Table 1. GWAS on non-communicable diseases and traits in recent African and African ancestry populations

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| --- | --- | --- | --- | --- |
| **Disease/Trait** | **Sample size** | **Replication sample size** | **Genes** | **Ref** |
| Addiction | 1,393 European ancestry women, 1,131 European ancestry men, 568 African ancestry women, 535 African ancestry men | NR | *NCK2* | [[115](#_ENREF_115)] |
| Adiponectin levels | 29,347 European ancestry individuals, 4,232 African American ancestry individuals, 1,776 Filipino individuals | NR | *LYPLAL1, IRS1, GNL3, ADIPOQ, TRIB1, GPR109A, CMIP, CDH13, PEPD, Intergenic* | [[116](#_ENREF_116)] |
| Alcohol and nictotine co-dependence | 818 European ancestry cases, 1,396 European ancestry controls, 449 African American cases, 480 African American controls | NR | *SIX3, RGPD2, SH3BP5, NR2C2, ZFYVE20, HIVEP1, PLEKHG1, PKNOX2, LOC339568, KCND2* | [[117](#_ENREF_117)] |
| Alcohol and nictotine co-dependence | 818 European ancestry cases, 1,396 European ancestry controls | Up to 907 European ancestry cases, up to 2,830 European ancestry controls, up to 449 African American cases, up to 480 African American controls | *HTR1A, IPO11* | [[118](#_ENREF_118)] |
| Alcohol dependence | 1,897 cases, 1,932 controls | 219 European American families, 35 African American families, 4 other families, 487 German cases, 1,358 German controls | NS | [[70](#_ENREF_70)] |
| Alcohol dependence | 847 European descent cases, 552 European descent controls, 345 African American cases, 140 African American controls | 262 families | NS | [[119](#_ENREF_119)] |
| Alcohol dependence | 2,357 European American individuals, 812 African American individuals | NR | *C3orf31, ZNF124, USP12* | [[120](#_ENREF_120)] |
| Alcohol dependence | 1,409 European ancestry cases, 1,518 European ancestry controls, 681 African American cases, 508 African American controls | NR | *SH3BP5, NXPH2, PKNOX2* | [[121](#_ENREF_121)] |
| Alzheimer's disease | 1,299 European ancestry, African American ancestry and Native American ancestry cases with psychosis, 735 European ancestry, African American ancestry and Native American ancestry cases without psychosis, 5,659 European ancestry, African American ancestry and Native American ancestry controls | NR | *SLC2A9, VSNL1, BIN1, RP11-291J9.2, AC015804.1, RP11-572M11.4, SLC2A9, AP003097.1, RP11-242G20.2, RIMBP2, MPP7* | [[122](#_ENREF_122)] |
| **Alzheimer's disease** | **513 African American ancestry cases, 496 African American ancestry controls** |  | ***PVRL2 ,SLC4A1AP, STK24, POLN, CNTNAP2, Intergenic 1, 2, 3 ,8, 12, 13*** | **[**[**123**](#_ENREF_123)**]** |
| **Alzheimer's disease (late onset)** | **1,968 African American cases, 3,928 African American controls** |  | ***ABCA7, HMHA1, GRIN3B, Intergenic*** | **[**[**124**](#_ENREF_124)**]** |
| Amygdala reactivity | 224 individuals | 50 European ancestry individuals, 13 African American individuals, 29 Asian ancestry individuals, 7 other ancestry individuals | NS | [[125](#_ENREF_125)] |
| **Anthropometric traits** | **743 African Americans, 1,188 Nigerians** | **756 African American family members, 982 African Americans, 2,437 Jamaicans** | **NS** | **[**[**3**](#_ENREF_3)**]** |
| Antipsychotic drug-induced weight gain | 77 European ancestry individuals, 32 African American individuals, 30 individuals | 183 European ancestry individuals, 22 African American individuals | *MC4R* | [[126](#_ENREF_126)] |
| **Aortic root size** | **1,086 African American family members** | **NR** | ***SIRPA, PDYNKCTD7, RABGEF1, GOT2, LOC401365, LOC493754, CRCP, FHIT, Intergenic 8q23.3*** | **[**[**127**](#_ENREF_127)**]** |
| Aortic-valve calcification | 6,942 European ancestry individuals | 745 European ancestry individuals, 2,497 African American individuals, 2,027 Hispanic individuals, 774 Chinese ancestry individuals | *LPA* | [[128](#_ENREF_128)] |
| Asthma | 422 cases, 1,533 controls | 3,750 white cases, 13,365 white controls, 592 white trios, 1,903 black cases, 2,432 black controls, 929 black family members | *PDE4D* | [[28](#_ENREF_28)] |
| Asthma | 464 African American cases, 471 African American controls, 1,028 African Caribbean family members | 994 European descent cases, 1,243 European descent controls; 2,331 African descent cases, 2,874 African descent controls (includes family members) | NS | [[29](#_ENREF_29)] |
| Asthma | 793 European ancestry child cases, 1,988 European ancestry child controls | 917 European ancestry child cases, 1,546 European ancestry child controls, 1,667 African American child cases, 2,045 African American child controls | *DENND1B, CRB1* | [[27](#_ENREF_27)] |
| Asthma | 2,088 European American cases, 1,612 African American and African Caribbean cases, 1,688 Latino cases | 2,727 European American cases, 2,147 African American and African Caribbean cases, 2,299 Latino cases | *GSDMB, IL1RL1, TSLP, IL33, PYHIN1, C11orf71, CRCT1* | [[129](#_ENREF_129)] |
| Asthma (childhood onset) | 429 European ancestry affected offspring trios | 52 African American affected offspring trios, 46 Hispanic affected offspring trios | *IGSF3, HPSE2, PSAP, ATG3, MKLN1, XPR1, ABI3BP, KLHL5, Intergenic* | [[130](#_ENREF_130)] |
| Autism | 1,385 affected children from 1,369 families | 1,086 affected children from 595 families, 1,965 European, African American and other controls | *MACROD2, PPP2R5C* | [[131](#_ENREF_131)] |
| Beta-trace protein levels | 6,720 European ancestry individuals | 1,734 African American individuals | *PTGDS* | [[132](#_ENREF_132)] |
| **Bilirubin levels** | **619 African American individuals** | **NR** | ***UGT1A1, AC073072.5, AC068954.1, RP11-58O3.2, ERCC4, RP11-648C16.1, RP5-837I24.4, AC013262.1, KLHL1, RNU7-62P*** | **[**[**133**](#_ENREF_133)**]** |
| Bipolar disorder | 1,001 Caucasian cases, 345 African American cases, 1,033 Caucasian controls, 670 African American controls | 1,749 Caucasian family members, 1,263 Caucasian cases, 431 Caucasian controls | *DPY19L3* | [[64](#_ENREF_64)] |
| Blood lipid traits | Up to 100,184 European descent individuals | 9,705 South Asians, 15,046 East Asians, 8,061 African Americans, 7,063 Europeans | *CETP, SORT1* | [[134](#_ENREF_134)] |
| **Blood pressure** | **7,473 African American individuals** | **11,882 African American individuals** | **NS** | **[**[**135**](#_ENREF_135)**]** |
| Blood pressure | 28,190 African American individuals, 1,188 Nigerian individuals | 69,395 European ancestry individuals, 5,266 African American individuals, 6,497 African ancestry individuals, 19,601 East Asian ancestry individuals | *RSPO3, PLEKHG1, FAM46A, C6orf37, EVX1, HOXA, ULK4, SOX6, CYB5R2, SEC16B, ADCY3, GNPDA2, FTO, GALNT10, KLHL32, MIR148A, NFE2L3, MC4R, TMEM18* | [[136](#_ENREF_136)] |
| **Body mass index** | **1,715 African American individuals** | **3,274 African American individuals** | ***PP13439, TMEM212, MFAP3, GALNT10*** | **[**[**137**](#_ENREF_137)**]** |
| Body mass index (interaction) | 8,203 African American women, 3,484 Hispanic ancestry women | NR | *LOC645687, PELI2K, LOC347097, PIP5K1B, CNTNAP2, LOC100128373, DIO3OS, LOC645687, PELI2,RPL15P2, DICER1, SLC39A11, LRP8, SGK1,LOC442261, PA2G4P2, SPTLC3, DCC, LOC100130692, CNTNAP, LOC100130240, KCNE2* | [[138](#_ENREF_138)] |
| Bone mineral density | 1,524 European descent sisters | 669 related African American women | NS | [[53](#_ENREF_53)] |
| Bone mineral density | 1,000 white individuals | 4,925 white individuals, 350 Chinese hip fracture cases, 350 Chinese controls, 2,955 Chinese individuals, 908 West African men | *ADAMTS18, TGFBR3* | [[139](#_ENREF_139)] |
| Brain structure | 2,020 European ancestry neuropsychiatric disorder cases, 5,775 European ancestry controls | 599 European ancestry neuropsychiatric disorder cases, 11,915 European ancestry control, 143 European ancestry and African American neuropsychiatric disorder cases, 94 European ancestry and African American controls, 605 Hispanic ancestry controls | *HRK, FBXW8, HMGA2* | [[140](#_ENREF_140)] |
| Bronchopulmonary dysplasia | 21 Caucasian neonate cases, 75 Caucasian neonate controls, 21 African neonate cases, 86 African neonate controls | 30 Caucasian neonate cases, 112 Caucasian neonate controls, 15 African neonate cases, 32 African neonate controls, 4 infant cases with one Caucasian parent and one black African parent, 19 infant controls with one Caucasian parent and one black African parent, 55 Finnish neonate cases, 158 Finnish neonate controls | NS | [[141](#_ENREF_141)] |
| Bronchopulmonary dysplasia | 117 African American newborn cases, 108 African American newborn controls, 448 Hispanic newborn cases, 460 Hispanic newborn controls, 74 Asian or Pacific Islander newborn cases, 93 Asian or Pacific Islander newborn control, 174 European ancestry newborn control | 371 newborn cases, 424 newborn controls | *CARD17,CASP1P1, CHST9, COX19, CYP2W1, CTNNA3, FNIT, GRHL2, HIVEP3, ISCA1L, HTR1A, KLF12, LOC100129825, LOC100289139, LOC729992, LOC100288243, PAMR1, PLXDC2, PRR16, FTMT, STXBP5, YAP1P1, TNK2, CEP170, NDST4, TRAM1L1, SPOCK1, KLHL3, MAGI2, CSMD3, TRPS1, ZNF770, LOC441722, RASGRG1, LOC729911, DSC3, DSC2, LOC646864, ZNF728* | [[142](#_ENREF_142)] |
| Capecitabine sensitivity | Up to 84 East Asian ancestry lymphoblastoid cell lines, up to 164 European ancestry lymphoblastoid cell lines, up to 173 African ancestry lymphoblastoid cell lines, up to 82 African American lymphoblastoid cell lines | NR | *PDE4DIP, SLC44A5, SMARCAD1, ADCY2, MTRR, LOC643281, SH2D4B, SOX, Intergenic* | [[143](#_ENREF_143)] |
| Cardiac structure and function | 6,765 African American individuals | 2,468 African American individuals, 12,612 European ancestry individuals | NS | [[144](#_ENREF_144)] |
| Cardiac Tropo[[145](#_ENREF_145)]nin-T levels | 9,491 European ancestry individuals, up to 2,053 African American individuals | NR | *NCOA2, TRAM1, TNT2, LRRIQ3, NRG1, OR2B7P, LOC129656, CDH7, BCL2, STARD7, HNT, ATP6V1C2, FBLIM1, CASR, CXCL13, TNFAIP3, DLGAP1, GPR26, C8orf80* |  |
| **Chemotherapeutic susceptibility** | **83 African American lymphoblastoid cell lines, 176 African lymphoblastoid cell lines** | **NR** | **NS** | **[**[**146**](#_ENREF_146)**]** |
| **Cholelithiasis-related traits in sickle cell anemia** | **905 African American cases** | **2,152 African American cases** | **UGT1A1, UGT1A10** | **[**[**147**](#_ENREF_147)**]** |
| Cocaine dependence | 1,809 European ancestry cases, 570 European ancestry controls, 2,482 African American cases, 836 African American controls | 4,498 European ancestry individuals, 2,114 African American individuals | *STEAP3, RANP6, RIMS2, OR3A2, OR3A1, FAM53B, NCOR2, CDK1, RANP6, OR3A2, OR3A1, FAM53B, CDK1, Intergenic* | [[148](#_ENREF_148)] |
| Coronary artery calcification | 5,823 African American individuals | 9,992 European ancestry individuals | *AGBL1, ALDH8A1, ATXN3, CACNA1E, CACNA2D3, C10orf76, C2orf85, C6orf10, CAPS2, CCDC157, CDH9, EEF1E1, EMP1, ERBB4, FBXO15, FBXO3, FLJ43860, GRIN3A, IFT88, IPMK, KCNK13, KCNQ3, KLF6, LARGE, LOC100652953, LOC646730, LRP6, LYSMD4, MCART2, MSI2, MUTED, NRG1, PLD5, PRICKLE2, PRKCA, RGS2, RIT2, SEMA6D, SLC1A1, SORCS2, SOX9, SPATA7, STEAP1, SUCLG1, WDR33, ZFPM2, ZNF383* | [[149](#_ENREF_149)] |
| **Coronary heart disease** | **8,090 African American individuals** | **8,849 African American or African-Caribbean individuals** | ***CELSR2, LCAT, SMARCA4, PPP1R3B, SLC12A9, KLHL29, APOA5, ABCA1, CETP, RNF130, DNM2, TCF7L2, GCOM1, SLC30A1, PDGFD, LAMC2, TNIK, ZFHX3, DOCK6, OPRM1, DTNB, CSMD1, EDC4, PLEKHO2, IGSF5 and several Intergenic regions*** | **[**[**150**](#_ENREF_150)**]** |
| **Coronary heart disease** | **362 African American cases, 2,543 African American controls** | **862 African American cases, 7,293 African American controls** | **NS** | **[**[**151**](#_ENREF_151)**]** |
| **C-reactive protein** | **837 African American individuals** | **486 West African ancestry individuals** | ***CRPP1, CRP*** | **[**[**152**](#_ENREF_152)**]** |
| C-reactive protein | 8,280 African American women, 3,548 Hispanic/Latin American ancestry women | 3,787 African American women, 3,548 Hispanic/Latin American ancestry women, 5,656 European ancestry individuals | *TREM2, CRP, APCS, DARC, FCER1A, DUSP23, OR10J1, OR10J5, OR10J3, OLFML2B, IFI16, FCRL6, IL1F10, IL1RN, HNF1A, TOMM40, LEPR, CRP, HNF1A, OASL, C12orf43, CRP, APCS, DARC, FCER1A, DUSP23, OR10J1, OR10J5, OR10J3, OLFML2B, IFI16, FCRL6, HNF4A* | [[153](#_ENREF_153)] |
| **Diabetic nephropathy** | **965 African American cases, 1,029 African American controls** | **709 African American cases, 690 African American controls** | ***SASH1, RPS12, MSRB3, HMGA2, AUH, LIMK2*** | **[**[**154**](#_ENREF_154)**]** |
| **Dialysis-related mortality** | **610 African American type 2 diabetics** | **NR** | ***KLHL29, LOC339568, DHX35, PDZRN3, CALM2, COX18, ADAMTS3, EPHA7, GAS2, SLC24A4, CPSF2, NCRNA00113, ADAMTS5, TET3, DGUOK, PTPRM, GPATCH2, ESRRG, NCRNA00113, ADAMTS5, LOC729980, IL6, RAPGEF5, ABCA4, PCSK2, SVIP, HAS2, NRG1, GCNT1, RPSAP9, RIN3, SLC24A4, PTPRM, IRX5, IRX3, Intergenic chr 2, SH3BP4*** | **[**[**155**](#_ENREF_155)**]** |
| **End-stage renal disease** | **952 African American cases, 988 African American controls** | **640 African American cases, 683 African American controls** | **NS** | **[**[**156**](#_ENREF_156)**]** |
| **End-stage renal disease (non-diabetic)** | **464 African American cases, 478 African American controls** | **336 African American cases, 363 African American controls** | ***MYH9*** | **[**[**157**](#_ENREF_157)**]** |
| **Erectile dysfunction and prostate cancer treatment** | **27 African American cases, 52 African American controls** | **NR** | ***FSHR, TTC7A, PTGFRN, KIAA1166, CMKLR1, TSN, CHMP5, IGSF21, TMEM178, LRP1B, DDX53, FAM82A1, ZNF608, C9orf3, ELA2A, GLI2, CNNM3, HEPH, APOB, MAGEB18, GGTLC1, WDR42B, SYTL5*** | **[**[**158**](#_ENREF_158)**]** |
| Estradiol plasma levels (breast cancer) | 700 European ancestry cases, 50 African ancestry cases, 17 Asian ancestry cases, 5 American Indian cases | NR | *TSPYL5* | [[159](#_ENREF_159)] |
| Event-related brain oscillations | 431 European American cases, 340 European American controls, 209 African American cases, 84 African American controls | 683 individuals from affected multiplex families, 412 affected individuals | *ARID5A, GNAS1, ANXA13* | [[160](#_ENREF_160)] |
| Fasting plasma glucose | 2,349 European ancestry individuals, 664 Chinese ancestry individuals, 1,366 African American individuals, 1,171 Hispanic ancestry individuals | NR | *MTNR1B, GCKR, GAPC2* | [[161](#_ENREF_161)] |
| Fasting plasma glucose | 2,029 African American individuals, 7,428 European ancestry individuals | 1,571 African American individuals, 3,825 European ancestry individuals | *FOXA2* | [[162](#_ENREF_162)] |
| Fat body mass | 6,433 European ancestry individuals, 709 African American individuals, 408 Hispanic individuals, 1,622 Han Chinese ancestry individuals | 4,967 European ancestry individuals, 2,740 Han Chinese ancestry individuals | *MC4R, CTSS* | [[163](#_ENREF_163)] |
| F-cell distribution | 440 African ancestry individuals | NR | *BCL11A, B3GAT2, TSSK1, MOSC1, PHEX, PRDM5, ATP6V0A4, MAD2L1, UBXD4, YTHDC2* | [[36](#_ENREF_36)] |
| Fetal hemoglobin levels | 848 Black cases | 305 Black cases, 406 Chinese ancestry cases, 113 Thai cases, | *BCL11A, OR51B5,OR51B6* | [[164](#_ENREF_164)] |
| Fibrinogen | 91,323 European ancestry individuals | 8,423 African American individuals, 1,447 Hispanic individuals | *ACTN1, C5orf56, IRF1, CD300LF, CHD9, CPS1, DIP2B, FARP2, FGB, HGFAC, LRPAP1, IL1F10, IL1RN, IL1R1, IL1R2, IL6R, JMJD1C, LEPR, MS4A6A, MSL2, PCCB, NLRP3, PLEC1, PSMG1, SHANK3, ARSA, CPT1B, SNx13, PRPS1L1, SPPL2A, TOMM7, IL6, C5orf56, IRF1, CD36, PPP1R3B, LPL, CETP, LOC55908, APOA, APOC, CTEP, Intergenic* | [[165](#_ENREF_165)] |
| Glomerulosclerosis | 56 African American cases, 61 European descent cases | 1,759 African American controls, 1,531 European-American controls | *APOL1, MYH9* | [[166](#_ENREF_166)] |
| Heart failure | 20,926 European ancestry participants, 2,895 African ancestry participants | NR | *USP3, LRIG3, TBC1D4, SH3GL2, PRICKLE1, BTG1, RPUSD4, TMTC1, LOC339760,SNX16, MOBKL2B, GNA15, BCHE, LOC100129376, EVX1, CH25H* | [[167](#_ENREF_167)] |
| Heart rate | 455 African American individuals | NR | SERPINI1, TMEM132D, DAB2IP, DAB2IP | [[168](#_ENREF_168)] |
| **Height** | **20,427 African ancestry individuals** | **Up to 16,436 African American individuals** | ***LCORL, ARSE, PPARD, DYM, ZBTB38, MAP3K3, HMGA2, , ACAN, ANTXR1, HMGA1, CCDC88A, TTLL5, ,SYN3, DCLK1, ADAMTSL3, SULF1, ZFAT1, TNS1, LYRM4, FBN2, ATF7, ENPP2, C19orf35, Intergenic chr 2, 4, 6, 15, 17*** | **[**[**169**](#_ENREF_169)**]** |
| **Height** | **8,149 African American ancestry women** | **Up to 20,809 African American ancestry and African ancestry individuals** | ***LCORL, ARSE, HMGA2, MAP3K3, DYM, SERPINH1, TMEM100, PCTP, PRKCA*** | **[**[**170**](#_ENREF_170)**]** |
| Hematology traits | 7,943 African American children, 6,234 European ancestry children | NR | *HBE1, HBB, HBD, HBBP1, HBG1, Alpha-globin cluster, MPP1, DARC, ZBTB12, CFB, STK19, TMPRSS6, HFE, HBS1L, MYB, MUC21, HCG22, C6orf15, CDSN, PSORS1C1, PSORS1C2, CCHCR1, Intergenic* | [[171](#_ENREF_171)] |
| Heroin addiction | 200 Caucasian and 125 African American severe former addicts, 150 Caucasians and 100 African American controls | NR | NS | [[172](#_ENREF_172)] |
| Hippocampal atrophy | 1149 European ancestry Alzheimer disease cases, 336 European ancestry individuals with mild cognitive impairment, 188 European ancestry controls | 419 African American Alzheimer disease cases | *APOE, TTC27, METTL8, CHD6, SLC1A7, F5, SELP, GCFC2, TLE1, LHFP, COL18A1, APOE, Intergenic* | [[173](#_ENREF_173)] |
| **Hypertension** | **509 African American cases, 508 African American controls** | **366 West African cases, 614 West African controls** | ***ALDH1A2, ADH7*** | **[**[**71**](#_ENREF_71)**]** |
| IgE levels | 2,469 African American/Afro-Caribbean individuals, 259 Latino individuals, 1,564 European ancestry individuals | 2,961 African American/Afro-Caribbean individuals, 1,477 Latino individuals, 649 European ancestry individuals, 680 Hutterites | *SUCLG2, HLA-DQB1, WWP2, HLA-DQA2* | [[174](#_ENREF_174)] |
| Insulin-related traits | 927 non-diabetic African Americans | 570 non-diabetic West Africans | *SLC10A6, SC4MOL, PTTG1, TCERG1L* | [[175](#_ENREF_175)] |
| **LDL cholesterol** | **1,249 African American individuals** | **NR** | ***APOE*** | **[**[**176**](#_ENREF_176)**]** |
| LDL cholesterol | 7,861 African American individuals, 3,425 Hispanic individuals | 7,138 African American individuals | *PCSK9, APOB, ABCG8, LDLR, APOE* | [[177](#_ENREF_177)] |
| LDL cholesterol | 94,595 European ancestry individuals | up to 4,420 African ancestry individuals | *LDLR* | [[178](#_ENREF_178)] |
| Left ventricular mass | 101 Caucasian cases, 101 Caucasian controls | 704 Caucasian siblings, 1,467 African American siblings | *RAI14, CD36* | [[73](#_ENREF_73)] |
| Left ventricular mass | 1,264 African Americans | 989 African Americans, 1,316 Whites | *NCAM1* | [[179](#_ENREF_179)] |
| Lipid levels in hepatitis C treatment | 1,017 European ancestry cases, 207 African American ancestry cases, 95 Hispanic cases | NR | *IL28B* | [[180](#_ENREF_180)] |
| Lipid traits | 282 European ancestry children, 66 African American children, 63 Hispanic children | 1,627 European ancestry children, 1,478 Caucasian children, 1,443 Mexican American children | NS | [[181](#_ENREF_181)] |
| Lipoprotein diameter | 817 European ancestry individuals | 2,430 European ancestry individuals, 1,594 African American individuals, 1,422 Hispanic individuals, 758 Chinese ancestry individuals | NS | [[182](#_ENREF_182)] |
| Lung function (forced expiratory flow between 25% and 75% of forced vital capacity) | 1,015 European ancestry individuals, 541 African American individuals | NR | *INTS12, GSTCD, MYBPC1, CDH2, CTNNA3,* | [[183](#_ENREF_183)] |
| Major depressive disorder | 353 European descent cases, 366 European descent controls | 1,512 German cases, 2,415 German controls, 1,160 Dutch individuals, 991 African Americans, 1,636 European ancestry cases, 7,246 European ancestry controls | *SLC6A15* | [[184](#_ENREF_184)] |
| Male fertility | 269 Hutterite men | 72 Hispanic ancestry men, 32 African American men, 11 Middle Eastern ancestry men, 5 European ancestry men, 3 Asian ancestry men | NS | [[185](#_ENREF_185)] |
| Maximal oxygen uptake response | 473 European ancestry individuals from 99 families | 295 individuals, 247 black individuals from 105 families or sibships | NS | [[186](#_ENREF_186)] |
| Mean corpuscular hemoglobin | 7,943 African American children, 6,234 European ancestry children | NR | *Alpha-globin cluster, TMPRSS6, HBS1L, MYB, TMPRSS6, HFE, CITED2, RCL1, HBE1, HBB, HBD, HBBP1, HBG1, ATP2B4, MPP1, USP49, MED20, BYSL, CCND3* | [[171](#_ENREF_171)] |
| Mean platelet volume | 16,388 African American individuals | NR | *LRRC16A, BAK1, HBS1L, MYB, CD36, PIK3CGM, JMJD1C, BAD, ACAD10, TPM4, SLMO2, TUBB1, PIK3CG, TAOK1* | [[187](#_ENREF_187)] |
| Melanoma | 1,804 European ancestry cases, 1,026 European ancestry controls | 6,483 European and Middle East/North African ancestry cases, 23,324 European and Middle East/North African ancestry controls | *ANXA9* | [[188](#_ENREF_188)] |
| Metabolite levels | 1,260 African American individuals | NA | *SLCO5A1, LOC100131022, LOC138412, KC6, GTFE2, DAB2IP, CCL28, CADPS, PRKCE, CAT8, C20orf82, NRG1, MS4A13, CDKN3, LOC399774, LRRIQ3, MGMT, CNTN1, ZNF213, LOC149844, C18orf34, ALMS1, LPHN2, LOC729635, COMMD10,KIF13B, CDH4, LOC100129158, DGKH* | [[189](#_ENREF_189)] |
| Mitral annular calcification | 3,795 European ancestry individuals | 745 European ancestry individuals, 2,497 African American individuals, 2,027 Hispanic individuals, 774 Chinese ancestry individuals | NS | [[128](#_ENREF_128)] |
| Monocyte count | 9,849 European ancestry individuals, 894 African ancestry individuals, 271 other ancestry individuals | NR | *ITGA4, RPN1, CCBP2, PTGR1, IRF8* | [[190](#_ENREF_190)] |
| Mortality among heart failure patients | 2,526 European ancestry individuals, 466 African ancestry individuals | NR | *CMTM7, OTUD7A, LPHN1, LOC338797, ADAMTS12, LOC400804, GPM6A, KCNMA1, PARVA, KCNK13, IFRD1* | [[191](#_ENREF_191)] |
| Naphthyl-keratin adduct levels | 100 European ancestry, Hispanic, Asian and African American individuals | NR | *NS* | [[192](#_ENREF_192)] |
| Narcolepsy | 807 Caucasian cases, 1,074 Caucasian controls | 363 Caucasian cases, 355 Caucasian controls, 561 Asian cases, 605 Asian controls, 133 African American cases, 144 African American controls | *TRA-alpha, TRAJ10* | [[193](#_ENREF_193)] |
| Nicotine dependence | 2,267 European ancestry individuals, 99 Hispanic ancestry individuals, 999 African American individuals | 835 individuals | *CHRNB3* | [[194](#_ENREF_194)] |
| Obsessive-compulsive disorder | 1,279 European ancestry cases, 5,139 European ancestry controls, 93 South African Afrikaner cases, 158 South African Afrikaner controls, 93 Ashkenazi Jewish cases, 260 Ashkenazi Jewish controls, 299 European ancestry trios, 101 trios | NR | *FAIM2, AQP2, GRIK2, HACE1, DACH1, MZT1* | [[195](#_ENREF_195)] |
| Opioid sensitivity | 1,383 European ancestry cases, 996 European ancestry controls, 683 African American cases, 2,635 African American controls | 2,116 European ancestry individuals, 4,496 African American individuals | *APBB2, KCNC1, KCNG2* | [[196](#_ENREF_196)] |
| Orofacial clefts (interaction) | 272 European ancestry case-parent trios, 259 Asian ancestry case-parent trios, 19 African ancestry or other ancestry case-parent trios | NR | *C6orf105, SMC2* | [[197](#_ENREF_197)] |
| Ovarian reserve | 232 European ancestry women, 200 African American ancestry women | NR | *MYADML, JARID2, GRIN2B, NPR3, ITIH2, TPRXL, TMEM86A* | [[198](#_ENREF_198)] |
| Pemphigus vulgaris | 100 Jewish ancestry cases, 397 Jewish ancestry controls | 59 Jewish ancestry cases, 285 Jewish ancestry controls, 124 European ancestry cases, 275 European anestry controls, 126 North African ancestry controls, 246 North African ancestry controls | NS | [[199](#_ENREF_199)] |
| Pericardial fat | 5,487 European ancestry individuals | 1,442 African ancestry individuals, 1,399 Hispanic ancestry individuals, 761 Chinese ancestry individuals | *TRIB2* | [[200](#_ENREF_200)] |
| Periodontitis | 4,504 European ancestry individuals | 656 European ancestry and African American individuals | *NPY, NCR2, EMR1, VAV1* | [[201](#_ENREF_201)] |
| Platelet aggregation | Up to 3,991 European ancestry individuals | Up to 840 African American individuals | *PEAR1, GP6, ADRA2A, JMJD1C, SHH, PTPRD, NEURL, MST151, MRVI1, HSD17B6, PRNP, TRIM27, SGCZ, KCNQ1* | [[202](#_ENREF_202)] |
| **Platelet counts** | **115 black HIV-negative individuals** | **NR** | ***AC130454.2, AC130454.1, ABCB9AC008620.2, PITPNM2, CHRM3, NFYC, EEPD1, AC105105.1, AC007425.1, DPYD*** | **[**[**203**](#_ENREF_203)**]** |
| Platelet counts | 7,943 African American children, 6,234 European ancestry children | NR | *ARHGEF3, BAK1, ARHGEF3, COPZ1, JMJD1C, RCL1* | [[171](#_ENREF_171)] |
| **Podoconiosis** | **194 cases and 203 controls from Africa** | **202 family trios (two parents and one affected child) for family-based association testing; 94 cases and 94 controls for HLA-typing** | ***HLA-DQA1*** | **[**[**55**](#_ENREF_55)**]** |
| Post-traumatic stress disorder | 295 European ancestry cases, 196 European ancestry controls | 143 African American cases, 462 African American controls | NS | [[204](#_ENREF_204)] |
| Post-traumatic stress disorder | 300 European ancestry cases, up to 1,538 European ancestry controls, 444 African American cases, up to 2,936 African American controls | 207 European ancestry cases, up to 1,692 European ancestry controls, 89 African American cases, up to 655 African American controls | *TLL1* | [[205](#_ENREF_205)] |
| Post-traumatic stress disorder | 81 African American female cases, 261 African American female controls, 10 European ancestry female cases, 35 European ancestry female controls, 3 female cases, 22 female controls | 578 European ancestry female cases, 1,963 European ancestry female controls | NS | [[206](#_ENREF_206)] |
| **PR interval** | **6,247 African American individuals** | **2,022 African American individuals** | ***SCN5A*** | **[**[**207**](#_ENREF_207)**]** |
| **PR interval** | **13,415 African American individuals** | **NR** | ***MEIS1, ITGA9, SCN5A, ARHGAP24, CAV1, TBX5, SCN5A, SCN10A, SICAL2, MYO3A, VWC2L, BCL6, MAGI1, MFSD2, Intergenic*** | **[**[**208**](#_ENREF_208)**]** |
| **QT interval** | **13,105 African American individuals** | **NR** | ***NOS1AP, PLN, KCNH2, ATP1B1, LITAF, KCNQ1, DPP6, FGFBP2, LDB2, Intergenic*** | **[**[**209**](#_ENREF_209)**]** |
| Radiation response | Human lymphoblastoid cell lines from 93 African Americans, 89 Caucasian-Americans, and 95 Han Chinese Americans | NR | *TINAG, PLEKHF2, WWOX, WDR64, KIAA0319, FSHR, KDM4C, ADARB2, ULBP1, PLEKHF2, LOC100132612, DLX6AS* | [[210](#_ENREF_210)] |
| Red blood cell traits | Up to 16,485 African American individuals | 9,692 African American individuals, 21,020 European ancestry individuals, 14,088 Japanese ancestry individuals | *G6PD, TKTL1, MECP2, MPP1, PRKCE, ITFG3, LUCL7, NPRL3, POLR3K, RPL2B, MPG, CD164, FAM3A, F8, MPP1, CTAG2, HFE, NME4, DECR, RHOT2, LMF1,WDR90* | [[211](#_ENREF_211)] |
| Response to acetaminophen (hepatotoxicity) | 60 Caucasian American lymphoblastoid cell lines, 56 African- American lymphoblastoid cell lines, 60 Han Chinese-American lymphoblastoid cell lines | NR | *C3orf38, LMX1A, LOC100129661,KIAA1712, ETNK2* | [[212](#_ENREF_212)] |
| Response to amphetamines | 1 American Indian ancestry individual, 18 African American/Afro-Caribbean ancestry individuals, 10 East Asian and South Asian ancestry individuals, 325 European ancestry individuals, 17 Latin American ancestry individuals, 6 other ancestry individuals, 4 | NR | *ABL1, ADRA1A, ANKRD31, CA8, CCDC146, CDH13, CNTLN, CNTNAP4, CSMD2, FAM190A, FARP1, FBX17, FHIT, IGSF11, KCTD8, KLHL1, MAP2K4, MFSD9, NEDD4L, NELL1, ODZ3, PAX7, PLBD1, PTPRE, PRPRN2, SMGS1, SRD5A1, THADA, TMEM106B, TRAPPC9, WWOX, Integenic* | [[213](#_ENREF_213)] |
| Response to angiotensin II receptor blocker therapy | 198 European ancestry hypertensive individuals, 193 African American hypertensive individuals | NR | *IQSEC3, C10orf110, SYNRG, FUT4, EYA4, SLC9A9, PRRX1, JAKMIP1, TMC7, APBB1IP, CTB-212O16.1, DNAJC21, WBSCR17, MIR1261, EMCN, EIF4BP8, AC112482.3, TMEM212, AC010148.1, C6orf214, GPR83, AC007246.3, RGMA, EIF4BP8* | [[214](#_ENREF_214)] |
| Response to antiplatelet therapy | 565 Amish individuals | 710 European ancestry individuals, 237 African American/Afro-Caribbean individuals, 276 Hispanic individuals, 4 individuals | NS | [[215](#_ENREF_215)] |
| Response to antipsychotic treatment | 738 European American, African American, and other schizophrenia cases | NR | *MEIS2, GPR98, PRKAR2B, SOX5, FHOD3, CLMN, RNF144A, ASTN2, PPARD, ATF7IP2, CDH13, LOC729993,KIRREL3 and several intergenic regions* | [[216](#_ENREF_216)] |
| Response to antipsychotic treatment | Up to 421 European ancestry Schizophrenia cases, up to 214 African American individuals, up to 103 individuals | NR | *ATP1A2, TNFRSF11A, PPA2, SPOPL, PDE4D, TJP1, Intergenic* | [[217](#_ENREF_217)] |
| Response to citalopram treatment | 1,392 European ancestry depression cases, 264 African American depression cases, 106 depression cases | NR | *EMID2. LAMA1, EGFLAM, AOX2P, FNIT, RPT2, Intergenic* | [[218](#_ENREF_218)] |
| Response to clopidogrel therapy | 429 Amish individuals | 140 white, 83 African American, and 4 unspecified individuals | *CYP2C18, CYP2C19, CYP2C9, CYP2C8* | [[219](#_ENREF_219)] |
| Response to dabigatran etexilate treatment | 1,490 European ancestry atrial fibrillation patients at risk of stroke | 204 European ancestry atrial fibrillation patients at risk of stroke, 66 Latin American ancestry atrial fibrillation patients at risk of stroke, 1 Arab ancestry atrial fibrillation patient at risk of stroke, 5 Black African atrial fibrillation patients at | *CES1* | [[220](#_ENREF_220)] |
| Response to diuretic therapy | 194 blacks, 195 whites | NR | *LYZ, YEATS4, FRS2* | [[17](#_ENREF_17)] |
| Response to hepatitis C treatment | 871 Caucasian, 191 African American, and 75 Hispanic participants | NR | *IL28B, AKD2, Intergenic 4q34.3* | [[6](#_ENREF_6)] |
| Response to platinum-based chemotherapy in small cell and non-small cell lung cancers | 283 African American, Caucasian American and Han Chinese lymphoblastoid cell lines | 222 European ancestry small cell lung cancer cases, 961 European ancestry non-small cell lung cancer cases | NS | [[221](#_ENREF_221)] |
| Response to statin therapy | 667 European ancestry individuals with an event, 2,246 European ancestry individuals without an event, 18 African American individuals with an event, 60 African American individuals without an event, 20 Hispanic ancestry individuals with an event, 65 His | 590 individuals with an event, 4,654 individuals without an event | *DNAJC5B, TRIM55, CRH* | [[222](#_ENREF_222)] |
| **Resting heart rate** | **13,372 African American individuals** | **NR** | ***GJA1, HMGB3P18, MYH6*** | **[**[**223**](#_ENREF_223)**]** |
| Schizophrenia | 2,681 European ancestry cases, 2,653 European ancestry controls, 1,286 African American cases, 973 African American controls | 5,327 European ancestry cases, 16,424 European ancestry controls | *SLC17A1, SLC17A3, BTN3A2, BTN2A2, BTN3A1, HIST1H2AG, HIST1H2BJ, PRSS16, POM121L2, ZNF184,HLA-DQA1* | [[62](#_ENREF_62)] |
| Schizophrenia | 1,658 European ancestry cases, 1,655 European ancestry controls | 5,203 European ancestry cases, 5,277 European ancestry controls, 1,875 Irish individuals, 1,142 African American cases, 985 African American controls | NS | [[224](#_ENREF_224)] |
| Schizophrenia | 11,185 European ancestry cases, 10,768 European ancestry controls | 1,262 African American ancestry individuals, 2,740 European ancestry individuals, 2,296 Asian ancestry individuals | *GRIK3, NOTCH4, AS3MT, CNNM2, NT5C2, BRD1, SEC16B, FBXO11, ARHGAP31, POM121L2, NOTCH4, NKAIN2, TCF4, CLC, LGALS17A, FEZ1, PRRC2A, BAG6* | [[225](#_ENREF_225)] |
| Serologic markers in systemic lupus erythematosus | 20 African American cases, 36 European American cases, 32 Hispanic American cases, 16 Asian American cases, selected for extremes of serum IFN-alpha activity | 280 African American cases, 173 European American cases, 85 Hispanic American cases | NS | [[226](#_ENREF_226)] |
| **Serum urate** | **8,651 African American individuals** | **1,996 African American individuals** | ***MAP4K2, SLC22A12, MEN1, SF1 ,PYGM, RASGRP2, CDC42BPG, NRXN2 Intergenic chr 6 and 11*** | **[**[**227**](#_ENREF_227)**]** |
| **Serum uric acid** | **1,017 African American individuals** | **NR** | ***SLC2A9, AL162718.1, ARID1B, MYO18B, AC007953.1, AC106810.1, RP11, 523018.1, WDR1*** | **[**[**94**](#_ENREF_94)**]** |
| **Sickle cell anemia (haemolysis)** | **1,117 individuals** | **958 African, West African, Afro-Caribbean, NR individuals** | ***NPRL3, OR51L1, BCL11A, OR51I2*** | **[**[**228**](#_ENREF_228)**]** |
| **Sickle cell anemia (severity)** | **177 African American severe patients, 1,088 African American mild patients** | **68 severe patients, 95 mild patients** | **NS** | **[**[**40**](#_ENREF_40)**]** |
| Smoking behavior | 417 Caucasian males, 423 Caucasian females | 412 African American males, 839 African American females, 3,491 Caucasian males, 4,132 Caucasian females | NS | [[65](#_ENREF_65)] |
| Smoking behavior | 8,842 Korean smokers | 1,366 African American smokers and family members, 671 European ancestry smokers and family members | *C7orf66, LOC154907, PNPLA8, THAP5, DNAJB9, intergenic* | [[229](#_ENREF_229)] |
| **Smoking behavior** | **Up to 32,389 African American individuals** | **NR** | ***CHRNA5, C1orf100, LOC503519, CHRNA5, SPOCK2*** | **[**[**230**](#_ENREF_230)**]** |
| Stroke | 19,602 Caucasian individuals | 3,004 African American individuals, 652 Caucasian cases, 3,613 Caucasian controls | *NINJ2* | [[74](#_ENREF_74)] |
| Stroke | 466 European ancestry cases, 377 African American cases, 46 Chinese, Japanese, Asian and other unspecified cases, 523 European ancestry controls, 357 African American controls, 47 Chinese, Japanese, Asian and other unspecified controls | 1,586 European ancestry cases, 2,690 European ancestry controls | NS | [[231](#_ENREF_231)] |
| Subclinical brain infarct | 9,401 white individuals | 1,822 white individuals, 644 black individuals | NS | [[232](#_ENREF_232)] |
| Substance dependence | 2,524 individuals of European ancestry, 1,103 individuals of African ancestry | NR | *PKNOX2* | [[233](#_ENREF_233)] |
| **Systolic blood pressure in sickle cell anemia** | **1617 African American cases** | **NR** | ***NCK2, C2orf40, ACTR3, DPP10, ABCB11, THRB, ODZ3, PLEKHG1, CSMD1, KIAA0020, RFX3, DRD2, MIR4301, CLEC12B*** |  |
| Tardive dyskinesia | 88 white ancestry cases, 40 African ancestry cases, 3 other ancestry cases, 129 white ancestry controls, 62 African ancestry controls, 5 other ancestry controls | 52 Ashkenazi ancestry TD individuals, 44 non-Ashkenazi ancestry individuals, 41 Ashkenazi ancestry non-TD individuals, 33 non-Ashkenazi ancestry non-TD individuals | NS | [[234](#_ENREF_234)] |
| Telomere length | 3,417 European ancestry individuals | 1,893 African American and white individuals, 2,876 British women | *OBFC1, ZNF676, CXCR4, SLC44A4* | [[235](#_ENREF_235)] |
| Thiazide-induced adverse metabolic effects in hypertensive patients | 425 European ancestry cases, 342 African American cases | NR | *SLC39A11, MYO10, PHF17, NMUR1, HTR2B, PPARGC1A, GRIN3A, IDDM8, LOX, MGAT1, ADAM12, MEF2C, GCLM, PHF17, PHLDB1, CYP7B1, COX4I1, BCKDHB, JAZF1, CD44, PCDH15, CDC14C, IGF1, FBXO8, NIPAL2, PPP1R12A, WDR37, MFSD9, SCL9A2, BCAT1, CA10, ZNF626, PMFBMP1, CYP19A1, NELL-1, GOLIM4, FAM38B, GDF3, AGBL1, ASAH2, ZNF238, ERLIN1, DAB2IP, TNRC6C, ANGPTL6, UBL5, CHRM3, GRIN2A, EYA, SLC35F1, ZDHHC20, IQGAP2, c14ORF143, ARRB1, CT62, STOX2, NUDT12, OLIG3, Intergenic* | [[236](#_ENREF_236)] |
| Triglycerides | 7,601 African American individuals, 3,335 Hispanic individuals | 7,138 African American individuals | *GCKR, LPL, APOA, APOC, APOC1,* | [[177](#_ENREF_177)] |
| Type 2 diabetes | 2,413 European ancestry cases, 810 African American cases, 2,392 European ancestry controls, 873 African American controls | NR | *TCF7L2* | [[237](#_ENREF_237)] |
| **Type 2 diabetes** | **965 African American ancestry cases, 1,029 African American ancestry controls** | **2,167 African American ancestry cases, 2,288 African American ancestry controls** | ***RBM43, RND3, TMEM45B, BARX2, GALNTL4, LOC729013SLC44A3, F3*** | **[**[**238**](#_ENREF_238)**]** |
| **Waist circumference** | **Up to 23,564 African American individuals** | **Up to 10,027 African American individuals** | ***LHX2, DENND1A, MAP3K1, BRE, PCSK1, ASZ1, IL1RL2, IL1RL1, SATB2*** | **[**[**239**](#_ENREF_239)**]** |
| Waist-to-hip circumference ratio (interaction) | 8,203 African American women, 3,484 Hispanic ancestry women | NR | *ITGBL1, MGMT, ZNF385D, LOC728516, LOC642340, MOSPD2, LOC100128621, LOC152225, ZPLD1, BCAM, PVRL2, LOC359819, EEF1B3, DNAJC10, FRZB, SLC28A3, NTRK2, MAML2, CDK4PS* | [[138](#_ENREF_138)] |
| **Warfarin maintenance dose** | **533 African American individuals** | **432 African American individuals** | ***CYP2C, CYP2C18, CYP2C9, CYP2C8, CYP2C19*** | **[**[**240**](#_ENREF_240)**]** |
| White blood cell count | 62 American Indian or Alaska Native ancestry individuals, 158 Asian ancestry individuals, 3,272 African American ancestry individuals, 114 other ancestry individuals, 23,244 European ancestry individuals, 996 unknown ancestry individuals | NR | *DARC, GSDMA* | [[33](#_ENREF_33)] |
| White blood cell count | 16,388 African American individuals | 3,551 Hispanic American individuals, 14,767 Japanese individuals, 19,509 European American individuals | *CXCL2, CDK6* | [[34](#_ENREF_34)] |

NR not replicated, NS not significant, Bold GWAS publication with only African ancestry populations, Population names are as used in the related publications

Table 2. GWAS on cancer related diseases in recent African and African ancestry populations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disease/Trait** | | **Sample Size** | **Replication Sample Size** | | **Genes** | **Ref** |
| Acute lymphoblastic leukemia (childhood) | | 972 European ancestry cases, 1,386 European ancestry controls, 89 African American cases, 1,363 African American controls, 305 Hispanic cases, 1,008 Hispanic controls | 574 European ancestry cases, 2,601 European ancestry controls, 128 African American cases, 1,075 African American controls, 143 Hispanic cases, 640 Hispanic controls | | *IKZF1,DDC,GRB10, ARID5B,CEBPE* | [[253](#_ENREF_253)] |
| Asparaginase hypersensitivity in acute lymphoblastic leukemia | | 211 European ancestry child cases, 40 Black child cases, 46 Hispanic child cases, 4 Asian child cases, 21 child cases | 99 European ancestry child cases, 33 Black child cases, 24 Hispanic child cases, 2 Asian child cases, 5 child cases | | *GRIA1* | [[254](#_ENREF_254)] |
| **Breast cancer** | | **3,016 African American cases, 2,745 African American controls** | **3,533 African ancestry cases, 11,046 African ancestry controls** | | ***GALC*** | **[**[**255**](#_ENREF_255)**]** |
| Breast cancer | | 3,666 European ancestry cases, 28,864 European ancestry controls, 1,004 African American cases, 2,744 African American controls | 562 European ancestry cases, 6,410 European ancestry controls, 84 Japanese ancestry cases, 830 Japanese ancestry controls, 300 Hispanic/Latin American cases, 1,164 Hispanic/Latin American controls | | *RALY, EIF2S2, ASIP, FAM46A, C6orf37* | [[256](#_ENREF_256)] |
| **Breast cancer** | | **3,016 African American cases; 2,745 African American controls** | **NR** | | ***SLC45A1, TNIP3*** | **[**[**257**](#_ENREF_257)**]** |
| Breast cancer | | 1,004 African ancestry cases, 2,745 African ancestry controls,1,718 European ancestry cases, 3,670 European ancestry controls | 2,222 European ancestry cases, 16,363 European ancestry controls | | *TERT* | [[258](#_ENREF_258)] |
| Erectile dysfunction and prostate cancer treatment | | 132 African American, European ancestry, Hispanic/Latin American ancestry, East Asian ancestry, South Asian ancestry cases, 103 African American, European ancestry, Hispanic/Latin American ancestry, East Asian ancestry, South Asian ancestry controls | 128 African American, European ancestry, Hispanic/Latin American ancestry, East Asian ancestry, South Asian ancestry cases, 102 African American, European ancestry, Hispanic/Latin American ancestry, East Asian ancestry, South Asian ancestry controls | | NS | [[259](#_ENREF_259)] |
| Methotrexate clearance (acute lymphoblastic leukemia) | | 22 East Asian ancestry cases, 58 African ancestry or African American/Afro-Caribbean cases, 266 Hispanic/Latin American ancestry cases, 806 European ancestry cases, 127 other ancestry cases | 699 European ancestry cases | | *SLCO1B1* | [[260](#_ENREF_260)] |
| Methotrexate phramacokinetics (acute lymphoblastic leukemia) | | 5 Asian, unspecified child cases; 73 African American child cases; 315 European ancestry child cases; 41 Other ancestry child cases; 206 child cases | NR | | *C10orf11,GLIS3,KIAA0774,SLCO1A2,SLCO1B,* Intergenic regions | [[261](#_ENREF_261)] |
| Neuroblastoma | | 2,101 European ancestry cases, 4,202 European ancestry controls | 351 Italian cases, 780 Italian controls, 365 African American cases, 2,491 African American controls | | *HACE1, LIN28B, BARD1, LINC00340, FLJ44180, LMO1, HSD17B12* | [[262](#_ENREF_262)] |
| Paclitaxel-induced neuropathy | | 855 European ancestry breast cancer cases | 154 European ancestry breast cancer cases, 117 African American breast cancer cases | | NS | [[263](#_ENREF_263)] |
| Paclitaxel-induced neuropathy | | 77 European ancestry lymphoblastoid cell lines, 87 Yoruban lymphoblastoid cell lines, 83 African American lymphoblastoid cell lines | NR | | NS | [[264](#_ENREF_264)] |
| Pancreatic cancer | | 252 European ancestry cases | 798 European ancestry cases, 21 African American cases, 10 East Asian cases, 4 Asian Indian cases | | NS | [[265](#_ENREF_265)] |
| **Prostate cancer** | | **474 West African ancestry cases, 458 West African ancestry controls** | **5,096 African American cases, 4,972 African American controls** | | **NS** | **[**[**266**](#_ENREF_266)**]** |
| Prostate cancer | 1,854 European ancestry cases, 1,894 European ancestry controls | | 19,879 cases, 18,761 controls (European, Chinese, Japanese, African American, Latino, and Hawaiian ancestry) | *IGF2, IGF2AS, INS, TH, NKX3.1, ITGA6, PDLIM5,TET2, THADA, JAZF1, EHBP1* and several intergenic regions | | [[43](#_ENREF_43)] |
| Prostate cancer | 6,621 European ancestry cases, 6,939 European ancestry controls | | 22,957 European ancestry cases, 23,234 European ancestry controls, 285 Japanese cases, 298 Japanese controls, 135 Chinese cases, 135 Chinese controls, 112 African American cases, 298 African American controls, 7,140 cases, 5,455 controls | *TERT, CLDN11, SKIL, GGCX, VAMP8, VAMP5, RNF181, PRPH, Intergenic chr 3, AR, ZBTB38, CCHCR1, FGF10* | | [[267](#_ENREF_267)] |
| Prostate cancer | 3,425 African American cases, 3,290 African American controls | | 1,275 African American cases, 1,695 African American controls, 86 Senegalese cases, 414 Senegalese controls, 271 Ghanaian cases, 968 Ghanaian controls, 246 Barbadian cases, 253 Barbadian controls | *ZNF652* | | [[268](#_ENREF_268)] |
| Prostate cancer | 316 cases, 229 controls | | 55 Asian ancestry cases, 1,382 European ancestry cases, 184 African American ancestry cases, 42 Other ancestry cases, 134 Asian ancestry controls, 1,428 European ancestry controls, 127 African American ancestry controls, 87 Other ancestry controls | *Intergenic chr 10, 15* | | [[269](#_ENREF_269)] |
| Response to mTOR inhibitor (everolimus, and rapamycin) | | 87 European ancestry individuals, 91 African American individuals, 94 Han Chinese ancestry individuals | NR | | *NKX2-6 - STC1, MGC46496, PBX3, USP10, AGA, RNA5SP173 - LINC00290, RGS4, RGS5, MCTP2, APBA2, PCAF, RIMS1* | [[270](#_ENREF_270)] |
| Response to taxane treatment (docetaxel, and placlitaxel) | | 96 African American lymphoblastoid cell lines, 96 European ancestry lymphoblastoid cell lines, 96 Han Chinese lymphoblastoid cell lines | NR | | *TTLL7, RYR2, ZNF670, POU3F3, SLC616, GHR, CANA2D1, DKK3, TRIM49, COL1A1, HRH4, KIAA0427, ZNF254, OSCAR, C20orf23, NPHP4, IL12B, TMEM106B, TMEM26, C10orf107, TSPAN15, SC5DL, ASB7, SEZ6L2, ZNF254, PRDM15, FGF13* | [[271](#_ENREF_271)] |
| Urinary symptoms in response to radiotherapy in prostate cancer | | 346 European, African, Hispanic and Asian individuals | 377 European, African, Hispanic and Asian individuals | | *IFNK, MOB3B* | [[272](#_ENREF_272)] |

NR not replicated, NS not significant, Bold GWAS publication with only African ancestry populations, Population names are as used in the related publications

Table 3. GWAS on communicable diseases in recent African and African ancestry populations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Disease** | **Sample size** | **Replication sample size** | **Genes** | | **Ref** |
| Chronic Hepatitis C infection | 988 European-American cases, 198 African-American cases, 100 Hispanic cases | NR | *ITPA* | [[241](#_ENREF_241)] | |
|  |  |  |  |  | |
| **HIV (mother-to-child transmission)** | **100 Malawian infant cases, 126 Malawian infant controls** | **NR** | **NS** | **[**[**242**](#_ENREF_242)**]** | |
| HIV-1 | 515 African American cases | NR | *MCMB, HLA-B, AOAH, EVI5L, GPC5, ACO23798.16, RP11-100A16.1, PPP3CC, SORBS3,* Intergenic 11q14.1 | [[92](#_ENREF_92)] | |
| HIV-1 control | 516 European cases, 1,196 European controls, 341 African American cases, 892 African American controls, 117 Hispanic controls, 560 Hispanic controls | NR | *HLA-C, MICA, HLA-B, PSORS1C3* Intergenic 6p21.33 | [[243](#_ENREF_243)] | |
| **HIV-1 susceptibility** | **848 Malawian cases, 531 Malawian controls** | **NR** | ***AL591509.5, GLRX3, TXNL3, FAM174B, AC009271.7, ZDHHC19, BUD13*** | **[**[**244**](#_ENREF_244)**]** | |
| HIV-1 viral setpoint | 496 HIV-1 infected individuals of African ancestry, 302 HIV-1 exposed and uninfected individuals of African ancestry | NR | *VEGFC, EPHA5, HIST1H4A, AL391500.13, KB-67B5.12, CMTM8, AC095058.3, AC087190.5-2, DNAJC5B, ZFP90, MAD2L1, HSP90AB3P, Intergenic chr 2, GALNT14* | [[245](#_ENREF_245)] | |
| IFN-related cytopenia | 984 European Americans with genotype 1 HCV, 201 African Americans with genotype 1 HCV, 99 Hispanics with genotype 1 HCV | NR | *IPTA* | [[246](#_ENREF_246)] | |
| Immune response to smallpox (secreted IFN-alpha; IL-10, IL-12p40, IL-1beta, IL-2, TNF-alpha) | Up to 512 European ancestry individuals, up to 199 African American individuals | NR | *WDR92, ECSM2, TMEM173, LOC100128265, ZNF827, MNAT1, MAMLD1, TIMELESS, KCND3, LOC152118, COL4A4, RAB14, ATP10A, PHEX, LOC728241, OR2H1, LOC344332, CEP110, BMP4, , LTBP1,UBE2D2, LPP, PTCHD1, ODZ1, DIP2C, LOC100129027, CYMP, ELAC1, ATP8A1, hCG\_1820717, SGK1, DAPK1, NLRP13, NLRP8* | [[247](#_ENREF_247)] | |
| Immune response to smallpox vaccine (IL-6) | 217 African American ancestry individuals, 580 European ancestry individuals, 217 Hispanic ancestry individuals | NR | *MKX, LOC388460, GPR158, ZHX2, SPIRE1, GREM2, CSMD1, RUNX1, RBM24, LOC100132612, SPIRE1, RASAL2, LOC388460, VENTXP5, IL5RA, PRKCQ, KIF6, LOC1001311899, CYP2C9, ANKLE2, GOLGA3, CYP2C8, PDYN, UNC13C, IRX1, SNX18, CRBN, FAM108C1, LOC387761, TMTC2, FEV, LOC151300, FLJ45139, TMTC2, LOC654254, CACNA2D3, RAB10, BCR, LOC647132, MEX3C, PDE4D, LTBP1, LOC100129725, NDUFB6, TOPORS, CDC42, BLK, ODZ2, C6orf190* | [[248](#_ENREF_248)] | |
| **Malaria** | **958 Gambian cases, 1,382 Gambian controls, all children** | **1,087 Gambian cases, 2,376 Gambian controls, all children** | ***HBB, SCO1, DDC*** | **[**[**76**](#_ENREF_76)**]** | |
| **Malaria** | **1,325 African ancestry, 828 African ancestry controls** | **2,229 African ancestry cases, 3,526 African ancestry controls** | ***ATP2B4, ABO, HBB, MARVELD3*** | **[**[**249**](#_ENREF_249)**]** | |
| **Malaria** | **5,425 African cases, 6,891 African controls** | **NR** | ***ABO, HBB*** | **[**[**250**](#_ENREF_250)**]** | |
| **Tuberculosis** | **921 Ghanaian cases 1,740 Ghanaian controls, 1,316 Gambian cases, 1,382 Gambian controls** | **1,226 Ghanaian cases, 3,825 Ghanaian controls, 236 Malawian cases, 779 Malawian controls, 332 Ghana parent/child trios and duos** | ***GATA6,CTAGE1,RBBP8,CABLES1*** | **[**[**84**](#_ENREF_84)**]** | |
| Tuberculosis | 1,329 African ancestry cases, 1,847 African ancestry controls | 2,024 African ancestry cases, 5,154 African ancestry controls, 1,025 Indonesian ancestry cases, 983 Indonesian ancestry controls, 4,441 European ancestry cases, 5,874 European ancestry controls | *WT1* | [[251](#_ENREF_251)] | |
| **Tuberculosis** | **642 South African coloured cases, 91 South African coloured controls** | **NR** | ***C2CD2, CNOT6L, CYP2C8, DCUN1D5, DSCAM, DYNC2H1, E2F7, IL2RB, LOC100508120, NAA60, PLD5, RNF187, SMOC1, SOX11, VWA8, WT1, ZFPM2, DMRTA1, SPON1, SNORD114-31, WT1,* Intergenic regions** | **[**[**252**](#_ENREF_252)**]** | |

NR not replicated, NS not significant, Bold GWAS publication with only African ancestry populations, Population names are as used in the related publications