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Supplemental Material

Association of Cardiometabolic Genes with Arsenic Metabolism Biomarkers in American Indian Communities: The Strong Heart Family Study (SHFS)

Poojitha Balakrishnan, Dhananjay Vaidya, Nora Franceschini, V. Saroja Voruganti, Matthew O. Gribble, Karin Haack, Sandra Laston, Jason G. Umans, Kevin A. Francesconi, Walter Goessler, Kari E. North, Elisa Lee, Joseph Yracheta, Lyle G. Best, Jean W. MacCluer, Jack Kent, Jr, Shelley A. Cole, and Ana Navas-Acien

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Figure S10. Distribution of percent arsenic species by rs3740394 genotype

Figure S11. Distribution of percent arsenic species by rs7098825 genotype
|                | As (Kation) | DMA | MA | As (III+V) | Summe |
|----------------|-------------|-----|----|------------|-------|
| **Nies 18**    |             |     |    |            |       |
| Mean           | 70,6        | 39,0| 6,2| 3,3        | 119   |
| SD             | 2,7         | 2,6 | 0,3| 0,5        | 7     |
| CV %           | 3,8         | 6,7 | 4,1| 14,4       | 5,8   |
| **Nist 2669 I**|             |     |    |            |       |
| Mean           | 12,3        | 3,2 | 1,7| 3,4        | 20,3  |
| SD             | 1,6         | 0,3 | 0,2| 0,3        | 1,5   |
| CV %           | 13,1        | 8,1 | 11,6| 9,3        | 7,4   |
| **Nist 2669 II**|             |     |    |            |       |
| Mean           | 7,5         | 24,6| 6,9| 11,1       | 50,2  |
| SD             | 0,6         | 1,4 | 0,4| 0,6        | 2,3   |
| CV %           | 7,7         | 5,5 | 5,3| 5,4        | 4,5   |

Table S1. Inter-batch variability of urine arsenic measurements (n=46)
### Table S2. Fine mapped loci on MetaboChip

| ID   | Symbol | Description                                                                 | Locus    | Chr | Start Position | End Position   |
|------|--------|-----------------------------------------------------------------------------|----------|-----|----------------|----------------|
| 4363 | ABCC1  | ATP-binding cassette, sub-family C (CFTR/MRP), member 1                      | 16p13.1  | 16  | 15949577       | 16143074       |
| 1244 | ABCC2  | ATP-binding cassette, sub-family C (CFTR/MRP), member 2                      | 10q24    | 10  | 99782598       | 99852576       |
| 368  | ABCC6  | ATP-binding cassette, sub-family C (CFTR/MRP), member 6                      | 16p13.1  | 16  | 16149565       | 16223673       |
| 328  | APEX1  | APEX nuclease (multifunctional DNA repair enzyme) 1                          | 14q11.2  | 14  | 20455131       | 20457772       |
| 360  | AQP3   | aquaporin 3 (Gill blood group)                                              | 9p13     | 9   | 33441154       | 33447633       |
| 364  | AQP7   | aquaporin 7                                                                 | 9p13     | 9   | 33384947       | 33402645       |
| 57412| AS3MT  | arsenite methyltransferase                                                  | 10q24.32 | 10  | 102869453      | 102901899      |
| 55799| CACNA2D3| calcium channel, voltage-dependent, alpha 2/delta subunit 3                 | 3p21.1   | 3   | 54122593       | 55074557       |
| 11132| CAPN10 | calpain 10                                                                  | 2q37.3   | 2   | 240586716      | 240599109      |
| 847  | CAT    | catalase                                                                    | 11p13    | 11  | 34438925       | 34472060       |
| 875  | CBS    | cystathionine-beta-synthase                                                 | 21q22.3  | 21  | 43053191       | 43076868       |
| 55349| CHDH   | choline dehydrogenase                                                       | 3p21.1   | 3   | 53816297       | 53846393       |
| 54805| CNNM2  | cyclin and CBS domain divalent metal cation transport mediator 2            | 10q24.32 | 10  | 102918293      | 103078587      |
| 1786 | DNMT1  | DNA (cytosine-5-)methyltransferase 1                                        | 19p13.2  | 19  | 10133345       | 10195079       |
| 1788 | DNMT3A | DNA (cytosine-5-)methyltransferase 3 alpha                                  | 2p23     | 2   | 25232961       | 25342590       |
| 1789 | DNMT3B | DNA (cytosine-5-)methyltransferase 3 beta                                   | 20q11.2  | 20  | 32762385       | 32809356       |
| 79813| EHMT1  | euchromatic histone-lysine N-methyltransferase 1                            | 9q34.3   | 9   | 137618992      | 137836127      |
| ID   | Symbol | Description                                               | Locus  | Chr | Start Position | End Position   |
|------|--------|-----------------------------------------------------------|--------|-----|----------------|----------------|
| 2068 | ERCC2  | excision repair cross-complementation group 2             | 19q13.3| 19  | 45351391       | 45370646       |
| 79072| FASTKD3| FAST kinase domains 3                                     | 5p15.31| 5   | 7859159        | 7869037        |
| 161835| FSIP1 | fibrous sheath interacting protein 1                      | 15q14  | 15  | 39599529       | 39782838       |
| 2745 | GLRX   | glutaredoxin (thioltransferase)                           | 5q14   | 5   | 95813849       | 95822873       |
| 2944 | GSTM1  | glutathione S-transferase mu 1                            | 1p13.3 | 1   | 109687796      | 109693745      |
| 9446 | GSTO1  | glutathione S-transferase omega 1                         | 10q25.1| 10  | 104254194      | 104267464      |
| 119391| GSTO2 | glutathione S-transferase omega 2                         | 10q25.1| 10  | 104268416      | 104304948      |
| 2950 | GSTP1  | glutathione S-transferase pi 1                            | 11q13  | 11  | 67583595       | 67586653       |
| 2954 | GSTZ1  | glutathione S-transferase zeta 1                          | 14q24.3| 14  | 77320887       | 77331597       |
| 10021| HCN4   | hyperpolarization activated cyclic nucleotide gated potassium channel 4 | 15q24.1| 15  | 73319859       | 73369264       |
| 3269 | HRH1   | histamine receptor H1                                     | 3p25   | 3   | 11137093       | 11263253       |
| 4049 | LTA    | lymphotoxin alpha                                         | 6p21.3 | 6   | 31560550       | 31574324       |
| 4524 | MTHFR  | methylenetetrahydrofolate reductase (NAD(P)H)             | 1p36.3 | 1   | 11785730       | 11806103       |
| 4548 | MTR    | 5-methyltetrahydrofolate-homocysteine methyltransferase   | 1q43   | 1   | 236794304      | 236903981      |
| 4552 | MTRR   | 5-methyltetrahydrofolate-homocysteine methyltransferase reductase | 5p15.31| 5   | 7851186        | 7901124        |
| 4627 | MYH9   | myosin, heavy chain 9, non-muscle                         | 22q13.1| 22  | 36281277       | 36388067       |
| 29104| N6AMT1 | N-6 adenine-specific DNA methyltransferase 1 (putative)    | 21q21.3| 21  | 28872191       | 28885373       |
| 55655| NLRP2  | NLR family, pyrin domain containing 2                     | 19q13.42| 19  | 54965284       | 55001142       |
| 4846 | NOS3   | nitric oxide synthase 3 (endothelial cell)                | 7q36   | 7   | 150991056      | 151014599      |
| ID   | Symbol | Description                                         | Locus | Chr | Start Position | End Position |
|------|--------|-----------------------------------------------------|-------|-----|----------------|--------------|
| 4968 | OGG1   | 8-oxoguanine DNA glycosylase                        | 3p26.2| 3   | 9749944        | 9788246      |
| 55644| OSGEP  | O-sialoglycoprotein endopeptidase                    | 14q11.2| 14  | 20447048       | 20455108     |
| 84108| PCGF6  | polycomb group ring finger 6                        | 10q24.33| 10  | 103302796      | 103351134    |
| 4860 | PNP    | purine nucleoside phosphorylase                     | 14q13.1| 14  | 20469379       | 20478006     |
| 56979| PRDM9  | PR domain containing 9                             | 5p14 | 5   | 23507615       | 23528597     |
| 7001 | PRDX2  | peroxiredoxin 2                                    | 19p13.2| 19  | 12796820       | 12801910     |
| 23378| RRP8   | ribosomal RNA processing 8, methyltransferase, homolog (yeast) | 11p15.4| 11  | 6514830        | 6603678      |
| 57466| SCAF4  | SR-related CTD-associated factor 4                  | 21q22.1| 21  | 31671000       | 31732118     |
| 29986| SLC39A2| solute carrier family 39 (zinc transporter), member 2 | 14q11.2| 14  | 20999255       | 21001875     |
| 10599| SLCO1B1| solute carrier organic anion transporter family, member 1B1 | 12p | 12  | 21131194       | 21239796     |
| 6647 | SOD1   | superoxide dismutase 1, soluble                     | 21q22.11| 21  | 31659622       | 31668931     |
| 6648 | SOD2   | superoxide dismutase 2, mitochondrial               | 6q25.3| 6   | 159679116      | 159693321    |
| 6649 | SOD3   | superoxide dismutase 3, extracellular               | 4p15.2| 4   | 24795463       | 24800845     |
| 7124 | TNF    | tumor necrosis factor                               | 6p21.3| 6   | 31575567       | 31578336     |
| 7157 | TP53   | tumor protein p53                                    | 17p13.1| 17  | 7668402        | 7687550      |
| 55135| WRAP53 | WD repeat containing, antisense to TP53            | 17p13.1| 17  | 7686071        | 7703502      |
| 7507 | XPA    | xeroderma pigmentosum, complementation group A      | 9q22.3| 9   | 97654398       | 97697409     |
| 7515 | XRCC1  | X-ray repair complementing defective repair in Chinese hamster cells 1 | 19q13.2| 19  | 43543312       | 43575578     |
| 7517 | XRCC3  | X-ray repair complementing defective repair in Chinese hamster cells 3 | 14q32.3| 14  | 103697608      | 103715486     |
Start and end base position according to human genome build 19.
### Table S3. Top MetaboChip associations for percent inorganic arsenic

| SNP         | Chr | Position  | Alleles | MAF | Gene    | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-------------|-----|-----------|---------|-----|---------|----------|--------------|--------------|------------------|-----------------|----------------------|-----------------------------|----------------------------|
| rs12768205  | 10  | 104637839 | G/A     | 0.27| AS3MT   | intron   | 8.27e-8      | -0.26        | 1.59e-10       | 0.00            | 0.99                 | -0.14                      | 1.68e-3                   |
| rs10883796  | 10  | 104645305 | G/A     | 0.27| AS3MT   | intron   | 8.27e-8      | -0.26        | 1.59e-10       | 0.00            | 0.99                 | -0.14                      | 1.68e-3                   |
| rs3740390   | 10  | 104628470 | G/A     | 0.19| AS3MT   | intron   | 3.11e-7      | -0.27        | 4.08e-10       | 0.00            | 0.99                 | -0.16                      | 4.11e-3                   |
| rs113282265 | 10  | 104647238 | A/G     | 0.19| AS3MT   | intron   | 3.11e-7      | -0.27        | 4.08e-10       | 0.00            | 0.99                 | -0.16                      | 4.11e-3                   |
| rs11191447  | 10  | 104642131 | G/A     | 0.19| AS3MT   | intron   | 3.11e-7      | -0.27        | 4.08e-10       | 0.00            | 0.99                 | -0.16                      | 4.11e-3                   |
| rs10786722  | 10  | 104650058 | G/A     | 0.27| AS3MT   | intron   | 3.21e-7      | -0.25        | 3.02e-9        | 0.00            | 0.99                 | -0.14                      | 1.68e-3                   |
| rs7897654   | 10  | 104652448 | A/G     | 0.27| AS3MT, | intergenic| 3.21e-7      | -0.25        | 3.02e-9        | 0.00            | 0.99                 | -0.14                      | 1.68e-3                   |
| rs10883799  | 10  | 104653300 | G/A     | 0.27| AS3MT, | intergenic| 3.21e-7      | -0.25        | 3.02e-9        | 0.00            | 0.99                 | -0.14                      | 1.68e-3                   |
| rs1046778   | 10  | 104651474 | A/G     | 0.27| AS3MT   | UTR      | 3.21e-7      | -0.25        | 3.02e-9        | 0.00            | 0.99                 | -0.14                      | 1.68e-3                   |
| rs10786736  | 10  | 104839106 | C/G     | 0.20| NT5C2   | UTR      | 3.31e-7      | -0.26        | 7.25e-9        | 0.00            | 0.99                 | -0.17                      | 1.11e-3                   |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All 18 SNP associations are below MetaboChip-wide significance threshold of 3.57e-7 for meta-analysis. Base position according to human genome build 18.
Table S4. Top MetaboChip associations for percent monomethylarsonate

| SNP            | Chr | Position  | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|----------------|-----|-----------|---------|-----|----------|----------|--------------|-------------|---------|---------------|---------|--------------------------|---------|
| rs12768205     | 10  | 104637839 | G/A     | 0.27| AS3MT    | intron   | 1.20e-15     | -0.26       | 2.92e-15 | -0.08         | 0.05   | -0.15                   | 1.90e-5 |
| rs10883796     | 10  | 104645305 | G/A     | 0.27| AS3MT    | intron   | 1.20e-15     | -0.26       | 2.92e-15 | -0.08         | 0.05   | -0.15                   | 1.90e-5 |
| rs10786722     | 10  | 104650058 | G/A     | 0.27| AS3MT    | intron   | 1.12e-14     | -0.24       | 1.65e-13 | -0.08         | 0.05   | -0.15                   | 1.90e-5 |
| rs7897654      | 10  | 104652448 | A/G     | 0.27| AS3MT, CNNM2 | intergenic | 1.12e-14     | -0.24       | 1.65e-13 | -0.08         | 0.05   | -0.15                   | 1.90e-5 |
| rs10883799     | 10  | 104653300 | G/A     | 0.27| AS3MT, CNNM2 | intergenic | 1.12e-14     | -0.24       | 1.65e-13 | -0.08         | 0.05   | -0.15                   | 1.90e-5 |
| rs1046778      | 10  | 104651474 | A/G     | 0.27| AS3MT    | UTR      | 1.12e-14     | -0.24       | 1.65e-13 | -0.08         | 0.05   | -0.15                   | 1.90e-5 |
| rs3740393      | 10  | 104626645 | G/C     | 0.21| AS3MT    | intron   | 1.07e-13     | -0.27       | 2.25e-15 | -0.08         | 0.09   | -0.14                   | 3.24e-4 |
| rs12765002     | 10  | 104625338 | G/A     | 0.25| AS3MT    | intron   | 2.31e-13     | -0.26       | 2.97e-14 | -0.07         | 0.09   | -0.13                   | 2.42e-4 |
| rs11191447     | 10  | 104642313 | G/A     | 0.19| AS3MT    | intron   | 4.56e-13     | -0.27       | 1.62e-14 | -0.08         | 0.10   | -0.15                   | 4.29e-4 |
| rs12764049     | 10  | 104624946 | A/G     | 0.25| AS3MT    | intron   | 4.91e-13     | -0.26       | 2.97e-14 | -0.07         | 0.12   | -0.13                   | 2.42e-4 |
| rs7920697      | 10  | 104623327 | A/G     | 0.26| AS3MT    | intron   | 5.05e-13     | -0.26       | 2.97e-14 | -0.07         | 0.13   | -0.13                   | 2.37e-4 |
| rs3740390      | 10  | 104628470 | G/A     | 0.19| AS3MT    | intron   | 5.52e-13     | -0.27       | 1.62e-14 | -0.08         | 0.11   | -0.15                   | 4.29e-4 |
| rs113282265    | 10  | 104647238 | A/G     | 0.19| AS3MT    | intron   | 5.52e-13     | -0.27       | 1.62e-14 | -0.08         | 0.11   | -0.15                   | 4.29e-4 |
| rs17878846     | 10  | 104620402 | T/A     | 0.19| AS3MT    | intron   | 9.63e-13     | -0.27       | 1.49e-14 | -0.07         | 0.14   | -0.15                   | 4.50e-4 |
| rs11191416     | 10  | 104594906 | A/C     | 0.19| CYP17A1, C10orf32 | intergenic | 1.08e-12     | -0.27       | 2.43e-14 | -0.07         | 0.13   | -0.15                   | 4.50e-4 |
| SNP          | Chr | Position | Alleles | MAF | Gene         | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|----------|---------|-----|--------------|----------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|----------------------------|
| rs11191425   | 10  | 104615960| G/A     | 0.19| C10orf32, AS3MT | intergenic | 1.08e-12 | -0.27        | 2.43e-14      | -0.07         | 0.13              | -0.15                    | 4.50e-4                    |
| rs188299216  | 10  | 104944768| G/A     | 0.19| NT5C2, LOC40164 8 | intergenic | 1.18e-12 | -0.26        | 5.12e-13      | -0.08         | 0.08              | -0.15                    | 3.12e-4                    |
| rs3824754    | 10  | 104604340| G/A     | 0.19| C10orf32 | intron | 1.23e-12 | -0.27        | 2.43e-14      | -0.07         | 0.14              | -0.15                    | 4.50e-4                    |
| rs3824755    | 10  | 104585839| C/G     | 0.19| CYP17A1   | intron | 1.97e-12 | -0.26        | 4.39e-14      | -0.07         | 0.13              | -0.14                    | 5.83e-4                    |
| rs1004467    | 10  | 104584497| A/G     | 0.19| CYP17A1   | intron | 1.97e-12 | -0.26        | 4.39e-14      | -0.07         | 0.13              | -0.14                    | 5.83e-4                    |
| rs12221064   | 10  | 104667116| G/A     | 0.19| AS3MT, CNNM2 | intergenic | 2.45e-12 | -0.26        | 6.68e-13      | -0.08         | 0.09              | -0.15                    | 4.29e-4                    |
| rs11191479   | 10  | 104713610| A/G     | 0.19| CNNM2      | intron | 2.69e-12 | -0.26        | 6.68e-13      | -0.08         | 0.11              | -0.15                    | 3.23e-4                    |
| rs11191555   | 10  | 104847513| A/C     | 0.19| NT5C2      | intron | 3.12e-12 | -0.26        | 6.68e-13      | -0.07         | 0.11              | -0.15                    | 3.41e-4                    |
| rs79668541   | 10  | 104783894| G/A     | 0.19| CNNM2      | intron | 3.25e-12 | -0.26        | 4.50e-13      | -0.07         | 0.11              | -0.15                    | 4.29e-4                    |
| rs4409766    | 10  | 104606653| A/G     | 0.19| C10orf32  | intron | 3.38e-12 | -0.26        | 4.39e-14      | -0.06         | 0.17              | -0.14                    | 5.83e-4                    |
| rs78821730   | 10  | 104674534| G/A     | 0.19| CNNM2      | intron | 3.56e-12 | -0.26        | 6.68e-13      | -0.08         | 0.11              | -0.15                    | 4.29e-4                    |
| rs11191453   | 10  | 104649842| A/G     | 0.19| AS3MT      | intron | 3.72e-12 | -0.26        | 6.68e-13      | -0.08         | 0.11              | -0.15                    | 4.29e-4                    |
| rs12221193   | 10  | 104655257| A/C     | 0.19| AS3MT, CNNM2 | intergenic | 3.72e-12 | -0.26        | 6.68e-13      | -0.08         | 0.11              | -0.15                    | 4.29e-4                    |
| rs77180047   | 10  | 104656747| G/A     | 0.19| AS3MT, CNNM2 | intergenic | 3.72e-12 | -0.26        | 6.68e-13      | -0.08         | 0.11              | -0.15                    | 4.29e-4                    |
| rs17115213   | 10  | 104671133| A/G     | 0.19| CNNM2      | intron | 3.72e-12 | -0.26        | 6.68e-13      | -0.08         | 0.11              | -0.15                    | 4.29e-4                    |
| SNP          | Chr | Position     | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|--------------|---------|-----|----------|----------|--------------|--------------|-----------------|---------------|-----------------|--------------------------|---------------------------|
| rs10509759   | 10  | 104679655    | T/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs5011520    | 10  | 104687506    | G/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs10883808   | 10  | 104711116    | T/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs10883815   | 10  | 104729169    | A/G     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191502   | 10  | 104755484    | A/C     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191514   | 10  | 104763354    | G/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs77787671   | 10  | 104766195    | G/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs75970938   | 10  | 104783638    | A/G     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191535   | 10  | 104805866    | G/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs1058729    | 10  | 104831469    | G/A     | 0.19| CNNM2, NT5C2 | intergenic | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191454   | 10  | 104649994    | A/G     | 0.19| AS3MT    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191472   | 10  | 104697006    | T/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191515   | 10  | 104766517    | G/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs11191548   | 10  | 104836168    | A/G     | 0.19| CNNM2, NT5C2 | intergenic | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs12411886   | 10  | 104675289    | C/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs12413409   | 10  | 104709086    | G/A     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| rs3781285    | 10  | 104815655    | C/G     | 0.19| CNNM2    | intron   | 3.72e-12     | -0.26        | 6.68e-13        | -0.08         | 0.11            | -0.15                    | 4.29e-4                  |
| SNP         | Chr | Position | Alleles | MAF | Gene          | Location                  | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|-------------|-----|----------|---------|-----|---------------|---------------------------|--------------|--------------|-----------------|---------------|--------------------|-----------------------------|
| rs12219901  | 10  | 104830957| A/G     | 0.19| CNNM2, NT5C2  | intergenic                | 3.90e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs732998    | 10  | 104887891| A/G     | 0.19| NT5C2         | intron                    | 3.99e-12     | -0.26        | 6.52e-13        | -0.07         | 0.11               | -0.15                      |
| rs79237883  | 10  | 104930936| A/G     | 0.19| LOC729081, NT5C2 | intergenic                | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs77420391  | 10  | 104935813| G/A     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs11191558  | 10  | 104854668| G/A     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs11191560  | 10  | 104859028| A/G     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs11191580  | 10  | 104896201| A/G     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs11191582  | 10  | 104903643| G/A     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs12220375  | 10  | 104891481| A/G     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs12413046  | 10  | 104861194| A/G     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs9633712   | 10  | 104863751| G/C     | 0.19| NT5C2         | intron                    | 4.05e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs12412038  | 10  | 104846152| G/A     | 0.19| NT5C2         | intron                    | 4.06e-12     | -0.26        | 6.68e-13        | -0.07         | 0.11               | -0.15                      |
| rs12217501  | 10  | 104841879| A/G     | 0.19| NT5C2         | intron                    | 4.25e-12     | -0.26        | 6.06e-13        | -0.07         | 0.12               | -0.15                      |
| rs10883832  | 10  | 104861269| A/C     | 0.19| NT5C2         | intron                    | 4.34e-12     | -0.26        | 6.68e-13        | -0.07         | 0.12               | -0.15                      |
| rs12220743  | 10  | 104841902| G/A     | 0.19| NT5C2         | intron                    | 4.38e-12     | -0.26        | 6.68e-13        | -0.07         | 0.12               | -0.15                      |
| rs943037    | 10  | 104825909| G/A     | 0.19| CNNM2         | coding                   | 4.38e-12     | -0.26        | 6.68e-13        | -0.07         | 0.12               | -0.15                      |
| rs79780963  | 10  | 104942489| G/A     | 0.19| NT5C2         | intron                    | 5.06e-12     | -0.25        | 6.72e-13        | -0.07         | 0.13               | -0.15                      |
| SNP       | Chr | Position    | Alleles | MAF | Gene | Location | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|-----------|-----|-------------|---------|-----|------|----------|--------------|-------------|---------|---------------|---------|--------------------------|---------|
| rs1060240 | 10  | 104873327   | A/G     | 0.19| NT5C2| intron   | 5.37e-12     | -0.26      | 4.53e-13 | -0.07         | 0.15    | -0.15                  | 4.04e-4 |
| rs184992072| 10  | 104846756   | A/G     | 0.19| NT5C2| intron   | 5.81e-12     | -0.26      | 6.92e-13 | -0.07         | 0.13    | -0.15                  | 4.67e-4 |
| rs17884001 | 10  | 104651235   | G/A     | 0.19| AS3MT| UTR      | 6.37e-12     | -0.26      | 6.68e-13 | -0.07         | 0.14    | -0.15                  | 4.29e-4 |
| rs10430665 | 10  | 104838420   | G/A     | 0.19| NT5C2| UTR      | 8.30e-12     | -0.25      | 8.97e-13 | -0.07         | 0.15    | -0.15                  | 4.24e-4 |
| rs7098825  | 10  | 104618224   | A/G     | 0.17| C10orf32, AS3MT | intergenic | 9.01e-12     | -0.30      | 6.80e-13 | -0.05         | 0.33    | -0.18                  | 8.90e-5 |
| rs11191595 | 10  | 104933038   | A/C     | 0.19| NT5C2| intron   | 9.75e-12     | -0.25      | 9.71e-13 | -0.07         | 0.16    | -0.15                  | 4.36e-4 |
| rs10786736 | 10  | 104839106   | C/G     | 0.20| NT5C2| UTR      | 1.19e-11     | -0.25      | 1.13e-12 | -0.06         | 0.18    | -0.14                  | 3.73e-4 |
| rs2297787 | 10   | 104670127  | T/A     | 0.20| CNNM2| intron   | 5.61e-11     | -0.25      | 1.69e-12 | -0.06         | 0.22    | -0.14                  | 8.45e-4 |
| rs2482507  | 10  | 104551346   | G/A     | 0.21| C10orf26| intron | 1.22e-10     | -0.22      | 6.49e-11 | -0.05         | 0.25    | -0.15                  | 2.30e-4 |
| rs1926032  | 10  | 104819459   | G/A     | 0.18| CNNM2| intron   | 2.92e-10     | -0.24      | 1.22e-11 | -0.03         | 0.50    | -0.16                  | 2.11e-4 |
| rs284841   | 10  | 104540069   | A/G     | 0.20| C10orf26| intron | 5.51e-10     | -0.23      | 4.44e-11 | -0.06         | 0.23    | -0.13                  | 1.30e-3 |
| rs284844   | 10  | 104544519   | G/A     | 0.21| C10orf26| intron | 5.51e-10     | -0.23      | 4.44e-11 | -0.06         | 0.23    | -0.13                  | 1.30e-3 |
| rs284861   | 10  | 104562266   | G/A     | 0.15| C10orf26| intron | 1.61e-9      | -0.24      | 2.46e-8  | -0.10         | 0.07    | -0.14                  | 1.20e-3 |
| rs284851   | 10  | 104568521   | G/C     | 0.15| C10orf26, CYP17A1 | intergenic | 1.61e-9      | -0.24      | 2.46e-8  | -0.10         | 0.07    | -0.14                  | 1.20e-3 |
| rs4917384  | 10  | 104985778   | G/A     | 0.26| LOC401648, LOC729020 | intergenic | 8.26e-9      | -0.22      | 3.04e-10 | -0.05         | 0.23    | -0.10                  | 6.08e-3 |
| rs10509763 | 10  | 104766381   | G/A     | 0.18| CNNM2| intron   | 1.32e-7      | 0.12       | 1.22e-3  | 0.10          | 0.05    | 0.14                   | 8.00e-5 |
| SNP          | Chr | Position  | Alleles | MAF | Gene      | Location    | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|-----------|---------|-----|-----------|-------------|--------------|--------------|-----------------|----------------|-------------------|--------------------------|-----------------------------|
| rs74749600   | 10  | 104722986 | A/G     | 0.18| CNNM2     | intron      | 1.40e-7      | 0.12         | 1.08e-3        | 0.10           | 0.06              | 0.14                     | 7.60e-5                    |
| rs78893207   | 10  | 104786128 | A/G     | 0.17| CNNM2     | intron      | 1.47e-7      | 0.12         | 1.39e-3        | 0.10           | 0.05              | 0.14                     | 8.00e-5                    |
| rs76892505   | 10  | 104709280 | G/A     | 0.18| CNNM2     | intron      | 1.50e-7      | 0.12         | 1.77e-3        | 0.11           | 0.05              | 0.14                     | 7.60e-5                    |
| rs74376228   | 10  | 104667652 | C/G     | 0.18| AS3MT, CNNM2 | intergenic  | 1.60e-7      | 0.12         | 1.72e-3        | 0.11           | 0.05              | 0.14                     | 7.60e-5                    |
| rs80327774   | 10  | 104646661 | A/G     | 0.18| AS3MT     | intron      | 1.63e-7      | 0.12         | 1.20e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs12251035   | 10  | 104661449 | A/C     | 0.18| AS3MT, CNNM2 | intergenic  | 1.65e-7      | 0.12         | 1.22e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs11191473   | 10  | 104700700 | G/C     | 0.18| CNNM2     | intron      | 1.65e-7      | 0.12         | 1.22e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs7100592    | 10  | 104759088 | A/C     | 0.18| CNNM2     | intron      | 1.65e-7      | 0.12         | 1.22e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs12245343   | 10  | 104764040 | A/G     | 0.18| CNNM2     | intron      | 1.65e-7      | 0.12         | 1.22e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs79331374   | 10  | 104872903 | G/A     | 0.17| NT5C2     | intron      | 1.67e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs12258551   | 10  | 104757882 | G/C     | 0.18| CNNM2     | intron      | 1.78e-7      | 0.12         | 1.22e-3        | 0.10           | 0.06              | 0.14                     | 8.80e-5                    |
| rs11191523   | 10  | 104782390 | A/G     | 0.18| CNNM2     | intron      | 1.85e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs11191525   | 10  | 104783425 | C/G     | 0.18| CNNM2     | intron      | 1.85e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs58317752   | 10  | 104789257 | A/T     | 0.18| CNNM2     | intron      | 1.85e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs77827514   | 10  | 104811999 | G/A     | 0.18| CNNM2     | intron      | 1.85e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs78214351   | 10  | 104812678 | A/G     | 0.18| CNNM2     | intron      | 1.85e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| rs12257941   | 10  | 104823151 | G/A     | 0.18| CNNM2     | intron      | 1.85e-7      | 0.12         | 1.39e-3        | 0.10           | 0.06              | 0.14                     | 8.00e-5                    |
| SNP        | Chr | Position | Alleles | MAF | Gene       | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|------------|-----|----------|---------|-----|------------|----------|--------------|--------------|-----------------|---------------|-----------------|------------------------|--------------------------|
| rs12252500 | 10  | 104784974| G/C     | 0.17| CNNM2      | intron   | 1.95e-7      | 0.12         | 1.39e-3         | 0.10          | 0.06            | 0.14                   | 8.00e-5                  |
| rs12257935 | 10  | 104793052| C/A     | 0.17| CNNM2      | intron   | 1.95e-7      | 0.12         | 1.39e-3         | 0.10          | 0.06            | 0.14                   | 8.00e-5                  |
| rs12266291 | 10  | 104796874| G/A     | 0.17| CNNM2      | intron   | 1.95e-7      | 0.12         | 1.39e-3         | 0.10          | 0.06            | 0.14                   | 8.00e-5                  |
| rs11191545 | 10  | 104819783| G/A     | 0.17| CNNM2      | intron   | 2.00e-7      | 0.12         | 1.39e-3         | 0.10          | 0.07            | 0.14                   | 8.00e-5                  |
| rs77505796 | 10  | 104637764| T/A     | 0.18| AS3MT      | intron   | 2.10e-7      | 0.12         | 1.77e-3         | 0.10          | 0.06            | 0.14                   | 7.60e-5                  |
| rs17787717 | 10  | 104685689| A/C     | 0.18| CNNM2      | intron   | 2.10e-7      | 0.12         | 1.77e-3         | 0.10          | 0.06            | 0.14                   | 7.60e-5                  |
| rs75219158 | 10  | 104737584| G/A     | 0.18| CNNM2      | intron   | 2.10e-7      | 0.12         | 1.77e-3         | 0.10          | 0.06            | 0.14                   | 7.60e-5                  |
| rs17727391 | 10  | 104826091| C/A     | 0.18| CNNM2      | intron   | 2.36e-7      | 0.12         | 1.39e-3         | 0.10          | 0.06            | 0.14                   | 1.09e-4                  |
| rs17727044 | 10  | 104811246| T/A     | 0.17| CNNM2      | intron   | 2.37e-7      | 0.12         | 2.03e-3         | 0.10          | 0.06            | 0.14                   | 7.60e-5                  |
| rs58700372 | 10  | 104790195| A/G     | 0.17| CNNM2      | intron   | 2.45e-7      | 0.12         | 1.39e-3         | 0.10          | 0.08            | 0.14                   | 8.00e-5                  |
| rs12241091 | 10  | 104798987| G/A     | 0.17| CNNM2      | intron   | 2.45e-7      | 0.12         | 1.39e-3         | 0.10          | 0.08            | 0.14                   | 8.00e-5                  |
| rs11191490 | 10  | 104735164| T/A     | 0.18| CNNM2      | intron   | 2.46e-7      | 0.11         | 1.95e-3         | 0.10          | 0.06            | 0.14                   | 8.00e-5                  |
| rs11191439 | 10  | 104628713| A/G     | 0.18| AS3MT      | coding   | 2.58e-7      | 0.12         | 1.15e-3         | 0.10          | 0.06            | 0.14                   | 1.46e-4                  |
| rs76255497 | 10  | 104641945| A/G     | 0.18| AS3MT      | intron   | 3.16e-7      | 0.12         | 1.22e-3         | 0.09          | 0.10            | 0.14                   | 8.00e-5                  |
| rs12253284 | 10  | 104655135| C/G     | 0.18| AS3MT, CNNM2| intergenic| 3.16e-7      | 0.12         | 1.22e-3         | 0.09          | 0.10            | 0.14                   | 8.00e-5                  |
| rs12261040 | 10  | 104655387| A/G     | 0.18| AS3MT, CNNM2| intergenic| 3.16e-7      | 0.12         | 1.22e-3         | 0.09          | 0.10            | 0.14                   | 8.00e-5                  |
| rs10509758 | 10  | 104671700| A/G     | 0.18| CNNM2      | intron   | 3.16e-7      | 0.12         | 1.22e-3         | 0.09          | 0.10            | 0.14                   | 8.00e-5                  |
| SNP          | Chr | Position    | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas | Dakota P-value |
|--------------|-----|-------------|---------|-----|--------|----------|--------------|--------------|-----------------|----------------|-------------------|-------------------|----------------|
| rs4919694    | 10  | 104688968   | A/G     | 0.18| CNNM2  | intron   | 3.16e-7      | 0.12         | 1.22e-3        | 0.09           | 0.10              | 0.14              | 8.00e-5        |
| rs12268849   | 10  | 104727672   | G/A     | 0.18| CNNM2  | intron   | 3.16e-7      | 0.12         | 1.22e-3        | 0.09           | 0.10              | 0.14              | 8.00e-5        |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All 116 SNP associations are below MetaboChip-wide significance threshold of 3.57e-7 for meta-analysis. Base position according to human genome build 18.
Table S5. Top MetaboChip associations for percent dimethylarsinate

| SNP         | Chr | Position   | Alleles | MAF | Gene     | Location   | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|-------------|-----|------------|---------|-----|----------|------------|--------------|--------------|----------|----------------|---------|----------------------------|---------|
| rs12768205  | 10  | 104637839  | G/A     | 0.27| AS3MT    | intron     | 5.90e-24     | 0.28         | 1.33e-18 | 0.11          | 5.76e-4 | 0.17                      | 3.89e-8 |
| rs10883796  | 10  | 104645305  | G/A     | 0.27| AS3MT    | intron     | 5.90e-24     | 0.28         | 1.33e-18 | 0.11          | 5.76e-4 | 0.17                      | 3.89e-8 |
| rs11191447  | 10  | 104642313  | G/A     | 0.19| AS3MT    | intron     | 2.54e-23     | 0.30         | 2.60e-18 | 0.13          | 6.41e-4 | 0.20                      | 8.59e-8 |
| rs3740393   | 10  | 104626645  | G/C     | 0.21| AS3MT    | intron     | 2.71e-23     | 0.30         | 1.91e-18 | 0.13          | 3.52e-4 | 0.18                      | 2.47e-7 |
| rs3740390   | 10  | 104628470  | G/A     | 0.19| AS3MT    | intron     | 4.36e-23     | 0.30         | 2.60e-18 | 0.12          | 8.99e-4 | 0.20                      | 8.59e-8 |
| rs113282265 | 10  | 104647238  | A/G     | 0.19| AS3MT    | intron     | 4.36e-23     | 0.30         | 2.60e-18 | 0.12          | 8.99e-4 | 0.20                      | 8.59e-8 |
| rs11191416  | 10  | 104594906  | A/C     | 0.19| CYP17A1, C10orf32 | intergenic | 6.40e-23     | 0.30         | 4.13e-18 | 0.12          | 1.02e-3 | 0.20                      | 7.83e-8 |
| rs11191425  | 10  | 104615960  | G/A     | 0.19| C10orf32, AS3MT | intergenic | 6.40e-23     | 0.30         | 4.13e-18 | 0.12          | 1.02e-3 | 0.20                      | 7.83e-8 |
| rs3824754   | 10  | 104604340  | G/A     | 0.19| C10orf32 | intron     | 6.80e-23     | 0.30         | 4.13e-18 | 0.12          | 1.06e-3 | 0.20                      | 7.83e-8 |
| rs17878846  | 10  | 104620402  | T/A     | 0.19| AS3MT    | intron     | 6.90e-23     | 0.30         | 4.23e-18 | 0.12          | 1.06e-3 | 0.20                      | 7.83e-8 |
| rs188299216 | 10  | 104944768  | G/A     | 0.19| NT5C2, LOC401648 | intergenic | 8.83e-23     | 0.28         | 4.19e-16 | 0.13          | 3.86e-4 | 0.20                      | 2.95e-8 |
| rs10786722  | 10  | 104650058  | G/A     | 0.27| AS3MT    | intron     | 1.85e-22     | 0.26         | 3.24e-16 | 0.11          | 5.76e-4 | 0.17                      | 3.89e-8 |
| rs7897654   | 10  | 104652448  | A/G     | 0.27| AS3MT, CNNM2 | intergenic | 1.85e-22     | 0.26         | 3.24e-16 | 0.11          | 5.76e-4 | 0.17                      | 3.89e-8 |
| rs10883799  | 10  | 104653300  | G/A     | 0.27| AS3MT, | intergenic | 1.85e-22     | 0.26         | 3.24e-16 | 0.11          | 5.76e-4 | 0.17                      | 3.89e-8 |
| SNP        | Chr | Position   | Alleles | MAF  | Gene      | Location | Meta P-value | Arizona     | Oklahoma   | North/South Dakotas |
|------------|-----|------------|---------|------|-----------|----------|--------------|-------------|------------|---------------------|
|            |     |            |         |      |           |          |              | Beta        | P-value    | Beta                |
| rs1046778  | 10  | 104651474  | A/G     | 0.27 | AS3MT     | UTR      | 1.85e-22     | 0.26        | 3.24e-16  | 0.11 5.76e-4 0.17 3.89e-8 |
| rs3824755  | 10  | 104585839  | C/G     | 0.19 | CYP17A1   | intron   | 3.82e-22     | 0.30        | 4.53e-18  | 0.12 1.02e-3 0.18 3.70e-7 |
| rs1004467  | 10  | 104584497  | A/G     | 0.19 | CYP17A1   | intron   | 3.82e-22     | 0.30        | 4.53e-18  | 0.12 1.02e-3 0.18 3.70e-7 |
| rs77420391 | 10  | 104935813  | G/A     | 0.19 | NT5C2     | intron   | 5.19e-22     | 0.28        | 5.20e-16  | 0.12 9.06e-4 0.20 3.96e-8 |
| rs11191582 | 10  | 104903643  | G/A     | 0.19 | NT5C2     | intron   | 5.19e-22     | 0.28        | 5.20e-16  | 0.12 9.06e-4 0.20 3.96e-8 |
| rs4409766  | 10  | 104606653  | A/G     | 0.19 | C10orf32  | intron   | 6.73e-22     | 0.30        | 4.53e-18  | 0.12 1.45e-3 0.18 3.70e-7 |
| rs12221064 | 10  | 104667116  | G/A     | 0.19 | AS3MT, CNNM2 | intergenic | 7.81e-22     | 0.28        | 5.20e-16  | 0.13 6.96e-4 0.20 8.59e-8 |
| rs11191479 | 10  | 104713610  | A/G     | 0.19 | CNNM2     | intron   | 9.82e-22     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 7.33e-8 |
| rs78821730 | 10  | 104674534  | G/A     | 0.19 | CNNM2     | intron   | 1.08e-21     | 0.28        | 5.20e-16  | 0.12 8.56e-4 0.20 8.59e-8 |
| rs732998   | 10  | 104887891  | A/G     | 0.19 | NT5C2     | intron   | 1.15e-21     | 0.28        | 5.02e-16  | 0.12 9.06e-4 0.20 8.59e-8 |
| rs11191453 | 10  | 104649842  | A/G     | 0.19 | AS3MT     | intron   | 1.16e-21     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 8.59e-8 |
| rs12221193 | 10  | 104655257  | A/C     | 0.19 | AS3MT, CNNM2 | intergenic | 1.16e-21     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 8.59e-8 |
| rs77180047 | 10  | 104656747  | G/A     | 0.19 | AS3MT, CNNM2 | intergenic | 1.16e-21     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 8.59e-8 |
| rs17115213 | 10  | 104671133  | A/G     | 0.19 | CNNM2     | intron   | 1.16e-21     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 8.59e-8 |
| rs10509759 | 10  | 104679655  | T/A     | 0.19 | CNNM2     | intron   | 1.16e-21     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 8.59e-8 |
| rs5011520  | 10  | 104687506  | G/A     | 0.19 | CNNM2     | intron   | 1.16e-21     | 0.28        | 5.20e-16  | 0.12 8.99e-4 0.20 8.59e-8 |
| SNP      | Chr | Position     | Alleles | MAF  | Gene       | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|----------|-----|--------------|---------|------|------------|----------|--------------|--------------|-----------------|---------------|-------------------|-------------------------|---------------------------|
| rs10883808 | 10  | 104711116    | T/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs10883815 | 10  | 104729169    | A/G     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191502 | 10  | 104755484    | A/C     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191514 | 10  | 104763354    | G/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs77787671 | 10  | 104766195    | G/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs75970938 | 10  | 104783638    | A/G     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191535 | 10  | 104805866    | G/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs10458729 | 10  | 104831469    | G/A     | 0.19 | CNNM2, NT5C2 | intergenic | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191454 | 10  | 104649994    | A/G     | 0.19 | AS3MT      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191472 | 10  | 104697006    | T/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191515 | 10  | 104766517    | G/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191548 | 10  | 104836168    | A/G     | 0.19 | CNNM2, NT5C2 | intergenic | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs12411886 | 10  | 104675289    | C/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs12413409 | 10  | 104709086    | G/A     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs3781285  | 10  | 104815655    | C/G     | 0.19 | CNNM2      | intron   | 1.16e-21     | 0.28         | 5.20e-16       | 0.12          | 8.99e-4           | 0.20                    | 8.59e-8                  |
| rs11191555 | 10  | 104847513    | A/C     | 0.19 | NT5C2      | intron   | 1.17e-21     | 0.28         | 5.20e-16       | 0.12          | 9.06e-4           | 0.20                    | 8.51e-8                  |
| rs10786736 | 10  | 104839106    | C/G     | 0.20 | NT5C2      | UTR      | 1.17e-21     | 0.28         | 7.76e-16       | 0.11          | 1.93e-3           | 0.20                    | 2.09e-8                  |
| SNP        | Chr | Position  | Alleles | MAF  | Gene          | Location     | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|------------|-----|-----------|---------|------|---------------|--------------|--------------|-------------|-----------------|---------------|-----------------|-----------------------------|
| rs79237883 | 10  | 104930936 | A/G     | 0.19 | LOC729081, NT5C2 | intergenic   | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs11191558 | 10  | 104854668 | G/A     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs11191560 | 10  | 104859028 | A/G     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs11191580 | 10  | 104896201 | A/G     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs12220375 | 10  | 104891481 | A/G     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs12413046 | 10  | 104861194 | A/G     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs9633712  | 10  | 104863751 | G/C     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs12412038 | 10  | 104846152 | G/A     | 0.19 | NT5C2         | intron       | 1.18e-21     | 0.28        | 5.20e-16        | 0.12          | 9.06e-4         | 0.20                        |
| rs79780963 | 10  | 104942489 | G/A     | 0.19 | NT5C2         | intron       | 1.39e-21     | 0.28        | 1.65e-15        | 0.12          | 1.05e-3         | 0.20                        |
| rs12220743 | 10  | 104841902 | G/A     | 0.19 | NT5C2         | intron       | 1.41e-21     | 0.28        | 5.20e-16        | 0.12          | 1.02e-3         | 0.20                        |
| rs943037   | 10  | 104825909 | G/A     | 0.19 | CNNM2         | coding       | 1.41e-21     | 0.28        | 5.20e-16        | 0.12          | 1.02e-3         | 0.20                        |
| rs10883832 | 10  | 104861269 | A/C     | 0.19 | NT5C2         | intron       | 1.45e-21     | 0.28        | 5.20e-16        | 0.12          | 1.04e-3         | 0.20                        |
| rs12217501 | 10  | 104841879 | A/G     | 0.19 | NT5C2         | intron       | 1.50e-21     | 0.28        | 4.89e-16        | 0.12          | 1.08e-3         | 0.20                        |
| rs12219901 | 10  | 104830957 | A/G     | 0.19 | CNNM2, NT5C2  | intergenic   | 1.71e-21     | 0.28        | 5.20e-16        | 0.12          | 1.15e-3         | 0.20                        |
| rs1060240  | 10  | 104873327 | A/G     | 0.19 | NT5C2         | intron       | 2.02e-21     | 0.28        | 3.59e-16        | 0.12          | 1.64e-3         | 0.20                        |
| rs17884001 | 10  | 104651235 | G/A     | 0.19 | AS3MT         | UTR          | 2.04e-21     | 0.28        | 5.20e-16        | 0.12          | 1.28e-3         | 0.20                        |
| rs79668541 | 10  | 104783894 | G/A     | 0.19 | CNNM2         | intron       | 3.35e-21     | 0.28        | 2.01e-15        | 0.12          | 1.02e-3         | 0.20                        |
| SNP       | Chr | Position | Alleles | MAF | Gene  | Location | Meta P-value | Arizona | Oklahoma | North/South Dakotas |
|-----------|-----|----------|---------|-----|-------|----------|--------------|----------|----------|---------------------|
| rs12765002 | 10  | 104625338 | G/A     | 0.25 | AS3MT | intron   | 3.42e-21     | 0.29     | 2.74e-18 | 0.10 2.08e-3 0.16 1.18e-6 |
| rs10430665 | 10  | 104838420 | G/A     | 0.19 | NT5C2 | UTR      | 4.07e-21     | 0.28     | 6.42e-16 | 0.12 1.84e-3 0.20 8.38e-8 |
| rs184992072 | 10  | 104846756 | A/G     | 0.19 | NT5C2 | intron   | 5.35e-21     | 0.28     | 5.50e-16 | 0.12 1.22e-3 0.19 2.19e-7 |
| rs12764049 | 10  | 104624946 | A/G     | 0.25 | AS3MT | intron   | 7.03e-21     | 0.29     | 2.74e-18 | 0.10 3.20e-3 0.16 1.18e-6 |
| rs7920697  | 10  | 104623327 | A/G     | 0.26 | AS3MT | intron   | 8.77e-21     | 0.29     | 2.74e-18 | 0.10 3.73e-3 0.16 1.14e-6 |
| rs11191595 | 10  | 104933038 | A/C     | 0.19 | NT5C2 | intron   | 1.23e-20     | 0.27     | 3.88e-15 | 0.12 1.76e-3 0.20 8.76e-8 |
| rs2482507  | 10  | 104551346 | G/A     | 0.21 | C10orf26 | intron | 2.41e-20     | 0.26     | 1.81e-14 | 0.11 3.22e-3 0.19 2.42e-8 |
| rs3740394  | 10  | 104624464 | A/G     | 0.18 | AS3MT | intron   | 3.87e-20     | -0.21    | 7.93e-9  | -0.19 1.10e-5 -0.19 7.28e-9 |
| rs10509760 | 10  | 104624097 | A/G     | 0.18 | AS3MT | intron   | 4.69e-20     | -0.21    | 7.93e-9  | -0.19 1.10e-5 -0.19 8.89e-9 |
| rs7098825  | 10  | 104618224 | A/G     | 0.17 | C10orf32, AS3MT | intergenic | 6.37e-20 | 0.32     | 2.74e-15 | 0.12 6.81e-3 0.22 5.79e-8 |
| rs74376228 | 10  | 104667652 | C/G     | 0.18 | AS3MT, CNNM2 | intergenic | 1.19e-19 | -0.21    | 9.56e-9  | -0.18 2.90e-5 -0.19 5.96e-9 |
| rs2297787  | 10  | 104670127 | T/A     | 0.20 | CNNM2 | intron   | 1.21e-19     | 0.27     | 2.04e-15 | 0.11 3.54e-3 0.18 3.79e-7 |
| rs76892505 | 10  | 104709280 | G/A     | 0.18 | CNNM2 | intron   | 1.32e-19     | -0.20    | 1.50e-8  | -0.18 2.30e-5 -0.19 5.96e-9 |
| rs10509763 | 10  | 104766381 | G/A     | 0.18 | CNNM2 | intron   | 1.47e-19     | -0.21    | 7.47e-9  | -0.18 3.20e-5 -0.19 8.15e-9 |
| rs80327774 | 10  | 104646661 | A/G     | 0.18 | AS3MT | intron   | 1.73e-19     | -0.21    | 7.38e-9  | -0.18 3.70e-5 -0.19 8.15e-9 |
| rs4917986  | 10  | 104620171 | A/G     | 0.18 | AS3MT | intron   | 1.76e-19     | -0.21    | 7.93e-9  | -0.17 3.90e-5 -0.19 7.28e-9 |
| rs12251035 | 10  | 104661449 | A/C     | 0.18 | AS3MT, CNNM2 | intergenic | 1.81e-19 | -0.21    | 7.47e-9  | -0.18 3.80e-5 -0.19 8.15e-9 |
| SNP         | Chr | Position | Alleles | MAF  | Gene     | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|------------|-----|----------|---------|------|----------|----------|--------------|--------------|------------------|----------------|------------------|-----------------------------|
| rs11191473 | 10  | 104700700| G/C     | 0.18 | CNNM2    | intron   | 1.81e-19     | -0.21        | 7.47e-9         | -0.18         | 3.80e-5          | -0.19                       |
| rs7100592  | 10  | 104759088| A/C     | 0.18 | CNNM2    | intron   | 1.81e-19     | -0.21        | 7.47e-9         | -0.18         | 3.80e-5          | -0.19                       |
| rs12245343 | 10  | 104764040| A/G     | 0.18 | CNNM2    | intron   | 1.81e-19     | -0.21        | 7.47e-9         | -0.18         | 3.80e-5          | -0.19                       |
| rs74749600 | 10  | 104722986| A/G     | 0.18 | CNNM2    | intron   | 1.99e-19     | -0.21        | 9.02e-9         | -0.18         | 4.60e-5          | -0.19                       |
| rs12258551 | 10  | 104757882| G/C     | 0.18 | CNNM2    | intron   | 2.14e-19     | -0.21        | 7.47e-9         | -0.18         | 3.80e-5          | -0.19                       |
| rs77505796 | 10  | 104637764| T/A     | 0.18 | AS3MT    | intron   | 3.05e-19     | -0.20        | 1.50e-8         | -0.18         | 4.60e-5          | -0.19                       |
| rs17787717 | 10  | 104685689| A/C     | 0.18 | CNNM2    | intron   | 3.05e-19     | -0.20        | 1.50e-8         | -0.18         | 4.60e-5          | -0.19                       |
| rs75219158 | 10  | 104735164| G/A     | 0.18 | CNNM2    | intron   | 3.05e-19     | -0.20        | 1.50e-8         | -0.18         | 4.60e-5          | -0.19                       |
| rs11191490 | 10  | 104757882| A/G     | 0.18 | CNNM2    | intron   | 3.80e-19     | -0.20        | 1.81e-8         | -0.18         | 3.80e-5          | -0.19                       |
| rs284841   | 10  | 104540069| A/G     | 0.20 | C10orf26 | intron   | 3.92e-19     | 0.26         | 2.56e-14        | 0.11          | 2.63e-3          | 0.18                        |
| rs284844   | 10  | 104544519| G/A     | 0.21 | C10orf26 | intron   | 3.92e-19     | 0.26         | 2.56e-14        | 0.11          | 2.63e-3          | 0.18                        |
| rs11191439 | 10  | 104540069| A/G     | 0.18 | AS3MT    | coding   | 4.37e-19     | -0.21        | 6.45e-9         | -0.18         | 3.90e-5          | -0.18                       |
| rs79331374 | 10  | 104879203| G/A     | 0.17 | NT5C2    | intron   | 4.76e-19     | -0.21        | 3.33e-8         | -0.18         | 3.00e-5          | -0.19                       |
| rs78893207 | 10  | 104786128| A/G     | 0.17 | CNNM2    | intron   | 5.15e-19     | -0.21        | 3.33e-8         | -0.18         | 3.20e-5          | -0.19                       |
| rs11191545 | 10  | 104819783| G/A     | 0.17 | CNNM2    | intron   | 5.53e-19     | -0.21        | 3.33e-8         | -0.18         | 3.40e-5          | -0.19                       |
| rs11191523 | 10  | 104783425| C/G     | 0.18 | CNNM2    | intron   | 6.33e-19     | -0.21        | 3.33e-8         | -0.18         | 3.80e-5          | -0.19                       |
| rs11191525 | 10  | 104789257| A/T     | 0.18 | CNNM2    | intron   | 6.33e-19     | -0.21        | 3.33e-8         | -0.18         | 3.80e-5          | -0.19                       |
| rs58317752 | 10  | 104811999| G/A     | 0.18 | CNNM2    | intron   | 6.33e-19     | -0.21        | 3.33e-8         | -0.18         | 8.15e-9          | -0.19                       |
| SNP        | Chr | Position  | Alleles | MAF | Gene     | Location | Meta P-value     | Arizona  | Oklahoma | North/South Dakotas |
|------------|-----|-----------|---------|-----|----------|----------|-----------------|----------|----------|-------------------|
| rs78214351 | 10  | 104812678 | A/G     | 0.18| CNNM2    | intron   | 6.33e-19        | -0.21    | 3.33e-8  | -0.19            | 8.15e-9     |
| rs12257941 | 10  | 104823151 | G/A     | 0.18| CNNM2    | intron   | 6.33e-19        | -0.21    | 3.33e-8  | -0.19            | 8.15e-9     |
| rs76255497 | 10  | 104641945 | A/G     | 0.18| AS3MT    | intron   | 8.25e-19        | -0.21    | 7.47e-9 | -0.16            | 8.15e-9     |
| rs12253284 | 10  | 104655135 | C/G     | 0.18| AS3MT, CNNM2 | intergenic | 8.25e-19    | -0.21    | 7.47e-9 | -0.16            | 8.15e-9     |
| rs12261040 | 10  | 104655387 | A/G     | 0.18| AS3MT, CNNM2 | intergenic | 8.25e-19    | -0.21    | 7.47e-9 | -0.16            | 8.15e-9     |
| rs10509758 | 10  | 104671700 | A/G     | 0.18| CNNM2    | intron   | 8.25e-19        | -0.21    | 7.47e-9 | -0.16            | 8.15e-9     |
| rs4919694  | 10  | 104688968 | A/G     | 0.18| CNNM2    | intron   | 8.25e-19        | -0.21    | 7.47e-9 | -0.16            | 8.15e-9     |
| rs12268849 | 10  | 104727672 | G/A     | 0.18| CNNM2    | intron   | 8.25e-19        | -0.21    | 7.47e-9 | -0.16            | 8.15e-9     |
| rs17727391 | 10  | 104826091 | C/A     | 0.18| CNNM2    | intron   | 9.43e-19        | -0.21    | 3.33e-8 | -0.18            | 1.25e-8     |
| rs17727044 | 10  | 104811246 | T/A     | 0.17| CNNM2    | intron   | 1.08e-18        | -0.20    | 6.62e-8 | -0.18            | 5.96e-9     |
| rs4917384  | 10  | 104985778 | G/A     | 0.26| LOC401648, LOC729020 | intergenic | 1.20e-18    | 0.25     | 1.60e-13 | 0.12             | 3.36e-6     |
| rs12252500 | 10  | 104784974 | G/C     | 0.17| CNNM2    | intron   | 1.47e-18        | -0.21    | 3.33e-8 | -0.17            | 8.15e-9     |
| rs12257935 | 10  | 104793052 | C/A     | 0.17| CNNM2    | intron   | 1.47e-18        | -0.21    | 3.33e-8 | -0.17            | 8.15e-9     |
| rs12266291 | 10  | 104796874 | G/A     | 0.17| CNNM2    | intron   | 1.47e-18        | -0.21    | 3.33e-8 | -0.17            | 8.15e-9     |
| rs58700372 | 10  | 104790195 | A/G     | 0.17| CNNM2    | intron   | 1.82e-18        | -0.21    | 3.33e-8 | -0.17            | 8.15e-9     |
| rs12241091 | 10  | 104798987 | G/A     | 0.17| CNNM2    | intron   | 1.82e-18        | -0.21    | 3.33e-8 | -0.17            | 8.15e-9     |
| SNP          | Chr | Position   | Alleles | MAF | Gene     | Location     | Meta P-value | Arizona | Oklahoma | North/South Dakotas |
|--------------|-----|------------|---------|-----|----------|--------------|--------------|---------|----------|---------------------|
| rs75691516   | 10  | 104642035  | G/A     | 0.18| AS3MT    | intron       | 2.26e-18     | -0.21   | 7.47e-9  | -0.16               | -0.19 | 8.15e-9           |
| rs1926032    | 10  | 104819459  | G/A     | 0.18| CNNM2    | intron       | 4.59e-18     | 0.27    | 1.34e-14 | 0.09                | 0.01  | 2.19e-7           |
| rs143910868  | 10  | 104625749  | G/A     | 0.19| AS3MT    | intron       | 9.43e-18     | -0.20   | 3.25e-8  | -0.17               | -0.17 | 1.63e-7           |
| rs284861     | 10  | 104562266  | G/A     | 0.15| C10orf26 | intron       | 1.46e-17     | 0.26    | 8.45e-10 | 0.15                | 0.15  | 8.75e-8           |
| rs284851     | 10  | 104568521  | G/C     | 0.15| C10orf26, CYP17A1 | intergenic   | 1.46e-17     | 0.26    | 8.45e-10 | 0.15                | 0.15  | 8.75e-8           |
| rs12261294   | 10  | 104924942  | G/A     | 0.19| LOC729081| intron       | 1.91e-16     | -0.20   | 4.58e-8  | -0.14               | -0.17 | 7.42e-8           |
| rs12262258   | 10  | 104890262  | G/A     | 0.19| NT5C2    | intron       | 3.92e-16     | -0.20   | 1.23e-7  | -0.14               | -0.17 | 5.51e-8           |
| rs12243903   | 10  | 104896982  | A/G     | 0.19| NT5C2    | intron       | 3.92e-16     | -0.20   | 1.23e-7  | -0.14               | -0.17 | 5.51e-8           |
| rs4917995    | 10  | 104835433  | T/A     | 0.19| CNNM2, NT5C2 | intergenic   | 4.96e-16     | -0.20   | 1.23e-7  | -0.13               | 8.02e-4| 0.17            |
| rs4919685    | 10  | 104577352  | C/A     | 0.25| C10orf26, CYP17A1 | intergenic   | 5.25e-16     | -0.18   | 1.68e-7  | -0.15               | 3.00e-5| -0.14           |
| rs12240508   | 10  | 104929222  | G/A     | 0.19| LOC729081, NT5C2 | intergenic   | 5.34e-16     | -0.20   | 9.60e-8  | -0.13               | 9.90e-4| -0.17           |
| rs743575     | 10  | 104584896  | A/C     | 0.25| CYP17A1  | intron       | 6.98e-16     | -0.18   | 1.78e-7  | -0.14               | 8.60e-5| -0.15           |
| rs4919687    | 10  | 104585238  | G/A     | 0.25| CYP17A1  | intron       | 6.98e-16     | -0.18   | 1.78e-7  | -0.14               | 8.60e-5| -0.15           |
| rs4919686    | 10  | 104582239  | A/C     | 0.25| CYP17A1  | intron       | 8.32e-16     | -0.18   | 3.21e-7  | -0.15               | 3.50e-5| -0.14           |
| rs12416687   | 10  | 104619001  | A/G     | 0.24| C10orf32, AS3MT | intergenic   | 9.26e-16     | -0.18   | 1.85e-7  | -0.14               | 1.75e-4| -0.15           |
| rs9527       | 10  | 104613568  | G/A     | 0.23| C10orf32 | UTR          | 9.67e-16     | -0.18   | 1.95e-7  | -0.14               | 1.75e-4| -0.15           |
| SNP         | Chr | Position       | Alleles | MAF | Gene      | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|-------------|-----|----------------|---------|-----|-----------|----------|--------------|--------------|-----------------|----------------|--------------------|-----------------------------|
| rs10883783  | 10  | 104581142      | T/A     | 0.25| CYP17A1   | intron   | 1.69e-15     | -0.18        | 1.68e-7         | -0.14          | 8.60e-5            | -0.14                       |
| rs12255761  | 10  | 104791856      | G/A     | 0.19| CNNM2     | intron   | 2.43e-15     | -0.20        | 1.23e-7         | -0.13          | 1.31e-3            | -0.16                       |
| rs1475642   | 10  | 104536173      | A/G     | 0.24| C10orf26  | intron   | 2.63e-15     | -0.16        | 3.19e-6         | -0.17          | 1.20e-5            | -0.14                       |
| rs4919690   | 10  | 104606490      | A/G     | 0.24| C10orf32  | intron   | 2.85e-15     | -0.18        | 1.78e-7         | -0.13          | 4.53e-4            | -0.15                       |
| rs11191381  | 10  | 104483434      | G/A     | 0.24| SFXN2     | intron   | 6.64e-15     | -0.17        | 1.93e-6         | -0.15          | 7.50e-5            | -0.14                       |
| rs11191385  | 10  | 104503039      | C/A     | 0.24| C10orf26  | intron   | 7.82e-15     | -0.17        | 1.93e-6         | -0.15          | 8.70e-5            | -0.14                       |
| rs12776506  | 10  | 104522818      | A/G     | 0.25| C10orf26  | intron   | 1.16e-14     | -0.16        | 3.14e-6         | -0.15          | 8.30e-5            | -0.14                       |
| rs12256506  | 10  | 104953608      | A/T     | 0.19| NT5C2, LOC401648 | intergenic | 1.23e-14 | -0.17 | 4.89e-6  | -0.13 | 8.64e-4 | -0.17 | 5.51e-8 |
| rs34416174  | 10  | 104533878      | C/G     | 0.25| C10orf26  | intron   | 1.26e-14     | -0.16        | 6.06e-6         | -0.16          | 3.90e-5            | -0.14                       |
| rs10786667  | 10  | 104209122      | A/G     | 0.46| C10orf95, TMEM180 | intergenic | 1.49e-14 | 0.16 | 2.08e-8 | 0.10 | 8.98e-4 | 0.12 | 7.06e-6 |
| rs56254970  | 10  | 104209283      | A/G     | 0.46| C10orf95, TMEM180 | intergenic | 1.49e-14 | 0.16 | 2.08e-8 | 0.10 | 8.98e-4 | 0.12 | 7.06e-6 |
| rs674816    | 10  | 104530555      | C/G     | 0.39| C10orf26  | intron   | 7.88e-14     | 0.20         | 1.55e-11        | 0.10           | 1.47e-3            | 0.09                        |
| rs631381    | 10  | 104533378      | T/A     | 0.39| C10orf26  | intron   | 1.02e-13     | 0.20         | 9.25e-12        | 0.10           | 2.00e-3            | 0.09                        |
| rs12765459  | 10  | 104455677      | C/G     | 0.25| ARL3      | intron   | 1.17e-13     | -0.16        | 3.81e-6         | -0.15          | 6.80e-5            | -0.12                       |
| rs541393    | 10  | 104528601      | G/A     | 0.39| C10orf26  | intron   | 1.20e-13     | 0.20         | 1.30e-11        | 0.10           | 1.51e-3            | 0.09                        |
| rs524430    | 10  | 104531490      | A/C     | 0.39| C10orf26  | intron   | 1.58e-13     | 0.20         | 1.44e-11        | 0.10           | 1.78e-3            | 0.09                        |
| rs593410    | 10  | 104522822      | A/G     | 0.39| C10orf26  | intron   | 1.60e-13     | 0.20         | 1.54e-11        | 0.10           | 1.75e-3            | 0.09                        |
| SNP       | Chr | Position       | Alleles | MAF | Gene       | Location | Meta P-value |    | Arizona Beta | Arizona P-value |    | Oklahoma Beta | Oklahoma P-value |    | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|----------------|---------|-----|------------|----------|--------------|----|--------------|------------------|----|----------------|------------------|----|------------------------|--------------------------|
| rs549466  | 10  | 104522903      | A/G     | 0.39| C10orf26   | intron   | 1.60e-13     | 0.20| 1.54e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs553258  | 10  | 104523312      | G/A     | 0.39| C10orf26   | intron   | 1.60e-13     | 0.20| 1.54e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs499770  | 10  | 104524897      | G/C     | 0.39| C10orf26   | intron   | 1.60e-13     | 0.20| 1.54e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs2254093 | 10  | 104529907      | C/A     | 0.39| C10orf26   | intron   | 1.60e-13     | 0.20| 1.54e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs2482498 | 10  | 104525440      | G/C     | 0.39| C10orf26   | intron   | 1.61e-13     | 0.20| 1.55e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs630185  | 10  | 104527139      | G/A     | 0.39| C10orf26   | intron   | 1.61e-13     | 0.20| 1.55e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs2254111 | 10  | 104529510      | A/T     | 0.39| C10orf26   | intron   | 1.61e-13     | 0.20| 1.55e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs2253703 | 10  | 104532964      | A/G     | 0.39| C10orf26   | intron   | 1.61e-13     | 0.20| 1.55e-11     | 0.10             | 1.75e-3 | 0.09        | 1.57e-3          |     |
| rs77308618| 10  | 104405811      | A/G     | 0.26| TRIM8      | intron   | 1.62e-13     | -0.18| 3.01e-7      | -0.12            | 5.71e-4 | -0.12       | 1.80e-5          |     |
| rs34269636| 10  | 104400589      | A/G     | 0.24| TRIM8      | intron   | 1.88e-13     | -0.19| 1.97e-7      | -0.13            | 7.74e-4 | -0.13       | 2.00e-5          |     |
| rs2253983 | 10  | 104530451      | A/G     | 0.39| C10orf26   | intron   | 2.22e-13     | 0.20| 1.54e-11     | 0.09             | 2.25e-3 | 0.09        | 1.57e-3          |     |
| rs2254563 | 10  | 104526355      | C/G     | 0.39| C10orf26   | intron   | 2.63e-13     | 0.20| 1.47e-11     | 0.09             | 2.61e-3 | 0.09        | 1.57e-3          |     |
| rs10883790| 10  | 104630945      | A/C     | 0.24| AS3MT      | intron   | 2.89e-13     | -0.17| 6.53e-7      | -0.12            | 1.74e-3 | -0.14       | 4.44e-6          |     |
| rs7923415 | 10  | 104408646      | G/A     | 0.40| TRIM8,     | intergenic| 2.96e-13     | 0.18| 9.90e-10     | 0.10             | 1.15e-3 | 0.10        | 5.21e-4          |     |
| rs3740392 | 10  | 104626845      | A/G     | 0.24| AS3MT      | intron   | 3.28e-13     | -0.17| 7.67e-7      | -0.12            | 1.74e-3 | -0.14       | 4.44e-6          |     |
| rs12249194| 10  | 104633688      | A/G     | 0.24| AS3MT      | intron   | 3.44e-13     | -0.17| 6.53e-7      | -0.11            | 1.99e-3 | -0.14       | 4.44e-6          |     |
| rs141653928| 10   | 104721009      | G/A     | 0.03| CNNM2      | intron   | 4.39e-13     | -0.31| 2.14e-4      | -0.66            | 9.12e-6 | -0.39       | 1.20e-5          |     |
| rs2273555 | 10  | 104117161      | A/G     | 0.45| GBF1       | intron   | 6.76e-13     | -0.12| 5.90e-5      | -0.11            | 3.57e-4 | -0.14       | 1.38e-6          |     |
| SNP       | Chr | Position | Alleles | MAF | Gene         | Location     | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|----------|---------|-----|--------------|--------------|--------------|--------------|------------------|----------------|-------------------|------------------------|---------------------------|
| rs12764219 | 10  | 104388885 | C/A     | 0.24 | SUFU, TRIM8  | intergenic   | 7.37e-13     | -0.19        | 1.95e-7          | -0.11          | 2.35e-3           | -0.13                  | 2.00e-5                   |
| rs11191371 | 10  | 104449887 | C/G     | 0.26 | ARL3         | intron       | 7.84e-13     | -0.16        | 4.35e-6          | -0.13          | 3.99e-4           | -0.12                  | 1.60e-5                   |
| rs12241712 | 10  | 104398262 | C/A     | 0.25 | TRIM8        | intron       | 8.86e-13     | -0.18        | 1.62e-7          | -0.11          | 1.89e-3           | -0.12                  | 3.60e-5                   |
| rs142298786| 10  | 104405084 | A/C     | 0.25 | TRIM8        | intron       | 8.97e-13     | -0.18        | 1.65e-7          | -0.11          | 1.89e-3           | -0.12                  | 3.60e-5                   |
| rs3850699  | 10  | 104404211 | A/G     | 0.25 | TRIM8        | intron       | 8.97e-13     | -0.18        | 1.65e-7          | -0.11          | 1.89e-3           | -0.12                  | 3.60e-5                   |
| rs7900450  | 10  | 104446300 | G/A     | 0.26 | ARL3         | intron       | 1.05e-12     | -0.16        | 4.49e-6          | -0.13          | 2.97e-4           | -0.12                  | 2.90e-5                   |
| rs7905481  | 10  | 104466282 | A/G     | 0.26 | SFXN2        | intron       | 1.14e-12     | -0.16        | 4.63e-6          | -0.12          | 6.36e-4           | -0.13                  | 1.30e-5                   |
| rs80288225 | 10  | 104248073 | A/G     | 0.24 | ACTR1A       | intron       | 1.34e-12     | -0.17        | 2.35e-6          | -0.12          | 1.33e-3           | -0.13                  | 1.10e-5                   |
| rs34058856 | 10  | 104359313 | G/A     | 0.23 | SUFU         | intron       | 1.39e-12     | -0.18        | 1.09e-6          | -0.12          | 1.05e-3           | -0.12                  | 2.80e-5                   |
| rs35485301 | 10  | 104360817 | G/A     | 0.23 | SUFU         | intron       | 1.39e-12     | -0.18        | 1.09e-6          | -0.12          | 1.05e-3           | -0.12                  | 2.80e-5                   |
| rs12773600 | 10  | 104408218 | C/G     | 0.25 | TRIM8, ARL3  | intergenic   | 1.45e-12     | -0.16        | 8.57e-6          | -0.13          | 3.43e-4           | -0.12                  | 2.00e-5                   |
| rs12784517 | 10  | 104454960 | A/G     | 0.26 | ARL3         | intron       | 1.49e-12     | -0.16        | 4.63e-6          | -0.13          | 3.99e-4           | -0.12                  | 2.90e-5                   |
| rs12761195 | 10  | 104453664 | A/G     | 0.26 | ARL3         | intron       | 1.49e-12     | -0.16        | 4.63e-6          | -0.13          | 3.99e-4           | -0.12                  | 2.90e-5                   |
| rs77060053 | 10  | 104207743 | A/G     | 0.18 | C10orf95, TMEM180 | intergenic | 1.56e-12     | -0.18        | 3.10e-6          | -0.13          | 2.44e-3           | -0.15                  | 4.59e-6                   |
| rs7907503  | 10  | 104430040 | G/A     | 0.26 | ARL3         | intron       | 1.64e-12     | -0.16        | 4.73e-6          | -0.13          | 4.27e-4           | -0.12                  | 2.90e-5                   |
| rs12783444 | 10  | 104470649 | G/A     | 0.26 | SFXN2        | intron       | 1.84e-12     | -0.16        | 4.63e-6          | -0.12          | 6.14e-4           | -0.12                  | 2.20e-5                   |
| rs17784294 | 10  | 104469375 | C/A     | 0.26 | SFXN2        | intron       | 1.84e-12     | -0.16        | 4.63e-6          | -0.12          | 6.14e-4           | -0.12                  | 2.20e-5                   |
| SNP          | Chr | Position     | Alleles | MAF | Gene              | Location     | Meta Beta | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-------------|-----|--------------|---------|-----|-------------------|--------------|-----------|-------------|--------------|-----------------|----------------|-----------------|------------------------|--------------------------|
| rs12779263  | 10  | 104876523    | C/A     | 0.25 | NT5C2            | intron       | 2.12e-12  | -0.17       | 2.57e-6      | -0.10           | 4.92e-3         | -0.14           | 2.78e-6            |
| rs12780827  | 10  | 104457944    | A/G     | 0.26 | ARL3             | intron       | 2.41e-12  | -0.16       | 4.63e-6      | -0.12           | 6.14e-4         | -0.12           | 2.90e-5            |
| rs4917999   | 10  | 104953041    | G/C     | 0.25 | NT5C2, LOC401648 | intergenic   | 2.71e-12  | -0.17       | 2.57e-6      | -0.10           | 5.53e-3         | -0.14           | 3.06e-6            |
| rs4917991   | 10  | 104773823    | A/G     | 0.26 | CNNM2            | intron       | 3.77e-12  | -0.17       | 4.70e-7      | -0.10           | 4.69e-3         | -0.12           | 2.20e-5            |
| rs182441718 | 10  | 104924388    | A/G     | 0.25 | NT5C2            | intron       | 3.83e-12  | -0.17       | 2.43e-6      | -0.10           | 7.58e-3         | -0.14           | 2.94e-6            |
| rs7094325   | 10  | 104419736    | G/C     | 0.26 | TRIM8, ARL3      | intergenic   | 4.87e-12  | -0.16       | 5.43e-6      | -0.12           | 8.65e-4         | -0.12           | 3.50e-5            |
| rs12773833  | 10  | 104408340    | G/A     | 0.26 | TRIM8, ARL3      | intergenic   | 5.56e-12  | -0.16       | 6.41e-6      | -0.12           | 8.65e-4         | -0.12           | 3.50e-5            |
| rs7898770   | 10  | 104746626    | G/A     | 0.26 | CNNM2            | intron       | 5.70e-12  | -0.17       | 1.03e-6      | -0.10           | 4.29e-3         | -0.12           | 2.10e-5            |
| rs10883820  | 10  | 104754651    | C/A     | 0.26 | CNNM2            | intron       | 5.70e-12  | -0.17       | 1.03e-6      | -0.10           | 4.29e-3         | -0.12           | 2.10e-5            |
| rs10509764  | 10  | 104766465    | G/A     | 0.26 | CNNM2            | intron       | 5.70e-12  | -0.17       | 1.03e-6      | -0.10           | 4.29e-3         | -0.12           | 2.10e-5            |
| rs6584537   | 10  | 104768257    | G/C     | 0.26 | CNNM2            | intron       | 5.70e-12  | -0.17       | 1.03e-6      | -0.10           | 4.29e-3         | -0.12           | 2.10e-5            |
| rs12570611  | 10  | 104411669    | G/C     | 0.26 | TRIM8, ARL3      | intergenic   | 5.79e-12  | -0.16       | 6.74e-6      | -0.12           | 8.65e-4         | -0.12           | 3.50e-5            |
| rs7894959   | 10  | 104746172    | G/A     | 0.26 | CNNM2            | intron       | 5.96e-12  | -0.17       | 1.03e-6      | -0.10           | 4.29e-3         | -0.12           | 2.20e-5            |
| rs12763720  | 10  | 104231973    | A/G     | 0.23 | ACTR1A           | intron       | 5.98e-12  | -0.18       | 1.09e-6      | -0.11           | 2.61e-3         | -0.12           | 4.00e-5            |
| rs10883818  | 10  | 104749576    | A/G     | 0.26 | CNNM2            | intron       | 6.41e-12  | -0.17       | 1.03e-6      | -0.10           | 4.69e-3         | -0.12           | 2.10e-5            |
| rs10786732  | 10  | 104752525    | A/G     | 0.26 | CNNM2            | intron       | 6.41e-12  | -0.17       | 1.03e-6      | -0.10           | 4.69e-3         | -0.12           | 2.10e-5            |
| SNP          | Chr | Position     | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|--------------|---------|-----|----------|----------|--------------|--------------|-----------------|---------------|-----------------|----------------------|----------------------------|
| rs11191513   | 10  | 104762974    | A/C     | 0.26| CNNM2    | intron   | 6.41e-12     | -0.17        | 1.03e-6         | -0.10         | 4.69e-3         | -0.12                | 2.10e-5                   |
| rs192145925  | 10  | 104666944    | G/A     | 0.26| AS3MT, CNNM2 | intergenic | 7.32e-12     | -0.17        | 4.68e-7         | -0.09         | 7.96e-3         | -0.12                | 2.10e-5                   |
| rs76099321   | 10  | 104787273    | G/A     | 0.29| CNNM2    | intron   | 7.79e-12     | -0.19        | 1.51e-9         | -0.09         | 0.01           | -0.12                | 4.58e-4                   |
| rs78193706   | 10  | 104770554    | A/G     | 0.26| CNNM2    | intron   | 7.80e-12     | -0.17        | 1.03e-6         | -0.10         | 5.45e-3         | -0.12                | 2.10e-5                   |
| rs10883801   | 10  | 10467877     | A/C     | 0.26| AS3MT, CNNM2 | intergenic | 8.48e-12     | -0.17        | 7.25e-7         | -0.10         | 7.03e-3         | -0.12                | 2.10e-5                   |
| rs10883829   | 10  | 104830625    | A/G     | 0.26| CNNM2, NT5C2 | intergenic | 9.95e-12     | -0.17        | 2.37e-6         | -0.10         | 3.92e-3         | -0.12                | 2.20e-5                   |
| rs12573077   | 10  | 104424620    | C/A     | 0.25| ARL3     | UTR      | 1.01e-11     | -0.15        | 2.30e-5         | -0.13         | 5.79e-4         | -0.12                | 3.50e-5                   |
| rs35637354   | 10  | 104211844    | A/C     | 0.23| TMEM180  | intron   | 1.06e-11     | -0.18        | 1.09e-6         | -0.11         | 2.84e-3         | -0.12                | 6.40e-5                   |
| rs7894588    | 10  | 104746020    | A/T     | 0.26| CNNM2    | intron   | 1.11e-11     | -0.17        | 1.03e-6         | -0.10         | 7.08e-3         | -0.12                | 2.10e-5                   |
| rs17115317   | 10  | 104734215    | G/A     | 0.28| CNNM2    | intron   | 1.16e-11     | -0.17        | 2.22e-8         | -0.09         | 9.03e-3         | -0.13                | 2.17e-4                   |
| rs1935323    | 10  | 104867025    | A/G     | 0.25| NT5C2    | intron   | 1.18e-11     | -0.17        | 2.31e-6         | -0.10         | 4.69e-3         | -0.12                | 2.10e-5                   |
| rs17115414   | 10  | 104815142    | A/C     | 0.29| CNNM2    | intron   | 1.20e-11     | -0.19        | 1.51e-9         | -0.09         | 0.01           | -0.12                | 5.91e-4                   |
| rs10883800   | 10  | 104661202    | A/C     | 0.26| AS3MT, CNNM2 | intergenic | 1.29e-11     | -0.17        | 1.03e-6         | -0.09         | 7.96e-3         | -0.12                | 2.10e-5                   |
| rs7073295    | 10  | 104662223    | A/G     | 0.26| AS3MT, CNNM2 | intergenic | 1.29e-11     | -0.17        | 1.03e-6         | -0.09         | 7.96e-3         | -0.12                | 2.10e-5                   |
| rs58289149   | 10  | 104770542    | G/A     | 0.26| CNNM2    | intron   | 1.34e-11     | -0.17        | 1.03e-6         | -0.09         | 8.18e-3         | -0.12                | 2.10e-5                   |
| rs11191293   | 10  | 104211529    | G/A     | 0.42| TMEM180  | intron   | 1.37e-11     | 0.18         | 1.63e-9         | 0.09          | 3.16e-3         | 0.08                 | 3.18e-3                   |
| SNP          | Chr | Position   | Alleles | MAF | Gene, Location          | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|------------|---------|-----|-------------------------|--------------|--------------|-----------------|---------------|-------------------|-------------------------|----------------------------|
| rs74233806   | 10  | 104836881  | G/A     | 0.29| CNNM2, NT5C2, intergenic | 1.39e-11     | -0.19        | 1.51e-9         | -0.09         | 0.01              | -0.12                  | 5.70e-4                    |
| rs1046411    | 10  | 104827806  | G/A     | 0.25| CNNM2, UTR              | 1.51e-11     | -0.16        | 4.92e-6         | -0.11         | 2.44e-3          | -0.12                  | 3.50e-5                    |
| rs7096452    | 10  | 104726553  | G/A     | 0.26| CNNM2, intron           | 1.52e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 1.90e-5                    |
| rs17725614   | 10  | 104675483  | G/C     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs3897401    | 10  | 104686369  | A/G     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs10883804   | 10  | 104696510  | G/A     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs7089061    | 10  | 104713005  | C/A     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs10883810   | 10  | 104717214  | A/C     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs7899622    | 10  | 104717323  | G/A     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs12248123   | 10  | 104725356  | A/G     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs7080462    | 10  | 104726689  | A/G     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs11191489   | 10  | 104730558  | C/A     | 0.26| CNNM2, intron           | 1.67e-11     | -0.17        | 1.03e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs11191485   | 10  | 104719806  | C/G     | 0.26| CNNM2, intron           | 1.72e-11     | -0.17        | 1.07e-6         | -0.09         | 9.59e-3          | -0.12                  | 2.10e-5                    |
| rs1926029    | 10  | 104845660  | G/A     | 0.25| NT5C2, intron           | 2.11e-11     | -0.16        | 4.92e-6         | -0.10         | 4.70e-3          | -0.12                  | 2.10e-5                    |
| rs2274339    | 10  | 104850043  | A/T     | 0.25| NT5C2, intron           | 2.11e-11     | -0.16        | 4.92e-6         | -0.10         | 4.70e-3          | -0.12                  | 2.10e-5                    |
| rs7912517    | 10  | 104895519  | G/A     | 0.25| NT5C2, intron           | 2.11e-11     | -0.16        | 4.92e-6         | -0.10         | 4.70e-3          | -0.12                  | 2.10e-5                    |
| rs2066322    | 10  | 104899329  | A/C     | 0.25| NT5C2, intron           | 2.11e-11     | -0.16        | 4.92e-6         | -0.10         | 4.70e-3          | -0.12                  | 2.10e-5                    |
| rs10786744   | 10  | 104935018  | C/A     | 0.25| NT5C2, intron           | 2.11e-11     | -0.16        | 4.92e-6         | -0.10         | 4.70e-3          | -0.12                  | 2.10e-5                    |
| SNP        | Chr | Position   | Alleles | MAF | Gene          | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|------------|-----|------------|---------|-----|---------------|----------|--------------|--------------|-----------------|---------------|--------------------|-----------------------------|----------------------------|
| rs10883843 | 10  | 104937483  | G/C     | 0.25| NT5C2        | intron   | 2.11e-11     | -0.16        | 4.92e-6        | -0.10         | 4.70e-3            | -0.12                       | 2.10e-5                     |
| rs11191602 | 10  | 104944209  | G/A     | 0.25| NT5C2, LOC401648 | intergenic | 2.11e-11     | -0.16        | 4.92e-6        | -0.10         | 4.70e-3            | -0.12                       | 2.10e-5                     |
| rs7095304  | 10  | 104944785  | G/A     | 0.25| NT5C2, LOC401648 | intergenic | 2.11e-11     | -0.16        | 4.92e-6        | -0.10         | 4.70e-3            | -0.12                       | 2.10e-5                     |
| rs7100369  | 10  | 104946208  | C/A     | 0.25| NT5C2, LOC401648 | intergenic | 2.11e-11     | -0.16        | 4.92e-6        | -0.10         | 4.70e-3            | -0.12                       | 2.10e-5                     |
| rs12246739 | 10  | 104777009  | C/A     | 0.23| CNNM2        | intron   | 2.24e-11     | -0.18        | 1.30e-6        | -0.11         | 5.17e-3            | -0.12                       | 5.60e-5                     |
| rs10883847 | 10  | 104948274  | G/A     | 0.25| NT5C2, LOC401648 | intergenic | 2.30e-11     | -0.16        | 4.92e-6        | -0.10         | 5.04e-3            | -0.12                       | 2.10e-5                     |
| rs7901197  | 10  | 104830423  | G/A     | 0.25| CNNM2, NT5C2 | intergenic | 2.37e-11     | -0.16        | 4.89e-6        | -0.10         | 5.17e-3            | -0.12                       | 2.10e-5                     |
| rs11191549 | 10  | 104836787  | G/A     | 0.25| CNNM2, NT5C2 | intergenic | 2.47e-11     | -0.16        | 4.67e-6        | -0.10         | 5.49e-3            | -0.12                       | 2.10e-5                     |
| rs11191547 | 10  | 104833138  | G/A     | 0.25| CNNM2, NT5C2 | intergenic | 2.57e-11     | -0.16        | 4.92e-6        | -0.10         | 5.49e-3            | -0.12                       | 2.10e-5                     |
| rs12785223 | 10  | 104834001  | A/G     | 0.25| CNNM2, NT5C2 | intergenic | 2.57e-11     | -0.16        | 4.92e-6        | -0.10         | 5.49e-3            | -0.12                       | 2.10e-5                     |
| rs10883830 | 10  | 104841275  | G/A     | 0.25| NT5C2        | intron   | 2.57e-11     | -0.16        | 4.92e-6        | -0.10         | 5.49e-3            | -0.12                       | 2.10e-5                     |
| rs11191553 | 10  | 104841386  | C/A     | 0.25| NT5C2        | intron   | 2.57e-11     | -0.16        | 4.92e-6        | -0.10         | 5.49e-3            | -0.12                       | 2.10e-5                     |
| rs7074395  | 10  | 104834918  | C/A     | 0.25| CNNM2, NT5C2 | intergenic | 2.57e-11     | -0.16        | 4.92e-6        | -0.10         | 5.49e-3            | -0.12                       | 2.10e-5                     |
| SNP          | Chr | Position    | Alleles | MAF | Gene          | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|-------------|---------|-----|---------------|----------|--------------|--------------|-----------------|---------------|------------------|-------------------------|-----------------------------|
| rs11191608   | 10  | 104951109   | A/G     | 0.25| NT5C2, LOC401648 | intergenic | 2.66e-11     | -0.16        | 4.92e-6        | -0.10         | 5.28e-3           | -0.12                   | 2.30e-5                     |
| rs12259163   | 10  | 104951467   | A/G     | 0.25| NT5C2, LOC401648 | intergenic | 2.66e-11     | -0.16        | 4.92e-6        | -0.10         | 5.28e-3           | -0.12                   | 2.30e-5                     |
| rs7920868    | 10  | 104785399   | G/A     | 0.25| CNNM2         | intron   | 2.79e-11     | -0.16        | 4.92e-6        | -0.10         | 5.85e-3           | -0.12                   | 2.10e-5                     |
| rs12415388   | 10  | 104786335   | A/G     | 0.25| CNNM2         | intron   | 2.79e-11     | -0.16        | 4.92e-6        | -0.10         | 5.85e-3           | -0.12                   | 2.10e-5                     |
| rs7087459    | 10  | 104780989   | A/G     | 0.25| CNNM2         | intron   | 3.12e-11     | -0.16        | 4.92e-6        | -0.10         | 6.38e-3           | -0.12                   | 2.10e-5                     |
| rs1572578    | 10  | 104812421   | G/C     | 0.25| CNNM2         | intron   | 3.12e-11     | -0.16        | 4.92e-6        | -0.10         | 6.38e-3           | -0.12                   | 2.10e-5                     |
| rs11191540   | 10  | 104812799   | G/C     | 0.25| CNNM2         | intron   | 3.12e-11     | -0.16        | 4.92e-6        | -0.10         | 6.38e-3           | -0.12                   | 2.10e-5                     |
| rs7092029    | 10  | 104813899   | T/A     | 0.25| CNNM2         | intron   | 3.12e-11     | -0.16        | 4.92e-6        | -0.10         | 6.38e-3           | -0.12                   | 2.10e-5                     |
| rs943039     | 10  | 104815122   | G/A     | 0.25| CNNM2         | intron   | 3.12e-11     | -0.16        | 4.92e-6        | -0.10         | 6.38e-3           | -0.12                   | 2.10e-5                     |
| rs2182348    | 10  | 104862674   | A/G     | 0.25| NT5C2         | intron   | 4.03e-11     | -0.16        | 4.92e-6        | -0.09         | 8.98e-3           | -0.13                   | 1.70e-5                     |
| rs726010     | 10  | 104831967   | G/A     | 0.25| CNNM2, NT5C2  | intergenic | 4.17e-11     | -0.16        | 4.92e-6        | -0.10         | 7.96e-3           | -0.12                   | 2.10e-5                     |
| rs1926037    | 10  | 104868000   | A/C     | 0.25| NT5C2         | intron   | 5.28e-11     | -0.16        | 5.06e-6        | -0.09         | 9.36e-3           | -0.12                   | 2.10e-5                     |
| rs2281877    | 10  | 104856052   | G/A     | 0.25| NT5C2         | intron   | 5.39e-11     | -0.16        | 4.92e-6        | -0.09         | 9.65e-3           | -0.12                   | 2.10e-5                     |
| rs10786738   | 10  | 104859441   | G/A     | 0.25| NT5C2         | intron   | 5.39e-11     | -0.16        | 4.92e-6        | -0.09         | 9.65e-3           | -0.12                   | 2.10e-5                     |
| rs6584539    | 10  | 104869392   | C/G     | 0.25| NT5C2         | intron   | 5.39e-11     | -0.16        | 4.92e-6        | -0.09         | 9.65e-3           | -0.12                   | 2.10e-5                     |
| rs10883834   | 10  | 104871392   | A/G     | 0.25| NT5C2         | intron   | 5.39e-11     | -0.16        | 4.92e-6        | -0.09         | 9.65e-3           | -0.12                   | 2.10e-5                     |
| rs1541213    | 10  | 104875320   | A/G     | 0.25| NT5C2         | intron   | 5.39e-11     | -0.16        | 4.92e-6        | -0.09         | 9.65e-3           | -0.12                   | 2.10e-5                     |
| SNP          | Chr | Position   | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|------------|---------|-----|--------|----------|--------------|--------------|-----------------|----------------|-------------------|--------------------------|-----------------------------|
| rs10883836   | 10  | 104881188  | A/G     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs34104646   | 10  | 104886068  | T/A     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs11191573   | 10  | 104886806  | A/G     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs12775302   | 10  | 104901346  | A/G     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs10883839   | 10  | 104910331  | A/G     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs10509766   | 10  | 104916324  | A/G     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs2148198    | 10  | 104905300  | G/A     | 0.25| NT5C2  | intron   | 5.39e-11     | -0.16        | 4.92e-6       | -0.09       | 9.65e-3            | -0.12                    | 2.10e-5                    |
| rs7073323    | 10  | 104787413  | A/C     | 0.25| CNNM2  | intron   | 5.65e-11     | -0.16        | 4.95e-6       | -0.09       | 9.96e-3            | -0.12                    | 2.10e-5                    |
| rs7910900    | 10  | 104819888  | G/A     | 0.25| CNNM2  | intron   | 5.71e-11     | -0.16        | 4.92e-6       | -0.10       | 7.19e-3            | -0.12                    | 3.40e-5                    |
| rs10218853   | 10  | 104786777  | A/C     | 0.25| CNNM2  | intron   | 6.00e-11     | -0.16        | 5.05e-6       | -0.09       | 9.98e-3            | -0.12                    | 2.20e-5                    |
| rs77273695   | 10  | 104694520  | G/A     | 0.28| CNNM2  | intron   | 6.02e-11     | -0.17        | 3.01e-8       | -0.09       | 0.01              | -0.12                    | 4.53e-4                    |
| rs7089680    | 10  | 104792061  | A/G     | 0.25| CNNM2  | intron   | 6.28e-11     | -0.16        | 4.92e-6       | -0.09       | 0.01              | -0.12                    | 2.10e-5                    |
| rs12355120   | 10  | 104842156  | A/C     | 0.25| NT5C2  | intron   | 6.51e-11     | -0.16        | 4.92e-6       | -0.09       | 0.01              | -0.12                    | 2.10e-5                    |
| rs3781282    | 10  | 104842409  | A/G     | 0.25| NT5C2  | intron   | 6.51e-11     | -0.16        | 4.92e-6       | -0.09       | 0.01              | -0.12                    | 2.10e-5                    |
| rs3781281    | 10  | 104842638  | G/A     | 0.25| NT5C2  | intron   | 6.51e-11     | -0.16        | 4.92e-6       | -0.09       | 0.01              | -0.12                    | 2.10e-5                    |
| rs186617435  | 10  | 104852649  | T/A     | 0.25| NT5C2  | intron   | 6.51e-11     | -0.16        | 4.92e-6       | -0.09       | 0.01              | -0.12                    | 2.10e-5                    |
| rs10786721   | 10  | 104929172  | G/A     | 0.25| LOC729081, NT5C2 | intron | 8.74e-11     | -0.16        | 4.92e-6       | -0.09       | 0.01              | -0.12                    | 2.10e-5                    |
| rs35195396   | 10  | 104918760  | A/T     | 0.25| NT5C2  | intron   | 9.86e-11     | -0.16        | 4.89e-6       | -0.09       | 0.01              | -0.12                    | 2.30e-5                    |
| SNP          | Chr | Position | Alleles | MAF | Gene          | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|----------|---------|-----|---------------|----------|--------------|--------------|-----------------|---------------|---------------------|--------------------------|-----------------------------|
| rs7067663    | 10  | 104873640| A/G     | 0.25| NT5C2        | intron   | 1.39e-10     | -0.16    | 4.92e-6        | -0.09    | 9.65e-3           | -0.12    | 5.80e-5            |
| rs884825     | 10  | 104417606| C/A     | 0.32| TRIM8, ARL3  | intergenic| 3.50e-10     | 0.16      | 1.35e-7        | 0.08      | 0.01               | 0.10      | 7.26e-4            |
| rs3961457    | 10  | 104419629| A/G     | 0.33| TRIM8, ARL3  | intergenic| 9.07e-10     | 0.16      | 2.69e-7        | 0.08      | 0.02               | 0.10      | 8.08e-4            |
| rs74541879   | 10  | 104616219| A/G     | 0.06| C10orf32, AS3MT | intergenic| 1.39e-9     | 0.26      | 9.31e-8        | 0.17      | 0.06               | 0.20      | 5.79e-4            |
| rs284849     | 10  | 104581172| C/A     | 0.33| CYP17A1      | intron   | 4.69e-9     | -0.15    | 7.38e-7        | -0.06    | 0.09               | -0.11    | 2.89e-4            |
| rs284848     | 10  | 104582115| G/A     | 0.33| CYP17A1      | intron   | 4.69e-9     | -0.15    | 7.38e-7        | -0.06    | 0.09               | -0.11    | 2.89e-4            |
| rs2486758    | 10  | 104587470| A/G     | 0.33| CYP17A1, C10orf32 | intergenic| 1.33e-8     | -0.15    | 6.72e-7        | -0.06    | 0.09               | -0.10    | 7.83e-4            |
| rs284859     | 10  | 104563007| C/A     | 0.33| C10orf26     | coding   | 1.61e-8     | -0.13    | 8.76e-6        | -0.05    | 0.11               | -0.12    | 1.28e-4            |
| rs4285804    | 10  | 104376299| A/T     | 0.33| SUFU         | intron   | 2.93e-8     | -0.14    | 2.60e-5        | -0.06    | 0.05               | -0.10    | 3.42e-4            |
| rs2432580    | 10  | 104552202| G/A     | 0.33| C10orf26     | intron   | 3.57e-8     | -0.13    | 1.00e-5        | -0.05    | 0.13               | -0.12    | 2.16e-4            |
| rs4919682    | 10  | 104574320| G/A     | 0.30| C10orf26, CYP17A1 | intergenic| 3.74e-8     | -0.05    | 0.11           | -0.12    | 5.22e-4           | -0.13    | 1.60e-5            |
| rs145033011  | 10  | 104405808| A/G     | 0.04| TRIM8        | intron   | 5.58e-8     | -0.31    | 9.24e-4        | -0.29    | 3.33e-3           | -0.21    | 1.46e-3            |
| rs11191355   | 10  | 104382487| A/G     | 0.28| SUFU         | UTR      | 7.70e-8     | 0.15     | 4.36e-6        | 0.09     | 7.60e-3           | 0.07     | 0.02               |
| rs11598702   | 10  | 104887975| A/G     | 0.20| NT5C2        | intron   | 8.00e-8     | 0.22     | 1.90e-5        | 0.07     | 0.07               | 0.10     | 8.92e-4            |
| rs10883846   | 10  | 104948234| G/A     | 0.20| NT5C2, LOC401648 | intergenic| 9.00e-8     | 0.22     | 1.90e-5        | 0.07     | 0.08               | 0.10     | 8.92e-4            |
| SNP         | Chr | Position  | Alleles | MAF | Gene            | Location | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|-------------|-----|-----------|---------|-----|-----------------|----------|--------------|--------------|---------|----------------|---------|--------------------------|---------|
| rs6892      | 10  | 104565860 | A/G     | 0.25| C10orf26       | UTR      | 1.21e-7      | -0.17        | 9.50e-5 | -0.07          | 0.08    | -0.14                    | 3.23e-4 |
| rs60459635  | 10  | 104490978 | A/C     | 0.28| SFXN2, C10orf26| intergenic | 2.69e-7      | 0.16         | 3.01e-7 | 0.07           | 0.02    | 0.06                     | 0.06    |
| rs2297450   | 10  | 104493164 | A/G     | 0.28| SFXN2, C10orf26| intergenic | 2.69e-7      | 0.16         | 3.01e-7 | 0.07           | 0.02    | 0.06                     | 0.06    |
| rs11191393  | 10  | 104517420 | G/C     | 0.27| C10orf26       | intron   | 3.03e-7      | 0.16         | 4.10e-7 | 0.07           | 0.02    | 0.06                     | 0.06    |
| rs72845847  | 10  | 104521596 | A/G     | 0.27| C10orf26       | intron   | 3.03e-7      | 0.16         | 4.10e-7 | 0.07           | 0.02    | 0.06                     | 0.06    |
| rs1339919   | 10  | 104524438 | A/G     | 0.27| C10orf26       | intron   | 3.03e-7      | 0.16         | 4.10e-7 | 0.07           | 0.02    | 0.06                     | 0.06    |
| rs11191389  | 10  | 104513008 | G/A     | 0.28| C10orf26       | intron   | 3.61e-7      | 0.16         | 4.10e-7 | 0.07           | 0.03    | 0.06                     | 0.06    |
| rs4147155   | 10  | 104526761 | G/A     | 0.28| C10orf26       | intron   | 3.61e-7      | 0.16         | 4.10e-7 | 0.07           | 0.03    | 0.06                     | 0.06    |
| rs4917968   | 10  | 104210566 | G/A     | 0.30| C10orf95, TMEM180| intergenic | 3.72e-7      | 0.10         | 1.29e-3 | 0.08           | 0.01    | 0.10                     | 1.32e-3 |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 306 associations are below MetaboChip-wide significance threshold of 3.57e-7 for meta-analysis. Base position according to human genome build 18.
Table S6. Top MetaboChip associations for principal component 1 of arsenic species

| SNP        | Chr | Position     | Alleles | MAF | Gene   | Location          | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|------------|-----|--------------|---------|-----|--------|-------------------|--------------|--------------|-----------------|---------------|---------------------|-----------------------------|-----------------------------|
| rs3740394  | 10  | 104624464    | A/G     | 0.18| AS3MT  | intron            | 2.19e-38     | 5.43         | 8.98e-12        | 5.96          | 4.97e-14            | 5.57                        | 9.18e-16                   |
| rs10509760 | 10  | 104624097    | A/G     | 0.18| AS3MT  | intron            | 2.45e-38     | 5.43         | 8.98e-12        | 5.96          | 4.97e-14            | 5.54                        | 1.03e-15                   |
| rs4917986  | 10  | 104620171    | A/G     | 0.18| AS3MT  | intron            | 6.11e-38     | 5.43         | 8.98e-12        | 5.85          | 1.40e-13            | 5.57                        | 9.18e-16                   |
| rs74376228 | 10  | 104667652    | C/G     | 0.18| AS3MT, CNNM2 | intergenic   | 7.74e-37     | 5.35         | 2.60e-11        | 5.97          | 1.45e-13            | 5.45                        | 4.00e-15                   |
| rs76892505 | 10  | 104709280    | G/A     | 0.18| CNNM2  | intron            | 1.50e-36     | 5.27         | 5.30e-11        | 5.99          | 1.37e-13            | 5.45                        | 4.00e-15                   |
| rs74749600 | 10  | 104722986    | A/G     | 0.18| CNNM2  | intron            | 2.10e-36     | 5.33         | 3.31e-11        | 5.88          | 3.11e-13            | 5.45                        | 4.00e-15                   |
| rs80327774 | 10  | 104646661    | A/G     | 0.18| AS3MT  | intron            | 2.16e-36     | 5.44         | 1.01e-11        | 5.72          | 6.20e-13            | 5.41                        | 6.84e-15                   |
| rs12251035 | 10  | 104661449    | A/C     | 0.18| AS3MT, CNNM2 | intergenic   | 2.50e-36     | 5.44         | 1.02e-11        | 5.70          | 7.10e-13            | 5.41                        | 6.84e-15                   |
| rs11191473 | 10  | 104700700    | G/C     | 0.18| CNNM2  | intron            | 2.50e-36     | 5.44         | 1.02e-11        | 5.70          | 7.10e-13            | 5.41                        | 6.84e-15                   |
| rs7100592  | 10  | 104759088    | A/C     | 0.18| CNNM2  | intron            | 2.50e-36     | 5.44         | 1.02e-11        | 5.70          | 7.10e-13            | 5.41                        | 6.84e-15                   |
| rs12245343 | 10  | 104764040    | A/G     | 0.18| CNNM2  | intron            | 2.50e-36     | 5.44         | 1.02e-11        | 5.70          | 7.10e-13            | 5.41                        | 6.84e-15                   |
| rs10509763 | 10  | 104766381    | G/A     | 0.18| CNNM2  | intron            | 3.04e-36     | 5.44         | 1.02e-11        | 5.70          | 8.61e-13            | 5.41                        | 6.84e-15                   |
| rs77505796 | 10  | 104637764    | T/A     | 0.18| AS3MT  | intron            | 3.38e-36     | 5.27         | 5.30e-11        | 5.88          | 3.11e-13            | 5.45                        | 4.00e-15                   |
| rs17787717 | 10  | 104685689    | A/C     | 0.18| CNNM2  | intron            | 3.38e-36     | 5.27         | 5.30e-11        | 5.88          | 3.11e-13            | 5.45                        | 4.00e-15                   |
| rs75219158 | 10  | 104737584    | G/A     | 0.18| CNNM2  | intron            | 3.38e-36     | 5.27         | 5.30e-11        | 5.88          | 3.11e-13            | 5.45                        | 4.00e-15                   |
| SNP       | Chr | Position   | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|------------|---------|-----|----------|----------|--------------|--------------|-----------------|---------------|-----------------|------------------------|---------------------------|
| rs12258551 | 10  | 104757882  | G/C     | 0.18| CNNM2    | intron   | 3.48e-36     | 5.44         | 1.02e-11        | 5.70          | 7.10e-13         | 5.38                   | 9.58e-15                  |
| rs75691516 | 10  | 104642035  | G/A     | 0.18| AS3MT    | intron   | 4.01e-36     | 5.44         | 1.02e-11        | 5.68          | 1.13e-12        | 5.41                   | 6.84e-15                  |
| rs76255497 | 10  | 104641945  | A/G     | 0.18| AS3MT    | intron   | 6.82e-36     | 5.44         | 1.02e-11        | 5.58          | 1.91e-12        | 5.41                   | 6.84e-15                  |
| rs12253284 | 10  | 104655135  | C/G     | 0.18| AS3MT, CNNM2 | intergenic | 6.82e-36 | 5.44 | 1.02e-11 | 5.58 | 1.91e-12 | 5.41 | 6.84e-15 |
| rs12261040 | 10  | 104655387  | A/G     | 0.18| AS3MT, CNNM2 | intergenic | 6.82e-36 | 5.44 | 1.02e-11 | 5.58 | 1.91e-12 | 5.41 | 6.84e-15 |
| rs10509758 | 10  | 104671700  | A/G     | 0.18| CNNM2    | intron   | 6.82e-36     | 5.44         | 1.02e-11        | 5.58          | 1.91e-12        | 5.41                   | 6.84e-15                  |
| rs4919694  | 10  | 104688968  | A/G     | 0.18| CNNM2    | intron   | 6.82e-36     | 5.44         | 1.02e-11        | 5.58          | 1.91e-12        | 5.41                   | 6.84e-15                  |
| rs12268849 | 10  | 104727672  | G/A     | 0.18| CNNM2    | intron   | 6.82e-36     | 5.44         | 1.02e-11        | 5.58          | 1.91e-12        | 5.41                   | 6.84e-15                  |
| rs79331374 | 10  | 104872903  | G/A     | 0.17| NT5C2    | intron   | 6.95e-36     | 5.47         | 5.29e-11        | 5.79          | 3.83e-13        | 5.41                   | 6.84e-15                  |
| rs11191439 | 10  | 104628713  | A/G     | 0.18| AS3MT    | coding   | 9.14e-36     | 5.46         | 8.45e-12        | 5.69          | 8.23e-13        | 5.26                   | 2.64e-14                  |
| rs11191490 | 10  | 104735164  | T/A     | 0.18| CNNM2    | intron   | 9.79e-36     | 5.30         | 4.04e-11        | 5.70          | 7.10e-13        | 5.41                   | 6.84e-15                  |
| rs11191545 | 10  | 104819783  | G/A     | 0.17| CNNM2    | intron   | 1.02e-35     | 5.47         | 5.29e-11        | 5.73          | 5.65e-13        | 5.41                   | 6.84e-15                  |
| rs11191523 | 10  | 104782390  | A/G     | 0.18| CNNM2    | intron   | 1.28e-35     | 5.47         | 5.29e-11        | 5.70          | 7.10e-13        | 5.41                   | 6.84e-15                  |
| rs11191525 | 10  | 104783425  | C/G     | 0.18| CNNM2    | intron   | 1.28e-35     | 5.47         | 5.29e-11        | 5.70          | 7.10e-13        | 5.41                   | 6.84e-15                  |
| rs58317752 | 10  | 104789257  | A/T     | 0.18| CNNM2    | intron   | 1.28e-35     | 5.47         | 5.29e-11        | 5.70          | 7.10e-13        | 5.41                   | 6.84e-15                  |
| rs77827514 | 10  | 104811999  | G/A     | 0.18| CNNM2    | intron   | 1.28e-35     | 5.47         | 5.29e-11        | 5.70          | 7.10e-13        | 5.41                   | 6.84e-15                  |
| rs78214351 | 10  | 104812678  | A/G     | 0.18| CNNM2    | intron   | 1.28e-35     | 5.47         | 5.29e-11        | 5.70          | 7.10e-13        | 5.41                   | 6.84e-15                  |
| SNP       | Chr | Position   | Alleles | MAF | Gene       | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|------------|---------|-----|------------|----------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|-----------------------------|
| rs12257941 | 10  | 104823151  | G/A     | 0.18| CNNM2      | intron   | 1.28e-35     | 5.47         | 5.29e-11       | 5.70          | 7.10e-13           | 5.41                     | 6.84e-15                    |
| rs78893207 | 10  | 104786128  | A/G     | 0.17| CNNM2      | intron   | 1.56e-35     | 5.47         | 5.29e-11       | 5.70          | 8.61e-13           | 5.41                     | 6.84e-15                    |
| rs17727044 | 10  | 104811246  | T/A     | 0.17| CNNM2      | intron   | 1.83e-35     | 5.28         | 2.74e-10       | 5.88          | 3.11e-13           | 5.45                     | 4.00e-15                    |
| rs17727391 | 10  | 104826091  | C/A     | 0.18| CNNM2      | intron   | 2.06e-35     | 5.47         | 5.29e-11       | 5.70          | 7.10e-13           | 5.34                     | 1.11e-14                    |
| rs4919685  | 10  | 104577352  | C/A     | 0.25| C10orf26, CYP17A1 | intron | 3.34e-35     | 4.89         | 2.49e-10       | 5.14          | 6.07e-14           | 4.77                     | 4.15e-14                    |
| rs3824754  | 10  | 104604340  | G/A     | 0.19| C10orf32  | intron   | 3.74e-35     | -6.05        | 3.81e-15       | -5.01         | 9.48e-13           | -5.12                  | 6.10e-11                    |
| rs4919686  | 10  | 104582239  | A/C     | 0.19| CYP17A1, C10orf32 | intron | 4.86e-35     | -6.05        | 3.81e-15       | -4.98         | 1.23e-12           | -5.12                  | 6.10e-11                    |
| rs11191425 | 10  | 104615960  | G/A     | 0.19| C10orf32, AS3MT | intergenic | 4.86e-35 | -6.05        | 3.81e-15       | -4.98         | 1.23e-12           | -5.12                  | 6.10e-11                    |
| rs11191425 | 10  | 104620402  | T/A     | 0.19| AS3MT      | intron   | 4.94e-35     | -6.02        | 5.31e-15       | -5.01         | 9.48e-13           | -5.12                  | 6.10e-11                    |
| rs4919686  | 10  | 104582239  | A/C     | 0.25| CYP17A1    | intron   | 6.13e-35     | 4.70         | 1.40e-9        | 5.28          | 2.76e-14           | 4.81                     | 2.57e-14                    |
| rs10883783 | 10  | 104581142  | T/A     | 0.25| CYP17A1    | intron   | 7.35e-35     | 4.89         | 2.49e-10       | 5.06          | 1.39e-13           | 4.77                     | 4.15e-14                    |
| rs12416687 | 10  | 104619001  | A/G     | 0.24| C10orf32, AS3MT | intergenic | 1.46e-34 | 4.91         | 2.71e-10       | 5.14          | 1.57e-13           | 4.76                     | 6.75e-14                    |
| rs58700372 | 10  | 104790195  | A/G     | 0.17| CNNM2      | intron   | 1.52e-34     | 5.47         | 5.29e-11       | 5.50          | 8.17e-12           | 5.41                     | 6.84e-15                    |
| rs12241091 | 10  | 104798987  | G/A     | 0.17| CNNM2      | intron   | 1.52e-34     | 5.47         | 5.29e-11       | 5.50          | 8.17e-12           | 5.41                     | 6.84e-15                    |
| rs143910868| 10  | 104625749  | G/A     | 0.19| AS3MT      | intron   | 1.57e-34     | 5.17         | 7.92e-11       | 5.47          | 2.27e-12           | 5.24                     | 1.80e-14                    |
| rs12252500 | 10  | 104784974  | G/C     | 0.17| CNNM2      | intron   | 1.84e-34     | 5.47         | 5.29e-11       | 5.49          | 9.86e-12           | 5.41                     | 6.84e-15                    |
| SNP          | Chr | Position   | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|------------|---------|-----|--------|----------|--------------|--------------|----------------|--------------|----------------|------------------------|-----------------------------|
| rs12257935   | 10  | 104793052  | C/A     | 0.17| CNNM2  | intron   | 1.84e-34     | 5.47         | 5.29e-11       | 5.49         | 9.86e-12       | 5.41                   | 6.84e-15                   |
| rs12266291   | 10  | 104796874  | G/A     | 0.17| CNNM2  | intron   | 1.84e-34     | 5.47         | 5.29e-11       | 5.49         | 9.86e-12       | 5.41                   | 6.84e-15                   |
| rs9527       | 10  | 104613568  | G/A     | 0.23| C10orf32 | UTR      | 1.94e-34     | 4.87         | 3.58e-10       | 5.14         | 1.57e-13       | 4.76                   | 6.75e-14                   |
| rs743575     | 10  | 104584896  | A/C     | 0.25| CYP17A1| intron   | 1.96e-34     | 4.91         | 2.65e-10       | 5.06         | 1.39e-13       | 4.70                   | 1.04e-13                   |
| rs4919687    | 10  | 104585238  | G/A     | 0.25| CYP17A1| intron   | 1.96e-34     | 4.91         | 2.65e-10       | 5.06         | 1.39e-13       | 4.70                   | 1.04e-13                   |
| rs3740393    | 10  | 104626645  | G/C     | 0.21| AS3MT  | intron   | 2.58e-34     | -5.75        | 3.91e-14       | -4.92        | 4.57e-13       | -4.77                  | 1.10e-10                   |
| rs4919690    | 10  | 104606490  | A/G     | 0.24| C10orf32 | intron   | 3.13e-34     | 4.91         | 2.65e-10       | 5.06         | 3.56e-13       | 4.76                   | 6.75e-14                   |
| rs3740390    | 10  | 104628470  | G/A     | 0.19| AS3MT  | intron   | 4.56e-34     | -5.96        | 8.40e-15       | -4.84        | 5.56e-12       | -5.10                  | 6.46e-11                   |
| rs113282265  | 10  | 104647238  | A/G     | 0.19| AS3MT  | intron   | 4.56e-34     | -5.96        | 8.40e-15       | -4.84        | 5.56e-12       | -5.10                  | 6.46e-11                   |
| rs3824755    | 10  | 104585839  | C/G     | 0.19| CYP17A1| intron   | 5.08e-34     | -6.05        | 3.76e-15       | -4.98        | 1.23e-12       | -4.82                  | 4.72e-10                   |
| rs1004467    | 10  | 104584497  | A/G     | 0.19| CYP17A1| intron   | 5.08e-34     | -6.05        | 3.76e-15       | -4.98        | 1.23e-12       | -4.82                  | 4.72e-10                   |
| rs4409766    | 10  | 104606653  | A/G     | 0.19| C10orf32 | intron   | 5.44e-34     | -6.05        | 3.76e-15       | -4.95        | 1.32e-12       | -4.82                  | 4.72e-10                   |
| rs10786736   | 10  | 104839106  | C/G     | 0.20| NT5C2  | UTR      | 6.98e-34     | -5.64        | 4.90e-13       | -4.78        | 4.83e-12       | -5.22                  | 4.31e-12                   |
| rs188299216  | 10  | 104944768  | G/A     | 0.19| NT5C2, LOC401648 | intergenic | 8.33e-34     | -5.69        | 3.18e-13       | -4.86        | 3.19e-12       | -5.26                  | 1.08e-11                   |
| rs77420391   | 10  | 104935813  | G/A     | 0.19| NT5C2  | intron   | 2.40e-33     | -5.67        | 3.69e-13       | -4.84        | 5.25e-12       | -5.27                  | 1.61e-11                   |
| rs11191582   | 10  | 104903643  | G/A     | 0.19| NT5C2  | intron   | 2.40e-33     | -5.67        | 3.69e-13       | -4.84        | 5.25e-12       | -5.27                  | 1.61e-11                   |
| rs11191447   | 10  | 104642313  | G/A     | 0.19| AS3MT  | intron   | 4.51e-33     | -5.96        | 8.40e-15       | -4.57        | 5.18e-11       | -5.10                  | 6.46e-11                   |
| rs79780963   | 10  | 104942489  | G/A     | 0.19| NT5C2  | intron   | 7.79e-33     | -5.53        | 1.10e-12       | -4.84        | 6.01e-12       | -5.27                  | 1.72e-11                   |
| SNP          | Chr | Position   | Alleles | MAF | Gene   | Location         | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|--------------|-----|------------|---------|-----|--------|------------------|--------------|--------------|---------|-----------------|---------|--------------------------|---------|
| rs78821730   | 10  | 104674534  | G/A     | 0.19| CNNM2  | intron           | 1.03e-32     | -5.67        | 3.69e-13 | -4.85          | 4.99e-12 | -5.10                    | 6.46e-11|
| rs732998     | 10  | 104887891  | A/G     | 0.19| NT5C2  | intron           | 1.04e-32     | -5.68        | 3.53e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs79237883   | 10  | 104930936  | A/G     | 0.19| LOC729081, NT5C2 | intergenic  | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs11191558   | 10  | 104854668  | G/A     | 0.19| NT5C2  | intron           | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs11191560   | 10  | 104859028  | A/G     | 0.19| NT5C2  | intron           | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs11191580   | 10  | 104896201  | A/G     | 0.19| NT5C2  | intron           | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs12220375   | 10  | 104891481  | A/G     | 0.19| NT5C2  | intron           | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs12413046   | 10  | 104861194  | A/G     | 0.19| NT5C2  | intron           | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs9633712    | 10  | 104863751  | G/C     | 0.19| NT5C2  | intron           | 1.08e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.46e-11|
| rs12412038   | 10  | 104846152  | G/A     | 0.19| NT5C2  | intron           | 1.14e-32     | -5.67        | 3.69e-13 | -4.84          | 5.25e-12 | -5.10                    | 6.78e-11|
| rs11191453   | 10  | 104649842  | A/G     | 0.19| AS3MT  | intron           | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| rs12221193   | 10  | 104655257  | A/C     | 0.19| AS3MT, CNNM2 | intergenic  | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| rs77180047   | 10  | 104656747  | G/A     | 0.19| AS3MT, CNNM2 | intergenic  | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| rs17115213   | 10  | 104671133  | A/G     | 0.19| CNNM2  | intron           | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| rs10509759   | 10  | 104679655  | T/A     | 0.19| CNNM2  | intron           | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| rs5011520    | 10  | 104687506  | G/A     | 0.19| CNNM2  | intron           | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| rs10883808   | 10  | 104711116  | T/A     | 0.19| CNNM2  | intron           | 1.15e-32     | -5.67        | 3.69e-13 | -4.84          | 5.56e-12 | -5.10                    | 6.46e-11|
| SNP       | Chr | Position   | Alleles | MAF | Gene      | Location | Meta P-value | Arizona | Oklahoma | North/South Dakotas |
|-----------|-----|------------|---------|-----|-----------|----------|--------------|---------|----------|---------------------|
| rs10883815 | 10  | 104729169  | A/G     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191502 | 10  | 104755484  | A/C     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191514 | 10  | 104763354  | G/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs77787671 | 10  | 104766195  | G/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs75970938 | 10  | 104783638  | A/G     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191535 | 10  | 104805866  | G/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs10458729 | 10  | 104831469  | G/A     | 0.19| CNNM2, NT5C2 | intergenic | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191454 | 10  | 104649994  | A/G     | 0.19| AS3MT     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191472 | 10  | 104697006  | T/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191515 | 10  | 104766517  | G/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs11191548 | 10  | 104836168  | A/G     | 0.19| CNNM2, NT5C2 | intergenic | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs12411886 | 10  | 104675289  | C/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs12413409 | 10  | 104709086  | G/A     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs3781285  | 10  | 104815655  | C/G     | 0.19| CNNM2     | intron   | 1.15e-32     | -5.67  | 3.69e-13 | -4.84              | -5.10  | 6.46e-11            |
| rs17884001 | 10  | 104651235  | G/A     | 0.19| AS3MT     | UTR      | 1.23e-32     | -5.67  | 3.69e-13 | -4.81              | -5.10  | 6.46e-11            |
| rs12220743 | 10  | 104841902  | G/A     | 0.19| NT5C2     | intron   | 1.28e-32     | -5.67  | 3.69e-13 | -4.83              | -5.10  | 6.46e-11            |
| rs943037   | 10  | 104825909  | G/A     | 0.19| CNNM2     | coding   | 1.28e-32     | -5.67  | 3.69e-13 | -4.83              | -5.10  | 6.46e-11            |
| SNP          | Chr | Position      | Alleles | MAF | Gene    | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|---------------|---------|-----|---------|----------|--------------|--------------|-----------------|----------------|-------------------|-------------------------|-----------------------------|
| rs34416174   | 10  | 104533878     | C/G     | 0.25| C10orf26 | intron   | 1.36e-32     | 4.22         | 5.11e-8         | 5.22           | 1.94e-13          | 4.76                    | 1.68e-14                   |
| rs11191479   | 10  | 104713610     | A/G     | 0.19| CNNM2   | intron   | 1.40e-32     | -5.67        | 3.69e-13        | -4.84         | 5.56e-12          | -5.10                   | 7.73e-11                   |
| rs1475642    | 10  | 104536173     | A/G     | 0.24| C10orf26 | intron   | 1.44e-32     | 4.33         | 2.56e-8         | 5.18           | 3.78e-13          | 4.78                    | 2.13e-14                   |
| rs12217501   | 10  | 104841879     | A/G     | 0.19| NT5C2   | intron   | 1.60e-32     | -5.68        | 3.53e-13        | -4.81         | 8.10e-12          | -5.10                   | 6.46e-11                   |
| rs10883832   | 10  | 104861269     | A/C     | 0.19| NT5C2   | intron   | 1.68e-32     | -5.67        | 3.69e-13        | -4.79         | 8.14e-12          | -5.10                   | 6.46e-11                   |
| rs11191555   | 10  | 104847513     | A/C     | 0.19| NT5C2   | intron   | 1.69e-32     | -5.67        | 3.69e-13        | -4.84         | 5.25e-12          | -5.02                   | 9.68e-11                   |
| rs12221064   | 10  | 104667116     | G/A     | 0.19| AS3MT, CNNM2 | intergenic | 2.02e-32  | -5.67        | 3.69e-13        | -4.79         | 9.80e-12          | -5.10                   | 6.46e-11                   |
| rs1060240    | 10  | 104873327     | A/G     | 0.19| NT5C2   | intron   | 2.14e-32     | -5.73        | 2.91e-13        | -4.76         | 1.46e-11          | -5.12                   | 5.72e-11                   |
| rs12219901   | 10  | 104830957     | A/G     | 0.19| CNNM2, NT5C2 | intergenic | 3.11e-32  | -5.67        | 3.69e-13        | -4.75         | 1.51e-11          | -5.10                   | 6.46e-11                   |
| rs7098825    | 10  | 104618224     | A/G     | 0.17| C10orf32, AS3MT | intergenic | 3.80e-32  | -6.71        | 1.25e-13        | -5.63         | 1.06e-11          | -5.48                   | 2.47e-10                   |
| rs10430665   | 10  | 104838420     | G/A     | 0.19| NT5C2   | UTR      | 4.18e-32     | -5.65        | 4.79e-13        | -4.76         | 1.62e-11          | -5.10                   | 6.44e-11                   |
| rs79668541   | 10  | 104783894     | G/A     | 0.19| CNNM2   | intron   | 6.82e-32     | -5.50        | 1.81e-12        | -4.80         | 8.18e-12          | -5.10                   | 6.46e-11                   |
| rs184992072  | 10  | 104846756     | A/G     | 0.19| NT5C2   | intron   | 7.28e-32     | -5.68        | 3.50e-13        | -4.78         | 9.42e-12          | -4.99                   | 2.24e-10                   |
| rs2482507    | 10  | 104551346     | G/A     | 0.21| C10orf26 | intron   | 8.27e-32     | -5.36        | 7.48e-13        | -4.56         | 2.44e-11          | -4.87                   | 5.78e-11                   |
| rs12776506   | 10  | 104522818     | A/G     | 0.25| C10orf26 | intron   | 1.91e-31     | 4.36         | 2.61e-8         | 4.95          | 2.06e-12          | 4.71                    | 5.94e-14                   |
| rs2297787    | 10  | 104670127     | T/A     | 0.20| CNNM2   | intron   | 2.00e-31     | -5.52        | 1.03e-12        | -4.68         | 1.59e-11          | -4.94                   | 1.50e-10                   |
| rs11191595   | 10  | 104933038     | A/C     | 0.19| NT5C2   | intron   | 2.30e-31     | -5.42        | 3.35e-12        | -4.76         | 1.51e-11          | -5.10                   | 6.90e-11                   |
| SNP       | Chr | Position   | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | P-value | Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|-----------|-----|------------|---------|-----|----------|----------|-------------|-------------|---------|-------|---------|-----------------|---------|--------------------------|---------|
| rs11191381| 10  | 104483434  | G/A     | 0.24| SFXN2    | intron   | 2.31e-31    | 4.39        | 2.03e-8 | 5.01  | 1.14e-12 | 4.64            | 1.74e-13|
| rs11191385| 10  | 104503039  | C/A     | 0.24| C10orf26 | intron   | 2.78e-31    | 4.39        | 2.03e-8 | 4.99  | 1.39e-12 | 4.64            | 1.74e-13|
| rs12261294| 10  | 104924942  | G/A     | 0.19| LOC729081| intron   | 3.45e-31    | 5.51        | 1.85e-11| 4.56  | 1.39e-9  | 4.90            | 2.16e-13|
| rs12262258| 10  | 104890262  | G/A     | 0.19| NT5C2    | intron   | 7.17e-31    | 5.32        | 9.36e-11| 4.59  | 1.06e-9  | 4.94            | 1.29e-13|
| rs12243903| 10  | 104896982  | A/G     | 0.19| NT5C2    | intron   | 7.17e-31    | 5.32        | 9.36e-11| 4.59  | 1.06e-9  | 4.94            | 1.29e-13|
| rs4917384 | 10  | 104985778  | G/A     | 0.26| LOC401648, LOC729020 | intergenic | 9.84e-31 | -5.03 | 4.15e-11 | -4.54 | 2.46e-13 | -3.98 | 1.10e-9 |
| rs4917995 | 10  | 104835433  | T/A     | 0.19| CNNM2, NT5C2 | intergenic | 1.14e-30 | 5.32 | 9.36e-11 | 4.52 | 1.63e-9 | 4.94 | 1.29e-13 |
| rs12240508| 10  | 104929222  | G/A     | 0.19| LOC729081, NT5C2 | intergenic | 1.95e-30 | 5.41 | 5.61e-11 | 4.46 | 4.35e-9 | 4.95 | 1.20e-13 |
| rs284841  | 10  | 104540069  | A/G     | 0.20| C10orf26 | intron   | 2.16e-30    | -5.36       | 2.10e-12| -4.59 | 3.00e-11 | -4.72 | 4.19e-10 |
| rs284844  | 10  | 104544519  | G/A     | 0.21| C10orf26 | intron   | 2.16e-30    | -5.36       | 2.10e-12| -4.59 | 3.00e-11 | -4.72 | 4.19e-10 |
| rs12768205| 10  | 104637839  | G/A     | 0.27| AS3MT    | intron   | 1.15e-29    | -5.56       | 1.07e-14| -3.76 | 1.87e-9  | -4.02 | 2.03e-9 |
| rs10883796| 10  | 104645305  | G/A     | 0.27| AS3MT    | intron   | 1.15e-29    | -5.56       | 1.07e-14| -3.76 | 1.87e-9  | -4.02 | 2.03e-9 |
| rs10883790| 10  | 104630945  | A/C     | 0.24| AS3MT    | intron   | 2.08e-29    | 4.62        | 2.27e-9 | 4.57  | 3.00e-11 | 4.33 | 7.52e-12 |
| rs12255761| 10  | 104791856  | G/A     | 0.19| CNNM2    | intron   | 2.50e-29    | 5.32        | 9.36e-11| 4.37  | 8.25e-9 | 4.81 | 5.18e-13 |
| rs12256506| 10  | 104953608  | A/T     | 0.19| NT5C2, LOC401648 | intergenic | 2.56e-29 | 4.72 | 3.60e-9 | 4.58 | 1.08e-9 | 4.94 | 1.29e-13 |
| rs12249194| 10  | 104633688  | A/G     | 0.24| AS3MT    | intron   | 3.41e-29    | 4.62        | 2.27e-9 | 4.51  | 4.96e-11 | 4.33 | 7.52e-12 |
| SNP          | Chr | Position       | Alleles | MAF | Gene      | Location | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|--------------|-----|----------------|---------|-----|-----------|----------|-------------|--------------|---------|----------------|---------|--------------------------|---------|
| rs3740392    | 10  | 104626845      | A/G     | 0.24| AS3MT     | intron   | 3.71e-29    | 4.54         | 4.04e-9 | 4.57          | 3.00e-11 | 4.33                     | 7.52e-12 |
| rs10786722   | 10  | 104650058      | G/A     | 0.27| AS3MT     | intron   | 2.62e-28    | -5.23        | 5.42e-13| -3.76         | 1.87e-9 | -4.02                    | 2.03e-9  |
| rs7897654    | 10  | 104652448      | A/G     | 0.27| AS3MT,   | intron   | 2.62e-28    | -5.23        | 5.42e-13| -3.76         | 1.87e-9 | -4.02                    | 2.03e-9  |
| rs10883799   | 10  | 104653300      | G/A     | 0.27| AS3MT,   | intron   | 2.62e-28    | -5.23        | 5.42e-13| -3.76         | 1.87e-9 | -4.02                    | 2.03e-9  |
| rs1046778    | 10  | 104651474      | A/G     | 0.27| AS3MT     | UTR      | 2.62e-28    | -5.23        | 5.42e-13| -3.76         | 1.87e-9 | -4.02                    | 2.03e-9  |
| rs1926032    | 10  | 104819459      | G/A     | 0.18| CNNM2     | intron   | 2.07e-27    | -5.47        | 3.22e-12| -4.50         | 3.80e-10| -4.64                    | 1.47e-8  |
| rs34269636   | 10  | 104400589      | A/G     | 0.24| TRIM8     | intron   | 2.18e-27    | 4.76         | 2.32e-9 | 4.39          | 5.18e-10| 4.15                     | 4.75e-11 |
| rs12765002   | 10  | 104625338      | G/A     | 0.25| AS3MT     | intron   | 3.27e-27    | -5.79        | 4.57e-15| -3.64         | 1.18e-8 | -3.69                    | 8.27e-8  |
| rs12764049   | 10  | 104624946      | A/G     | 0.25| AS3MT     | intron   | 3.33e-27    | -5.79        | 4.57e-15| -3.64         | 1.20e-8 | -3.69                    | 8.27e-8  |
| rs12765459   | 10  | 104455677      | C/G     | 0.25| ARL3      | intron   | 3.68e-27    | 4.30         | 4.32e-8 | 4.62          | 2.60e-11| 4.01                     | 7.73e-11 |
| rs4917991    | 10  | 104773823      | A/G     | 0.26| CNNM2     | intron   | 4.21e-27    | 4.78         | 5.31e-10| 3.97          | 2.26e-9 | 4.03                     | 8.24e-11 |
| rs12779263   | 10  | 104876523      | C/A     | 0.25| NT5C2     | intron   | 4.51e-27    | 4.68         | 3.44e-9 | 3.99          | 2.69e-9 | 4.22                     | 1.22e-11 |
| rs4917999    | 10  | 104953041      | G/C     | 0.25| NT5C2,   | intergenic| 4.62e-27    | 4.68         | 3.44e-9 | 3.98          | 3.04e-9 | 4.22                     | 1.10e-11 |
| rs192145925  | 10  | 104666944      | G/A     | 0.26| AS3MT,   | intergenic| 4.96e-27    | 4.77         | 5.26e-10| 3.94          | 2.88e-9 | 4.04                     | 7.62e-11 |
| rs7920697    | 10  | 104623327      | A/G     | 0.26| AS3MT     | intron   | 6.11e-27    | -5.79        | 4.57e-15| -3.58         | 2.17e-8 | -3.69                    | 8.02e-8  |
| rs12764219   | 10  | 104388885      | C/A     | 0.24| SUFU,   | intergenic| 6.14e-27    | 4.79         | 2.07e-9 | 4.20          | 1.61e-9 | 4.15                     | 4.75e-11 |
| SNP          | Chr | Position    | Alleles | MAF | Gene     | Location     | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|-------------|---------|-----|----------|--------------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|-----------------------------|
| rs10883801   | 10  | 104667877   | A/C     | 0.26| AS3MT,  | intergenic   | 6.18e-27     | 4.70         | 1.06e-9        | 3.99          | 1.90e-9           | 4.04                     | 7.62e-11                    |
| rs10883818   | 10  | 104749576   | A/G     | 0.26| CNNM2    | intron       | 1.29e-26     | 4.62         | 1.92e-9        | 3.97          | 2.26e-9           | 4.04                     | 7.62e-11                    |
| rs10786732   | 10  | 104752525   | A/G     | 0.26| CNNM2    | intron       | 1.29e-26     | 4.62         | 1.92e-9        | 3.97          | 2.26e-9           | 4.04                     | 7.62e-11                    |
| rs11191513   | 10  | 104762974   | A/C     | 0.26| CNNM2    | intron       | 1.29e-26     | 4.62         | 1.92e-9        | 3.97          | 2.26e-9           | 4.04                     | 7.62e-11                    |
| rs78193706   | 10  | 104770554   | A/G     | 0.26| CNNM2    | intron       | 1.53e-26     | 4.62         | 1.92e-9        | 3.95          | 2.68e-9           | 4.04                     | 7.62e-11                    |
| rs7898770    | 10  | 104746626   | G/A     | 0.26| CNNM2    | intron       | 1.53e-26     | 4.62         | 1.92e-9        | 3.96          | 2.68e-9           | 4.04                     | 7.62e-11                    |
| rs10509764   | 10  | 104766465   | G/A     | 0.26| CNNM2    | intron       | 1.53e-26     | 4.62         | 1.92e-9        | 3.96          | 2.68e-9           | 4.04                     | 7.62e-11                    |
| rs6584537    | 10  | 104768257   | G/C     | 0.26| CNNM2    | intron       | 1.53e-26     | 4.62         | 1.92e-9        | 3.96          | 2.68e-9           | 4.04                     | 7.62e-11                    |
| rs10883800   | 10  | 104661202   | A/C     | 0.26| AS3MT,  | intergenic   | 1.65e-26     | 4.62         | 1.92e-9        | 3.94          | 2.88e-9           | 4.04                     | 7.62e-11                    |
| rs7073295    | 10  | 104662223   | A/G     | 0.26| AS3MT,  | intergenic   | 1.65e-26     | 4.62         | 1.92e-9        | 3.94          | 2.88e-9           | 4.04                     | 7.62e-11                    |
| rs7894959    | 10  | 104746172   | G/A     | 0.26| CNNM2    | intron       | 1.71e-26     | 4.62         | 1.92e-9        | 3.96          | 2.68e-9           | 4.03                     | 8.51e-11                    |
| rs182441718  | 10  | 104924388   | A/G     | 0.25| NT5C2    | intron       | 2.08e-26     | 4.72         | 3.09e-9        | 3.86          | 1.17e-8           | 4.22                     | 1.35e-11                    |
| rs77308618   | 10  | 104405811   | A/G     | 0.26| TRIM8    | intron       | 2.21e-26     | 4.64         | 2.20e-9        | 3.92          | 7.50e-9           | 4.09                     | 3.27e-11                    |
| rs7096452    | 10  | 104726553   | G/A     | 0.26| CNNM2    | intron       | 2.51e-26     | 4.62         | 1.92e-9        | 3.89          | 4.36e-9           | 4.03                     | 7.60e-11                    |
| rs17725614   | 10  | 104675483   | G/C     | 0.26| CNNM2    | intron       | 2.52e-26     | 4.62         | 1.92e-9        | 3.89          | 4.36e-9           | 4.04                     | 7.62e-11                    |
| rs3897401    | 10  | 104686369   | A/G     | 0.26| CNNM2    | intron       | 2.52e-26     | 4.62         | 1.92e-9        | 3.89          | 4.36e-9           | 4.04                     | 7.62e-11                    |
| SNP         | Chr | Position  | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-------------|-----|-----------|---------|-----|----------|----------|--------------|--------------|-----------------|---------------|-----------------|------------------------|---------------------------|
| rs10883804  | 10  | 104696510 | G/A     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs7089061   | 10  | 104713005 | C/A     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs10883810  | 10  | 104717214 | A/C     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs7899622   | 10  | 104717323 | G/A     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs12248123  | 10  | 104725356 | A/G     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs7080462   | 10  | 104726689 | A/G     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs11191489  | 10  | 104730558 | C/A     | 0.26 | CNNM2    | intron   | 2.52e-26     | 4.62         | 1.92e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs11191485  | 10  | 104719806 | C/G     | 0.26 | CNNM2    | intron   | 2.65e-26     | 4.61         | 2.02e-9         | 3.89          | 4.36e-9         | 4.04                   | 7.62e-11                  |
| rs1935323   | 10  | 104867025 | A/G     | 0.25 | NT5C2    | intron   | 3.37e-26     | 4.71         | 1.98e-9         | 3.89          | 5.59e-9         | 4.04                   | 7.62e-11                  |
| rs7894588   | 10  | 104746020 | A/T     | 0.26 | CNNM2    | intron   | 5.09e-26     | 4.62         | 1.92e-9         | 3.84          | 8.59e-9         | 4.04                   | 7.62e-11                  |
| rs58289149  | 10  | 104770542 | G/A     | 0.26 | CNNM2    | intron   | 6.05e-26     | 4.62         | 1.92e-9         | 3.82          | 1.01e-8         | 4.04                   | 7.62e-11                  |
| rs142298786 | 10  | 104405084 | A/C     | 0.25 | TRIM8    | intron   | 6.47e-26     | 4.75         | 1.04e-9         | 4.01          | 5.93e-9         | 3.99                   | 2.53e-10                  |
| rs3850699   | 10  | 104404211 | A/G     | 0.25 | TRIM8    | intron   | 6.47e-26     | 4.75         | 1.04e-9         | 4.01          | 5.93e-9         | 3.99                   | 2.53e-10                  |
| rs12241712  | 10  | 104398262 | C/A     | 0.25 | TRIM8    | intron   | 6.90e-26     | 4.73         | 1.11e-9         | 4.01          | 5.93e-9         | 3.99                   | 2.53e-10                  |
| rs10883829  | 10  | 104830625 | A/G     | 0.26 | CNNM2, NT5C2 | intergenic | 7.07e-26     | 4.71         | 2.05e-9         | 3.82          | 1.01e-8         | 4.03                   | 8.41e-11                  |
| rs7087459   | 10  | 104780989 | A/G     | 0.25 | CNNM2    | intron   | 8.66e-26     | 4.55         | 7.05e-9         | 3.90          | 4.37e-9         | 4.04                   | 7.62e-11                  |
| rs1572578   | 10  | 104812421 | G/C     | 0.25 | CNNM2    | intron   | 8.66e-26     | 4.55         | 7.05e-9         | 3.90          | 4.37e-9         | 4.04                   | 7.62e-11                  |
| rs11191540  | 10  | 104812799 | G/C     | 0.25 | CNNM2    | intron   | 8.66e-26     | 4.55         | 7.05e-9         | 3.90          | 4.37e-9         | 4.04                   | 7.62e-11                  |
| SNP         | Chr | Position | Alleles | MAF | Gene   | Location | Meta P-value | Arizona  | Oklahoma | North/South Dakotas |
|-------------|-----|----------|---------|-----|--------|----------|--------------|----------|----------|---------------------|
| rs7092029   | 10  | 104813899| T/A     | 0.25| CNNM2  | intron   | 8.66e-26     | 4.55     | 7.05e-9  | 3.90 7.62e-11       |
| rs943039    | 10  | 104815122| G/A     | 0.25| CNNM2  | intron   | 8.66e-26     | 4.55     | 7.05e-9  | 3.90 7.62e-11       |
| rs7900450   | 10  | 104446300| G/A     | 0.26| ARL3   | intron   | 9.15e-26     | 4.23     | 3.29e-8 | 4.23 3.92 1.79e-10 |
| rs7907503   | 10  | 104430040| G/A     | 0.26| ARL3   | intron   | 9.79e-26     | 4.24     | 3.18e-8 | 4.15 6.60e-10 1.31e-10 |
| rs12773600  | 10  | 104408218| C/G     | 0.25| TRIM8, ARL3 | intergenic | 9.99e-26     | 4.22     | 9.64e-8 | 4.19 1.91e-9 1.39e-11 |
| rs7920868   | 10  | 104785399| G/A     | 0.25| CNNM2  | intron   | 1.03e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs12415388  | 10  | 104786335| A/G     | 0.25| CNNM2  | intron   | 1.03e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs12780827  | 10  | 104457944| A/G     | 0.26| ARL3   | intron   | 1.06e-25     | 4.23     | 3.36e-8 | 4.21 4.65e-10 1.90e-10 |
| rs1926029   | 10  | 104845660| G/A     | 0.25| NT5C2  | intron   | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs2274339   | 10  | 104850043| A/T     | 0.25| NT5C2  | intron   | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs7912517   | 10  | 104895519| G/A     | 0.25| NT5C2  | intron   | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs2066322   | 10  | 104899329| A/C     | 0.25| NT5C2  | intron   | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs10786744  | 10  | 104935018| C/A     | 0.25| NT5C2  | intron   | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs10883843  | 10  | 104937483| G/C     | 0.25| NT5C2  | intron   | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs11191602  | 10  | 104944209| G/A     | 0.25| NT5C2, LOC401648 | intergenic | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs7095304   | 10  | 104944785| G/A     | 0.25| NT5C2, LOC401648 | intergenic | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| rs7100369   | 10  | 104946208| C/A     | 0.25| NT5C2,   | intergenic | 1.13e-25     | 4.55     | 7.05e-9  | 3.89 7.62e-11       |
| SNP           | Chr | Position | Alleles | MAF | Gene | Location       | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|---------------|-----|----------|---------|-----|------|----------------|--------------|--------------|-----------------|---------------|-----------------|------------------------|-----------------------------|
| rs11191608    | 10  | 104951109| A/G     | 0.25| NTSC2, LOC401648 | intergenic    | 1.16e-25     | 4.55           | 7.05e-9        | 3.88          | 6.35e-9         | 4.04                   | 6.93e-11                   |
| rs12259163    | 10  | 104951467| A/G     | 0.25| NTSC2, LOC401648 | intergenic    | 1.16e-25     | 4.55           | 7.05e-9        | 3.88          | 6.35e-9         | 4.04                   | 6.93e-11                   |
| rs10883847    | 10  | 104948274| G/A     | 0.25| NTSC2, LOC401648 | intergenic    | 1.26e-25     | 4.55           | 7.05e-9        | 3.88          | 6.29e-9         | 4.04                   | 7.62e-11                   |
| rs2482498     | 10  | 104525440| G/C     | 0.39| C10orf26       | intron        | 1.29e-25     | -4.32          | 6.26e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs630185      | 10  | 104527139| G/A     | 0.39| C10orf26       | intron        | 1.29e-25     | -4.32          | 6.26e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs2254111     | 10  | 104529510| A/T     | 0.39| C10orf26       | intron        | 1.29e-25     | -4.32          | 6.26e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs2253703     | 10  | 104532964| A/G     | 0.39| C10orf26       | intron        | 1.29e-25     | -4.32          | 6.26e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs12246739    | 10  | 104777009| C/A     | 0.23| CNNM2          | intron        | 1.37e-25     | 4.84           | 1.79e-9        | 4.06          | 9.27e-9         | 3.97                   | 2.05e-10                   |
| rs593410      | 10  | 104522822| A/G     | 0.39| C10orf26       | intron        | 1.37e-25     | -4.31          | 6.70e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs549466      | 10  | 104522903| A/G     | 0.39| C10orf26       | intron        | 1.37e-25     | -4.31          | 6.70e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs553258      | 10  | 104523312| G/A     | 0.39| C10orf26       | intron        | 1.37e-25     | -4.31          | 6.70e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs499770      | 10  | 104524897| G/C     | 0.39| C10orf26       | intron        | 1.37e-25     | -4.31          | 6.70e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs2254093     | 10  | 104529907| C/A     | 0.39| C10orf26       | intron        | 1.37e-25     | -4.31          | 6.70e-11       | -3.43         | 4.99e-9         | -3.52                  | 6.31e-9                    |
| rs12783444    | 10  | 104470649| G/A     | 0.26| SFXN2          | intron        | 1.37e-25     | 4.23           | 3.36e-8        | 4.21          | 4.65e-10        | 3.91                   | 2.45e-10                   |
| rs17784294    | 10  | 104469375| C/A     | 0.26| SFXN2          | intron        | 1.37e-25     | 4.23           | 3.36e-8        | 4.21          | 4.65e-10        | 3.91                   | 2.45e-10                   |
| rs11191549    | 10  | 104836787| G/A     | 0.25| CNNM2,        | intergenic    | 1.50e-25     | 4.58           | 5.93e-9        | 3.82          | 8.74e-9         | 4.04                   | 7.62e-11                   |
| SNP         | Chr | Position   | Alleles | MAF | Gene       | Location       | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-------------|-----|------------|---------|-----|------------|----------------|--------------|--------------|----------------|---------------|-----------------|------------------------|---------------------------|
| rs674816    | 10  | 104530555  | C/G     | 0.39| C10orf26   | intron         | 1.61e-25     | -4.32        | 6.26e-11        | -3.33         | 1.04e-8         | -3.56                  | 3.82e-9                   |
| rs524430    | 10  | 104531490  | A/C     | 0.39| C10orf26   | intron         | 1.68e-25     | -4.33        | 5.93e-11        | -3.40         | 6.73e-9         | -3.52                  | 6.31e-9                   |
| rs11191547  | 10  | 104833138  | G/A     | 0.25| CNNM2, NT5C2 | intergenic    | 1.76e-25     | 4.55         | 7.05e-9         | 3.82         | 8.74e-9         | 4.04                   | 7.62e-11                  |
| rs12785223  | 10  | 104834001  | A/G     | 0.25| CNNM2, NT5C2 | intergenic    | 1.76e-25     | 4.55         | 7.05e-9         | 3.82         | 8.74e-9         | 4.04                   | 7.62e-11                  |
| rs10883830  | 10  | 104841275  | G/A     | 0.25| NT5C2      | intron         | 1.76e-25     | 4.55         | 7.05e-9         | 3.82         | 8.74e-9         | 4.04                   | 7.62e-11                  |
| rs11191553  | 10  | 104841386  | C/A     | 0.25| NT5C2      | intron         | 1.76e-25     | 4.55         | 7.05e-9         | 3.82         | 8.74e-9         | 4.04                   | 7.62e-11                  |
| rs7074395   | 10  | 104834918  | C/A     | 0.25| CNNM2, NT5C2 | intergenic    | 1.76e-25     | 4.55         | 7.05e-9         | 3.82         | 8.74e-9         | 4.04                   | 7.62e-11                  |
| rs726010    | 10  | 104831967  | G/A     | 0.25| CNNM2, NT5C2 | intergenic    | 1.81e-25     | 4.55         | 7.05e-9         | 3.86         | 8.94e-9         | 4.04                   | 7.62e-11                  |
| rs12784517  | 10  | 104454960  | A/G     | 0.26| ARL3       | intron         | 1.89e-25     | 4.23         | 3.36e-8         | 4.13         | 8.41e-10        | 3.92                   | 1.90e-10                  |
| rs12761195  | 10  | 104455364  | A/G     | 0.26| ARL3       | intron         | 1.89e-25     | 4.23         | 3.36e-8         | 4.13         | 8.41e-10        | 3.92                   | 1.90e-10                  |
| rs1926037   | 10  | 104868000  | A/C     | 0.25| NT5C2      | intron         | 2.03e-25     | 4.55         | 7.36e-9         | 3.83         | 9.64e-9         | 4.04                   | 7.62e-11                  |
| rs7901197   | 10  | 104830423  | G/A     | 0.25| CNNM2, NT5C2 | intergenic    | 2.05e-25     | 4.55         | 7.03e-9         | 3.81         | 1.01e-8         | 4.04                   | 7.62e-11                  |
| rs2253983   | 10  | 104530451  | A/G     | 0.39| C10orf26   | intron         | 2.18e-25     | -4.31        | 6.70e-11        | -3.38        | 7.84e-9         | -3.52                  | 6.31e-9                   |
| rs2281877   | 10  | 104856052  | G/A     | 0.25| NT5C2      | intron         | 2.18e-25     | 4.55         | 7.05e-9         | 3.81         | 1.07e-8         | 4.04                   | 7.62e-11                  |
| rs10786738  | 10  | 104859441  | G/A     | 0.25| NT5C2      | intron         | 2.18e-25     | 4.55         | 7.05e-9         | 3.81         | 1.07e-8         | 4.04                   | 7.62e-11                  |
| SNP         | Chr | Position   | Alleles | MAF | Gene    | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-------------|-----|------------|---------|-----|---------|----------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|---------------------------|
| rs6584539   | 10  | 104869392  | C/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs10883834  | 10  | 104871392  | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs1541213   | 10  | 104875320  | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs10883836  | 10  | 104881188  | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs34104646  | 10  | 10486066   | T/A     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs11191573  | 10  | 10486806   | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs12775302  | 10  | 104901346  | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs10883839  | 10  | 104910331  | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs10509766  | 10  | 104916324  | A/G     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs2148198   | 10  | 104905300  | G/A     | 0.25| NT5C2   | intron   | 2.18e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8         | 4.04                     | 7.62e-11                  |
| rs2254563   | 10  | 104526355  | C/G     | 0.39| C10orf26| intron   | 2.46e-25     | -4.33        | 5.83e-11       | -3.37         | 9.90e-9         | -3.52                    | 6.31e-9                   |
| rs11191371  | 10  | 104449887  | C/G     | 0.26| ARL3    | intron   | 2.78e-25     | 4.24         | 3.04e-8        | 4.13          | 8.41e-10        | 3.87                     | 3.11e-10                  |
| rs631381    | 10  | 10453378   | T/A     | 0.39| C10orf26| intron   | 2.90e-25     | -4.38        | 3.46e-11       | -3.36         | 8.10e-9         | -3.44                    | 1.33e-8                   |
| rs7905481   | 10  | 104466282  | A/G     | 0.26| SFXN2   | intron   | 2.97e-25     | 4.23         | 3.36e-8        | 4.21          | 4.77e-10        | 3.85                     | 5.18e-10                  |
| rs2182348   | 10  | 104862674  | A/G     | 0.25| NT5C2   | intron   | 3.16e-25     | 4.55         | 7.05e-9        | 3.88          | 5.36e-9         | 3.94                     | 2.32e-10                  |
| rs541393    | 10  | 104528601  | G/A     | 0.39| C10orf26| intron   | 3.35e-25     | -4.35        | 5.34e-11       | -3.32         | 1.43e-8         | -3.52                    | 6.31e-9                   |
| rs12355120  | 10  | 104842156  | A/C     | 0.25| NT5C2   | intron   | 3.37e-25     | 4.55         | 7.05e-9        | 3.75          | 1.63e-8         | 4.04                     | 7.62e-11                  |
| rs3781282   | 10  | 104842409  | A/G     | 0.25| NT5C2   | intron   | 3.37e-25     | 4.55         | 7.05e-9        | 3.75          | 1.63e-8         | 4.04                     | 7.62e-11                  |
| rs3781281   | 10  | 104842638  | G/A     | 0.25| NT5C2   | intron   | 3.37e-25     | 4.55         | 7.05e-9        | 3.75          | 1.63e-8         | 4.04                     | 7.62e-11                  |
| SNP         | Chr | Position   | Alleles | MAF | Gene | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|------------|-----|------------|---------|-----|------|----------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|---------------------------|
| rs186617435 | 10  | 104842649  | T/A     | 0.25| NT5C2 | intron   | 3.37e-25     | 4.55         | 7.05e-9        | 3.75          | 1.63e-8           | 4.04                     | 7.62e-11                  |
| rs1046411   | 10  | 104827806  | G/A     | 0.25| CNNM2 | UTR      | 4.35e-25     | 4.55         | 7.05e-9        | 3.82          | 1.03e-8           | 3.97                     | 1.63e-10                  |
| rs7089680   | 10  | 104792061  | A/G     | 0.25| CNNM2 | intron   | 5.28e-25     | 4.55         | 7.05e-9        | 3.74          | 2.50e-8           | 4.04                     | 7.62e-11                  |
| rs7073323   | 10  | 104787413  | A/C     | 0.25| CNNM2 | intron   | 6.35e-25     | 4.55         | 7.13e-9        | 3.72          | 2.95e-8           | 4.04                     | 7.62e-11                  |
| rs10218853  | 10  | 104786777  | A/C     | 0.25| CNNM2 | intron   | 7.01e-25     | 4.55         | 7.35e-9        | 3.72          | 2.94e-8           | 4.03                     | 8.22e-11                  |
| rs7067663   | 10  | 104873640  | A/G     | 0.25| NT5C2 | intron   | 7.82e-25     | 4.55         | 7.05e-9        | 3.81          | 1.07e-8           | 3.91                     | 2.83e-10                  |
| rs77060053  | 10  | 104207743  | A/G     | 0.18| C10orf95, TMEM180 | intergenic | 8.20e-25     | 4.69         | 5.69e-8        | 4.28          | 4.55e-8           | 4.65                     | 7.03e-12                  |
| rs10786741  | 10  | 104929172  | G/A     | 0.25| LOC729081, NT5C2 | intergenic | 8.91e-25     | 4.55         | 7.05e-9        | 3.69          | 4.10e-8           | 4.04                     | 7.62e-11                  |
| rs35195396  | 10  | 104918760  | A/T     | 0.25| NT5C2 | intron   | 9.26e-25     | 4.55         | 7.03e-9        | 3.68          | 3.89e-8           | 4.03                     | 8.42e-11                  |
| rs7094325   | 10  | 104419736  | G/C     | 0.26| TRIM8, ARL3 | intergenic | 1.67e-24     | 4.25         | 3.59e-8        | 3.85          | 1.73e-8           | 4.04                     | 7.39e-11                  |
| rs34058856  | 10  | 104359313  | G/A     | 0.23| SUFU  | intron   | 1.76e-24     | 4.67         | 1.16e-8        | 4.18          | 4.03e-9           | 3.87                     | 1.07e-9                   |
| rs35485301  | 10  | 104360817  | G/A     | 0.23| SUFU  | intron   | 1.76e-24     | 4.67         | 1.16e-8        | 4.18          | 4.03e-9           | 3.87                     | 1.07e-9                   |
| rs12773833  | 10  | 104408340  | G/A     | 0.26| TRIM8, ARL3 | intergenic | 2.07e-24     | 4.23         | 4.47e-8        | 3.85          | 1.73e-8           | 4.04                     | 7.39e-11                  |
| rs12570611  | 10  | 104411669  | G/C     | 0.26| TRIM8, ARL3 | intergenic | 2.11e-24     | 4.22         | 4.56e-8        | 3.85          | 1.73e-8           | 4.04                     | 7.39e-11                  |
| rs7910900   | 10  | 104819888  | G/A     | 0.25| CNNM2 | intron   | 2.41e-24     | 4.55         | 7.05e-9        | 3.71          | 3.51e-8           | 3.93                     | 2.54e-10                  |
| rs284861    | 10  | 104562266  | G/A     | 0.15| C10orf26 | intron    | 2.68e-24     | -5.60        | 4.48e-9        | -4.37         | 1.24e-7           | -5.06                    | 1.08e-10                  |
| SNP     | Chr | Position | Alleles | MAF | Gene           | Location     | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|---------|-----|----------|---------|-----|----------------|--------------|--------------|-------------|----------------|----------------|----------------|------------------------|-----------------------------|
| rs284851| 10  | 104568521| G/C     | 0.15| C10orf26, CYP17A1| intergenic   | 2.68e-24     | -5.60       | 4.48e-9        | -4.37          | 1.24e-7         | -5.06                  | 1.08e-10                     |
| rs12573077| 10  | 104424620| C/A     | 0.25| ARL3           | UTR          | 6.05e-24     | 4.13        | 2.25e-7        | 3.95           | 1.01e-8         | 4.04                   | 7.39e-11                     |
| rs80288225| 10  | 104248073| A/G     | 0.24| ACTR1A         | intron       | 6.25e-24     | 4.44        | 3.28e-8        | 4.02           | 7.29e-9         | 3.83                   | 7.89e-10                     |
| rs12763720| 10  | 104231973| A/G     | 0.23| ACTR1A         | intron       | 6.83e-24     | 4.67        | 1.16e-8        | 4.07           | 9.66e-9         | 3.80                   | 1.74e-9                     |
| rs35637354| 10  | 104211844| A/C     | 0.23| TMEM180        | intron       | 9.00e-24     | 4.67        | 1.16e-8        | 4.11           | 6.11e-9         | 3.73                   | 3.58e-9                     |
| rs10786667| 10  | 104209122| A/G     | 0.46| C10orf95, TMEM180| intergenic   | 1.11e-23     | -3.40       | 1.07e-7        | -2.95          | 3.51e-7         | -4.03                  | 5.25e-12                    |
| rs56254970| 10  | 104209283| A/G     | 0.46| C10orf95, TMEM180| intergenic   | 1.11e-23     | -3.40       | 1.07e-7        | -2.95          | 3.51e-7         | -4.03                  | 5.25e-12                    |
| rs7923415| 10  | 104408646| G/A     | 0.40| TRIM8, ARL3    | intergenic   | 8.73e-23     | -4.16       | 5.88e-10       | -2.88          | 7.42e-7         | -3.56                  | 3.16e-9                     |
| rs2273555| 10  | 104117161| A/G     | 0.45| GBF1           | intron       | 2.60e-22     | 2.22        | 6.63e-4        | 3.12           | 7.56e-8         | 4.68                   | 6.56e-15                    |
| rs11191293| 10  | 104211529| G/A     | 0.42| TMEM180        | intron       | 4.47e-20     | -3.95       | 1.90e-9        | -2.84          | 1.12e-6         | -3.06                  | 3.36e-7                     |
| rs4919682| 10  | 104574320| G/A     | 0.30| C10orf26, CYP17A1| intergenic   | 3.73e-17     | 2.04        | 3.71e-3        | 2.64           | 2.70e-5         | 4.56                   | 4.52e-13                    |
| rs884825| 10  | 104417606| C/A     | 0.32| TRIM8, ARL3    | intergenic   | 5.36e-17     | -3.62       | 1.55e-7        | -2.91          | 3.93e-6         | -3.00                  | 2.52e-6                     |
| rs17115317| 10  | 104734215| G/A     | 0.28| CNNM2          | intron       | 1.49e-16     | 2.90        | 2.50e-5        | 3.07           | 5.15e-6         | 4.08                   | 4.47e-8                     |
| rs141653928| 10  | 104721009| G/A     | 0.03| CNNM2          | intron       | 1.60e-16     | 8.11        | 1.00e-5        | 13.19          | 9.86e-7         | 9.45                   | 7.09e-7                     |
| rs76099321| 10  | 104787273| G/A     | 0.29| CNNM2          | intron       | 2.68e-16     | 3.10        | 6.03e-6        | 3.06           | 4.88e-6         | 3.70                   | 3.95e-7                     |
| SNP          | Chr | Position | Alleles | MAF | Gene      | Location      | Meta P-value | Arizona P-value | Oklahoma P-value | North/South Dakotas P-value |
|--------------|-----|----------|---------|-----|-----------|---------------|--------------|----------------|-------------------|-----------------------------|
| rs4285804    | 10  | 104376299| A/T     | 0.33| SUFU      | intron        | 3.57e-16     | 3.71           | 8.86e-7          | 2.77                        |
| rs17115414   | 10  | 104815142| A/C     | 0.29| CNNM2     | intron        | 4.00e-16     | 3.10           | 6.03e-6          | 3.08                        |
| rs74233806   | 10  | 104836881| G/A     | 0.29| CNNM2, NT5C2 | intergenic  | 8.00e-16     | 3.10           | 6.03e-6          | 3.03                        |
| rs3961457    | 10  | 104419629| A/G     | 0.33| TRIM8, ARL3 | intergenic  | 1.01e-15     | -3.51          | 3.74e-7          | -2.80                      |
| rs77273695   | 10  | 104694520| G/A     | 0.28| CNNM2     | intron        | 3.33e-15     | 2.80           | 4.30e-5          | 3.03                        |
| rs11598702   | 10  | 104887975| A/G     | 0.20| NT5C2     | intron        | 4.26e-15     | -5.36          | 2.15e-6          | -2.76                      |
| rs10883846   | 10  | 104948234| G/A     | 0.20| NT5C2, LOC401648 | intergenic  | 4.89e-15     | -5.36          | 2.15e-6          | -2.72                      |
| rs10786697   | 10  | 104368553| A/C     | 0.33| SUFU      | intron        | 7.59e-14     | 2.92           | 1.38e-4          | 2.77                        |
| rs74541879   | 10  | 104616219| A/G     | 0.06| C10orf32, AS3MT | intergenic  | 8.06e-14     | -5.47          | 3.32e-7          | -7.55                      |
| rs10786696   | 10  | 104368124| G/A     | 0.33| SUFU      | intron        | 8.12e-14     | 2.92           | 1.38e-4          | 2.76                        |
| rs7087984    | 10  | 104370676| A/G     | 0.33| SUFU      | intron        | 8.12e-14     | 2.92           | 1.38e-4          | 2.76                        |
| rs7081467    | 10  | 104221652| G/C     | 0.33| TMEM180   | intron        | 1.13e-13     | 2.90           | 1.57e-4          | 2.91                        |
| rs7908249    | 10  | 104363290| G/A     | 0.33| SUFU      | intron        | 1.18e-13     | 2.92           | 1.38e-4          | 2.70                        |
| rs7912339    | 10  | 104363748| G/C     | 0.33| SUFU      | intron        | 1.18e-13     | 2.92           | 1.38e-4          | 2.70                        |
| rs4604806    | 10  | 104363894| A/G     | 0.33| SUFU      | intron        | 1.18e-13     | 2.92           | 1.38e-4          | 2.70                        |
| rs2863716    | 10  | 104365726| G/A     | 0.34| SUFU      | intron        | 1.22e-13     | 2.93           | 1.35e-4          | 2.90                        |
| SNP        | Chr | Position  | Alleles | MAF | Gene        | Location | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|------------|-----|-----------|---------|-----|-------------|----------|--------------|--------------|---------|----------------|---------|---------------------------|---------|
| rs7081110  | 10  | 104221641 | A/G     | 0.33| TMEM180     | intron   | 1.27e-13     | 2.91         | 1.53e-4| 2.88           | 5.95e-6| 2.64                      | 7.18e-6 |
| rs12570859 | 10  | 104247216 | G/A     | 0.32| ACTR1A     | intron   | 1.36e-13     | 2.86         | 1.97e-4| 2.95           | 3.58e-6| 2.61                      | 9.47e-6 |
| rs2281880  | 10  | 104259207 | G/A     | 0.32| SUFU       | intron   | 1.36e-13     | 2.86         | 1.97e-4| 2.95           | 3.58e-6| 2.61                      | 9.47e-6 |
| rs12781718 | 10  | 104217423 | G/A     | 0.33| TMEM180    | intron   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs11593526 | 10  | 104218007 | C/A     | 0.33| TMEM180    | intron   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs11593583 | 10  | 104218139 | G/A     | 0.33| TMEM180    | intron   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs41306870 | 10  | 104219775 | G/A     | 0.33| TMEM180    | coding   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs2025712  | 10  | 104220054 | A/G     | 0.33| TMEM180    | intron   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs11191295 | 10  | 104221044 | A/G     | 0.33| TMEM180    | coding   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs3740415  | 10  | 104222706 | G/A     | 0.33| TMEM180    | intron   | 1.55e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs74337554 | 10  | 104217414 | A/G     | 0.33| TMEM180    | intron   | 1.56e-13     | 2.91         | 1.53e-4| 2.85           | 7.34e-6| 2.64                      | 7.22e-6 |
| rs2025713  | 10  | 104220146 | A/G     | 0.33| TMEM180    | intron   | 1.59e-13     | 2.90         | 1.57e-4| 2.85           | 7.34e-6| 2.64                      | 7.18e-6 |
| rs7078511  | 10  | 104273864 | C/A     | 0.32| SUFU       | intron   | 1.61e-13     | 2.83         | 2.32e-4| 2.95           | 3.58e-6| 2.61                      | 9.47e-6 |
| rs4917968  | 10  | 104210566 | G/A     | 0.30| C10orf95, | intergenic| 1.86e-13     | -2.23        | 1.13e-3| -3.07          | 3.06e-6| -3.08                     | 2.13e-6 |
| rs5870     | 10  | 104229090 | A/G     | 0.33| ACTR1A     | UTR      | 2.45e-13     | 2.86         | 1.97e-4| 2.75           | 1.60e-5| 2.72                      | 4.14e-6 |
| rs1056744  | 10  | 104226677 | A/G     | 0.33| TMEM180    | UTR      | 2.67e-13     | 2.91         | 1.53e-4| 2.75           | 1.50e-5| 2.66                      | 6.29e-6 |
| rs11593971 | 10  | 104224080 | G/C     | 0.33| TMEM180    | intron   | 3.03e-13     | 2.91         | 1.53e-4| 2.75           | 1.50e-5| 2.64                      | 7.17e-6 |
| rs729023   | 10  | 104331877 | A/G     | 0.34| SUFU       | intron   | 3.11e-13     | 2.92         | 1.41e-4| 2.86           | 7.77e-6| 2.57                      | 1.50e-5 |
| SNP      | Chr | Position | Alleles | MAF | Gene    | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|----------|-----|----------|---------|-----|---------|----------|--------------|--------------|-----------------|---------------|-------------------|-----------------------------|
| rs7906115 | 10  | 104317154| G/A     | 0.33| SUFU    | intron   | 3.12e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.65                        |
| rs10786684| 10  | 104313018| A/C     | 0.33| SUFU    | intron   | 4.17e-13     | 2.89         | 1.64e-4         | 2.83          | 9.07e-6          | 2.57                        |
| rs7342070 | 10  | 104213618| A/G     | 0.33| TMEM180 | intron   | 4.44e-13     | 2.91         | 1.53e-4         | 2.72          | 1.60e-5          | 2.60                        |
| rs3862030 | 10  | 104317574| G/A     | 0.33| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs181536287| 10 | 104330968| A/G     | 0.34| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs729024  | 10  | 104331965| G/A     | 0.33| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs3936017 | 10  | 104344414| G/A     | 0.33| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs4919663 | 10  | 104353283| G/A     | 0.33| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs7075269 | 10  | 104355714| A/G     | 0.33| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs4919665 | 10  | 104356032| G/A     | 0.33| SUFU    | intron   | 5.62e-13     | 2.92         | 1.38e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs4917977 | 10  | 104353109| A/G     | 0.34| SUFU    | intron   | 6.33e-13     | 2.92         | 1.38e-4         | 2.74          | 1.70e-5          | 2.57                        |
| rs10883738| 10  | 104311711| G/A     | 0.33| SUFU    | intron   | 6.66e-13     | 2.89         | 1.64e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs6584512 | 10  | 104319675| G/A     | 0.33| SUFU    | intron   | 6.66e-13     | 2.89         | 1.64e-4         | 2.76          | 1.50e-5          | 2.57                        |
| rs7091252 | 10  | 104318849| A/C     | 0.34| SUFU    | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5          | 2.57                        |
| rs7907760 | 10  | 104335187| A/G     | 0.34| SUFU    | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5          | 2.57                        |
| rs10748826| 10  | 104344794| G/A     | 0.34| SUFU    | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5          | 2.57                        |
| rs10786689| 10  | 104346349| G/A     | 0.34| SUFU    | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5          | 2.57                        |
| rs4919661 | 10  | 104343893| G/A     | 0.34| SUFU    | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5          | 2.57                        |
| rs4917975 | 10  | 104348397| C/G     | 0.34| SUFU    | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5          | 2.57                        |
| SNP          | Chr | Position     | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|--------------|---------|-----|--------|----------|--------------|--------------|-----------------|---------------|-----------------|---------------------------|---------------------------|
| rs4917976    | 10  | 104350508    | A/G     | 0.34| SUFU   | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10786691   | 10  | 104354642    | A/G     | 0.34| SUFU   | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs11191352   | 10  | 104362234    | G/A     | 0.34| SUFU   | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10883753   | 10  | 104362431    | A/G     | 0.34| SUFU   | intron   | 8.08e-13     | 2.92         | 1.38e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10786682   | 10  | 104308312    | A/C     | 0.33| SUFU   | intron   | 9.55e-13     | 2.89         | 1.64e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10883736   | 10  | 104310019    | A/C     | 0.33| SUFU   | intron   | 9.55e-13     | 2.89         | 1.64e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10786683   | 10  | 104310466    | A/G     | 0.33| SUFU   | intron   | 9.55e-13     | 2.89         | 1.64e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10786685   | 10  | 104313093    | A/G     | 0.33| SUFU   | intron   | 9.55e-13     | 2.89         | 1.64e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs4919664    | 10  | 104353398    | C/A     | 0.33| SUFU   | intron   | 9.55e-13     | 2.89         | 1.64e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs10786695   | 10  | 104358746    | C/A     | 0.33| SUFU   | intron   | 9.55e-13     | 2.89         | 1.64e-4         | 2.70          | 2.20e-5         | 2.57                      | 1.50e-5                   |
| rs11594073   | 10  | 104298183    | A/G     | 0.33| SUFU   | intron   | 1.19e-12     | 2.92         | 1.38e-4         | 2.75          | 1.60e-5         | 2.48                      | 3.00e-5                   |
| rs11593710   | 10  | 104318709    | A/C     | 0.33| SUFU   | intron   | 1.29e-12     | 2.92         | 1.38e-4         | 2.65          | 3.60e-5         | 2.55                      | 1.50e-5                   |
| rs12782153   | 10  | 104358284    | A/G     | 0.33| SUFU   | intron   | 2.01e-12     | 2.89         | 1.64e-4         | 2.77          | 1.40e-5         | 2.41                      | 4.80e-5                   |
| rs11595170   | 10  | 104329841    | A/G     | 0.33| SUFU   | intron   | 2.36e-12     | 2.92         | 1.38e-4         | 2.72          | 2.00e-5         | 2.41                      | 4.80e-5                   |
| rs12779854   | 10  | 104348464    | G/A     | 0.33| SUFU   | intron   | 2.36e-12     | 2.92         | 1.38e-4         | 2.72          | 2.00e-5         | 2.41                      | 4.80e-5                   |
| rs11191393   | 10  | 104517420    | G/C     | 0.27| C10orf26 | intron | 2.61e-12     | -3.42        | 9.26e-7         | -2.91         | 6.53e-6         | -1.97                     | 4.43e-3                   |
| rs72845847   | 10  | 104521596    | A/G     | 0.27| C10orf26 | intron | 2.61e-12     | -3.42        | 9.26e-7         | -2.91         | 6.53e-6         | -1.97                     | 4.43e-3                   |
| rs1339919    | 10  | 104524438    | A/G     | 0.27| C10orf26 | intron | 2.61e-12     | -3.42        | 9.26e-7         | -2.91         | 6.53e-6         | -1.97                     | 4.43e-3                   |
| rs7907417    | 10  | 104360652    | A/G     | 0.33| SUFU   | intron   | 2.78e-12     | 2.89         | 1.64e-4         | 2.72          | 2.00e-5         | 2.41                      | 4.80e-5                   |
| SNP       | Chr | Position | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|----------|---------|-----|--------|----------|--------------|--------------|-----------------|----------------|-------------------|---------------------------|----------------------------|
| rs11191389 | 10  | 104513008 | G/A     | 0.28| C10orf26 | intron   | 4.40e-12     | -3.42        | 9.26e-7        | -2.83          | 1.20e-5           | -1.98                     | 4.37e-3                   |
| rs4147155  | 10  | 104526761 | G/A     | 0.28| C10orf26 | intron   | 4.40e-12     | -3.42        | 9.26e-7        | -2.83          | 1.20e-5           | -1.98                     | 4.37e-3                   |
| rs4147157  | 10  | 104526350 | G/A     | 0.26| C10orf26 | intron   | 5.17e-12     | -3.46        | 1.03e-6        | -2.84          | 1.70e-5           | -2.08                     | 3.68e-3                   |
| rs11191355 | 10  | 104382487 | A/G     | 0.28| SUFU   | UTR      | 6.20e-12     | -3.27        | 3.79e-6        | -2.88          | 7.26e-6           | -1.97                     | 3.53e-3                   |
| rs60459635 | 10  | 104490978 | A/C     | 0.28| SFXN2, C10orf26 | intergenic | 6.77e-12     | -3.43        | 8.70e-7        | -2.87          | 8.08e-6           | -1.84                     | 7.87e-3                   |
| rs2297450  | 10  | 104493164 | A/G     | 0.28| SFXN2, C10orf26 | intergenic | 6.77e-12     | -3.43        | 8.70e-7        | -2.87          | 8.08e-6           | -1.84                     | 7.87e-3                   |
| rs11191356 | 10  | 104383479 | A/G     | 0.26| SUFU, TRIM8 | intergenic | 1.08e-11     | -3.21        | 6.82e-6        | -2.89          | 1.10e-5           | -2.08                     | 2.87e-3                   |
| rs17114534 | 10  | 104211519 | A/G     | 0.28| TMEM180 | intron   | 1.33e-11     | -3.08        | 1.10e-5        | -2.83          | 1.30e-5           | -2.09                     | 2.24e-3                   |
| rs11191359 | 10  | 104391476 | T/A     | 0.26| SUFU, TRIM8 | intergenic | 1.49e-11     | -3.19        | 7.69e-6        | -2.89          | 1.30e-5           | -2.07                     | 3.06e-3                   |
| rs17114803 | 10  | 104376924 | A/G     | 0.27| SUFU   | coding   | 1.52e-11     | -3.28        | 4.25e-6        | -2.89          | 1.10e-5           | -1.96                     | 4.91e-3                   |
| rs12573474 | 10  | 104383496 | A/G     | 0.26| SUFU, TRIM8 | intergenic | 1.63e-11     | -3.17        | 8.88e-6        | -2.79          | 2.30e-5           | -2.16                     | 2.01e-3                   |
| rs7086898  | 10  | 104376142 | A/G     | 0.27| SUFU   | intron   | 1.64e-11     | -3.26        | 4.70e-6        | -2.89          | 1.10e-5           | -1.96                     | 4.91e-3                   |
| rs10786700 | 10  | 104377725 | G/A     | 0.27| SUFU   | intron   | 1.64e-11     | -3.26        | 4.70e-6        | -2.89          | 1.10e-5           | -1.96                     | 4.91e-3                   |
| rs17114810 | 10  | 104381535 | G/A     | 0.27| SUFU   | UTR      | 1.64e-11     | -3.26        | 4.70e-6        | -2.89          | 1.10e-5           | -1.96                     | 4.91e-3                   |
| rs11818043 | 10  | 104381617 | A/G     | 0.27| SUFU   | UTR      | 1.64e-11     | -3.26        | 4.70e-6        | -2.89          | 1.10e-5           | -1.96                     | 4.91e-3                   |
| rs17114808 | 10  | 104381275 | G/A     | 0.27| SUFU   | UTR      | 1.64e-11     | -3.26        | 4.70e-6        | -2.89          | 1.10e-5           | -1.96                     | 4.91e-3                   |
| SNP       | Chr | Position     | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|--------------|---------|-----|--------|----------|--------------|--------------|-----------------|---------------|-------------------|-------------------------|-----------------------------|
| rs4919666 | 10  | 104374019    | G/A     | 0.27| SUFU   | intron   | 1.64e-11     | -3.26        | 4.70e-6        | -2.89         | 1.10e-5           | -1.96                   | 4.91e-3                    |
| rs2902544 | 10  | 104251349    | G/A     | 0.27| ACTR1A | intron   | 1.79e-11     | -2.83        | 5.70e-5        | -3.09         | 2.69e-6           | -2.06                   | 2.72e-3                    |
| rs4919649 | 10  | 104262326    | A/G     | 0.27| SUFU   | intron   | 1.90e-11     | -2.81        | 6.30e-5        | -3.11         | 2.61e-6           | -2.06                   | 2.72e-3                    |
| rs193185980| 10 | 104258849   | G/A     | 0.27| SUFU   | intron   | 1.95e-11     | -2.81        | 6.30e-5        | -3.09         | 2.69e-6           | -2.06                   | 2.72e-3                    |
| rs4919656 | 10  | 104272851    | G/A     | 0.27| SUFU   | intron   | 1.95e-11     | -2.81        | 6.30e-5        | -3.09         | 2.69e-6           | -2.06                   | 2.72e-3                    |
| rs185072800| 10 | 104258850   | C/A     | 0.27| SUFU   | intron   | 1.95e-11     | -2.81        | 6.30e-5        | -3.09         | 2.69e-6           | -2.07                   | 2.72e-3                    |
| rs74558061| 10  | 104374327    | A/G     | 0.26| SUFU   | intron   | 2.10e-11     | -3.26        | 4.81e-6        | -2.89         | 1.30e-5           | -1.95                   | 5.23e-3                    |
| rs4919643 | 10  | 104212367    | G/C     | 0.28| TMEM180| intron   | 2.17e-11     | -2.98        | 2.30e-5        | -2.88         | 1.20e-5           | -2.10                   | 2.16e-3                    |
| rs12415043| 10  | 104457599    | C/G     | 0.26| ARL3   | intron   | 2.17e-11     | -3.20        | 6.06e-6        | -2.98         | 6.14e-6           | -1.87                   | 7.48e-3                    |
| rs7089422 | 10  | 104595318    | G/A     | 0.14| CYP17A1, C10orf32 | intergenic | 2.18e-11     | -4.12        | 3.34e-3        | -2.78         | 2.77e-4           | -3.61                   | 8.86e-7                    |
| rs4146429 | 10  | 104391622    | A/G     | 0.26| SUFU, TRIM8 | intergenic | 2.44e-11     | -3.18        | 7.95e-6        | -2.79         | 2.20e-5           | -2.07                   | 3.06e-3                    |
| rs10786701| 10  | 104402298    | G/A     | 0.26| TRIM8  | intron   | 2.44e-11     | -3.18        | 7.95e-6        | -2.79         | 2.20e-5           | -2.07                   | 3.06e-3                    |
| rs10883761| 10  | 104410008    | A/G     | 0.26| TRIM8, ARL3 | intergenic | 2.44e-11     | -3.18        | 7.95e-6        | -2.79         | 2.20e-5           | -2.07                   | 3.06e-3                    |
| rs10883766| 10  | 104454753    | G/A     | 0.26| ARL3   | intron   | 2.67e-11     | -3.20        | 6.06e-6        | -2.96         | 7.88e-6           | -1.87                   | 7.48e-3                    |
| rs4919669 | 10  | 104461965    | T/A     | 0.26| ARL3   | intron   | 3.04e-11     | -3.20        | 6.06e-6        | -2.94         | 9.18e-6           | -1.87                   | 7.48e-3                    |
| SNP       | Chr | Position   | Alleles | MAF | Gene          | Location     | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|-----------|-----|------------|---------|-----|---------------|--------------|--------------|--------------|-----------------|-----------------|-------------------|---------------------------|
| rs4244354 | 10  | 104416167  | G/A     | 0.26| TRIM8, ARL3   | intergenic   | 3.16e-11     | -3.18        | 7.95e-6        | -2.79          | 2.20e-5           | -2.03             | 3.74e-3                  |
| rs11191365| 10  | 104420241  | G/A     | 0.26| TRIM8, ARL3   | intergenic   | 3.16e-11     | -3.18        | 7.95e-6        | -2.79          | 2.20e-5           | -2.03             | 3.74e-3                  |
| rs8354    | 10  | 104426631  | G/A     | 0.26| ARL3          | UTR          | 3.94e-11     | -3.09        | 1.20e-5        | -2.98          | 6.61e-6           | -1.87             | 7.48e-3                  |
| rs2298278 | 10  | 104380293  | A/G     | 0.27| SUFU          | UTR          | 6.12e-11     | -3.13        | 1.10e-5        | -2.77          | 2.50e-5           | -1.97             | 4.69e-3                  |
| rs5011218 | 10  | 104391208  | A/C     | 0.26| SUFU, TRIM8   | intergenic   | 7.69e-11     | -3.08        | 1.60e-5        | -2.69          | 4.30e-5           | -2.07             | 3.06e-3                  |
| rs140683362| 10  | 104676874  | C/G     | 0.16| CNNM2         | intron       | 7.88e-11     | -4.02        | 4.02e-3        | -2.59          | 5.80e-4           | -3.48             | 1.30e-6                  |
| rs79025   | 10  | 104332196  | G/A     | 0.27| SUFU          | intron       | 7.96e-11     | -2.86        | 5.10e-5        | -2.96          | 7.39e-6           | -1.96             | 4.91e-3                  |
| rs3824756 | 10  | 104349340  | A/G     | 0.27| SUFU          | intron       | 7.96e-11     | -2.86        | 5.10e-5        | -2.96          | 7.39e-6           | -1.96             | 4.91e-3                  |
| rs17114641| 10  | 104277349  | A/C     | 0.27| SUFU          | intron       | 8.20e-11     | -2.90        | 3.90e-5        | -2.94          | 9.06e-6           | -1.95             | 5.23e-3                  |
| rs10883735| 10  | 104298436  | G/A     | 0.27| SUFU          | intron       | 8.89e-11     | -2.90        | 3.90e-5        | -2.93          | 1.00e-5           | -1.95             | 5.23e-3                  |
| rs2902548 | 10  | 104477372  | G/A     | 0.27| SFXN2         | intron       | 9.95e-11     | -3.58        | 2.88e-7        | -2.69          | 2.90e-5           | -1.45             | 3.64e-2                  |
| rs2778038 | 10  | 104505059  | A/C     | 0.11| C10orF26     | intron       | 1.02e-10     | -4.87        | 4.40e-4        | -2.78          | 3.69e-3           | -3.98             | 2.31e-6                  |
| rs3934495 | 10  | 104351701  | G/A     | 0.27| SUFU          | intron       | 1.06e-10     | -2.86        | 5.30e-5        | -2.94          | 9.06e-6           | -1.95             | 5.23e-3                  |
| rs10883737| 10  | 104310888  | G/C     | 0.27| SUFU          | intron       | 1.12e-10     | -2.84        | 5.80e-5        | -2.96          | 8.87e-6           | -1.95             | 5.23e-3                  |
| rs2432580 | 10  | 104552202  | G/A     | 0.33| C10orF26     | intron       | 1.14e-10     | 2.12         | 1.47e-3        | 2.41           | 1.01e-4           | 2.76              | 5.00e-5                  |
| rs11191343| 10  | 104335215  | G/A     | 0.27| SUFU          | intron       | 1.14e-10     | -2.84        | 5.80e-5        | -2.94          | 9.06e-6           | -1.95             | 5.23e-3                  |
| rs2244254 | 10  | 104479001  | G/C     | 0.12| SFXN2         | intron       | 1.16e-10     | -5.13        | 1.92e-4        | -2.74          | 3.29e-3           | -3.72             | 7.83e-6                  |
| SNP       | Chr | Position  | Alleles | MAF  | Gene    | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|----------|-----|-----------|---------|------|---------|----------|-------------|-------------|-----------------|---------------|-----------------|------------------------|--------------------------|
| rs284859 | 10  | 104563007 | C/A     | 0.33 | C10orf26 | coding   | 1.19e-10    | 2.15        | 1.31e-3        | 2.30          | 1.91e-4         | 2.85                   | 3.10e-5                  |
| rs3740409 | 10  | 104226635 | G/A     | 0.27 | TMEM180  | UTR      | 1.21e-10    | -2.66       | 1.69e-4        | -2.93         | 1.10e-5         | -2.10                 | 2.32e-3                  |
| rs186550244 | 10  | 104329779 | C/A     | 0.27 | SUFU    | intron   | 1.28e-10    | -2.85       | 5.60e-5        | -2.96         | 8.87e-6         | -1.92                 | 5.93e-3                  |
| rs4919644 | 10  | 104219578 | G/A     | 0.27 | TMEM180  | intron   | 1.29e-10    | -2.66       | 1.81e-4        | -2.93         | 1.10e-5         | -2.10                 | 2.32e-3                  |
| rs7092340 | 10  | 104519658 | A/G     | 0.12 | C10orf26 | intron   | 1.58e-10    | -5.07       | 2.38e-4        | -2.74         | 3.63e-3         | -3.72                 | 7.83e-6                  |
| rs12266856 | 10  | 104521040 | G/A     | 0.12 | C10orf26 | intron   | 1.62e-10    | -5.03       | 2.44e-4        | -2.74         | 3.63e-3         | -3.72                 | 7.83e-6                  |
| rs2031604 | 10  | 104287781 | G/A     | 0.27 | SUFU    | intron   | 1.89e-10    | -2.90       | 3.90e-5        | -2.93         | 8.51e-6         | -1.78                 | 1.01e-2                  |
| rs2244258 | 10  | 104478890 | T/A     | 0.12 | SFXN2   | intron   | 1.98e-10    | -5.13       | 1.92e-4        | -2.75         | 3.37e-3         | -3.63                 | 1.40e-5                  |
| rs145033011 | 10  | 104405808 | A/G     | 0.04 | TRIM8   | intron   | 2.39e-10    | 6.21        | 2.34e-3        | 6.40          | 5.36e-4         | 6.21                   | 1.10e-5                  |
| rs284849  | 10  | 104581172 | C/A     | 0.33 | CYP17A1  | intron   | 2.86e-10    | 2.50        | 2.34e-4        | 2.31          | 2.45e-4         | 2.41                   | 3.23e-4                  |
| rs284848  | 10  | 104582115 | G/A     | 0.33 | CYP17A1  | intron   | 2.86e-10    | 2.50        | 2.34e-4        | 2.31          | 2.45e-4         | 2.41                   | 3.23e-4                  |
| rs2486758 | 10  | 104587470 | A/G     | 0.33 | CYP17A1, C10orf32 | intergenic | 5.08e-10 | 2.49       | 2.28e-4        | 2.29          | 2.72e-4         | 2.29                   | 5.23e-4                  |
| rs2265308 | 10  | 104481104 | G/A     | 0.12 | SFXN2   | intron   | 1.47e-9     | -5.07       | 2.38e-4        | -2.51         | 6.30e-3         | -3.31                 | 4.80e-5                  |
| rs2778037 | 10  | 104482697 | G/C     | 0.12 | SFXN2   | intron   | 1.47e-9     | -5.07       | 2.38e-4        | -2.51         | 6.30e-3         | -3.31                 | 4.80e-5                  |
| rs9420873 | 10  | 104486012 | G/A     | 0.12 | SFXN2   | intron   | 1.47e-9     | -5.07       | 2.38e-4        | -2.51         | 6.30e-3         | -3.31                 | 4.80e-5                  |
| rs7917772 | 10  | 104477433 | G/A     | 0.38 | SFXN2   | intron   | 1.59e-9     | 2.45        | 7.71e-4        | 2.13          | 4.19e-4         | 2.12                   | 3.66e-4                  |
| rs58706228 | 10  | 104499808 | A/G     | 0.12 | C10orf26 | intron   | 1.95e-9     | -5.07       | 2.38e-4        | -2.45         | 7.96e-3         | -3.31                 | 4.80e-5                  |
| rs2244524 | 10  | 104476964 | A/G     | 0.38 | SFXN2   | intron   | 2.83e-9     | 2.50        | 5.76e-4        | 2.42          | 6.90e-5         | 1.73                   | 3.62e-3                  |
| SNP       | Chr | Position    | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | P-value          | Oklahoma Beta | P-value          | North/South Dakotas Beta | P-value          |
|-----------|-----|-------------|---------|-----|--------|----------|--------------|--------------|-----------------|----------------|-----------------|------------------------|-----------------|
| rs61869257 | 10 | 104506262   | G/A     | 0.11| C10orf26 | intron   | 3.40e-9      | -4.70        | 1.00e-3         | -2.63          | 5.38e-3         | -3.51                  | 3.60e-5         |
| rs7090307  | 10 | 104507109   | G/A     | 0.11| C10orf26 | intron   | 3.40e-9      | -4.70        | 1.00e-3         | -2.63          | 5.38e-3         | -3.51                  | 3.60e-5         |
| rs7077678  | 10 | 104428555   | A/G     | 0.40| ARL3   | intron   | 3.86e-9      | 2.39         | 8.92e-4         | 2.20           | 2.16e-4        | 1.90                   | 1.38e-3         |
| rs2286748  | 10 | 104404699   | C/A     | 0.14| TRIM8  | intron   | 3.89e-9      | -5.65        | 7.97e-6         | -1.50          | 7.29e-2        | -3.20                  | 6.30e-5         |
| rs11191369 | 10 | 104447446   | A/G     | 0.40| ARL3   | intron   | 3.97e-9      | 2.39         | 8.92e-4         | 2.21           | 2.23e-4        | 1.90                   | 1.38e-3         |
| rs11191377 | 10 | 104462767   | A/G     | 0.13| ARL3   | intron   | 3.98e-9      | -4.51        | 8.17e-4         | -2.26          | 8.86e-3        | -3.40                  | 2.70e-5         |
| rs10786705 | 10 | 104467695   | G/A     | 0.13| SFXN2  | intron   | 3.98e-9      | -4.51        | 8.17e-4         | -2.26          | 8.86e-3        | -3.40                  | 2.70e-5         |
| rs10883776 | 10 | 104531009   | A/G     | 0.11| C10orf26 | intron   | 4.72e-9      | -4.70        | 1.00e-3         | -2.57          | 7.15e-3        | -3.51                  | 3.60e-5         |
| rs7893687  | 10 | 104447593   | A/T     | 0.13| ARL3   | intron   | 4.97e-9      | -4.51        | 8.17e-4         | -2.20          | 1.07e-2        | -3.40                  | 2.70e-5         |
| rs28408682 | 10 | 104393300   | A/G     | 0.40| SUFU, TRIM8 | intergenic | 6.45e-9 | 2.33         | 1.45e-3         | 2.38           | 9.00e-5        | 1.74                   | 2.94e-3         |
| rs6892     | 10 | 104565860   | A/G     | 0.25| C10orf26 | UTR      | 7.43e-9      | 2.71         | 4.61e-3         | 2.58           | 1.26e-3        | 3.31                   | 9.60e-5         |
| rs11191362 | 10 | 104409225   | G/A     | 0.13| TRIM8, ARL3 | intergenic | 1.22e-8 | -4.87        | 2.15e-4         | -1.45          | 9.02e-2        | -3.61                  | 8.42e-6         |
| rs10883762 | 10 | 104410506   | A/G     | 0.13| TRIM8, ARL3 | intergenic | 1.22e-8 | -4.87        | 2.15e-4         | -1.45          | 9.02e-2        | -3.61                  | 8.42e-6         |
| rs10883756 | 10 | 104390102   | A/G     | 0.40| SUFU, TRIM8 | intergenic | 1.24e-8 | 2.21         | 2.42e-3         | 2.33           | 1.11e-4        | 1.74                   | 2.94e-3         |
| rs3977755  | 10 | 104410200   | G/A     | 0.13| TRIM8, ARL3 | intergenic | 1.32e-8 | -4.87        | 2.15e-4         | -1.43          | 9.44e-2        | -3.61                  | 8.42e-6         |
| rs2244647  | 10 | 104476294   | G/C     | 0.12| SFXN2  | intron   | 2.00e-8      | -4.74        | 8.13e-4         | -1.92          | 3.69e-2        | -3.56                  | 2.10e-5         |
| SNP       | Chr | Position | Alleles | MAF | Gene     | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|-----------|-----|----------|---------|-----|----------|----------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|--------------------------|
| rs2790914 | 10  | 104558008| G/A     | 0.36| C10orf26 | intron   | 2.31e-8      | 2.05         | 2.02e-3         | 1.95          | 1.19e-3          | 2.19                     | 8.24e-4                  |
| rs10883759| 10  | 104402039| G/A     | 0.14| TRIM8    | intron   | 2.64e-8      | -5.65        | 7.97e-6         | -1.34         | 1.04e-1          | -2.85                    | 2.84e-4                  |
| rs2250301 | 10  | 104538383| G/A     | 0.35| C10orf26 | intron   | 2.69e-8      | 2.05         | 2.02e-3         | 2.00          | 9.10e-4         | 2.17                     | 1.24e-3                  |
| rs3802676 | 10  | 104481692| G/A     | 0.11| SFXN2    | intron   | 2.81e-8      | -4.70        | 1.00e-3         | -2.42         | 9.34e-3         | -3.10                    | 1.99e-4                  |
| rs10883769| 10  | 104484937| G/C     | 0.11| SFXN2    | intron   | 2.81e-8      | -4.70        | 1.00e-3         | -2.42         | 9.34e-3         | -3.10                    | 1.99e-4                  |
| rs7912571 | 10  | 104489378| A/G     | 0.11| SFXN2,   | intergenic| 2.81e-8      | -4.70        | 1.00e-3         | -2.42         | 9.34e-3         | -3.10                    | 1.99e-4                  |
| rs7092723 | 10  | 104489754| G/A     | 0.11| SFXN2,   | intergenic| 2.81e-8      | -4.70        | 1.00e-3         | -2.42         | 9.34e-3         | -3.10                    | 1.99e-4                  |
| rs7074894 | 10  | 104494524| A/C     | 0.11| C10orf26 | intron   | 2.81e-8      | -4.70        | 1.00e-3         | -2.42         | 9.34e-3         | -3.10                    | 1.99e-4                  |
| rs7923711 | 10  | 104496533| G/C     | 0.11| C10orf26 | intron   | 3.05e-8      | -4.70        | 1.00e-3         | -2.40         | 1.00e-2         | -3.10                    | 1.99e-4                  |
| rs7342026 | 10  | 104498896| A/G     | 0.11| C10orf26 | intron   | 3.05e-8      | -4.70        | 1.00e-3         | -2.40         | 1.00e-2         | -3.10                    | 1.99e-4                  |
| rs10883771| 10  | 104500148| A/G     | 0.11| C10orf26 | intron   | 3.13e-8      | -4.68        | 1.04e-3         | -2.40         | 1.00e-2         | -3.10                    | 1.97e-4                  |
| rs3781571 | 10  | 104432447| G/A     | 0.14| ARL3     | intron   | 3.25e-8      | -4.51        | 8.17e-4         | -2.01         | 1.70e-2         | -3.03                    | 1.27e-4                  |
| rs10883770| 10  | 104496842| G/A     | 0.11| C10orf26 | intron   | 3.56e-8      | -3.86        | 5.63e-3         | -2.44         | 9.91e-3         | -3.51                    | 3.60e-5                  |
| rs11191384| 10  | 104496101| A/G     | 0.11| C10orf26 | intron   | 3.60e-8      | -4.70        | 1.00e-3         | -2.34         | 1.16e-2         | -3.10                    | 1.99e-4                  |
| rs7089279 | 10  | 104459417| G/A     | 0.14| ARL3     | intron   | 3.68e-8      | -4.51        | 8.17e-4         | -2.02         | 1.77e-2         | -3.03                    | 1.39e-4                  |
| rs3740606 | 10  | 104435358| G/A     | 0.14| ARL3     | intron   | 3.95e-8      | -4.51        | 8.17e-4         | -1.96         | 2.00e-2         | -3.03                    | 1.27e-4                  |
| rs284846  | 10  | 104547280| A/G     | 0.35| C10orf26 | intron   | 4.09e-8      | 2.05         | 2.02e-3         | 1.99          | 9.85e-4         | 2.10                     | 1.75e-3                  |
| SNP        | Chr | Position   | Alleles | MAF | Gene            | Location  | Meta P-value | Arizona Beta P-value | Oklahoma Beta P-value | North/South Dakotas Beta P-value |
|------------|-----|------------|---------|-----|-----------------|-----------|--------------|---------------------|------------------------|-------------------------------|
| rs2778039  | 10  | 104550273  | A/G     | 0.35| C10orf26        | intron    | 4.21e-8      | 2.05                | 1.99                   | 1.02e-3                      | 2.10                          | 1.75e-3                      |
| rs7893954  | 10  | 104308956  | G/A     | 0.39| SUFU            | intron    | 4.69e-8      | 2.63                | 1.38                   | 2.17e-2                      | 2.19                          | 2.37e-4                      |
| rs7908450  | 10  | 104749181  | C/G     | 0.10| CNNM2           | intron    | 7.76e-8      | -5.23               | -1.81                  | 6.50e-2                      | -3.71                         | 1.50e-5                      |
| rs3977747  | 10  | 104411558  | A/C     | 0.14| TRIM8, ARL3     | intergenic| 8.38e-8      | -4.87               | -1.28                  | 0.12                         | -3.24                         | 4.80e-5                      |
| rs7899004  | 10  | 104331425  | G/A     | 0.39| SUFU            | intron    | 8.79e-8      | 2.15                | 2.38                   | 8.80e-5                      | 1.47                          | 1.24e-2                      |
| rs58109969 | 10  | 104592597  | G/C     | 0.05| CYP17A1, C10orf32| intergenic| 1.65e-7      | -4.76               | 9.56e-3               | -2.93                        | -4.91                         | 1.60e-5                      |
| rs10509762 | 10  | 104596462  | A/C     | 0.05| CYP17A1, C10orf32| intergenic| 1.65e-7      | -4.76               | 9.56e-3               | -2.93                        | -4.91                         | 1.60e-5                      |
| rs17115171 | 10  | 104614662  | A/G     | 0.05| C10orf32, AS3MT | intergenic| 1.83e-7      | -4.76               | 1.04e-2               | -2.93                        | -4.91                         | 1.60e-5                      |
| rs17115203 | 10  | 104629959  | A/G     | 0.05| AS3MT           | intron    | 2.08e-7      | -4.56               | 1.21e-2               | -2.93                        | -4.91                         | 1.60e-5                      |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 463 associations are below MetaboChip-wide significance threshold of 3.57e-7 for meta-analysis. Base position according to human genome build 18.
Table S7. Top MetaboChip associations for principal component 2 of arsenic species

| SNP      | Chr | Position | Alleles | MAF | Gene                | Location        | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|----------|-----|----------|---------|-----|---------------------|-----------------|--------------|--------------|-----------------|---------------|--------------------|---------------------------|-----------------------------|
| rs7098825| 10  | 104618224| A/G     | 0.17| C10orf32, AS3MT     | intergenic      | 2.17e-9      | 1.39         | 2.91e-4        | 1.14          | 8.62e-4           | 1.24                      | 5.88e-4                    |
| rs3740393| 10  | 104626645| G/C     | 0.21| AS3MT               | intron          | 1.56e-8      | 1.19         | 2.06e-4        | 0.90          | 1.39e-3           | 0.90                      | 3.20e-3                    |
| rs79668541| 10  | 104783894| G/A     | 0.19| CNNM2               | intron          | 1.99e-8      | 1.16         | 4.11e-4        | 0.95          | 9.69e-4           | 0.96                      | 3.29e-3                    |
| rs17878846| 10  | 104620402| T/A     | 0.19| AS3MT               | intron          | 2.21e-8      | 1.12         | 5.37e-4        | 0.97          | 8.25e-4           | 0.96                      | 3.39e-3                    |
| rs3824754| 10  | 104604340| G/A     | 0.19| C10orf32            | intron          | 2.77e-8      | 1.10         | 7.04e-4        | 0.97          | 8.25e-4           | 0.96                      | 3.39e-3                    |
| rs11191416| 10  | 104594906| A/C     | 0.19| CYP17A1, C10orf32   | intergenic      | 2.82e-8      | 1.10         | 7.04e-4        | 0.96          | 8.39e-4           | 0.96                      | 3.39e-3                    |
| rs11191425| 10  | 104615960| G/A     | 0.19| C10orf32, AS3MT     | intergenic      | 2.82e-8      | 1.10         | 7.04e-4        | 0.96          | 8.39e-4           | 0.96                      | 3.39e-3                    |
| rs184992072| 10  | 104846756| A/G     | 0.19| NT5C2               | intron          | 2.95e-8      | 1.06         | 1.24e-3        | 0.93          | 1.20e-3           | 1.03                      | 1.62e-3                    |
| rs3824755| 10  | 104585839| C/G     | 0.19| CYP17A1             | intron          | 3.02e-8      | 1.06         | 1.12e-3        | 0.96          | 8.39e-4           | 0.96                      | 2.51e-3                    |
| rs1004467| 10  | 104584497| A/G     | 0.19| CYP17A1             | intron          | 3.02e-8      | 1.06         | 1.12e-3        | 0.96          | 8.39e-4           | 0.96                      | 2.51e-3                    |
| rs2297787| 10  | 104670127| T/A     | 0.20| CNNM2               | intron          | 3.44e-8      | 1.03         | 1.60e-3        | 0.96          | 7.54e-4           | 0.98                      | 2.30e-3                    |
| rs3740390| 10  | 104628470| G/A     | 0.19| AS3MT               | intron          | 3.47e-8      | 1.08         | 8.39e-4        | 0.96          | 9.30e-4           | 0.96                      | 3.29e-3                    |
| rs113282265| 10  | 104647238| A/G     | 0.19| AS3MT               | intron          | 3.47e-8      | 1.08         | 8.39e-4        | 0.96          | 9.30e-4           | 0.96                      | 3.29e-3                    |
| rs4409766| 10  | 104606653| A/G     | 0.19| C10orf32            | intron          | 4.22e-8      | 1.06         | 1.12e-3        | 0.93          | 1.20e-3           | 0.96                      | 2.51e-3                    |
| rs11191479| 10  | 104713610| A/G     | 0.19| CNNM2               | intron          | 4.22e-8      | 1.05         | 1.32e-3        | 0.96          | 9.30e-4           | 0.98                      | 2.72e-3                    |
| SNP         | Chr | Position | Alleles | MAF | Gene | Location     | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas P-value |
|-------------|-----|----------|---------|-----|------|--------------|--------------|--------------|----------------|---------------|-----------------|-----------------------------|
| rs12219901  | 10  | 104830957| A/G     | 0.19| CNNM2, NT5C2 | intergenic   | 4.35e-8 | 1.05 | 1.32e-3       | 0.97 | 7.74e-4       | 0.96 | 3.29e-3       |
| rs78821730  | 10  | 104674534| G/A     | 0.19| CNNM2 | intron        | 4.98e-8 | 1.05 | 1.32e-3       | 0.96 | 8.97e-4       | 0.96 | 3.29e-3       |
| rs11191595  | 10  | 104933038| A/C     | 0.19| NT5C2 | intron        | 5.08e-8 | 1.11 | 6.76e-4       | 0.91 | 1.64e-3       | 0.95 | 3.38e-3       |
| rs11191453  | 10  | 104649842| A/G     | 0.19| AS3MT | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs12221193  | 10  | 104655257| A/C     | 0.19| AS3MT, CNNM2 | intergenic  | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs77180047  | 10  | 104656747| G/A     | 0.19| AS3MT, CNNM2 | intergenic  | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs17115213  | 10  | 104671133| A/G     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs10509759  | 10  | 104679655| T/A     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs5011520   | 10  | 104687506| G/A     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs10883808  | 10  | 104711116| T/A     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs10883815  | 10  | 104729169| A/G     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs11191502  | 10  | 104755484| A/C     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs11191514  | 10  | 104763354| G/A     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs77787671  | 10  | 104766195| G/A     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs75970938  | 10  | 104783638| A/G     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs11191535  | 10  | 104805866| G/A     | 0.19| CNNM2 | intron        | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| rs10458729  | 10  | 104831469| G/A     | 0.19| CNNM2, intergenic | 5.14e-8 | 1.05 | 1.32e-3       | 0.96 | 9.30e-4       | 0.96 | 3.29e-3       |
| SNP       | Chr | Position   | Alleles | MAF | Gene       | Location | Meta P-value | Arizona | Oklahoma | North/South Dakotas |
|-----------|-----|------------|---------|-----|------------|----------|--------------|---------|----------|---------------------|
|           |     |            |         |     |            |          | Beta | P-value | Beta | P-value | Beta | P-value |
| rs11191454 | 10  | 104649994  | A/G     | 0.19| AS3MT      | intron   | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs11191472 | 10  | 104697006  | T/A     | 0.19| CNNM2      | intron   | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs11191515 | 10  | 104766517  | G/A     | 0.19| CNNM2      | intron   | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs11191548 | 10  | 104836168  | A/G     | 0.19| CNNM2, NT5C2 | intergenic | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs12411886 | 10  | 104675289  | C/A     | 0.19| CNNM2      | intron   | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs12413409 | 10  | 104709086  | G/A     | 0.19| CNNM2      | intron   | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs3781285  | 10  | 104815655  | C/G     | 0.19| CNNM2      | intron   | 5.14e-8 | 1.05 | 1.32e-3 | 0.96  | 9.30e-4 | 0.96  | 3.29e-3 |
| rs12221064 | 10  | 104667116  | G/A     | 0.19| AS3MT, CNNM2 | intergenic | 5.37e-8 | 1.05 | 1.32e-3 | 0.95  | 9.75e-4 | 0.96  | 3.29e-3 |
| rs12217501 | 10  | 104841879  | A/G     | 0.19| NT5C2      | intron   | 5.46e-8 | 1.06 | 1.27e-3 | 0.95  | 1.03e-3 | 0.96  | 3.29e-3 |
| rs12220743 | 10  | 104841902  | G/A     | 0.19| NT5C2      | intron   | 5.63e-8 | 1.05 | 1.32e-3 | 0.95  | 1.03e-3 | 0.96  | 3.29e-3 |
| rs943037   | 10  | 104825909  | G/A     | 0.19| CNNM2      | coding   | 5.63e-8 | 1.05 | 1.32e-3 | 0.95  | 1.03e-3 | 0.96  | 3.29e-3 |
| rs11191555 | 10  | 104847513  | A/C     | 0.19| NT5C2      | intron   | 5.81e-8 | 1.05 | 1.32e-3 | 0.93  | 1.20e-3 | 0.96  | 2.95e-3 |
| rs732998   | 10  | 104887891  | A/G     | 0.19| NT5C2      | intron   | 6.47e-8 | 1.05 | 1.31e-3 | 0.93  | 1.20e-3 | 0.96  | 3.29e-3 |
| rs79237883 | 10  | 104930936  | A/G     | 0.19| LOC729081, NT5C2 | intergenic | 6.51e-8 | 1.05 | 1.32e-3 | 0.93  | 1.20e-3 | 0.96  | 3.29e-3 |
| rs11191558 | 10  | 104854668  | G/A     | 0.19| NT5C2      | intron   | 6.51e-8 | 1.05 | 1.32e-3 | 0.93  | 1.20e-3 | 0.96  | 3.29e-3 |
| rs11191560 | 10  | 104859028  | A/G     | 0.19| NT5C2      | intron   | 6.51e-8 | 1.05 | 1.32e-3 | 0.93  | 1.20e-3 | 0.96  | 3.29e-3 |
| SNP          | Chr | Position     | Alleles | MAF | Gene    | Location | Meta P-value | Arizona Beta | P-value | Oklahoma Beta | P-value | North/South Dakotas Beta | P-value |
|--------------|-----|--------------|---------|-----|---------|----------|--------------|--------------|---------|----------------|---------|-------------------------|---------|
| rs11191580   | 10  | 104896201    | A/G     | 0.19| NT5C2   | intron   | 6.51e-8      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.96                    | 3.29e-3 |
| rs12220375   | 10  | 104891481    | A/G     | 0.19| NT5C2   | intron   | 6.51e-8      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.96                    | 3.29e-3 |
| rs12413046   | 10  | 104861194    | A/G     | 0.19| NT5C2   | intron   | 6.51e-8      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.96                    | 3.29e-3 |
| rs9633712    | 10  | 104863751    | G/C     | 0.19| NT5C2   | intron   | 6.51e-8      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.96                    | 3.29e-3 |
| rs12412038   | 10  | 104846152    | G/A     | 0.19| NT5C2   | intron   | 6.73e-8      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.95                    | 3.39e-3 |
| rs10883832   | 10  | 104861269    | A/C     | 0.19| NT5C2   | intron   | 6.85e-8      | 1.05         | 1.32e-3 | 0.93          | 1.27e-3 | 0.96                    | 3.29e-3 |
| rs17884001   | 10  | 104651235    | G/A     | 0.19| AS3MT   | UTR      | 7.14e-8      | 1.05         | 1.32e-3 | 0.92          | 1.33e-3 | 0.96                    | 3.29e-3 |
| rs10430665   | 10  | 104838420    | G/A     | 0.19| NT5C2   | UTR      | 8.41e-8      | 1.03         | 1.76e-3 | 0.94          | 1.16e-3 | 0.95                    | 3.43e-3 |
| rs188299216  | 10  | 104944768    | G/A     | 0.19| NT5C2, LOC401648 | intergenic | 8.71e-8 | 1.06 | 1.22e-3 | 0.94 | 1.09e-3 | 0.91 | 4.98e-3 |
| rs1060240    | 10  | 104873327    | A/G     | 0.19| NT5C2   | intron   | 8.77e-8      | 1.06         | 1.31e-3 | 0.91          | 1.59e-3 | 0.95                    | 3.45e-3 |
| rs79780963   | 10  | 104942489    | G/A     | 0.19| NT5C2   | intron   | 9.75e-8      | 1.11         | 6.81e-4 | 0.91          | 1.60e-3 | 0.89                    | 6.24e-3 |
| rs77420391   | 10  | 104935813    | G/A     | 0.19| NT5C2   | intron   | 1.26e-7      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.90                    | 6.08e-3 |
| rs11191582   | 10  | 104903643    | G/A     | 0.19| NT5C2   | intron   | 1.26e-7      | 1.05         | 1.32e-3 | 0.93          | 1.20e-3 | 0.90                    | 6.08e-3 |
| rs11191447   | 10  | 104642313    | G/A     | 0.19| AS3MT   | intron   | 1.44e-7      | 1.08         | 8.39e-4 | 0.82          | 4.11e-3 | 0.96                    | 3.29e-3 |
| rs1926032    | 10  | 104819459    | G/A     | 0.18| CNNM2   | intron   | 1.65e-7      | 1.01         | 2.32e-3 | 0.86          | 3.58e-3 | 1.05                    | 1.82e-3 |
| rs12768205   | 10  | 104637839    | G/A     | 0.27| AS3MT   | intron   | 1.78e-7      | 1.04         | 6.56e-4 | 0.72          | 4.87e-3 | 0.80                    | 4.13e-3 |
| rs10883796   | 10  | 104645305    | G/A     | 0.27| AS3MT   | intron   | 1.78e-7      | 1.04         | 6.56e-4 | 0.72          | 4.87e-3 | 0.80                    | 4.13e-3 |
| rs17727044   | 10  | 104811246    | T/A     | 0.17| CNNM2   | intron   | 1.81e-7      | -0.48        | 0.17   | -1.35         | 5.10e-5 | -1.00                   | 4.82e-4 |
| SNP          | Chr | Position   | Alleles | MAF | Gene   | Location          | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|------------|---------|-----|--------|-------------------|--------------|-------------|----------------|---------------|----------------------|--------------------------|----------------------------|
| rs78893207   | 10  | 104786128  | A/G     | 0.17| CNNM2  | intron            | 2.66e-7      | -0.55       | 0.11           | -1.21          | 2.20e-4              | -1.01                    | 4.28e-4                      |
| rs10786722   | 10  | 104650058  | G/A     | 0.27| AS3MT  | intron            | 2.68e-7      | 1.00        | 1.09e-3        | 0.72           | 4.87e-3              | 0.80                     | 4.13e-3                      |
| rs7897654    | 10  | 104652448  | A/G     | 0.27| AS3MT, CNNM2 | intergenic      | 2.68e-7      | 1.00        | 1.09e-3        | 0.72           | 4.87e-3              | 0.80                     | 4.13e-3                      |
| rs10883799   | 10  | 104653300  | G/A     | 0.27| AS3MT, CNNM2 | intergenic      | 2.68e-7      | 1.00        | 1.09e-3        | 0.72           | 4.87e-3              | 0.80                     | 4.13e-3                      |
| rs1046778    | 10  | 104651474  | A/G     | 0.27| AS3MT  | UTR               | 2.68e-7      | 1.00        | 1.09e-3        | 0.72           | 4.87e-3              | 0.80                     | 4.13e-3                      |
| rs12252500   | 10  | 104784974  | G/C     | 0.17| CNNM2  | intron            | 3.16e-7      | -0.55       | 0.11           | -1.21          | 2.74e-4              | -1.01                    | 4.28e-4                      |
| rs12257935   | 10  | 104793052  | C/A     | 0.17| CNNM2  | intron            | 3.16e-7      | -0.55       | 0.11           | -1.21          | 2.74e-4              | -1.01                    | 4.28e-4                      |
| rs12266291   | 10  | 104796874  | G/A     | 0.17| CNNM2  | intron            | 3.16e-7      | -0.55       | 0.11           | -1.21          | 2.74e-4              | -1.01                    | 4.28e-4                      |
| rs74749600   | 10  | 104722986  | A/G     | 0.18| CNNM2  | intron            | 3.20e-7      | -0.39       | 0.24           | -1.35          | 5.10e-5              | -1.00                    | 4.82e-4                      |
| rs11191523   | 10  | 104782390  | A/G     | 0.18| CNNM2  | intron            | 3.40e-7      | -0.55       | 0.11           | -1.19          | 3.00e-4              | -1.01                    | 4.28e-4                      |
| rs11191525   | 10  | 104783425  | C/G     | 0.18| CNNM2  | intron            | 3.40e-7      | -0.55       | 0.11           | -1.19          | 3.00e-4              | -1.01                    | 4.28e-4                      |
| rs58317752   | 10  | 104789257  | A/T     | 0.18| CNNM2  | intron            | 3.40e-7      | -0.55       | 0.11           | -1.19          | 3.00e-4              | -1.01                    | 4.28e-4                      |
| rs77827514   | 10  | 104811999  | G/A     | 0.18| CNNM2  | intron            | 3.40e-7      | -0.55       | 0.11           | -1.19          | 3.00e-4              | -1.01                    | 4.28e-4                      |
| rs78214351   | 10  | 104812678  | A/G     | 0.18| CNNM2  | intron            | 3.40e-7      | -0.55       | 0.11           | -1.19          | 3.00e-4              | -1.01                    | 4.28e-4                      |
| rs12257941   | 10  | 104823151  | G/A     | 0.18| CNNM2  | intron            | 3.40e-7      | -0.55       | 0.11           | -1.19          | 3.00e-4              | -1.01                    | 4.28e-4                      |
| rs12765002   | 10  | 104625338  | G/A     | 0.25| AS3MT  | intron            | 3.47e-7      | 0.99        | 1.56e-3        | 0.76           | 3.50e-3              | 0.79                     | 5.44e-3                      |
| rs76892505   | 10  | 104709280  | G/A     | 0.18| CNNM2  | intron            | 3.61e-7      | -0.37       | 0.27           | -1.36          | 4.70e-5              | -1.00                    | 4.82e-4                      |
| SNP          | Chr | Position   | Alleles | MAF | Gene | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|------------|---------|-----|------|----------|--------------|--------------|------------------|----------------|--------------------|------------------------|----------------------------|
| rs79331374   | 10  | 104872903  | G/A     | 0.17| NT5C2| intron   | 3.71e-7      | -0.55        | 0.11             | -1.18          | 3.35e-4            | -1.01                  | 4.28e-4                   |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 84 associations are below MetaboChip-wide significance threshold of 3.57e-7 for meta-analysis. Base position according to human genome build 18.
Table S8. Top candidate SNP associations for percent inorganic arsenic

| SNP        | Chr | Position   | Alleles | MAF | Gene    | Location | Meta P-value | Arizona | Oklahoma | North/South Dakotas |
|------------|-----|------------|---------|-----|---------|----------|--------------|---------|----------|---------------------|
|            |     |            |         |     |         | Beta     | P-value      | Beta    | P-value  | Beta                | P-value  |
| rs4919694  | 10  | 104698978  | T/C     | 0.19| CNNM2   | intron   | 8.10e-10     | 0.18    | 6.50e-05 | 0.08                | 1.40e-05 |
| rs3740390  | 10  | 104638480  | C/T     | 0.2 | AS3MT   | intron   | 1.76e-08     | -0.27   | 4.21e-10 | -0.02               | 0.33     |
| rs11191453 | 10  | 104659852  | T/C     | 0.2 | AS3MT   | intron   | 6.48e-07     | -0.26   | 6.71e-09 | -0.03               | 0.79     |
| rs7911488  | 10  | 105154089  | A/G     | 0.26| USMG5   | UTR      | 1.04e-06     | -0.26   | 7.72e-09 | -0.01               | 0.71     |
| rs3740394  | 10  | 104634474  | A/G     | 0.19| AS3MT   | intron   | 2.53e-06     | 0.19    | 4.10e-05 | 0.11                | 0.08     |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 5 associations are below candidate SNP significance threshold of 9.33e-5 for meta-analysis. Base position according to human genome build 18.
Table S9. Top candidate SNP associations for percent monomethylarsonate

| SNP    | Chr | Position   | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------|-----|------------|---------|-----|--------|----------|--------------|--------------|-----------------|----------------|-------------------|--------------------------|----------------------------|
| rs3740390 | 10  | 104638480  | C/T     | 0.20| AS3MT  | intron   | 9.24e-13     | -0.27        | 2.07e-14        | -0.08          | 0.11              | -0.14                    | 5.97e-4                   |
| rs11191453 | 10  | 104659852  | T/C     | 0.20| AS3MT  | intron   | 5.57e-12     | -0.26        | 6.69e-13        | -0.07          | 0.11              | -0.14                    | 5.97e-4                   |
| rs7911488  | 10  | 105154089  | A/G     | 0.26| USMG5  | UTR      | 6.54e-8      | -0.22        | 4.15e-10        | -0.04          | 0.41              | -0.09                    | 9.93e-3                   |
| rs11191439 | 10  | 104638723  | T/C     | 0.19| AS3MT  | coding   | 2.60e-7      | 0.12         | 1.15e-3         | 0.10           | 0.06              | 0.14                     | 1.51e-4                   |
| rs4919694  | 10  | 104698978  | T/C     | 0.19| CNNM2  | intron   | 4.74e-7      | 0.12         | 9.85e-4         | 0.09           | 0.10              | 0.14                     | 1.66e-4                   |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 5 associations are below candidate SNP significance threshold of 9.33e-5 for meta-analysis. Base position according to human genome build 18.
Table S10. Top candidate SNP associations for percent dimethylarsinate

| SNP      | Chr | Position | Alleles | MAF | Gene | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|----------|-----|----------|---------|-----|------|----------|--------------|--------------|-----------------|---------------|------------------|--------------------------|--------------------------|
| rs3740390| 10  | 104638480| C/T     | 0.20| AS3MT| intron   | 8.63e-23     | 0.30          | 2.69e-18       | 0.12           | 9.70e-4         | 0.19                     | 1.40e-7                  |
| rs11191453| 10 | 104659852| T/C     | 0.20| AS3MT| intron   | 2.18e-21     | 0.28          | 4.49e-16       | 0.12           | 1.02e-3         | 0.19                     | 1.40e-7                  |
| rs3740394| 10  | 104634474| A/G     | 0.19| AS3MT| intron   | 8.30e-20     | -0.20         | 1.04e-8        | -0.19          | 9.40e-6         | -0.18                    | 1.52e-8                  |
| rs11191439| 10 | 104638723| T/C     | 0.19| AS3MT| coding   | 2.89e-19     | -0.21         | 8.20e-9        | -0.18          | 3.50e-5         | -0.19                    | 1.36e-8                  |
| rs4919694| 10  | 104698978| T/C     | 0.19| CNNM2| intron   | 1.67e-18     | -0.21         | 7.65e-9        | -0.16          | 1.28e-4         | -0.18                    | 1.70e-8                  |
| rs7911488| 10  | 105154089| A/G     | 0.26| USMG5| UTR      | 7.04e-18     | 0.26          | 4.80e-14       | 0.10           | 3.80e-3         | 0.15                     | 2.29e-6                  |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 6 associations are below candidate SNP significance threshold of 9.33e-5 for meta-analysis. Base position according to human genome build 18.
Table S11. Top candidate SNP associations for principal component 1 of arsenic species

| SNP          | Chr | Position     | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|--------------|-----|--------------|---------|-----|--------|----------|--------------|--------------|-----------------|---------------|-------------------|--------------------------|----------------------------|
| rs3740394    | 10  | 104634474    | A/G     | 0.19| AS3MT  | intron   | 2.83e-38     | 5.37         | 1.29e-11        | 6.00          | 3.60e-14          | 5.57                      | 1.14e-15                   |
| rs11191439   | 10  | 104638723    | T/C     | 0.19| AS3MT  | coding   | 1.12e-36     | 5.48         | 7.27e-12        | 5.74          | 5.02e-13          | 5.44                      | 6.04e-15                   |
| rs4919694    | 10  | 104698978    | T/C     | 0.19| CNNM2  | intron   | 9.67e-36     | 5.42         | 1.17e-11        | 5.58          | 1.91e-12          | 5.41                      | 8.49e-15                   |
| rs3740390    | 10  | 104638480    | C/T     | 0.20| AS3MT  | intron   | 6.50e-34     | -6.00        | 6.24e-15        | -4.82         | 6.94e-12          | -5.06                     | 9.04e-11                   |
| rs11191453   | 10  | 104659852    | T/C     | 0.20| AS3MT  | intron   | 1.80e-32     | -5.70        | 2.77e-13        | -4.81         | 7.77e-12          | -5.06                     | 9.04e-11                   |
| rs7911488    | 10  | 105154089    | A/G     | 0.26| USMG5  | UTR      | 3.57e-31     | -5.34        | 7.35e-12        | -4.33         | 4.21e-12          | -4.20                     | 1.65e-10                   |
| rs4925       | 10  | 106022789    | C/A     | 0.13| GSTO1  | coding   | 4.60e-6      | -4.31        | 5.95e-4         | -2.28         | 0.01              | -1.65                     | 0.04                       |
| rs1147611    | 10  | 106025258    | G/T     | 0.19| GSTO1  | intron   | 8.45e-6      | -2.76        | 0.01            | -1.73         | 0.02              | -1.87                     | 4.54e-3                    |
| rs2297235    | 10  | 106034491    | A/G     | 0.12| GSTO2  | UTR      | 1.67e-5      | -4.32        | 5.23e-4         | -2.08         | 0.02              | -1.43                     | 0.07                       |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 9 associations are below candidate SNP significance threshold of 9.33e-5 for meta-analysis. Base position according to human genome build 18.
**Table S12.** Top candidate SNP associations for principal component 2 of arsenic species

| SNP     | Chr | Position   | Alleles | MAF | Gene   | Location | Meta P-value | Arizona Beta | Arizona P-value | Oklahoma Beta | Oklahoma P-value | North/South Dakotas Beta | North/South Dakotas P-value |
|---------|-----|------------|---------|-----|--------|----------|-------------|--------------|-----------------|-----------------|-----------------------|-----------------------------|----------------------------|
| rs3740390 | 10  | 104638480  | C/T     | 0.20 | AS3MT  | intron   | 3.96e-8     | 0.97          | 8.11e-4         | 0.97            | 8.11e-4              | 0.97                        | 8.11e-4                    |
| rs11191453 | 10  | 104659852  | T/C     | 0.20 | AS3MT  | intron   | 6.10e-8     | 0.96          | 8.88e-4         | 0.96            | 8.88e-4              | 0.96                        | 8.88e-4                    |
| rs11191439 | 10  | 104638723  | T/C     | 0.19 | AS3MT  | coding   | 7.55e-7     | -1.18         | 3.05e-4         | -1.18           | 3.05e-4              | -1.18                       | 3.05e-4                    |
| rs4919694  | 10  | 104698978  | T/C     | 0.19 | CNNM2  | intron   | 9.18e-7     | -1.17         | 3.64e-4         | -1.17           | 3.64e-4              | -1.17                       | 3.64e-4                    |
| rs3740394  | 10  | 104634474  | A/G     | 0.19 | AS3MT  | intron   | 6.64e-6     | -1.09         | 8.13e-4         | -1.09           | 8.13e-4              | -1.09                       | 8.13e-4                    |

Abbreviations: Chr, chromosome. MAF, minor allele frequency. SNP, single nucleotide polymorphism.

All SNP 5 associations are below candidate SNP significance threshold of 9.33e-5 for meta-analysis. Base position according to human genome build 18.
**Figure S1.** Quantile-quantile plot for MetaboChip of percent arsenic species and principal components of arsenic species

A. iAs%  
B. MMA%  
C. DMA%  
D. PC1  
E. PC2

Deviation from expected p-values using MetaboChip for A. percent inorganic arsenic (iAs%), B. percent monomethylarsononate (MMA%), C. percent dimethylarsinate (DMA%), D. principal components 1 (PC1), and E. principal components 2 (PC2).
Figure S2. Quantile-quantile plot for candidate SNPs of percent arsenic species and principal components of arsenic species

Deviation from expected p-values using MetaboChip for A. percent inorganic arsenic (iAs%), B. percent monomethylarsononate (MMA%), C. percent dimethylarsinate (DMA%), D. principal components 1 (PC1), and E. principal components 2 (PC2)
Figure S3. Manhattan plot of MetaboChip associations for percent inorganic arsenic

The solid red line is the MetaboChip-wide significance threshold at -log(4.13e-7) or 6.38. The dashed orange line is the suggestive MetaboChip-
Figure S4. Manhattan plot of MetaboChip associations for percent monomethylarsononate

The solid red line is the MetaboChip-wide significance threshold at -log(4.13e-7) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at -log(7.77e-7).

The solid red line is the MetaboChip-wide significance threshold at -log(4.13e-7) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at -log(7.77e-7).
Figure S5. Manhattan plot of MetaboChip associations for percent dimethylarsinate

The solid red line is the MetaboChip-wide significance threshold at \(-\log(4.13e-7)\) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at \(-\log(7.77e-7)\).
Figure S6. Manhattan plot of MetaboChip associations for principal component 1 of arsenic species

The solid red line is the MetaboChip-wide significance threshold at \(-\log(4.13e-7)\) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at \(-\log(7.77e-7)\).
Figure S7. Manhattan plot of MetaboChip associations for principal component 2 of arsenic species.

The solid red line is the MetaboChip-wide significance threshold at -log(4.13e-7) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at -log(7.77e-7).
Figure S8. Regional association plot at 10q24 of percent arsenic species conditioned on rs12768205

Index SNP rs12768205 nearby associations according to human genome build 18 for percent inorganic arsenic (iAs%) in top panel, percent monomethylarsononate (MMA%) in middle panel, and percent
dimethylarsinate (DMA%) in bottom panel. The solid red line is the MetaboChip-wide significance threshold at -log(4.13e-7) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at –log(7.77e-7).
**Figure S9.** Regional association plot at 10q24 of principal components of arsenic species conditioned on index SNP.

Index SNPs for principal components (PC1 rs3740394 in top panel, PC2 rs7098825 in bottom panel) and nearby associations according to human genome build 18. The solid red line is the MetaboChip-wide significance threshold at -log(4.13e-7) or 6.38. The dashed orange line is the suggestive MetaboChip-wide LD threshold at –log(7.77e-7).
Figure S10. Distribution of percent arsenic species by rs3740394 genotype

Index SNP rs3740394 for percent arsenic species principal components shows separation of distribution of percent inorganic arsenic (iAs%), percent monomethylarsononate (MMA%) and dimethylarsinate (DMA%) by genotype. Of the 2,428 participants, the distribution of genotypes are homozygous dominant AA (1594), heterozygous AG (732), homozygous recessive GG (102).
Figure S11. Distribution of percent arsenic species by rs7098825 genotype

Index SNP rs7098825 for percent arsenic species principal components shows separation of distribution of percent inorganic arsenic (iAs%), percent monomethylarsononate (MMA%) and dimethylarsinate (DMA%) by genotype. Of the 2,398 participants who were polymorphic at rs7098825, the distribution of genotypes are homozygous dominant AA (1543), heterozygous AG (847), homozygous recessive GG (8).