|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Supplement Table 1. List of all SNPs assessed |  |  |  |  |  |  |  |
|  |  | **Chromosome** | **Gene** |  |  | **Major/ Minor** | **MAF**1 | **FDR HWE *p*** |
| **Gene** | **Alias** | **Location** | **PARTP** | **dbSNP ID** | **Coordinate** | **Allele** | **NHW** | **HISP** | **NHW** | **HISP** |
| *ACVR1*  | *ACTRI, ACVR1A, ALK2,SKR1,*  | 2q23-q24  | 0.87 | rs2033962  | 158638441 | G/T  | 0.17 | 0.14 | 0.96 | 0.68 |
|  |   |  | rs4380178  | 158668445 | G/A  | 0.14 | 0.13 | 1.00 | 0.63 |
|  | *ACVRLK2,* |   |  | rs1220134  | 158603556 | T/A  | 0.29 | 0.20 | 0.96 | 0.81 |
|  | *FOP, TSRI*  |   |  | rs920522  | 158705824 | T/C  | 0.07 | 0.08 | 0.96 | 0.78 |
|  |  |   |  | rs2165436  | 158726896 | C/T  | 0.15 | 0.14 | 0.96 | 0.76 |
|  |  |   |  | rs6437117  | 158723183 | A/T  | 0.15 | 0.12 | 0.89 | 0.49 |
|  |  |   |  | rs17182166  | 158596197 | G/T  | 0.17 | 0.07 | 0.86 | 0.68 |
|  |  |   |  | rs1146035  | 158633411 | G/T  | 0.18 | 0.13 | 0.96 | 0.74 |
|  |  |   |  | rs17798043  | 158663277 | C/T  | 0.08 | 0.04 | 0.97 | 0.002 |
|  |  |   |  | rs10497191  | 158667217 | C/T  | 0.13 | 0.14 | 0.98 | 0.98 |
|  |  |   |  | rs10497192  | 158671700 | T/C  | 0.26 | 0.27 | 1.00 | 0.94 |
|  |  |   |  | rs4233672  | 158691926 | G/A  | 0.17 | 0.18 | 0.96 | 0.92 |
|  |  |   |  | rs10933443  | 158694121 | T/C  | 0.25 | 0.25 | 0.96 | 0.64 |
|  |  |   |  | rs2883605  | 158696529 | G/T  | 0.09 | 0.05 | 0.96 | 0.87 |
|  |  |   |  | rs10497193  | 158709678 | A/G  | 0.17 | 0.14 | 1.00 | 0.59 |
|  |  |   |  | rs4664901  | 158712538 | T/C  | 0.23 | 0.22 | 0.96 | 0.97 |
| *ACVR2A*  | *ACTRII,*  | 2q22.3  | 0.80 | rs1014064  | 148612154 | A/G  | 0.31 | 0.44 | 0.96 | 0.95 |
|  | *ACVR2*  |   |  | rs2161983  | 148649386 | C/T  | 0.31 | 0.44 | 0.96 | 0.81 |
|  |  |   |  | rs3768687  | 148672020 | G/A  | 0.31 | 0.44 | 0.96 | 0.83 |
|  |  |   |  | rs3768688  | 148671101 | C/T  | 0.42 | 0.40 | 0.62 | 0.59 |
|  |  |   |  | rs1424941  | 148643118 | G/A  | 0.21 | 0.10 | 0.98 | 0.81 |
|  |  |   |  | rs10497025  | 148662202 | C/G  | 0.25 | 0.20 | 0.96 | 0.57 |
| *ACVR2B*  | *ACTRIIB,*  | 3p22  | 0.82 | rs928813  | 38528537 | G/T  | 0.57 | 0.34 | 0.96 | 0.20 |
|  | *MGC116908,* |   |  | rs2276541  | 38512779 | A/G  | 0.38 | 0.49 | 0.96 | 0.84 |
|  | *ActR-IIB* |   |  | rs503327  | 38524363 | G/A  | 0.11 | 0.05 | 0.91 | 0.94 |
| *ACVRL1*  | *HHT, HHT2,*  | 12q11-q14  | 0.91 | rs7956340  | 52302443 | T/G  | 0.08 | 0.24 | 0.96 | 0.68 |
|  | *ALK-1, ALK1,* |   |  | rs11169953  | 52304399 | C/T  | 0.32 | 0.29 | 0.98 | 0.59 |
|  | *ACVRLK1,TSR-I,* |   |  | rs706819  | 52315923 | G/A  | 0.26 | 0.50 | 1.00 | 0.86 |
|  | *ORW2, SKR3,*  |   |  | rs2641534  | 52317973 | C/T  | 0.12 | 0.14 | 0.97 | 0.27 |
| *BMP1*  | *FLJ44432,*  | 8p21  | 0.21 | rs7592  | 22021883 | G/A  | 0.33 | 0.29 | 0.96 | 0.59 |
|  | *PCOLC,* |   |  | rs7812993  | 22025644 | A/G  | 0.22 | 0.20 | 0.96 | 0.63 |
|  | *PCP,* |   |  | rs4872360  | 22028668 | T/C  | 0.27 | 0.23 | 0.96 | 0.91 |
|  | *TLD* |   |  | rs12114940  | 22048790 | T/G  | 0.41 | 0.48 | 0.96 | 0.88 |
|  |  |   |  | rs3924231  | 22049780 | T/C  | 0.17 | 0.17 | 0.86 | 0.43 |
|  |  |   |  | rs3924229  | 22049892 | T/C  | 0.11 | 0.07 | 0.91 | 0.75 |
|  |  |   |  | rs4075478  | 22053123 | T/C  | 0.36 | 0.54 | 0.62 | 0.52 |
|  |  |   |  | rs3857979  | 22055348 | C/T  | 0.53 | 0.40 | 0.89 | 0.30 |
|  |  |   |  | rs11775186  | 22058122 | T/G  | 0.10 | 0.05 | 0.96 | 0.23 |
|  |  |   |  | rs13257482  | 22059606 | G/A  | 0.22 | 0.24 | 0.98 | 0.06 |
| *BMP2*  | *BMP2A*  | 20p12  | 0.04 | rs1979855  | 6747607 | T/C  | 0.18 | 0.10 | 0.89 | 0.63 |
|  |  |   |  | rs7270163  | 6751316 | A/G  | 0.11 | 0.17 | 0.99 | 0.85 |
|  |  |   |  | rs1005464  | 6756148 | G/A  | 0.23 | 0.22 | 1.00 | 0.61 |
|  |  |   |  | rs15705  | 6759980 | A/C  | 0.23 | 0.14 | 0.96 | 0.27 |
|  |  |   |  | rs3178250  | 6760201 | T/C  | 0.21 | 0.13 | 0.96 | 0.45 |
|  |  |   |  | rs235770  | 6761765 | C/T  | 0.36 | 0.31 | 0.96 | 0.95 |
| *BMP4*  | *BMP2B,*  | 14q22-q23  | 0.02 | rs17563  | 54417522 | T/C  | 0.56 | 0.31 | 0.86 | 0.06 |
|  | *BMP2B1* |   |  | rs762642  | 54423053 | T/G  | 0.41 | 0.42 | 0.98 | 0.76 |
|  | *ZYME* |   |  | rs2761887  | 54425052 | A/C  | 0.44 | 0.43 | 0.96 | 0.69 |
|  |  |   |  | rs4898820  | 54427057 | T/G  | 0.47 | 0.49 | 0.96 | 0.81 |
| *BMP6*  | *VGR, VGR1*  | 6p24-p23  | 0.14 | rs267190  | 7842121 | T/G  | 0.58 | 0.35 | 1.00 | 0.02 |
|  |  |   |  | rs267204  | 7860158 | A/G  | 0.22 | 0.13 | 0.96 | 0.40 |
|  |  |   |  | rs267205  | 7860317 | A/G  | 0.25 | 0.53 | 0.86 | 0.06 |
|  |  |   |  | rs270398  | 7765840 | C/A  | 0.19 | 0.19 | 0.96 | 0.96 |
|  |  |   |  | rs10498671  | 7797591 | T/C  | 0.18 | 0.17 | 0.97 | 0.69 |
|  |  |   |  | rs1225929  | 7874233 | A/T  | 0.61 | 0.33 | 0.96 | 0.09 |
|  |  |   |  | rs11759532  | 7791277 | C/A  | 0.40 | 0.51 | 1.00 | 0.43 |
|  |  |   |  | rs267806  | 7819895 | C/T  | 0.28 | 0.58 | 0.97 | 0.01 |
|  |  |   |  | rs9505293  | 7870593 | G/T  | 0.12 | 0.13 | 0.82 | 0.74 |
|  |  |   |  | rs270413  | 7749643 | T/C  | 0.50 | 0.38 | 0.96 | 0.77 |
|  |  |   |  | rs13196371  | 7748785 | G/C  | 0.16 | 0.21 | 0.96 | 0.59 |
|  |  |   |  | rs2326994  | 7810021 | A/G  | 0.29 | 0.14 | 0.98 | 0.07 |
|  |  |   |  | rs3812163  | 7725760 | T/A  | 0.46 | 0.26 | 0.98 | 0.61 |
|  |  |   |  | rs9505276  | 7751449 | A/G  | 0.18 | 0.19 | 0.52 | 0.68 |
|  |  |   |  | rs11243204  | 7772699 | A/G  | 0.23 | 0.23 | 0.81 | 0.78 |
|  |  |   |  | rs1107495  | 7726057 | A/G  | 0.19 | 0.43 | 0.98 | 0.0004 |
|  |  |   |  | rs270417  | 7729614 | T/C  | 0.28 | 0.18 | 0.96 | 0.02 |
|  |  |   |  | rs6910759  | 7733862 | A/G  | 0.46 | 0.25 | 0.96 | 0.71 |
|  |  |   |  | rs199205  | 7736417 | C/G  | 0.20 | 0.19 | 0.96 | 0.58 |
|  |  |   |  | rs2068361  | 7736743 | G/A  | 0.25 | 0.36 | 0.97 | 0.62 |
|  |  |   |  | rs911749  | 7738959 | G/A  | 0.23 | 0.33 | 1.00 | 0.01 |
|  |  |   |  | rs11964227  | 7820669 | G/A  | 0.43 | 0.29 | 0.96 | 0.73 |
|  |  |   |  | rs12215656  | 7829209 | G/A  | 0.15 | 0.05 | 0.93 | 0.68 |
| *BMP7*  | *OP-1*  | 20q13  | 0.58 | rs1475000  | 55792997 | A/G  | 0.41 | 0.40 | 0.96 | 0.48 |
|  |  |   |  | rs6127978  | 55819173 | A/G  | 0.14 | 0.28 | 0.62 | 0.51 |
|  |  |   |  | rs12438  | 55743905 | A/G  | 0.51 | 0.41 | 0.96 | 0.64 |
|  |  |   |  | rs4811822  | 55778969 | T/C  | 0.50 | 0.46 | 0.86 | 0.26 |
|  |  |   |  | rs162315  | 55808880 | G/A  | 0.22 | 0.33 | 0.86 | 0.78 |
|  |  |   |  | rs6127983  | 55824475 | T/C  | 0.34 | 0.48 | 0.96 | 0.52 |
|  |  |   |  | rs6123674  | 55762947 | A/G  | 0.41 | 0.35 | 0.91 | 0.38 |
|  |  |   |  | rs17404303  | 55803687 | C/T  | 0.43 | 0.29 | 0.96 | 0.63 |
|  |  |   |  | rs162317  | 55812278 | G/A  | 0.41 | 0.40 | 0.96 | 0.59 |
|  |  |   |  | rs3787380  | 55754110 | T/C  | 0.39 | 0.52 | 1.00 | 0.29 |
|  |  |   |  | rs17480735  | 55745485 | G/A  | 0.08 | 0.04 | 0.96 | 0.90 |
|  |  |   |  | rs13037653  | 55754239 | T/C  | 0.07 | 0.03 | 0.82 | 0.92 |
|  |  |   |  | rs6064508  | 55760567 | T/C  | 0.36 | 0.30 | 0.98 | 0.62 |
|  |  |   |  | rs7273197  | 55812058 | C/T  | 0.33 | 0.24 | 0.96 | 0.89 |
|  |  |   |  | rs6014949  | 55752810 | G/A  | 0.51 | 0.42 | 0.96 | 0.60 |
|  |  |   |  | rs3787382  | 55755170 | C/T  | 0.19 | 0.23 | 0.96 | 0.83 |
|  |  |   |  | rs6025446  | 55786811 | A/G  | 0.41 | 0.51 | 0.96 | 0.01 |
|  |  |   |  | rs12481628  | 55787622 | A/G  | 0.43 | 0.43 | 0.86 | 0.57 |
|  |  |   |  | rs172983  | 55800039 | G/A  | 0.10 | 0.25 | 0.89 | 0.82 |
|  |  |   |  | rs2180780  | 55800721 | C/G  | 0.44 | 0.42 | 0.96 | 0.78 |
|  |  |   |  | rs6127973  | 55806280 | G/A  | 0.13 | 0.15 | 0.97 | 0.98 |
|  |  |   |  | rs6025468  | 55830151 | A/G  | 0.20 | 0.20 | 0.86 | 0.38 |
|  |  |   |  | rs6070036  | 55831445 | G/T  | 0.11 | 0.06 | 0.68 | 0.71 |
|  |  |   |  | rs6014967  | 55836028 | G/A  | 0.21 | 0.31 | 0.96 | 0.95 |
| *BMPR1A*  | *ACVRLK3,*  | 10q22.3  | 0.66 | rs6586034  | 88524209 | T/G  | 0.42 | 0.49 | 0.96 | 0.71 |
|  | *ALK3,*  |   |  | rs7088641  | 88532510 | T/C  | 0.30 | 0.37 | 0.97 | 0.74 |
|  | *CD292*  |   |  | rs2168730  | 88567036 | A/G  | 0.24 | 0.35 | 0.96 | 0.57 |
|  |  |   |  | rs12415784  | 88572727 | T/C  | 0.16 | 0.28 | 1.00 | 0.35 |
|  |  |   |  | rs7895217  | 88588739 | T/A  | 0.36 | 0.43 | 0.96 | 0.50 |
|  |  |   |  | rs2883420  | 88611122 | T/C  | 0.38 | 0.45 | 0.96 | 0.69 |
|  |  |   |  | rs4934275  | 88617392 | T/C  | 0.13 | 0.30 | 0.96 | 0.92 |
|  |  |   |  | rs10887668  | 88662216 | A/C  | 0.11 | 0.08 | 0.86 | 0.68 |
|  |  |   |  | rs12765929  | 88682555 | G/T  | 0.27 | 0.37 | 0.96 | 0.46 |
| *BMPR1B*  | *ALK-6,* | 4q22-q24  | 0.44 | rs10049681  | 95684380 | T/C  | 0.27 | 0.53 | 0.96 | 0.71 |
|  | *ALK6,*  |   |  | rs12508087  | 95692641 | T/A  | 0.24 | 0.19 | 0.96 | 0.98 |
|  | *CDw293*  |   |  | rs9307147  | 95705451 | A/G  | 0.45 | 0.29 | 0.89 | 0.36 |
|  |  |   |  | rs4490463  | 95732345 | A/G  | 0.42 | 0.30 | 0.93 | 0.12 |
|  |  |   |  | rs2214395  | 95754840 | A/G  | 0.16 | 0.11 | 0.96 | 0.96 |
|  |  |   |  | rs2719176  | 95784645 | C/G  | 0.39 | 0.43 | 0.93 | 0.83 |
|  |  |   |  | rs17616243  | 95792516 | C/T  | 0.15 | 0.28 | 0.93 | 0.06 |
|  |  |   |  | rs6849425  | 95855547 | C/T  | 0.22 | 0.19 | 0.97 | 0.72 |
|  |  |   |  | rs7698964  | 95856974 | G/A  | 0.12 | 0.07 | 0.97 | 0.45 |
|  |  |   |  | rs17022671  | 95866073 | G/A  | 0.25 | 0.15 | 0.96 | 0.57 |
|  |  |   |  | rs7661049  | 95883027 | G/A  | 0.53 | 0.39 | 0.96 | 0.38 |
|  |  |   |  | rs2120834  | 95896344 | G/C  | 0.37 | 0.28 | 0.98 | 0.19 |
|  |  |   |  | rs4145993  | 95916279 | C/T  | 0.20 | 0.15 | 0.96 | 0.10 |
|  |  |   |  | rs7694043  | 95938768 | C/T  | 0.36 | 0.25 | 0.96 | 0.89 |
|  |  |   |  | rs13134042  | 95959027 | G/A  | 0.21 | 0.25 | 0.93 | 0.85 |
|  |  |   |  | rs1863652  | 95991417 | C/T  | 0.34 | 0.40 | 0.96 | 0.59 |
|  |  |   |  | rs3796442  | 96054027 | C/A  | 0.09 | 0.18 | 0.66 | 0.44 |
|  |  |   |  | rs3821968  | 96072245 | C/T  | 0.11 | 0.28 | 1.00 | 0.10 |
| *BMPR2*  | *BMPR-II,*  | 2q33-q34  | 0.47 | rs1980153  | 203246340 | A/T  | 0.11 | 0.17 | 0.96 | 0.56 |
|  | *BMPR3,*  |   |  | rs4303700  | 203246411 | G/A  | 0.24 | 0.13 | 0.99 | 0.53 |
|  | *BMR2,*  |   |  | rs4675278  | 203334572 | G/A  | 0.27 | 0.34 | 0.98 | 0.85 |
|  | *BRK-3,*  |   |  | rs12477602  | 203338245 | G/A  | 0.13 | 0.15 | 0.96 | 0.29 |
|  | *PPH1,* |   |  | rs6751210  | 203352937 | A/G  | 0.49 | 0.44 | 0.96 | 0.81 |
|  | *T-ALK,* |   |  | rs12621870  | 203358214 | T/C  | 0.23 | 0.21 | 0.86 | 0.72 |
|  | *TRG10*  |   |  | rs1199496  | 203408736 | A/T  | 0.29 | 0.35 | 0.96 | 0.67 |
|  |  |   |  | rs17199235  | 203419859 | A/G  | 0.12 | 0.06 | 0.73 | 0.88 |
| *GDF10*  | *BMP-3b,* | 10q11.22  | 0.06 | rs7093975  | 48424759 | C/T  | 0.27 | 0.23 | 0.62 | 0.82 |
|  | *BMP3B* |   |  | rs762454  | 48427246 | A/G  | 0.32 | 0.23 | 0.96 | 0.08 |
|  |  |   |  | rs11598444  | 48430867 | G/A  | 0.14 | 0.07 | 0.68 | 0.74 |
|  |  |   |  | rs2853838  | 48431110 | C/A  | 0.20 | 0.21 | 0.93 | 0.92 |
|  |  |   |  | rs1902725  | 48436242 | G/A  | 0.21 | 0.15 | 0.68 | 0.81 |
|  |  |   |  | rs1902724  | 48438147 | A/C  | 0.32 | 0.31 | 0.78 | 0.75 |
| *MSTN*  | *GDF8*  | 2q32.2  | 0.76 | rs3791783  | 190924163 | T/C  | 0.21 | 0.23 | 0.86 | 0.94 |
| *RUNX1*  | *AML1,*  | 21q22.3  | 0.002 | rs7279383  | 36224963 | C/G  | 0.19 | 0.11 | 0.89 | 0.74 |
|  | *AML1-EVI-1,*  |   |  | rs2268288  | 36232671 | T/C  | 0.20 | 0.12 | 1.00 | 0.84 |
|  | *AMLCR1,* |   |  | rs2252585  | 36241929 | T/C  | 0.27 | 0.43 | 0.96 | 0.42 |
|  | *CBFA2,*  |   |  | rs11701453  | 36338916 | G/C  | 0.20 | 0.15 | 0.96 | 0.81 |
|  | *EVI-1,* |   |  | rs8127225  | 36364765 | T/C  | 0.13 | 0.27 | 0.96 | 0.75 |
|  | *PEBP2aB*  |   |  | rs1474479  | 36405666 | G/A  | 0.38 | 0.17 | 0.78 | 0.40 |
|  |  |   |  | rs1883066  | 36412156 | G/C  | 0.12 | 0.07 | 0.96 | 0.91 |
|  |  |   |  | rs7279123  | 36415087 | C/T  | 0.26 | 0.18 | 0.96 | 0.69 |
| *RUNX2*  | *RP1-166H4.1,*  | 6p21  | 0.20 | rs1321075  | 45391943 | C/A  | 0.16 | 0.35 | 0.96 | 0.85 |
|  | *AML3,*  |   |  | rs17209895  | 45402445 | T/C  | 0.27 | 0.14 | 0.96 | 0.08 |
|  | *CBFA1,*  |   |  | rs2677108  | 45403774 | T/C  | 0.41 | 0.54 | 0.97 | 0.72 |
|  | *CCD, CCD1,*  |   |  | rs2819854  | 45404528 | T/C  | 0.51 | 0.47 | 0.96 | 0.43 |
|  | *MGC120022,*  |   |  | rs2790093  | 45437484 | A/G  | 0.33 | 0.31 | 0.86 | 0.68 |
|  | *MGC120023,*  |   |  | rs9463090  | 45453345 | G/A  | 0.21 | 0.18 | 0.86 | 0.82 |
|  | *OSF2PEA2aA,* |   |  | rs2396441  | 45467765 | C/T  | 0.50 | 0.49 | 0.86 | 0.11 |
|  | *PEBP2A1,*  |   |  | rs1316330  | 45469626 | G/T  | 0.25 | 0.16 | 0.66 | 0.72 |
|  | *PEBP2A2,*  |   |  | rs7750470  | 45473256 | T/C  | 0.19 | 0.20 | 0.97 | 0.84 |
|  | *PEBP2aA,*  |   |  | rs6930053  | 45488758 | C/T  | 0.41 | 0.30 | 0.89 | 0.99 |
|  | *PEBP2aA1*  |   |  | rs12208240  | 45501937 | G/A  | 0.08 | 0.12 | 0.96 | 0.95 |
|  |  |   |  | rs12209785  | 45506122 | A/G  | 0.25 | 0.28 | 0.59 | 0.52 |
|  |  |   |  | rs10948238  | 45511541 | C/T  | 0.39 | 0.39 | 0.68 | 0.32 |
|  |  |   |  | rs13201287  | 45511945 | G/A  | 0.25 | 0.30 | 0.62 | 0.64 |
|  |  |   |  | rs12333172  | 45512215 | C/T  | 0.20 | 0.16 | 1.00 | 0.52 |
|  |  |   |  | rs1200428  | 45518202 | C/A  | 0.22 | 0.28 | 0.62 | 0.95 |
|  |  |   |  | rs598953  | 45520030 | T/A  | 0.37 | 0.43 | 0.93 | 0.71 |
| *RUNX3*  | *RP3-398I9.1,*  | 1p36  | 0.56 | rs2236850  | 25240341 | T/C  | 0.44 | 0.40 | 0.96 | 0.59 |
|  | *AML2,*  |   |  | rs9438876  | 25241116 | A/G  | 0.54 | 0.42 | 0.62 | 0.80 |
|  | *CBFA3,*  |   |  | rs7517302  | 25254317 | T/C  | 0.43 | 0.37 | 0.96 | 0.88 |
|  | *FLJ34510,*  |   |  | rs906296  | 25264658 | C/G  | 0.23 | 0.18 | 0.96 | 0.39 |
|  | *MGC16070,* |   |  | rs7551188  | 25273200 | C/T  | 0.54 | 0.47 | 0.98 | 0.21 |
|  | *PEBP2aC*  |   |  | rs6688058  | 25274998 | G/A  | 0.13 | 0.14 | 0.96 | 0.61 |
|  |  |   |  | rs11249206  | 25277982 | T/C  | 0.51 | 0.35 | 0.96 | 0.81 |
|  |  |   |  | rs4478762  | 25281015 | G/A  | 0.11 | 0.12 | 0.62 | 0.82 |
| *SMAD1*  | *BSP1,*  | 4q31  | 0.18 | rs6537355  | 146402592 | A/G  | 0.12 | 0.10 | 0.96 | 0.97 |
|  | *JV4-1, JV41,*  |   |  | rs2118438  | 146428384 | G/A  | 0.20 | 0.39 | 0.96 | 0.05 |
|  | *MADH1,* |   |  | rs714195  | 146445680 | A/G  | 0.56 | 0.38 | 0.97 | 0.30 |
|  | *MADR1*  |   |  | rs12505085  | 146481705 | A/G  | 0.25 | 0.21 | 0.62 | 0.85 |
| *SMAD2*  | *JV18, JV18-1,*  | 18q21.1  | 0.16 | rs1792689  | 45368587 | C/T  | 0.12 | 0.07 | 1.00 | 0.62 |
|  | *MADH2, MADR2,*  |   |  | rs1792658  | 45382605 | A/C  | 0.20 | 0.42 | 0.98 | 0.17 |
|  | *MGC22139,*  |   |  | rs1787199  | 45404603 | A/T  | 0.47 | 0.37 | 0.93 | 0.74 |
|  | *MGC34440,*  |   |  | rs17814648  | 45413714 | C/T  | 0.05 | 0.05 | 0.97 | 0.68 |
|  | *hMAD-2, hSMAD2*  |   |  | rs4940086  | 45446307 | T/C  | 0.34 | 0.30 | 0.96 | 0.92 |
| *SMAD3*  | *DKFZP586N0721,* | 15q22.33  | 0.82 | rs12904944  | 67361774 | G/A  | 0.34 | 0.19 | 0.96 | 0.26 |
|  | *DKFZp686J10186,* |   |  | rs1498506  | 67367634 | A/C  | 0.46 | 0.33 | 0.96 | 0.88 |
|  | *HSPC193,*  |   |  | rs12901071  | 67370389 | A/G  | 0.34 | 0.15 | 0.86 | 0.68 |
|  | *HsT17436,*  |   |  | rs4776881  | 67376000 | T/C  | 0.45 | 0.35 | 0.89 | 0.16 |
|  | *JV15-2,*  |   |  | rs12907997  | 67380609 | C/T  | 0.50 | 0.36 | 0.93 | 0.47 |
|  | *MADH3,* |   |  | rs7176870  | 67388553 | A/G  | 0.43 | 0.30 | 0.96 | 0.53 |
|  | *MGC60396*  |   |  | rs9972423  | 67391805 | T/A  | 0.37 | 0.29 | 0.89 | 0.73 |
|  |  |   |  | rs4776890  | 67393045 | T/G  | 0.41 | 0.23 | 0.72 | 0.88 |
|  |  |   |  | rs2118611  | 67401466 | A/G  | 0.20 | 0.46 | 0.99 | 0.03 |
|  |  |   |  | rs11071933  | 67401746 | C/G  | 0.32 | 0.57 | 0.96 | 0.76 |
|  |  |   |  | rs11637581  | 67412049 | C/T  | 0.28 | 0.12 | 0.96 | 0.60 |
|  |  |   |  | rs7163381  | 67414055 | G/A  | 0.26 | 0.44 | 0.96 | 0.73 |
|  |  |   |  | rs4776892  | 67414237 | A/T  | 0.18 | 0.37 | 0.96 | 0.98 |
|  |  |   |  | rs1992215  | 67418937 | T/C  | 0.33 | 0.34 | 0.85 | 0.95 |
|  |  |   |  | rs991157  | 67419013 | G/A  | 0.31 | 0.15 | 0.89 | 0.68 |
|  |  |   |  | rs121021712  | 67425033 | C/T  | 0.16 | 0.23 | 0.04 | 2.6E-13 |
|  |  |   |  | rs4147358  | 67428014 | C/A  | 0.22 | 0.43 | 0.96 | 0.61 |
|  |  |   |  | rs2118610  | 67428334 | G/A  | 0.46 | 0.23 | 0.96 | 0.41 |
|  |  |   |  | rs2414937  | 67432676 | G/C  | 0.19 | 0.26 | 1.00 | 0.74 |
|  |  |   |  | rs12443188  | 67433941 | T/A  | 0.23 | 0.28 | 0.62 | 0.95 |
|  |  |   |  | rs12915039  | 67434348 | A/C  | 0.23 | 0.28 | 0.54 | 0.86 |
|  |  |   |  | rs745103  | 67435075 | C/T  | 0.55 | 0.42 | 0.96 | 0.42 |
|  |  |   |  | rs12439792  | 67437385 | T/A  | 0.09 | 0.37 | 0.97 | 0.66 |
|  |  |   |  | rs17293443  | 67437863 | T/C  | 0.23 | 0.12 | 0.96 | 0.70 |
|  |  |   |  | rs893473  | 67438091 | C/T  | 0.19 | 0.45 | 0.97 | 0.94 |
|  |  |   |  | rs750766  | 67438586 | G/A  | 0.47 | 0.40 | 0.78 | 1.00 |
|  |  |   |  | rs2289263  | 67439207 | A/C  | 0.47 | 0.39 | 0.82 | 0.94 |
|  |  |   |  | rs1866317  | 67441764 | C/G  | 0.12 | 0.06 | 0.96 | 0.83 |
|  |  |   |  | rs731874  | 67446831 | G/A  | 0.29 | 0.13 | 0.62 | 0.50 |
|  |  |   |  | rs4601989  | 67451954 | C/T  | 0.22 | 0.30 | 0.62 | 0.93 |
|  |  |   |  | rs11639295  | 67460757 | C/T  | 0.31 | 0.44 | 0.97 | 0.59 |
|  |  |   |  | rs7183244  | 67461311 | C/T  | 0.40 | 0.18 | 0.74 | 0.62 |
|  |  |   |  | rs16950687  | 67464013 | A/G  | 0.28 | 0.37 | 0.93 | 0.25 |
|  |  |   |  | rs12708492  | 67467541 | T/C  | 0.52 | 0.43 | 1.00 | 0.76 |
|  |  |   |  | rs1470003  | 67469335 | G/C  | 0.47 | 0.24 | 0.96 | 0.18 |
|  |  |   |  | rs7181556  | 67476768 | C/T  | 0.25 | 0.36 | 0.89 | 0.06 |
|  |  |   |  | rs7173811  | 67479051 | T/C  | 0.52 | 0.27 | 0.86 | 0.10 |
|  |  |   |  | rs3825977  | 67481248 | C/T  | 0.20 | 0.33 | 0.96 | 0.02 |
|  |  |   |  | rs11629568  | 67482368 | T/G  | 0.45 | 0.22 | 0.49 | 0.04 |
|  |  |   |  | rs3743343  | 67486775 | T/C  | 0.24 | 0.36 | 0.96 | 0.43 |
|  |  |   |  | rs1052488  | 67486847 | T/C  | 0.23 | 0.36 | 0.96 | 0.46 |
| *SMAD4*  | *DPC4, JIP,* | 18q21.1  | 0.55 | rs10502913  | 48568271 | G/A  | 0.23 | 0.29 | 1.00 | 0.77 |
|  | *MADH4*  |   |  | rs8096092  | 48581601 | C/A  | 0.38 | 0.40 | 0.97 | 0.76 |
| *SMAD6*  | *HsT17432,*  | 15q21-q22  | 0.51 | rs2439385  | 67026861 | C/A  | 0.30 | 0.16 | 0.97 | 0.70 |
|  | *MADH6, MADH7*  |  |  |  |  |  |  |  |  |  |
| *SMAD7* | *FLJ16482,* | 18q21.1  | 0.76 | rs12953717  | 46453929 | C/T  | 0.43 | 0.28 | 0.82 | 0.24 |
|  | *MADH7,* |  |  | rs12456328  | 46457096 | C/T  | 0.13 | 0.06 | 0.96 | 0.24 |
|  | *MADH8* |  |  | rs4464148  | 46459032 | T/C  | 0.31 | 0.19 | 0.86 | 0.50 |
|  |  |  |  | rs2337107  | 46459323 | G/A  | 0.40 | 0.40 | 0.96 | 0.80 |
|  |  |  |  | rs2337106  | 46460903 | G/C  | 0.52 | 0.48 | 0.93 | 0.94 |
|  |  |  |  | rs7238442  | 46461786 | T/C  | 0.45 | 0.45 | 0.54 | 0.89 |
|  |  |  |  | rs4939832  | 46465665 | A/G  | 0.24 | 0.29 | 0.98 | 0.83 |
|  |  |  |  | rs3764482  | 46468946 | C/T  | 0.20 | 0.10 | 0.96 | 0.50 |
|  |  |  |  | rs1316447  | 46472676 | C/T  | 0.19 | 0.12 | 0.94 | 0.84 |
|  |  |  |  | rs3736242  | 46474746 | G/A  | 0.24 | 0.25 | 0.97 | 0.99 |
| *TGFB1*  | *CED,*  | 19q13.1  | 0.08 | rs1800469  | 41860296 | C/T  | 0.32 | 0.46 | 0.62 | 0.82 |
|  | *DPD1, LAP,*  |   |  | rs4803455  | 41851509 | C/A  | 0.49 | 0.35 | 0.96 | 0.63 |
|  | *TGFB, TGFbeta*  |  |  |  |  |  |  |  |  |  |
| *TGFB2*  | *MGC116892,*  | 1q41  | 0.66 | rs6604609  | 218568482 | T/A  | 0.06 | 0.12 | 0.96 | 0.96 |
|  | *TGF-beta2*  |  |  |  |  |  |  |  |  |  |
| *TGFBR1*  | *AAT5,*  | 9q22  | 0.21 | rs6478974  | 101874403 | T/A  | 0.47 | 0.35 | 0.89 | 0.94 |
|  | *ACVRLK4,*  |   |  | rs1571590  | 101883808 | A/G  | 0.20 | 0.10 | 0.97 | 0.47 |
|  | *ALK-5, ALK5,*  |   |  | rs1013186  | 101884337 | G/A  | 0.20 | 0.11 | 0.97 | 0.60 |
|  | *LDS1A, LDS2A,* |   |  | rs11568785  | 101905834 | A/G  | 0.08 | 0.04 | 0.96 | 0.67 |
|  | *SKR4, TGFR-1*  |   |  | rs10733710  | 101907424 | G/A  | 0.23 | 0.35 | 0.97 | 0.12 |
| *TGFBR2*  | *AAT3, FAA3,*  | 3p22  | 0.14 | rs3773644  | 30712344 | C/T  | 0.40 | 0.27 | 0.96 | 0.35 |
|  | *LDS1B, LDS2B,*  |  |  |  |  |  |  |  |  |  |
|  | MFS2, RIIC,  |  |  |  |  |  |  |  |  |
|  | *TAAD2,* |  |  |  |  |  |  |  |  |  |
|  | *TGFR-2, TGFbeta-RII*  |  |  |  |  |  |  |  |  |  |
| *TGFBR3*  | *BGCAN,*  | 1p33-p32  | 0.04 | rs4650272  | 92168649 | T/A  | 0.18 | 0.24 | 0.89 | 0.49 |
|   | *betaglycan*  |   |  | rs284185  | 92233820 | A/T  | 0.41 | 0.49 | 0.96 | 0.66 |
|   |  |   |  | rs284200  | 92239336 | C/T  | 0.38 | 0.42 | 0.96 | 0.62 |
|   |  |   |  | rs6678564  | 92257650 | G/C  | 0.09 | 0.08 | 0.68 | 0.71 |
|   |  |   |  | rs10493856  | 92334749 | A/G  | 0.39 | 0.47 | 0.96 | 0.78 |

1Minor Allele Frequency (MAF) and FDR-adjusted Hardy-Weinberg Equilibrium (FDR HWE) based on control population.

2TagSNP is out of HWE (HWE p<0.003 among 0-28% and 29-100% NA ancestry groups) and is excluded from analysis.

|  |
| --- |
| Supplement Table 2. Breast cancer survival by ER/PR tumor status at time of diagnosis  |
|   |   | ER+/PR+ | ER+/PR- | ER-/PR- |   |
|   |   | Death/Person Years | HR1 | (95% CI) | Death/Person Years | HR | (95% CI) | Death/Person Years | HR | (95% CI) | Interaction P2 |
| **P ARTP:** | 0.34 |   |   |   | 0.16 |   |   |   | 0.58 |   |   |   |   |
| ***BMP6*** |   |   |   |   |   |   |   |   |   |   |   |   |   |
|  (rs3812163) |   |   |   |   |   |   |   |   |   |   |   |   | 0.03 |
|   | TT |  36 / 4476  | 1.00 |   |   |  3 / 729  | 1.00 |   |   |  30 / 1302  | 1.00 |   |   |   |
|   | TA |  41 / 4865  | 1.15 | (0.73, | 1.82) |  15 / 888  | 5.60 | (1.45, | 21.63) |  24 / 1528  | 0.76 | (0.43, | 1.32) |   |
|   | AA |  15 / 1604  | 1.63 | (0.86, | 3.09) |  5 / 309  | 5.67 | (1.17, | 27.49) |  7 / 395  | 0.75 | (0.31, | 1.79) |   |
|   | P-value |   | 0.14 |   |   |   | 0.03 |   |   |   | 0.51 |   |   |   |
|  (rs1107495) |   |   |   |   |   |   |   |   |   |   |   |   | 0.02 |
|   | AA |  57 / 6082  | 1.00 |   |   |  19 / 1137  | 1.00 |   |   |  26 / 1670  | 1.00 |   |   |   |
|   | AG/GG |  35 / 4881  | 0.75 | (0.48, | 1.17) |  4 / 789  | 0.29 | (0.08, | 0.99) |  35 / 1532  | 1.46 | (0.86, | 2.49) |   |
|   | P-value |   | 0.20 |   |   |   | 0.05 |   |   |   | 0.16 |   |   |   |
| (rs6910759) |   |   |   |   |   |   |   |   |   |   |   |   | 0.24 |
|   | AA |  40 / 4111  | 1.00 |   |   |  4 / 698  | 1.00 |   |   |  20 / 1305  | 1.00 |   |   |   |
|   | AG |  37 / 5131  | 0.80 | (0.50, | 1.29) |  12 / 873  | 2.88 | (0.80, | 10.38) |  33 / 1494  | 1.61 | (0.90, | 2.88) |   |
|   | GG |  15 / 1721  | 1.21 | (0.64, | 2.29) |  7 / 354  | 4.15 | (1.02, | 16.86) |  8 / 427  | 1.18 | (0.50, | 2.76) |   |
|   | P-value |   | 0.55 |   |   |   | 0.05 |   |   |   | 0.71 |   |   |   |
| ***RUNX2*** | 0.06 |   |   |   | 0.07 |   |   |   |  0.30 |   |   |   |   |
|  (rs1321075) |   |   |   |   |   |   |   |   |   |   |   |   | 0.03 |
|   | CC |  58 / 6324  | 1.00 |   |   |  9 / 1142  | 1.00 |   |   |  29 / 1954  | 1.00 |   |   |   |
|   | CA |  27 / 3931  | 0.70 | (0.44, | 1.13) |  11 / 676  | 3.06 | (1.15, | 8.17) |  29 / 960  | 1.94 | (1.11, | 3.38) |   |
|   | AA |  7 / 695  | 1.04 | (0.46, | 2.36) |  3 / 107  | 7.62 | (1.31, | 44.25) |  3 / 311  | 0.72 | (0.21, | 2.49) |   |
|   | P-value |   | 0.92 |   |   |   | 0.02 |   |   |   | 0.61 |   |   |   |
|  (rs2819854) |   |   |   |   |   |   |   |   |   |   |   |   | 0.04 |
|   | TT |  20 / 2656  | 1.00 |   |   |  5 / 402  | 1.00 |   |   |  23 / 868  | 1.00 |   |   |   |
|   | TC |  47 / 5618  | 1.19 | (0.70, | 2.03) |  13 / 1009  | 0.47 | (0.14, | 1.57) |  28 / 1502  | 0.85 | (0.48, | 1.50) |   |
|   | CC |  25 / 2679  | 1.48 | (0.82, | 2.69) |  5 / 514  | 0.39 | (0.10, | 1.49) |  10 / 856  | 0.49 | (0.23, | 1.04) |   |
|   | P-value |   | 0.20 |   |   |   | 0.17 |   |   |   | 0.06 |   |   |   |
|  (rs2396441) |   |   |   |   |   |   |   |   |   |   |   |   | 0.02 |
|   | CC |  15 / 2782  | 1.00 |   |   |  8 / 504  | 1.00 |   |   |  16 / 883  | 1.00 |   |   |   |
|   | CT |  46 / 5296  | 1.62 | (0.90, | 2.92) |  11 / 961  | 0.65 | (0.23, | 1.82) |  39 / 1583  | 1.05 | (0.58, | 1.92) |   |
|   | TT |  31 / 2885  | 2.10 | (1.13, | 3.93) |  4 / 460  | 0.53 | (0.15, | 1.87) |  6 / 760  | 0.38 | (0.15, | 0.99) |   |
|   | P-value |   | 0.02 |   |   |   | 0.33 |   |   |   | 0.05 |   |   |   |
| (rs6930053) |   |   |   |   |   |   |   |   |   |   |   |   | 0.04 |
|   | CC |  24 / 4311  | 1.00 |   |   |  8 / 698  | 1.00 |   |   |  30 / 1431  | 1.00 |   |   |   |
|   | CT |  51 / 5097  | 1.76 | (1.08, | 2.88) |  13 / 983  | 0.99 | (0.38, | 2.58) |  26 / 1425  | 0.77 | (0.45, | 1.31) |   |
|   | TT |  17 / 1546  | 2.11 | (1.12, | 3.98) |  2 / 244  | 0.59 | (0.12, | 2.93) |  5 / 370  | 0.61 | (0.23, | 1.60) |   |
|   | P-value |   | 0.02 |   |   |   | 0.52 |   |   |   | 0.32 |   |   |   |
|  (rs10948238) |   |   |   |   |   |   |   |   |   |   |   | 0.04 |
|   | CC |  39 / 3961  | 1.00 |   |   |  4 / 656  | 1.00 |   |   |  12 / 1083  | 1.00 |   |   |   |
|   | CT |  43 / 5186  | 0.72 | (0.46, | 1.12) |  14 / 992  | 1.83 | (0.58, | 5.76) |  39 / 1492  | 2.38 | (1.23, | 4.60) |   |
|   | TT |  10 / 1802  | 0.46 | (0.23, | 0.93) |  4 / 272  | 2.03 | (0.44, | 9.41) |  10 / 650  | 1.47 | (0.63, | 3.45) |   |
|   | P-value |   | 0.03 |   |   |   | 0.36 |   |   |   | 0.37 |   |   |   |
| (rs598953) |   |   |   |   |   |   |   |   |   |   |   |   | 0.24 |
|   | TT |  44 / 4088  | 1.00 |   |   |  8 / 755  | 1.00 |   |   |  21 / 1200  | 1.00 |   |   |   |
|   | TA |  40 / 5274  | 0.59 | (0.38, | 0.92) |  11 / 930  | 1.04 | (0.40, | 2.68) |  36 / 1581  | 1.30 | (0.75, | 2.26) |   |
|   | AA |  8 / 1601  | 0.41 | (0.19, | 0.88) |  4 / 241  | 1.08 | (0.27, | 4.29) |  4 / 445  | 0.54 | (0.18, | 1.62) |   |
|   | P-value |   | 0.02 |   |   |   | 0.91 |   |   |   | 0.27 |   |   |   |
| 1Hazard Ratios (HR) and 95% Confidence Intervals (CI) among primary invasive cases adjusted for age, study center, BMI during referent year, parity, genetic ancestry, and SEER summary stage. |
| 2P value based on 2-df Wald test treating ER/PR status as categorical. None of the interaction p values remained significant after adjustment for multiple comparisons |  |  |