign | WE: Weak Enhancer                    | 1119 | 9488  | 2082 | 5848                            | 1.00E+000 | 5.00E-002 | non-sign |