**Supplementary Tables**

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| **Supplementary Table 1. Eighty-Nine CpGs with genetically predicted methylation levels significantly associated with EOC risk** | | | | | | | | | | | |
| CpG | Chr | Position | Closest gene | Classification | Z score | OR (95% CI) a | P value | RFHS2 b | EOC risk SNPs | Distance to the risk SNP (Kb) | Adjusted c P value |
| cg25951210 | 2 | 177,016,619 | *HOXD4* | Exonic | -5.49 | 0.67 (0.58-0.77) | 4.04E-08 | 0.02 | rs6755777; rs711830 | 26; 20 | 0.03 |
| cg10803577 | 2 | 177,016,837 | *HOXD4* | Intronic | -5.41 | 0.74 (0.67-0.83) | 6.33E-08 | 0.04 | rs6755777; rs711830 | 26; 20 | 0.02 |
| cg25708328 | 2 | 177,022,056 | *HOXD4; HOXD3* | Intergenic | 5.54 | 1.55 (1.33-1.81) | 3.02E-08 | 0.02 | rs6755777; rs711830 | 21; 15 | 0.60 |
| cg25137403 | 2 | 177,022,172 | *HOXD4; HOXD3* | Intergenic | 7.51 | 1.24 (1.18-1.32) | 5.96E-14 | 0.15 | rs6755777; rs711830 | 21; 15 | 0.09 |
| cg14454907 | 2 | 177,022,285 | *HOXD4; HOXD3* | Intergenic | -7.09 | 0.63 (0.56-0.72) | 1.29E-12 | 0.03 | rs6755777; rs711830 | 20; 15 | 0.85 |
| cg10086659 | 2 | 177,040,226 | *HAGLR* | ncRNA\_Exonic | 5.96 | 2.08 (1.63-2.64) | 2.55E-09 | 0.02 | rs6755777; rs711830 | 3; -2 | 0.06 |
| cg26754761 | 2 | 177,040,938 | *HAGLR* | ncRNA\_Exonic | 6.02 | 1.08 (1.05-1.11) | 1.76E-09 | 0.59 | rs6755777; rs711830 | 2; -3 | 0.07 |
| cg20676716 | 2 | 177,053,568 | *HOXD1* | Exonic | -5.06 | 0.67 (0.58-0.79) | 4.13E-07 | 0.02 | rs6755777; rs711830 | -10; 16 | 0.07 |
| cg02019125 | 3 | 156,323,952 | *SSR3; TIPARP-AS1* | Intergenic | -9.35 | 0.63 (0.57-0.70) | 8.42E-21 | 0.05 | rs62274041 | 111 | 0.34 |
| cg26405475 | 3 | 156,324,038 | *SSR3; TIPARP-AS1* | Intergenic | -9.45 | 0.69 (0.64-0.74) | 3.42E-21 | 0.07 | rs62274041 | 111 | 0.34 |
| cg22481770 | 3 | 156,324,118 | *SSR3; TIPARP-AS1* | Intergenic | -9.13 | 0.64 (0.59-0.71) | 6.89E-20 | 0.04 | rs62274041 | 111 | 0.32 |
| cg22211092 | 3 | 156,361,584 | *SSR3; TIPARP-AS1* | Intergenic | 9.68 | 2.04 (1.77-2.36) | 3.51E-22 | 0.02 | rs62274041 | 74 | 0.68 |
| cg25738116 | 3 | 156,530,658 | *PA2G4P4* | TSS1500 | 7.29 | 1.15 (1.11-1.19) | 3.02E-13 | 0.27 | rs62274041 | -95 | 0.93 |
| cg08832018 | 3 | 156,543,647 | *LEKR1* | TSS1500 | -7.97 | 0.84 (0.80-0.88) | 1.53E-15 | 0.19 | rs62274041 | -108 | 1.00 |
| cg18139273 | 7 | 962,582 | *ADAP1* | Intronic | -4.95 | 0.51 (0.39-0.66) | 7.25E-07 | 0.01 | NA d | NA d | NA d |
| cg03634833 | 7 | 965,534 | *ADAP1* | Intronic | -5.00 | 0.84 (0.79-0.90) | 5.81E-07 | 0.09 | NA d | NA d | NA d |
| cg08478672 | 8 | 129,374,295 | *MIR1208; LINC00824* | Intergenic | 5.08 | 1.29 (1.17-1.42) | 3.81E-07 | 0.06 | rs1400482 | 167 | 0.05 |
| cg14653977 | 9 | 136,038,692 | *GBGT1* | Intronic | 5.99 | 1.75 (1.46-2.09) | 2.04E-09 | 0.03 | 9:136138765 e | 100 | 0.09 |
| cg21160290 | 9 | 136,149,941 | *ABO* | Intronic | 4.96 | 1.26 (1.15-1.38) | 7.01E-07 | 0.71 | 9:136138765 e | -11 | 0.11 |
| cg22535403 | 9 | 136,150,032 | *ABO* | Intronic | 5.12 | 1.33 (1.19-1.49) | 3.07E-07 | 0.69 | 9:136138765 e | -11 | 0.08 |
| cg24267699 | 9 | 136,151,359 | *ABO* | TSS1500 | 5.72 | 1.36 (1.23-1.52) | 1.07E-08 | 0.59 | 9:136138765 e | -12 | 0.18 |
| cg13568213 | 9 | 136,387,235 | *MYMK* | Intronic | 5.14 | 3.01 (1.98-4.58) | 2.74E-07 | 0.03 | 9:136138765 e | -248 | 0.09 |
| cg06874403 | 10 | 21,799,047 | *CASC10; SKIDA1* | Intergenic | 5.64 | 1.80 (1.47-2.21) | 1.66E-08 | 0.01 | rs144962376 | 79 | 0.90 |
| cg04714110 | 10 | 21,799,143 | *CASC10; SKIDA1* | Intergenic | 5.49 | 1.58 (1.34-1.87) | 4.10E-08 | 0.02 | rs144962376 | 79 | 0.93 |
| cg04707519 | 10 | 21,799,314 | *CASC10; SKIDA1* | Intergenic | 5.14 | 1.34 (1.20-1.50) | 2.80E-07 | 0.04 | rs144962376 | 79 | 0.93 |
| cg03610228 | 10 | 21,799,395 | *CASC10; SKIDA1* | Intergenic | 5.33 | 1.31 (1.19-1.44) | 9.73E-08 | 0.05 | rs144962376 | 79 | 0.95 |
| cg12733607 | 10 | 21,813,501 | *SKIDA1* | Intronic | 5.40 | 1.60 (1.35-1.89) | 6.64E-08 | 0.01 | rs144962376 | 65 | 0.81 |
| cg10900703 | 10 | 21,824,407 | *MLLT10* | Intronic | -5.30 | 0.86 (0.81-0.91) | 1.17E-07 | 0.13 | rs144962376 | 54 | 0.81 |
| cg04231319 | 10 | 21,824,447 | *MLLT10* | Intronic | -5.72 | 0.88 (0.84-0.92) | 1.05E-08 | 0.19 | rs144962376 | 54 | 0.94 |
| cg23659289 | 17 | 43,472,725 | *ARHGAP27* | 3'UTR | 7.20 | 1.25 (1.18-1.33) | 5.85E-13 | 0.14 | rs1879586 | 94 | 0.40 |
| cg07067577 | 17 | 43,506,829 | *ARHGAP27* | 3'UTR | -7.49 | 0.73 (0.67-0.79) | 6.86E-14 | 0.07 | rs1879586 | 60 | 0.01 |
| cg08113562 | 17 | 43,508,428 | *ARHGAP27* | Intronic | 7.36 | 1.10 (1.07-1.13) | 1.90E-13 | 0.57 | rs1879586 | 58 | 0.27 |
| cg16281322 | 17 | 43,510,478 | *ARHGAP27* | TSS200 | -7.18 | 0.87 (0.84-0.90) | 6.82E-13 | 0.29 | rs1879586 | 56 | 0.56 |
| cg25708777 | 17 | 43,510,841 | *ARHGAP27* | TSS1500 | -7.24 | 0.66 (0.59-0.74) | 4.61E-13 | 0.02 | rs1879586 | 56 | 0.10 |
| cg26471390 | 17 | 43,511,301 | *ARHGAP27; PLEKHM1* | Intergenic | 7.28 | 1.15 (1.11-1.20) | 3.37E-13 | 0.27 | rs1879586 | 56 | 0.49 |
| cg06925179 | 17 | 43,578,568 | *PLEKHM1; LRRC37A4P* | Intergenic | 7.08 | 1.16 (1.11-1.21) | 1.48E-12 | 0.22 | rs1879586 | -11 | 0.02 |
| cg04703951 | 17 | 43,578,652 | *PLEKHM1; LRRC37A4P* | Intergenic | 6.74 | 1.10 (1.07-1.14) | 1.62E-11 | 0.41 | rs1879586 | -11 | 0.10 |
| cg03915738 | 17 | 43,651,976 | *LRRC37A4P; MAPK8IP1P2* | Intergenic | 6.82 | 1.14 (1.10-1.19) | 8.95E-12 | 0.35 | rs1879586 | -84 | 0.64 |
| cg12609785 | 17 | 43,660,871 | *LRRC37A4P; MAPK8IP1P2* | Intergenic | 6.76 | 1.28 (1.19-1.38) | 1.42E-11 | 0.61 | rs1879586 | -93 | 0.10 |
| cg04927033 | 17 | 43,679,265 | *MAPK8IP1P2* | TSS200 | -7.09 | 0.72 (0.66-0.79) | 1.34E-12 | 0.16 | rs1879586 | -111 | 0.51 |
| cg16652462 | 17 | 43,679,667 | *MAPK8IP1P2* | TSS1500 | 6.16 | 1.29 (1.19-1.39) | 7.38E-10 | 0.25 | rs1879586 | -112 | 0.58 |
| cg23590916 | 17 | 43,697,445 | *C17orf69* | TSS1500 | -7.25 | 0.62 (0.54-0.70) | 4.17E-13 | 0.08 | rs1879586 | -130 | 0.33 |
| cg15413793 | 17 | 43,700,761 | *C17orf69* | ncRNA\_Intronic | -5.83 | 0.77 (0.70-0.84) | 5.46E-09 | 0.07 | rs1879586 | -133 | 0.75 |
| cg03954353 | 17 | 43,715,162 | *C17orf69* | ncRNA\_Exonic | 6.71 | 1.21 (1.15-1.29) | 1.97E-11 | 0.18 | rs1879586 | -147 | 0.70 |
| cg01882395 | 17 | 43,717,810 | *C17orf69* | ncRNA\_Exonic | 6.84 | 1.21 (1.15-1.28) | 7.79E-12 | 0.15 | rs1879586 | -150 | 0.59 |
| cg27551605 | 17 | 43,862,910 | *CRHR1* | Intronic | -6.93 | 0.42 (0.33-0.54) | 4.30E-12 | 0.02 | rs1879586 | -295 | 0.28 |
| cg24063856 | 17 | 43,863,303 | *CRHR1* | Intronic | -5.78 | 0.76 (0.69-0.83) | 7.66E-09 | 0.08 | rs1879586 | -295 | 0.84 |
| cg00025823 | 17 | 43,909,151 | *CRHR1* | Intronic | 5.15 | 1.41 (1.24-1.61) | 2.65E-07 | 0.03 | rs1879586 | -341 | 0.42 |
| cg15072306 | 17 | 43,922,875 | *SPPL2C* | Exonic | -6.85 | 0.68 (0.61-0.76) | 7.34E-12 | 0.03 | rs1879586 | -355 | 0.27 |
| cg05301556 | 17 | 43,971,177 | *MAPT* | TSS1500 | -6.47 | 0.85 (0.81-0.89) | 9.98E-11 | 0.18 | rs1879586 | -403 | 0.80 |
| cg00891649 | 17 | 43,972,573 | *MAPT* | 5'UTR | -6.65 | 0.80 (0.75-0.85) | 2.95E-11 | 0.12 | rs1879586 | -405 | 0.65 |
| cg18878992 | 17 | 43,974,344 | *MAPT* | 5'UTR | 7.15 | 1.27 (1.19-1.35) | 8.85E-13 | 0.14 | rs1879586 | -407 | 0.39 |
| cg10955972 | 17 | 43,976,002 | *MAPT* | 5'UTR | 7.32 | 3.18 (2.33-4.33) | 2.51E-13 | 0.02 | rs1879586 | -408 | 0.80 |
| cg05772917 | 17 | 44,027,251 | *MAPT* | Intronic | 6.60 | 1.55 (1.36-1.77) | 4.23E-11 | 0.03 | rs1879586 | -459 | 0.27 |
| cg03836283 | 17 | 44,058,856 | *MAPT* | Intronic | 7.08 | 1.81 (1.53-2.13) | 1.44E-12 | 0.03 | rs1879586 | -491 | 0.50 |
| cg01934064 | 17 | 44,064,242 | *MAPT* | Intronic | 7.28 | 1.19 (1.14-1.25) | 3.29E-13 | 0.21 | rs1879586 | -496 | 0.35 |
| cg00480298 | 17 | 44,068,857 | *MAPT* | Exonic | 5.81 | 1.47 (1.29-1.68) | 6.39E-09 | 0.02 | rs1879586 | -501 | 0.79 |
| cg24677220 | 17 | 44,075,684 | *MAPT* | Intronic | 6.94 | 1.96 (1.62-2.38) | 3.95E-12 | 0.01 | rs1879586 | -508 | 0.04 |
| cg07368061 | 17 | 44,090,862 | *MAPT* | Intronic | -7.25 | 0.88 (0.85-0.91) | 4.26E-13 | 0.43 | rs1879586 | -523 | 0.36 |
| cg09764761 | 17 | 44,105,544 | *MAPT* | 3'UTR | -7.21 | 0.88 (0.85-0.91) | 5.49E-13 | 0.38 | rs1879586 | -538 | 0.42 |
| cg04491389 | 17 | 44,214,771 | *KANSL1* | Intronic | -6.10 | 0.83 (0.79-0.88) | 1.04E-09 | 0.19 | rs1879586 | -647 | 0.34 |
| cg13732302 | 17 | 44,222,207 | *KANSL1* | Intronic | -6.52 | 0.86 (0.82-0.90) | 7.17E-11 | 0.17 | rs1879586 | -654 | 0.32 |
| cg23952828 | 17 | 44,246,087 | *KANSL1* | Intronic | -6.04 | 0.72 (0.65-0.80) | 1.49E-09 | 0.03 | rs1879586 | -678 | 0.11 |
| cg21214508 | 17 | 44,248,233 | *KANSL1* | Exonic | -5.80 | 0.85 (0.80-0.90) | 6.80E-09 | 0.16 | rs1879586 | -680 | 0.08 |
| cg19832721 | 17 | 44,249,866 | *KANSL1* | Intronic | 6.84 | 1.10 (1.07-1.13) | 8.10E-12 | 0.66 | rs1879586 | -682 | 0.57 |
| cg19976404 | 17 | 44,250,487 | *KANSL1* | Intronic | -5.13 | 0.84 (0.79-0.90) | 2.89E-07 | 0.11 | rs1879586 | -683 | 0.56 |
| cg06462185 | 17 | 44,305,081 | *KANSL1; LRRC37A* | Intergenic | -5.98 | 0.70 (0.62-0.78) | 2.20E-09 | 0.04 | rs1879586 | -737 | 0.58 |
| cg06291494 | 17 | 44,321,403 | *KANSL1; LRRC37A* | Intergenic | -7.14 | 0.77 (0.71-0.82) | 9.21E-13 | 0.14 | rs1879586 | -754 | 0.39 |
| cg14517863 | 17 | 44,321,492 | *KANSL1; LRRC37A* | Intergenic | 7.03 | 1.13 (1.09-1.17) | 2.08E-12 | 0.40 | rs1879586 | -754 | 0.29 |
| cg08670715 | 17 | 44,341,754 | *KANSL1; LRRC37A* | Intergenic | 6.14 | 1.16 (1.11-1.22) | 8.32E-10 | 0.37 | rs1879586 | -774 | 0.43 |
| cg05159804 | 17 | 44,343,776 | *KANSL1; LRRC37A* | Intergenic | -6.46 | 0.87 (0.84-0.91) | 1.07E-10 | 0.61 | rs1879586 | -776 | 0.74 |
| cg18027529 | 17 | 44,344,864 | *KANSL1; LRRC37A* | Intergenic | 6.99 | 1.18 (1.12-1.23) | 2.68E-12 | 0.24 | rs1879586 | -777 | 0.46 |
| cg24910739 | 17 | 44,657,394 | *ARL17A; ARL17B* | TSS1500; TSS1500 | 7.03 | 1.85 (1.56-2.20) | 2.02E-12 | 0.02 | rs1879586 | -1090 | 0.40 |
| cg19711530 | 17 | 44,847,427 | *WNT3* | Intronic | 5.12 | 1.27 (1.16-1.39) | 3.04E-07 | 0.04 | rs1879586 | -1280 | 0.04 |
| cg19139618 | 17 | 46,504,791 | *SKAP1* | Intronic | -4.96 | 0.84 (0.79-0.90) | 7.08E-07 | 0.10 | rs7207826 | -4 | 0.47 |
| cg02957270 | 17 | 46,508,097 | *SKAP1* | TSS1500 | 6.92 | 1.50 (1.33-1.68) | 4.40E-12 | 0.04 | rs7207826 | -7 | 0.05 |
| cg12350474 | 17 | 46,578,476 | *LOC101927166; HOXB1* | Intergenic | -5.82 | 0.77 (0.70-0.84) | 5.74E-09 | 0.06 | rs7207826 | -77 | 0.04 |
| cg20152430 | 17 | 46,641,504 | *HOXB3* | Intronic | 5.08 | 1.66 (1.36-2.01) | 3.69E-07 | 0.01 | rs7207826 | -140 | 0.13 |
| cg04800503 | 17 | 46,648,533 | *HOXB3* | Intronic | 5.45 | 1.28 (1.17-1.40) | 4.98E-08 | 0.07 | rs7207826 | -147 | 0.29 |
| cg12910797 | 17 | 46,651,722 | *HOXB3* | 5'UTR | 5.03 | 1.38 (1.22-1.56) | 4.82E-07 | 0.03 | rs7207826 | -151 | 0.06 |
| cg01572694 | 17 | 46,657,555 | *HOXB3* | Intronic | -5.83 | 0.81 (0.75-0.87) | 5.52E-09 | 0.08 | rs7207826 | -156 | 0.30 |
| cg14285150 | 17 | 46,659,019 | *HOXB3* | Intronic | -5.43 | 0.72 (0.64-0.81) | 5.53E-08 | 0.04 | rs7207826 | -158 | 0.38 |
| cg24672833 | 17 | 46,659,318 | *HOXB3* | Intronic | -5.35 | 0.73 (0.66-0.82) | 9.00E-08 | 0.03 | rs7207826 | -158 | 0.61 |
| cg22311200 | 17 | 46,695,514 | *HOXB8; HOXB9* | Intergenic | 5.88 | 1.92 (1.54-2.38) | 4.05E-09 | 0.01 | rs7207826 | -194 | 0.26 |
| cg26608174 | 17 | 46,711,035 | *MIR196A1; PRAC1* | TSS1500; Downstream | -4.96 | 0.63 (0.52-0.76) | 7.00E-07 | 0.01 | rs7207826 | -210 | 0.35 |
| cg21956434 | 19 | 17,377,697 | *BABAM1* | TSS1500 | 7.07 | 1.13 (1.09-1.17) | 1.53E-12 | 0.34 | rs4808075 | 12 | 0.39 |
| ch.19.732135R | 19 | 17,385,198 | *BABAM1* | Intronic | 6.70 | 1.48 (1.32-1.67) | 2.06E-11 | 0.04 | rs4808075 | 5 | 0.50 |
| cg17941109 | 19 | 17,407,198 | *ABHD8* | Intronic | -5.94 | 0.82 (0.77-0.87) | 2.88E-09 | 0.08 | rs4808075 | -16 | 0.21 |
| cg22813366 | 19 | 17,440,072 | *ANO8* | Intronic | -5.63 | 0.83 (0.78-0.88) | 1.82E-08 | 0.09 | rs4808075 | -49 | 0.35 |
| a OR, odds ratio per standard deviation increase in genetically predicted methylation level; CI, confidence interval. b Correlation between predicted and measured methylation levels. c Adjusting for the nearest EOC risk SNPs. d CpG located at novel locus without any perviously identified EOC risk SNPs. e GRCh37 position. | | | | | | | | | | | |

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| **Supplementary Table 2. Twenty-Three CpGs consistently associated with EOC risk using the summary statistics of the UK biobank data** | | | | | | | | | | |
| CpG | Chr | Position | Closest gene | Classification | OCAC | | UK Biobank histologically confirmed ovarian cancer | | UK Biobank self-reported ovarian cancer | |
| Z score | P value | Z score | P value | Z score | P value | |
| cg25708328 | 2 | 177,022,056 | *HOXD4; HOXD3* | Intergenic | 5.54 | 3.02E-08 | 1.72 | 0.09 | 1.51 | 0.13 | |
| cg25137403 | 2 | 177,022,172 | *HOXD4; HOXD3* | Intergenic | 7.51 | 5.96E-14 | 1.85 | 0.06 | 1.67 | 0.10 | |
| cg14454907 | 2 | 177,022,285 | *HOXD4; HOXD3* | Intergenic | -7.09 | 1.29E-12 | -2.08 | 0.04 | -2.28 | 0.02 | |
| cg10086659 | 2 | 177,040,226 | *HAGLR* | ncRNA\_Exonic | 5.96 | 2.55E-09 | 1.82 | 0.07 | 2.33 | 0.02 | |
| cg08478672 | 8 | 129,374,295 | *MIR1208; LINC00824* | Intergenic | 5.08 | 3.81E-07 | 1.07 | 0.28 | 2.20 | 0.03 | |
| cg06874403 | 10 | 21,799,047 | *CASC10; SKIDA1* | Intergenic | 5.64 | 1.66E-08 | 0.22 | 0.83 | 1.84 | 0.07 | |
| cg04714110 | 10 | 21,799,143 | *CASC10; SKIDA1* | Intergenic | 5.49 | 4.10E-08 | 0.41 | 0.68 | 1.91 | 0.06 | |
| cg04707519 | 10 | 21,799,314 | *CASC10; SKIDA1* | Intergenic | 5.14 | 2.80E-07 | -0.01 | 0.99 | 1.70 | 0.09 | |
| cg03610228 | 10 | 21,799,395 | *CASC10; SKIDA1* | Intergenic | 5.33 | 9.73E-08 | 0.03 | 0.98 | 1.84 | 0.07 | |
| cg12733607 | 10 | 21,813,501 | *SKIDA1* | Intronic | 5.4 | 6.64E-08 | 1.00 | 0.32 | 1.64 | 0.10 | |
| cg10900703 | 10 | 21,824,407 | *MLLT10* | Intronic | -5.3 | 1.17E-07 | -2.08 | 0.04 | -0.47 | 0.64 | |
| cg04231319 | 10 | 21,824,447 | *MLLT10* | Intronic | -5.72 | 1.05E-08 | -2.12 | 0.03 | -0.66 | 0.51 | |
| cg25708777 | 17 | 43,510,841 | *ARHGAP27* | TSS1500 | -7.24 | 4.61E-13 | 1.33 | 0.18 | 1.83 | 0.07 | |
| cg05772917 | 17 | 44,027,251 | *MAPT* | Intronic | 6.6 | 4.23E-11 | -1.72 | 0.09 | -1.35 | 0.18 | |
| cg19139618 | 17 | 46,504,791 | *SKAP1* | Intronic | -4.96 | 7.08E-07 | -0.64 | 0.52 | -2.03 | 0.04 | |
| cg02957270 | 17 | 46,508,097 | *SKAP1* | TSS1500 | 6.92 | 4.40E-12 | 1.82 | 0.07 | 1.78 | 0.08 | |
| cg20152430 | 17 | 46,641,504 | *HOXB3* | Intronic | 5.08 | 3.69E-07 | 1.55 | 0.12 | 1.76 | 0.08 | |
| cg04800503 | 17 | 46,648,533 | *HOXB3* | Intronic | 5.45 | 4.98E-08 | 1.37 | 0.17 | 2.02 | 0.04 | |
| cg01572694 | 17 | 46,657,555 | *HOXB3* | Intronic | -5.83 | 5.52E-09 | -1.81 | 0.07 | -2.68 | 7.32E-03 | |
| cg14285150 | 17 | 46,659,019 | *HOXB3* | Intronic | -5.43 | 5.53E-08 | -1.91 | 0.06 | -2.58 | 9.92E-03 | |
| cg24672833 | 17 | 46,659,318 | *HOXB3* | Intronic | -5.35 | 9.00E-08 | -1.82 | 0.07 | -2.59 | 9.72E-03 | |
| cg22311200 | 17 | 46,695,514 | *HOXB8; HOXB9* | Intergenic | 5.88 | 4.05E-09 | 2.05 | 0.04 | 2.97 | 2.98E-03 | |
| cg26608174 | 17 | 46,711,035 | *MIR196A1; PRAC1* | TSS1500; Downstream | -4.96 | 7.00E-07 | -1.70 | 0.09 | -2.88 | 3.97E-03 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 3. Fourteen CpGs showing a significant differential association with six EOC subtypes** | | | | | | | | | | | | | | | | | |
| CpG | Chr | Pos | Overall | | Serous a | | High-grade serous | | Endometrioid | | Mucinous | | Clear cell | | Low-grade serous | | Cochran's P value |
| Z score | P value | Z score | P value | Z score | P value | Z score | P value | Z score | P value | Z score | P value | Z score | P value |
| cg25137403 | 2 | 177,022,172 | 7.51 | 5.96E-14 | 7.45 | 9.06E-14 | 7.00 | 2.57E-12 | 4.02 | 5.80E-05 | 5.74 | 9.73E-09 | -1.08 | 0.28 | 3.09 | 2.00E-03 | 3.00E-04 |
| cg14454907 | 2 | 177,022,285 | -7.09 | 1.29E-12 | -7.09 | 1.33E-12 | -6.52 | 6.84E-11 | -3.91 | 9.07E-05 | -5.24 | 1.58E-07 | 1.26 | 0.21 | -3.42 | 6.29E-04 | 4.00E-04 |
| cg10086659 | 2 | 177,040,226 | 5.96 | 2.55E-09 | 6.10 | 1.05E-09 | 5.70 | 1.17E-08 | 3.20 | 1.37E-03 | 5.43 | 5.64E-08 | -1.55 | 0.12 | 2.63 | 8.57E-03 | 2.00E-04 |
| cg02019125 | 3 | 156,323,952 | -9.35 | 8.42E-21 | -10.05 | 9.20E-24 | -10.47 | 1.14E-25 | -2.51 | 0.01 | -0.70 | 0.48 | 0.13 | 0.90 | -0.23 | 0.82 | 0.00 |
| cg26405475 | 3 | 156,324,038 | -9.45 | 3.42E-21 | -10.19 | 2.29E-24 | -10.64 | 1.86E-26 | -2.59 | 9.64E-03 | -0.54 | 0.59 | 0.32 | 0.75 | -0.05 | 0.96 | 0.00 |
| cg22481770 | 3 | 156,324,118 | -9.13 | 6.89E-20 | -9.82 | 9.63E-23 | -10.22 | 1.54E-24 | -2.41 | 0.02 | -0.48 | 0.63 | 0.36 | 0.72 | -0.17 | 0.86 | 0.00 |
| cg22211092 | 3 | 156,361,584 | 9.68 | 3.51E-22 | 10.56 | 4.44E-26 | 11.06 | 1.98E-28 | 2.07 | 0.04 | 1.27 | 0.20 | 0.35 | 0.73 | 0.09 | 0.93 | 0.00 |
| cg25738116 | 3 | 156,530,658 | 7.29 | 3.02E-13 | 8.32 | 8.70E-17 | 8.79 | 1.52E-18 | 1.95 | 0.05 | -0.25 | 0.80 | -1.75 | 0.08 | -0.77 | 0.44 | 0.00 |
| cg08832018 | 3 | 156,543,647 | -7.97 | 1.53E-15 | -9.09 | 1.01E-19 | -9.40 | 5.58E-21 | -1.56 | 0.12 | -0.78 | 0.44 | -0.79 | 0.43 | -0.49 | 0.62 | 1.00E-04 |
| cg04491389 | 17 | 44,214,771 | -6.10 | 1.04E-09 | -6.17 | 6.84E-10 | -6.42 | 1.40E-10 | -2.26 | 0.02 | -1.99 | 0.05 | -0.01 | 0.99 | -0.31 | 0.76 | 0.00 |
| cg21956434 | 19 | 17,377,697 | 7.07 | 1.53E-12 | 8.78 | 1.64E-18 | 9.15 | 5.65E-20 | -0.89 | 0.38 | -0.70 | 0.49 | -0.66 | 0.51 | 0.55 | 0.58 | 0.00 |
| ch.19.732135R | 19 | 17,385,198 | 6.70 | 2.06E-11 | 8.60 | 7.77E-18 | 9.08 | 1.12E-19 | -1.20 | 0.23 | -0.85 | 0.40 | -0.83 | 0.41 | 0.07 | 0.95 | 0.00 |
| cg17941109 | 19 | 17,407,198 | -5.94 | 2.88E-09 | -7.01 | 2.45E-12 | -7.05 | 1.77E-12 | 0.79 | 0.43 | -0.48 | 0.63 | -0.63 | 0.53 | -1.50 | 0.13 | 3.00E-04 |
| cg22813366 | 19 | 17,440,072 | -5.63 | 1.82E-08 | -7.21 | 5.53E-13 | -7.22 | 5.05E-13 | 1.22 | 0.22 | 0.61 | 0.54 | 0.23 | 0.82 | -1.23 | 0.22 | 0.00 |
| a Including high-grade serous and low-grade serous ovarian cancers. | | | | | | | | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 4. Seventy-Five CpGs didn't show a significant differential association with six EOC subtypes** | | | | | | | | | | | | | | | | | |
| CpG | Chr | Pos | Over all | | Serous a | | High-grade serous | | Endometrioid | | Mucinous | | Clear cell | | Low-grade serous | | Cochran's P value |
| Z score | P value | Z score | P value | Z score | P value | Z score | P value | Z score | P value | Z score | P value | Z score | P value |
| cg25951210 | 2 | 177,016,619 | -5.49 | 4.04E-08 | -5.30 | 1.17E-07 | -4.91 | 9.11E-07 | -2.52 | 0.01 | -2.37 | 0.02 | -0.30 | 0.77 | -2.43 | 0.02 | 0.70 |
| cg10803577 | 2 | 177,016,837 | -5.41 | 6.33E-08 | -5.06 | 4.28E-07 | -4.77 | 1.84E-06 | -2.60 | 9.25E-03 | -1.31 | 0.19 | -1.03 | 0.30 | -1.98 | 0.05 | 0.95 |
| cg25708328 | 2 | 177,022,056 | 5.54 | 3.02E-08 | 5.45 | 4.95E-08 | 5.18 | 2.21E-07 | 3.94 | 8.10E-05 | 3.82 | 1.31E-04 | -0.21 | 0.84 | 2.22 | 0.03 | 0.09 |
| cg26754761 | 2 | 177,040,938 | 6.02 | 1.76E-09 | 5.74 | 9.32E-09 | 5.45 | 4.99E-08 | 3.09 | 2.01E-03 | 2.06 | 0.04 | 0.63 | 0.53 | 2.18 | 0.03 | 0.78 |
| cg20676716 | 2 | 177,053,568 | -5.06 | 4.13E-07 | -5.02 | 5.24E-07 | -4.73 | 2.28E-06 | -2.95 | 3.15E-03 | -0.99 | 0.32 | -0.74 | 0.46 | -2.02 | 0.04 | 0.82 |
| cg18139273 | 7 | 962,582 | -4.95 | 7.25E-07 | -4.87 | 1.13E-06 | -4.83 | 1.39E-06 | -1.78 | 0.08 | -0.99 | 0.32 | -1.87 | 0.06 | -0.97 | 0.33 | 0.91 |
| cg03634833 | 7 | 965,534 | -5.00 | 5.81E-07 | -4.85 | 1.21E-06 | -4.85 | 1.25E-06 | -2.21 | 0.03 | -1.40 | 0.16 | -1.76 | 0.08 | -0.87 | 0.39 | 0.97 |
| cg08478672 | 8 | 129,374,295 | 5.08 | 3.81E-07 | 5.62 | 1.93E-08 | 5.23 | 1.69E-07 | 1.76 | 0.08 | -0.37 | 0.71 | -0.75 | 0.45 | 2.58 | 9.84E-03 | 0.01 |
| cg14653977 | 9 | 136,038,692 | 5.99 | 2.04E-09 | 6.53 | 6.43E-11 | 6.55 | 5.66E-11 | 2.30 | 0.02 | 2.20 | 0.03 | 0.33 | 0.74 | 0.86 | 0.39 | 0.31 |
| cg21160290 | 9 | 136,149,941 | 4.96 | 7.01E-07 | 5.22 | 1.74E-07 | 5.04 | 4.55E-07 | 1.94 | 0.05 | 1.18 | 0.24 | -0.14 | 0.89 | 1.46 | 0.14 | 0.45 |
| cg22535403 | 9 | 136,150,032 | 5.12 | 3.07E-07 | 5.57 | 2.48E-08 | 5.33 | 9.79E-08 | 1.90 | 0.06 | 0.81 | 0.42 | 0.01 | 0.99 | 1.85 | 0.06 | 0.02 |
| cg24267699 | 9 | 136,151,359 | 5.72 | 1.07E-08 | 6.26 | 3.91E-10 | 6.27 | 3.52E-10 | 2.01 | 0.04 | 1.54 | 0.12 | 0.18 | 0.86 | 0.84 | 0.40 | 0.22 |
| cg13568213 | 9 | 136,387,235 | 5.14 | 2.74E-07 | 6.04 | 1.52E-09 | 5.81 | 6.11E-09 | 1.87 | 0.06 | 1.83 | 0.07 | -0.54 | 0.59 | 1.67 | 0.09 | 0.15 |
| cg06874403 | 10 | 21,799,047 | 5.64 | 1.66E-08 | 5.25 | 1.49E-07 | 5.01 | 5.40E-07 | 1.86 | 0.06 | 1.16 | 0.25 | 2.59 | 9.71E-03 | 1.99 | 0.05 | 0.86 |
| cg04714110 | 10 | 21,799,143 | 5.49 | 4.10E-08 | 5.24 | 1.59E-07 | 4.96 | 7.10E-07 | 1.79 | 0.07 | 1.08 | 0.28 | 2.46 | 0.01 | 2.19 | 0.03 | 0.82 |
| cg04707519 | 10 | 21,799,314 | 5.14 | 2.80E-07 | 4.97 | 6.57E-07 | 4.70 | 2.64E-06 | 1.50 | 0.13 | 1.11 | 0.27 | 2.36 | 0.02 | 2.08 | 0.04 | 0.81 |
| cg03610228 | 10 | 21,799,395 | 5.33 | 9.73E-08 | 4.94 | 7.67E-07 | 4.73 | 2.20E-06 | 2.04 | 0.04 | 1.16 | 0.25 | 2.54 | 0.01 | 1.85 | 0.06 | 0.93 |
| cg12733607 | 10 | 21,813,501 | 5.40 | 6.64E-08 | 4.98 | 6.38E-07 | 4.68 | 2.81E-06 | 1.51 | 0.13 | 0.73 | 0.47 | 2.48 | 0.01 | 2.07 | 0.04 | 0.69 |
| cg10900703 | 10 | 21,824,407 | -5.30 | 1.17E-07 | -4.95 | 7.59E-07 | -4.73 | 2.26E-06 | -1.66 | 0.10 | -0.14 | 0.89 | -2.51 | 0.01 | -1.82 | 0.07 | 0.53 |
| cg04231319 | 10 | 21,824,447 | -5.72 | 1.05E-08 | -5.35 | 8.72E-08 | -5.13 | 2.84E-07 | -1.81 | 0.07 | -0.55 | 0.58 | -2.58 | 9.97E-03 | -1.93 | 0.05 | 0.65 |
| cg23659289 | 17 | 43,472,725 | 7.20 | 5.85E-13 | 6.75 | 1.47E-11 | 7.11 | 1.19E-12 | 3.03 | 2.41E-03 | 2.57 | 0.01 | 1.07 | 0.28 | 0.08 | 0.94 | 0.28 |
| cg07067577 | 17 | 43,506,829 | -7.49 | 6.86E-14 | -7.05 | 1.74E-12 | -7.37 | 1.74E-13 | -3.10 | 1.90E-03 | -2.22 | 0.03 | -1.44 | 0.15 | -0.07 | 0.94 | 0.26 |
| cg08113562 | 17 | 43,508,428 | 7.36 | 1.90E-13 | 6.82 | 8.98E-12 | 7.17 | 7.35E-13 | 3.16 | 1.55E-03 | 2.33 | 0.02 | 1.61 | 0.11 | -0.08 | 0.93 | 0.29 |
| cg16281322 | 17 | 43,510,478 | -7.18 | 6.82E-13 | -6.78 | 1.17E-11 | -7.12 | 1.05E-12 | -3.05 | 2.27E-03 | -2.14 | 0.03 | -1.44 | 0.15 | 0.08 | 0.94 | 0.24 |
| cg25708777 | 17 | 43,510,841 | -7.24 | 4.61E-13 | -7.43 | 1.05E-13 | -7.64 | 2.12E-14 | -2.93 | 3.38E-03 | -1.43 | 0.15 | -1.90 | 0.06 | -0.63 | 0.53 | 0.30 |
| cg26471390 | 17 | 43,511,301 | 7.28 | 3.37E-13 | 6.91 | 4.88E-12 | 7.26 | 3.84E-13 | 3.05 | 2.31E-03 | 2.15 | 0.03 | 1.38 | 0.17 | -0.08 | 0.93 | 0.27 |
| cg06925179 | 17 | 43,578,568 | 7.08 | 1.48E-12 | 6.15 | 7.63E-10 | 6.36 | 2.01E-10 | 2.95 | 3.14E-03 | 3.34 | 8.26E-04 | 0.48 | 0.63 | 0.93 | 0.35 | 0.30 |
| cg04703951 | 17 | 43,578,652 | 6.74 | 1.62E-11 | 6.44 | 1.23E-10 | 6.43 | 1.31E-10 | 2.71 | 6.78E-03 | 2.85 | 4.37E-03 | 0.12 | 0.90 | 1.56 | 0.12 | 0.20 |
| cg03915738 | 17 | 43,651,976 | 6.82 | 8.95E-12 | 6.12 | 9.43E-10 | 6.44 | 1.20E-10 | 3.03 | 2.43E-03 | 2.44 | 0.01 | 0.67 | 0.50 | 0.00 | 1.00 | 0.63 |
| cg12609785 | 17 | 43,660,871 | 6.76 | 1.42E-11 | 5.93 | 2.98E-09 | 6.26 | 3.90E-10 | 2.99 | 2.77E-03 | 2.28 | 0.02 | 0.41 | 0.68 | 0.09 | 0.93 | 0.18 |
| cg04927033 | 17 | 43,679,265 | -7.09 | 1.34E-12 | -6.51 | 7.57E-11 | -6.87 | 6.29E-12 | -3.11 | 1.88E-03 | -2.45 | 0.01 | -0.72 | 0.47 | 0.06 | 0.95 | 0.13 |
| cg16652462 | 17 | 43,679,667 | 6.16 | 7.38E-10 | 5.74 | 9.62E-09 | 6.06 | 1.33E-09 | 2.77 | 5.58E-03 | 2.31 | 0.02 | 0.42 | 0.68 | -0.02 | 0.98 | 0.57 |
| cg23590916 | 17 | 43,697,445 | -7.25 | 4.17E-13 | -6.64 | 3.13E-11 | -6.95 | 3.59E-12 | -3.17 | 1.50E-03 | -2.52 | 0.01 | -0.65 | 0.51 | -0.21 | 0.83 | 0.18 |
| cg15413793 | 17 | 43,700,761 | -5.83 | 5.46E-09 | -6.00 | 1.95E-09 | -6.18 | 6.28E-10 | -2.25 | 0.02 | -1.69 | 0.09 | -0.14 | 0.89 | -0.56 | 0.57 | 0.30 |
| cg03954353 | 17 | 43,715,162 | 6.71 | 1.97E-11 | 6.15 | 7.82E-10 | 6.48 | 9.27E-11 | 3.04 | 2.35E-03 | 2.35 | 0.02 | 0.54 | 0.59 | -0.01 | 0.99 | 0.04 |
| cg01882395 | 17 | 43,717,810 | 6.84 | 7.79E-12 | 6.27 | 3.60E-10 | 6.59 | 4.44E-11 | 2.78 | 5.49E-03 | 2.49 | 0.01 | 0.68 | 0.50 | 0.05 | 0.96 | 0.25 |
| cg27551605 | 17 | 43,862,910 | -6.93 | 4.30E-12 | -6.31 | 2.73E-10 | -6.64 | 3.10E-11 | -3.15 | 1.63E-03 | -2.79 | 5.31E-03 | -0.33 | 0.74 | -0.05 | 0.96 | 0.14 |
| cg24063856 | 17 | 43,863,303 | -5.78 | 7.66E-09 | -5.61 | 2.02E-08 | -5.97 | 2.36E-09 | -2.38 | 0.02 | -1.67 | 0.10 | 0.12 | 0.90 | 0.30 | 0.77 | 0.05 |
| cg00025823 | 17 | 43,909,151 | 5.15 | 2.65E-07 | 4.35 | 1.35E-05 | 4.28 | 1.90E-05 | 2.30 | 0.02 | 2.20 | 0.03 | 0.69 | 0.49 | 1.30 | 0.19 | 0.95 |
| cg15072306 | 17 | 43,922,875 | -6.85 | 7.34E-12 | -6.43 | 1.25E-10 | -6.83 | 8.52E-12 | -3.30 | 9.53E-04 | -1.74 | 0.08 | -1.51 | 0.13 | 0.17 | 0.86 | 0.54 |
| cg05301556 | 17 | 43,971,177 | -6.47 | 9.98E-11 | -5.86 | 4.57E-09 | -6.17 | 6.75E-10 | -2.68 | 7.42E-03 | -2.55 | 0.01 | -0.25 | 0.80 | -0.06 | 0.95 | 0.21 |
| cg00891649 | 17 | 43,972,573 | -6.65 | 2.95E-11 | -6.22 | 4.95E-10 | -6.55 | 5.77E-11 | -2.80 | 5.10E-03 | -2.41 | 0.02 | -0.20 | 0.84 | -0.01 | 0.99 | 0.15 |
| cg18878992 | 17 | 43,974,344 | 7.15 | 8.85E-13 | 6.49 | 8.69E-11 | 6.82 | 9.13E-12 | 3.11 | 1.87E-03 | 2.55 | 0.01 | 0.49 | 0.62 | 0.13 | 0.90 | 0.18 |
| cg10955972 | 17 | 43,976,002 | 7.32 | 2.51E-13 | 6.81 | 9.52E-12 | 7.17 | 7.67E-13 | 3.10 | 1.91E-03 | 2.24 | 0.02 | 1.34 | 0.18 | -0.08 | 0.94 | 0.21 |
| cg05772917 | 17 | 44,027,251 | 6.60 | 4.23E-11 | 5.99 | 2.10E-09 | 6.13 | 8.68E-10 | 2.63 | 8.55E-03 | 2.25 | 0.02 | 0.41 | 0.68 | 0.84 | 0.40 | 0.50 |
| cg03836283 | 17 | 44,058,856 | 7.08 | 1.44E-12 | 6.61 | 3.72E-11 | 6.88 | 5.79E-12 | 2.97 | 3.01E-03 | 2.25 | 0.02 | 1.03 | 0.30 | 0.20 | 0.84 | 0.32 |
| cg01934064 | 17 | 44,064,242 | 7.28 | 3.29E-13 | 6.61 | 3.76E-11 | 6.94 | 3.88E-12 | 3.16 | 1.58E-03 | 2.63 | 8.59E-03 | 0.56 | 0.58 | 0.15 | 0.88 | 0.17 |
| cg00480298 | 17 | 44,068,857 | 5.81 | 6.39E-09 | 5.80 | 6.50E-09 | 6.12 | 9.55E-10 | 2.19 | 0.03 | 1.51 | 0.13 | 0.77 | 0.44 | -0.03 | 0.97 | 0.33 |
| cg24677220 | 17 | 44,075,684 | 6.94 | 3.95E-12 | 6.42 | 1.41E-10 | 6.64 | 3.11E-11 | 2.43 | 0.01 | 3.31 | 9.43E-04 | -0.58 | 0.56 | 0.47 | 0.64 | 0.06 |
| cg07368061 | 17 | 44,090,862 | -7.25 | 4.26E-13 | -6.72 | 1.84E-11 | -7.05 | 1.79E-12 | -3.02 | 2.52E-03 | -2.36 | 0.02 | -0.52 | 0.60 | -0.14 | 0.89 | 0.16 |
| cg09764761 | 17 | 44,105,544 | -7.21 | 5.49E-13 | -6.58 | 4.85E-11 | -6.93 | 4.25E-12 | -3.27 | 1.08E-03 | -2.39 | 0.02 | -0.74 | 0.46 | -0.01 | 0.99 | 3.90E-03 |
| cg13732302 | 17 | 44,222,207 | -6.52 | 7.17E-11 | -6.29 | 3.22E-10 | -6.59 | 4.47E-11 | -2.62 | 8.91E-03 | -2.41 | 0.02 | -0.29 | 0.77 | -0.17 | 0.87 | 0.23 |
| cg23952828 | 17 | 44,246,087 | -6.04 | 1.49E-09 | -6.01 | 1.85E-09 | -6.15 | 7.66E-10 | -2.68 | 7.47E-03 | -1.64 | 0.10 | -0.23 | 0.82 | -0.71 | 0.48 | 0.26 |
| cg21214508 | 17 | 44,248,233 | -5.80 | 6.80E-09 | -5.27 | 1.38E-07 | -5.46 | 4.90E-08 | -2.14 | 0.03 | -2.47 | 0.01 | 0.11 | 0.91 | -0.67 | 0.50 | 0.56 |
| cg19832721 | 17 | 44,249,866 | 6.84 | 8.10E-12 | 6.32 | 2.68E-10 | 6.68 | 2.47E-11 | 2.95 | 3.21E-03 | 2.14 | 0.03 | 0.48 | 0.63 | -0.10 | 0.92 | 0.13 |
| cg19976404 | 17 | 44,250,487 | -5.13 | 2.89E-07 | -5.28 | 1.28E-07 | -5.49 | 4.09E-08 | -2.18 | 0.03 | -1.97 | 0.05 | -0.20 | 0.84 | -0.30 | 0.76 | 0.43 |
| cg06462185 | 17 | 44,305,081 | -5.98 | 2.20E-09 | -5.86 | 4.72E-09 | -6.28 | 3.36E-10 | -2.39 | 0.02 | -2.15 | 0.03 | -0.36 | 0.72 | 0.61 | 0.54 | 0.07 |
| cg06291494 | 17 | 44,321,403 | -7.14 | 9.21E-13 | -6.71 | 1.90E-11 | -7.04 | 1.88E-12 | -2.97 | 2.97E-03 | -2.31 | 0.02 | -0.67 | 0.50 | -0.13 | 0.90 | 0.16 |
| cg14517863 | 17 | 44,321,492 | 7.03 | 2.08E-12 | 6.27 | 3.64E-10 | 6.60 | 4.13E-11 | 3.17 | 1.52E-03 | 2.35 | 0.02 | 0.64 | 0.52 | 0.04 | 0.97 | 0.25 |
| cg08670715 | 17 | 44,341,754 | 6.14 | 8.32E-10 | 5.24 | 1.58E-07 | 5.53 | 3.17E-08 | 2.85 | 4.42E-03 | 2.37 | 0.02 | 0.60 | 0.55 | -0.04 | 0.97 | 0.24 |
| cg05159804 | 17 | 44,343,776 | -6.46 | 1.07E-10 | -5.96 | 2.56E-09 | -6.31 | 2.72E-10 | -2.93 | 3.34E-03 | -2.47 | 0.01 | -0.66 | 0.51 | 0.11 | 0.91 | 0.36 |
| cg18027529 | 17 | 44,344,864 | 6.99 | 2.68E-12 | 6.54 | 6.33E-11 | 6.82 | 9.38E-12 | 2.95 | 3.19E-03 | 2.37 | 0.02 | 0.68 | 0.50 | 0.32 | 0.75 | 0.30 |
| cg24910739 | 17 | 44,657,394 | 7.03 | 2.02E-12 | 6.43 | 1.28E-10 | 6.77 | 1.26E-11 | 3.12 | 1.81E-03 | 2.45 | 0.01 | 0.51 | 0.61 | 0.09 | 0.93 | 0.08 |
| cg19711530 | 17 | 44,847,427 | 5.12 | 3.04E-07 | 4.35 | 1.37E-05 | 4.87 | 1.11E-06 | 2.68 | 7.32E-03 | 1.48 | 0.14 | 1.55 | 0.12 | -1.14 | 0.25 | 0.18 |
| cg19139618 | 17 | 46,504,791 | -4.96 | 7.08E-07 | -4.95 | 7.42E-07 | -4.62 | 3.83E-06 | -2.00 | 0.05 | 0.32 | 0.75 | -2.32 | 0.02 | -2.70 | 6.88E-03 | 0.29 |
| cg02957270 | 17 | 46,508,097 | 6.92 | 4.40E-12 | 7.60 | 2.95E-14 | 7.41 | 1.25E-13 | 2.20 | 0.03 | 0.35 | 0.72 | 1.28 | 0.20 | 2.46 | 0.01 | 0.07 |
| cg12350474 | 17 | 46,578,476 | -5.82 | 5.74E-09 | -6.05 | 1.49E-09 | -5.84 | 5.26E-09 | -1.82 | 0.07 | -0.23 | 0.82 | -0.17 | 0.86 | -2.27 | 0.02 | 0.13 |
| cg20152430 | 17 | 46,641,504 | 5.08 | 3.69E-07 | 5.53 | 3.12E-08 | 5.44 | 5.32E-08 | 0.57 | 0.57 | 0.45 | 0.65 | 0.23 | 0.82 | 1.64 | 0.10 | 0.10 |
| cg04800503 | 17 | 46,648,533 | 5.45 | 4.98E-08 | 5.84 | 5.24E-09 | 5.36 | 8.52E-08 | 1.07 | 0.29 | 0.84 | 0.40 | 0.52 | 0.60 | 3.09 | 1.99E-03 | 0.12 |
| cg12910797 | 17 | 46,651,722 | 5.03 | 4.82E-07 | 5.35 | 8.79E-08 | 5.34 | 9.43E-08 | 0.96 | 0.34 | 0.10 | 0.92 | 0.33 | 0.74 | 1.40 | 0.16 | 0.18 |
| cg01572694 | 17 | 46,657,555 | -5.83 | 5.52E-09 | -6.22 | 4.98E-10 | -5.65 | 1.60E-08 | -1.73 | 0.08 | -0.15 | 0.88 | -0.55 | 0.58 | -3.52 | 4.33E-04 | 0.03 |
| cg14285150 | 17 | 46,659,019 | -5.43 | 5.53E-08 | -5.95 | 2.66E-09 | -5.48 | 4.29E-08 | -1.34 | 0.18 | 0.46 | 0.65 | -0.79 | 0.43 | -3.05 | 2.29E-03 | 0.05 |
| cg24672833 | 17 | 46,659,318 | -5.35 | 9.00E-08 | -5.77 | 7.88E-09 | -5.34 | 9.09E-08 | -1.33 | 0.18 | 0.27 | 0.79 | -0.61 | 0.54 | -2.97 | 2.96E-03 | 0.07 |
| cg22311200 | 17 | 46,695,514 | 5.88 | 4.05E-09 | 6.52 | 7.21E-11 | 6.35 | 2.12E-10 | 1.02 | 0.31 | 0.28 | 0.78 | 0.40 | 0.69 | 1.99 | 0.05 | 0.04 |
| cg26608174 | 17 | 46,711,035 | -4.96 | 7.00E-07 | -5.10 | 3.31E-07 | -4.71 | 2.43E-06 | -1.30 | 0.19 | -1.06 | 0.29 | -0.83 | 0.41 | -2.43 | 0.02 | 0.59 |
| a Including high-grade serous and low-grade serous ovarian cancers. | | | | | | | | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 5. Correlations between methylation levels at 22 CpGs and expression levels of 11 homologous recombination (HR) genes, data from the Framingham Heart Study (FHS)** | | | | | | | | | | |
| CpG | Chr | Position | Gene | Chr | Start | End | CpG Vs. Gex a | | CpG Vs. EOC risk | |
| Rho | P value | Z score | P value |
| cg14454907 | 2 | 177,022,285 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.12 | 1.34E-05 | -7.09 | 1.29E-12 |
| cg22211092 | 3 | 156,361,584 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.14 | 9.33E-08 | 9.68 | 3.51E-22 |
| cg25738116 | 3 | 156,530,658 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.23 | 2.71E-18 | 7.29 | 3.02E-13 |
| cg08832018 | 3 | 156,543,647 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.11 | 2.22E-05 | -7.97 | 1.53E-15 |
| cg13568213 | 9 | 136,387,235 | *ATM* | 11 | 108,093,211 | 108,239,829 | -0.28 | 9.58E-27 | 5.14 | 2.74E-07 |
| cg12733607 | 10 | 21,813,501 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.15 | 3.61E-08 | 5.40 | 6.64E-08 |
| cg10900703 | 10 | 21,824,407 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.25 | 3.92E-21 | -5.30 | 1.17E-07 |
| cg04231319 | 10 | 21,824,447 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.17 | 2.34E-10 | -5.72 | 1.05E-08 |
| cg23659289 | 17 | 43,472,725 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.28 | 1.90E-25 | 7.20 | 5.85E-13 |
| cg16281322 | 17 | 43,510,478 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.23 | 1.47E-18 | -7.18 | 6.82E-13 |
| cg25708777 | 17 | 43,510,841 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.22 | 4.73E-16 | -7.24 | 4.61E-13 |
| cg26471390 | 17 | 43,511,301 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.15 | 1.86E-08 | 7.28 | 3.37E-13 |
| cg09764761 | 17 | 44,105,544 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.15 | 1.78E-08 | -7.21 | 5.49E-13 |
| cg21214508 | 17 | 44,248,233 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.15 | 2.81E-08 | -5.80 | 6.80E-09 |
| cg08670715 | 17 | 44,341,754 | *ATM* | 11 | 108,093,211 | 108,239,829 | -0.23 | 2.54E-18 | 6.14 | 8.32E-10 |
| cg19139618 | 17 | 46,504,791 | *ATM* | 11 | 108,093,211 | 108,239,829 | -0.23 | 9.80E-18 | -4.96 | 7.08E-07 |
| cg12350474 | 17 | 46,578,476 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.2 | 4.01E-14 | -5.82 | 5.74E-09 |
| cg01572694 | 17 | 46,657,555 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.18 | 6.31E-11 | -5.83 | 5.52E-09 |
| cg14285150 | 17 | 46,659,019 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.14 | 3.11E-07 | -5.43 | 5.53E-08 |
| cg17941109 | 19 | 17,407,198 | *ATM* | 11 | 108,093,211 | 108,239,829 | 0.19 | 1.00E-12 | -5.94 | 2.88E-09 |
| cg25738116 | 3 | 156,530,658 | *BARD1* | 2 | 215,590,370 | 215,674,428 | 0.11 | 2.75E-05 | 7.29 | 3.02E-13 |
| cg25738116 | 3 | 156,530,658 | *BRCA2* | 13 | 32,889,611 | 32,973,805 | 0.13 | 2.69E-06 | 7.29 | 3.02E-13 |
| cg13568213 | 9 | 136,387,235 | *BRCA2* | 13 | 32,889,611 | 32,973,805 | -0.12 | 1.56E-05 | 5.14 | 2.74E-07 |
| cg01572694 | 17 | 46,657,555 | *BRCA2* | 13 | 32,889,611 | 32,973,805 | 0.13 | 1.16E-06 | -5.83 | 5.52E-09 |
| cg13568213 | 9 | 136,387,235 | *BRIP1* | 17 | 59,758,627 | 59,940,882 | -0.13 | 1.89E-06 | 5.14 | 2.74E-07 |
| cg10900703 | 10 | 21,824,407 | *BRIP1* | 17 | 59,758,627 | 59,940,882 | 0.13 | 2.42E-06 | -5.30 | 1.17E-07 |
| cg23659289 | 17 | 43,472,725 | *BRIP1* | 17 | 59,758,627 | 59,940,882 | 0.14 | 1.02E-07 | 7.20 | 5.85E-13 |
| cg08670715 | 17 | 44,341,754 | *BRIP1* | 17 | 59,758,627 | 59,940,882 | -0.11 | 2.42E-05 | 6.14 | 8.32E-10 |
| cg01572694 | 17 | 46,657,555 | *BRIP1* | 17 | 59,758,627 | 59,940,882 | 0.11 | 2.56E-05 | -5.83 | 5.52E-09 |
| cg12733607 | 10 | 21,813,501 | *CHEK1* | 11 | 125,495,036 | 125,546,150 | 0.12 | 8.91E-06 | 5.40 | 6.64E-08 |
| cg23659289 | 17 | 43,472,725 | *CHEK1* | 11 | 125,495,036 | 125,546,150 | 0.12 | 3.98E-06 | 7.20 | 5.85E-13 |
| cg23659289 | 17 | 43,472,725 | *FANCA* | 16 | 89,803,957 | 89,883,065 | -0.11 | 2.77E-05 | 7.20 | 5.85E-13 |
| cg19139618 | 17 | 46,504,791 | *FANCA* | 16 | 89,803,957 | 89,883,065 | 0.12 | 5.09E-06 | -4.96 | 7.08E-07 |
| cg25738116 | 3 | 156,530,658 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.14 | 2.12E-07 | 7.29 | 3.02E-13 |
| cg13568213 | 9 | 136,387,235 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | -0.15 | 4.43E-08 | 5.14 | 2.74E-07 |
| cg10900703 | 10 | 21,824,407 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.12 | 3.64E-06 | -5.30 | 1.17E-07 |
| cg23659289 | 17 | 43,472,725 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.16 | 1.52E-09 | 7.20 | 5.85E-13 |
| cg16281322 | 17 | 43,510,478 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.12 | 1.07E-05 | -7.18 | 6.82E-13 |
| cg25708777 | 17 | 43,510,841 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.16 | 3.26E-09 | -7.24 | 4.61E-13 |
| cg08670715 | 17 | 44,341,754 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | -0.14 | 1.48E-07 | 6.14 | 8.32E-10 |
| cg19139618 | 17 | 46,504,791 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | -0.15 | 3.35E-08 | -4.96 | 7.08E-07 |
| cg12350474 | 17 | 46,578,476 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.13 | 5.96E-07 | -5.82 | 5.74E-09 |
| cg01572694 | 17 | 46,657,555 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.14 | 1.78E-07 | -5.83 | 5.52E-09 |
| cg14285150 | 17 | 46,659,019 | *MRE11A* | 11 | 94,152,895 | 94,227,074 | 0.13 | 3.05E-06 | -5.43 | 5.53E-08 |
| cg25738116 | 3 | 156,530,658 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.16 | 7.47E-09 | 7.29 | 3.02E-13 |
| cg13568213 | 9 | 136,387,235 | *MSH2* | 2 | 47,630,108 | 47,789,450 | -0.2 | 5.22E-14 | 5.14 | 2.74E-07 |
| cg12733607 | 10 | 21,813,501 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.14 | 1.66E-07 | 5.40 | 6.64E-08 |
| cg10900703 | 10 | 21,824,407 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.19 | 1.05E-12 | -5.30 | 1.17E-07 |
| cg04231319 | 10 | 21,824,447 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.15 | 1.68E-08 | -5.72 | 1.05E-08 |
| cg23659289 | 17 | 43,472,725 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.23 | 4.60E-18 | 7.20 | 5.85E-13 |
| cg16281322 | 17 | 43,510,478 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.2 | 1.37E-13 | -7.18 | 6.82E-13 |
| cg25708777 | 17 | 43,510,841 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.17 | 8.29E-11 | -7.24 | 4.61E-13 |
| cg26471390 | 17 | 43,511,301 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.13 | 1.74E-06 | 7.28 | 3.37E-13 |
| cg09764761 | 17 | 44,105,544 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.12 | 9.57E-06 | -7.21 | 5.49E-13 |
| cg21214508 | 17 | 44,248,233 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.15 | 3.70E-08 | -5.80 | 6.80E-09 |
| cg08670715 | 17 | 44,341,754 | *MSH2* | 2 | 47,630,108 | 47,789,450 | -0.16 | 8.62E-10 | 6.14 | 8.32E-10 |
| cg19139618 | 17 | 46,504,791 | *MSH2* | 2 | 47,630,108 | 47,789,450 | -0.2 | 7.31E-14 | -4.96 | 7.08E-07 |
| cg12350474 | 17 | 46,578,476 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.18 | 1.84E-11 | -5.82 | 5.74E-09 |
| cg01572694 | 17 | 46,657,555 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.14 | 8.22E-08 | -5.83 | 5.52E-09 |
| cg14285150 | 17 | 46,659,019 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.12 | 1.35E-05 | -5.43 | 5.53E-08 |
| cg17941109 | 19 | 17,407,198 | *MSH2* | 2 | 47,630,108 | 47,789,450 | 0.16 | 3.01E-09 | -5.94 | 2.88E-09 |
| cg25137403 | 2 | 177,022,172 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.12 | 1.30E-05 | 7.51 | 5.96E-14 |
| cg22211092 | 3 | 156,361,584 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.15 | 4.52E-08 | 9.68 | 3.51E-22 |
| cg25738116 | 3 | 156,530,658 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.12 | 6.26E-06 | 7.29 | 3.02E-13 |
| cg13568213 | 9 | 136,387,235 | *PALB2* | 16 | 23,614,488 | 23,652,631 | -0.14 | 1.90E-07 | 5.14 | 2.74E-07 |
| cg12733607 | 10 | 21,813,501 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.12 | 5.23E-06 | 5.40 | 6.64E-08 |
| cg23659289 | 17 | 43,472,725 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.18 | 1.16E-11 | 7.20 | 5.85E-13 |
| cg25708777 | 17 | 43,510,841 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.13 | 2.58E-06 | -7.24 | 4.61E-13 |
| cg08670715 | 17 | 44,341,754 | *PALB2* | 16 | 23,614,488 | 23,652,631 | -0.14 | 5.40E-07 | 6.14 | 8.32E-10 |
| cg19139618 | 17 | 46,504,791 | *PALB2* | 16 | 23,614,488 | 23,652,631 | -0.12 | 8.76E-06 | -4.96 | 7.08E-07 |
| cg12350474 | 17 | 46,578,476 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.13 | 2.47E-06 | -5.82 | 5.74E-09 |
| cg24672833 | 17 | 46,659,318 | *PALB2* | 16 | 23,614,488 | 23,652,631 | 0.12 | 7.77E-06 | -5.35 | 9.00E-08 |
| cg14454907 | 2 | 177,022,285 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.12 | 8.84E-06 | -7.09 | 1.29E-12 |
| cg22211092 | 3 | 156,361,584 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.16 | 7.12E-09 | 9.68 | 3.51E-22 |
| cg25738116 | 3 | 156,530,658 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.17 | 4.04E-10 | 7.29 | 3.02E-13 |
| cg13568213 | 9 | 136,387,235 | *RAD50* | 5 | 131,891,711 | 131,980,313 | -0.19 | 4.56E-13 | 5.14 | 2.74E-07 |
| cg12733607 | 10 | 21,813,501 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.14 | 4.39E-07 | 5.40 | 6.64E-08 |
| cg10900703 | 10 | 21,824,407 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.14 | 4.06E-07 | -5.30 | 1.17E-07 |
| cg23659289 | 17 | 43,472,725 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.17 | 1.75E-10 | 7.20 | 5.85E-13 |
| cg16281322 | 17 | 43,510,478 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.15 | 5.55E-08 | -7.18 | 6.82E-13 |
| cg25708777 | 17 | 43,510,841 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.18 | 4.41E-11 | -7.24 | 4.61E-13 |
| cg21214508 | 17 | 44,248,233 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.14 | 3.25E-07 | -5.80 | 6.80E-09 |
| cg08670715 | 17 | 44,341,754 | *RAD50* | 5 | 131,891,711 | 131,980,313 | -0.16 | 1.60E-09 | 6.14 | 8.32E-10 |
| cg19139618 | 17 | 46,504,791 | *RAD50* | 5 | 131,891,711 | 131,980,313 | -0.15 | 5.12E-08 | -4.96 | 7.08E-07 |
| cg01572694 | 17 | 46,657,555 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.14 | 7.43E-08 | -5.83 | 5.52E-09 |
| cg14285150 | 17 | 46,659,019 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.13 | 8.62E-07 | -5.43 | 5.53E-08 |
| cg24672833 | 17 | 46,659,318 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.12 | 1.22E-05 | -5.35 | 9.00E-08 |
| cg17941109 | 19 | 17,407,198 | *RAD50* | 5 | 131,891,711 | 131,980,313 | 0.14 | 9.07E-08 | -5.94 | 2.88E-09 |
| cg23659289 | 17 | 43,472,725 | *RAD51C* | 17 | 56,769,934 | 56,811,703 | 0.12 | 6.71E-06 | 7.20 | 5.85E-13 |
| cg19139618 | 17 | 46,504,791 | *RAD51C* | 17 | 56,769,934 | 56,811,703 | -0.11 | 2.18E-05 | -4.96 | 7.08E-07 |
| cg12350474 | 17 | 46,578,476 | *RAD51C* | 17 | 56,769,934 | 56,811,703 | 0.13 | 7.74E-07 | -5.82 | 5.74E-09 |
| a Gex, gene expression. | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 6. Correlations between methylation levels at 26 CpGs and expression levels of 12 genes, data from the FHS** | | | | | | |
| CpG | Chr | Position | Classification | Closest gene | Rho | P value |
| cg25137403 | 2 | 177,022,172 | Downstream | *HOXD4* | -0.06 | 0.02 |
| cg14454907 | 2 | 177,022,285 | Downstream | *HOXD4* | -0.06 | 0.03 |
| cg22211092 | 3 | 156,361,584 | Downstream | *SSR3* | 0.09 | 9.43E-04 |
| cg03634833 | 7 | 965,534 | Intronic | *ADAP1* | -0.08 | 2.99E-03 |
| cg14653977 | 9 | 136,038,692 | Intronic | *GBGT1* | -0.06 | 0.02 |
| cg21160290 | 9 | 136,149,941 | Intronic | *ABO* | -0.07 | 6.71E-03 |
| cg22535403 | 9 | 136,150,032 | Intronic | *ABO* | -0.07 | 0.02 |
| cg24267699 | 9 | 136,151,359 | TSS1500 | *ABO* | -0.09 | 8.07E-04 |
| cg10900703 | 10 | 21,824,407 | Intronic | *MLLT10* | 0.18 | 2.79E-11 |
| cg04231319 | 10 | 21,824,447 | Intronic | *MLLT10* | 0.12 | 1.36E-05 |
| cg23659289 | 17 | 43,472,725 | 3'UTR | *ARHGAP27* | -0.19 | 9.89E-13 |
| cg07067577 | 17 | 43,506,829 | 3'UTR | *ARHGAP27* | -0.09 | 1.20E-03 |
| cg16281322 | 17 | 43,510,478 | TSS200 | *ARHGAP27* | -0.16 | 1.14E-09 |
| cg25708777 | 17 | 43,510,841 | TSS1500 | *ARHGAP27* | -0.15 | 4.11E-08 |
| cg26471390 | 17 | 43,511,301 | Downstream | *ARHGAP27* | -0.09 | 1.38E-03 |
| cg18878992 | 17 | 43,974,344 | 5'UTR | *MAPT* | -0.08 | 2.64E-03 |
| cg03836283 | 17 | 44,058,856 | Intronic | *MAPT* | 0.06 | 0.03 |
| cg00480298 | 17 | 44,068,857 | Exonic | *MAPT* | -0.08 | 3.98E-03 |
| cg07368061 | 17 | 44,090,862 | Intronic | *MAPT* | 0.08 | 2.02E-03 |
| cg19139618 | 17 | 46,504,791 | Intronic | *SKAP1* | -0.21 | 2.98E-15 |
| cg02957270 | 17 | 46,508,097 | TSS1500 | *SKAP1* | 0.07 | 0.01 |
| cg01572694 | 17 | 46,657,555 | Intronic | *HOXB3* | 0.07 | 7.49E-03 |
| cg14285150 | 17 | 46,659,019 | Intronic | *HOXB3* | 0.11 | 8.44E-05 |
| cg24672833 | 17 | 46,659,318 | Intronic | *HOXB3* | 0.08 | 5.51E-03 |
| cg22311200 | 17 | 46,695,514 | Downstream | *HOXB8* | 0.08 | 2.59E-03 |
| cg17941109 | 19 | 17,407,198 | Intronic | *ABHD8* | -0.06 | 0.03 |

**A picture containing sky

Description generated with very high confidenceSupplementary Figure 1.** Manhattan plot of associations between genetically predicted methylation levels at 62,938 CpGs and EOC risk. The results are based on 22,406 EOC cases and 40,941 controls from OCAC. The blue line represents *P*=7.94×10-7.

**Supplementary Figure** **1**. Manhattan plot of association between genetically-predicted methylation at 62,938 CpGs and EOC risk