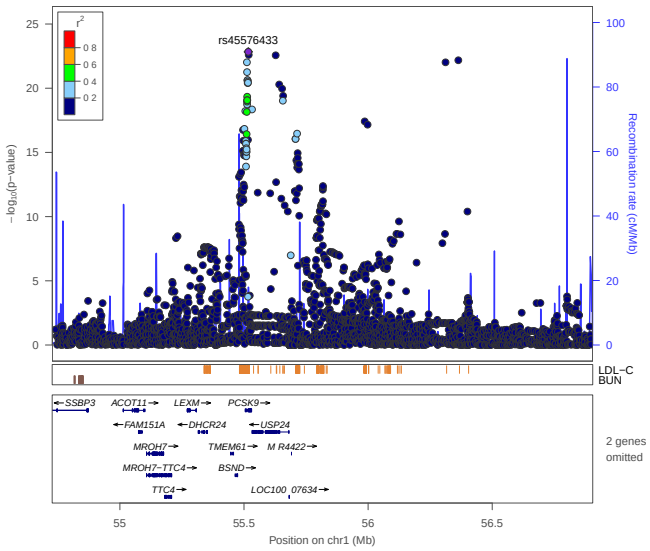
Supplementary Data Set 2 | Regional plots for the all identified trait-associated loci. Middle rugs represent significant variants ($P < 5.0 \times 10^{-8}$) for the other quantitative traits. GWAS was conducted using a linear regression model under the assumption of additive allelic effects of the SNP dosages.

INDEX

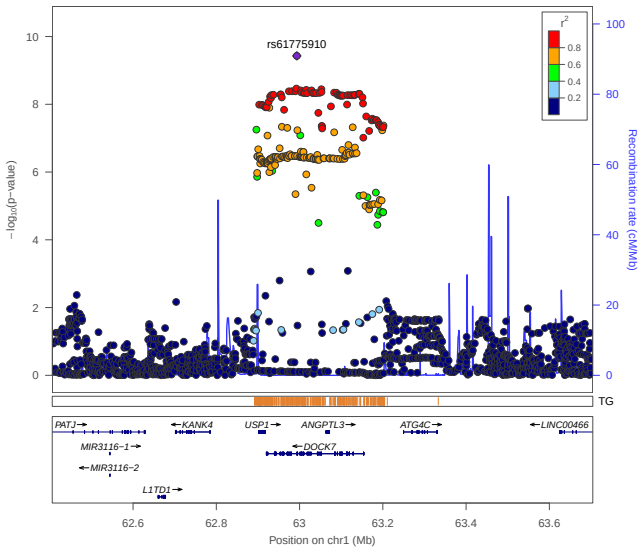
Metabolic 2
TC 2
HDL-C 3
LDL-C 4
TG 5
BS 6
HbA1c 7
Protein 8
TP 8
Alb 9
NAP 10
A/G 11
Kidney-related 12
BUN 12
sCr 13
eGFR 14
UA 15
Electrolyte 16
Na 16
K 17
Cl 18
Ca 19
P 20
Liver-related 21
TBil 21
ZTT 22
AST 23
ALT 24
ALP 25
GGT 26
Other biochemical 27
APTT 27
PT 28
Fbg 29
CK 30
LDH 31
CRP 32
Hematological 33
WBC 33
Neutro 34
Eosino 35
Baso 36
Mono 37
Lym 38
RBC 39
Hb 40
Ht 41
MCV 42
MCH 43
MCHC 44
Plt 45
Blood pressure 46
SBP 46
DBP 47
MAP 48
PP 49
Echocardiographic 50
IVS 50
PW 51
LVDd 52
LVDs 53
LVM 54
LVMI 55
RWT 56
FS 57
EF 58
E/A 59

2.1 TC (n = 128,305)

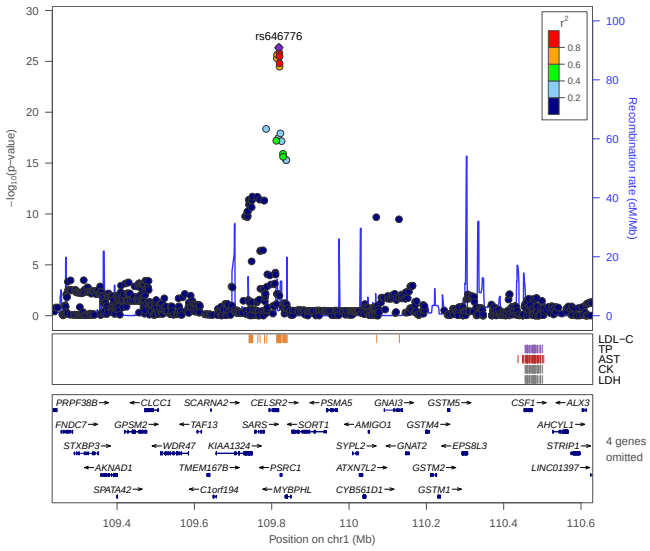
***PCSK9* (1p32.3)**



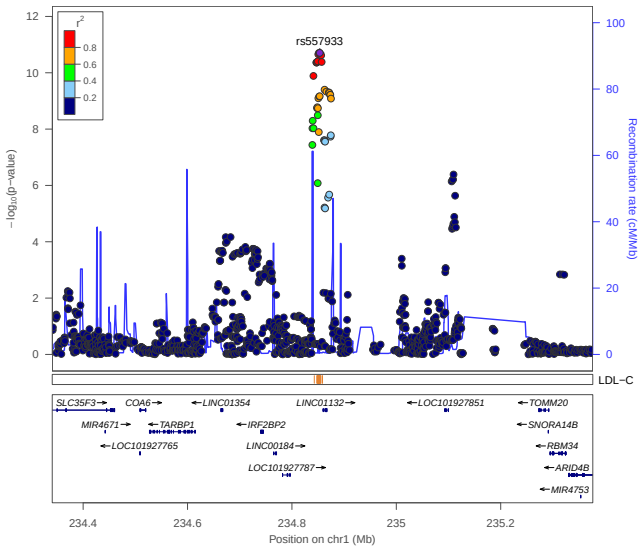
***DOCK7* (1p31.3)**



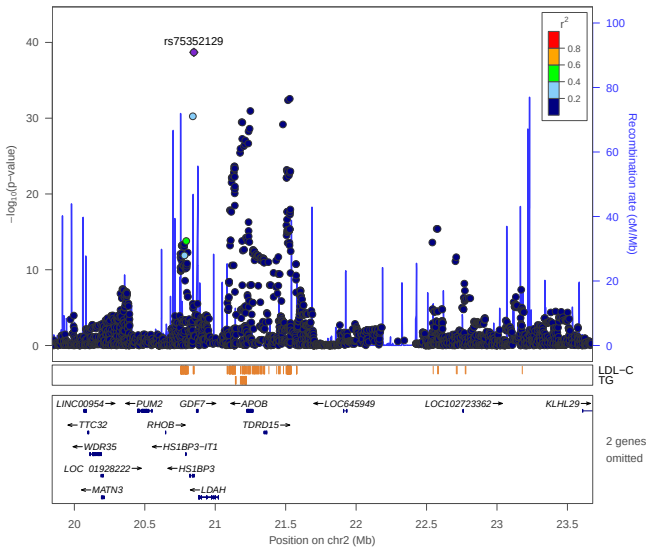
***CELSR2* (1p13.3)**



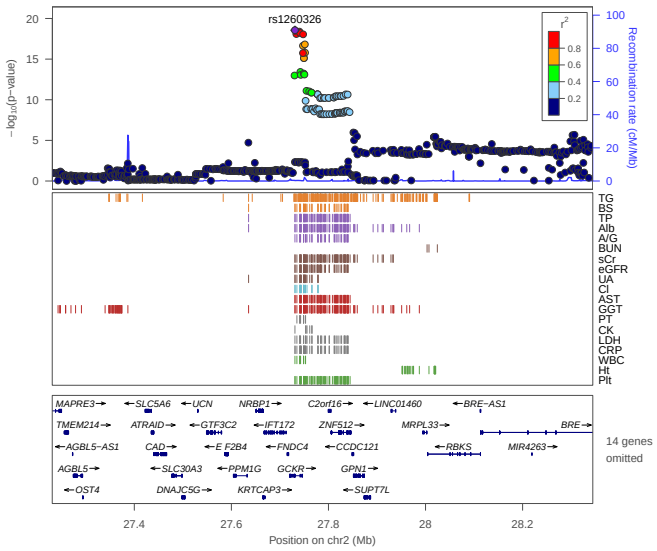
***LOC101927787,LINC01132* (1q42.3)**



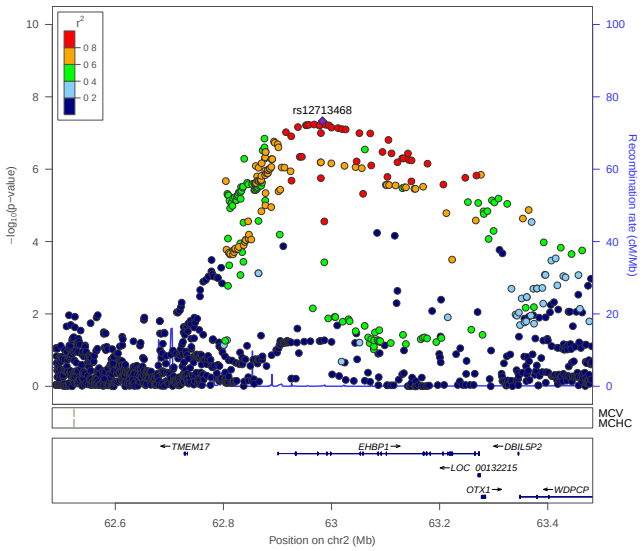
***HS1BP3* (2p24.1)**



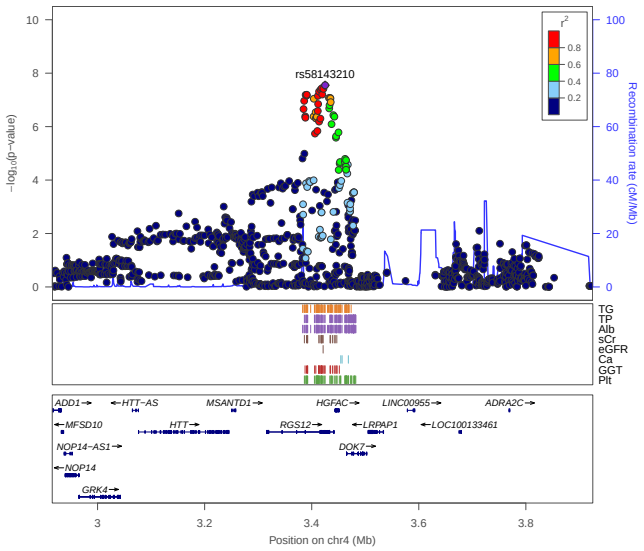
***GCKR* (2p23.3)**



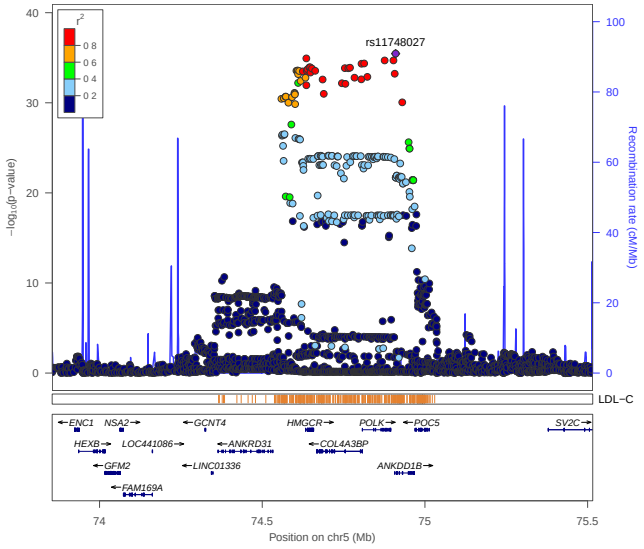
EHBP1 **(2p15)**



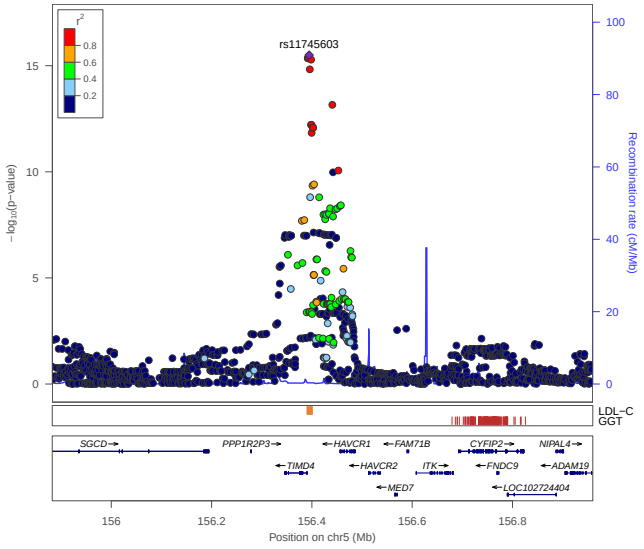
RGS12 **(4p16.3)**



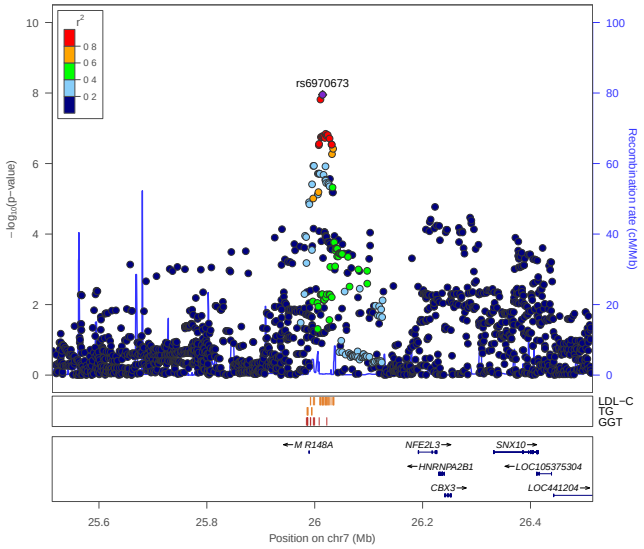
ANKDD1B **(5q13.3)**



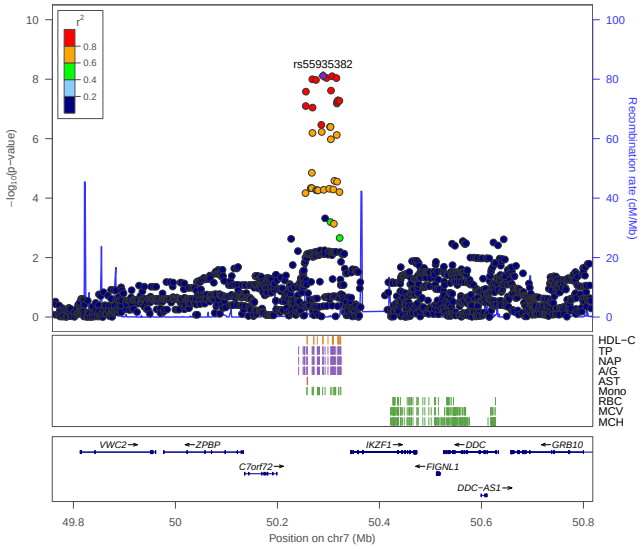
TIMD4,HAVCR1 **(5q33.3)**

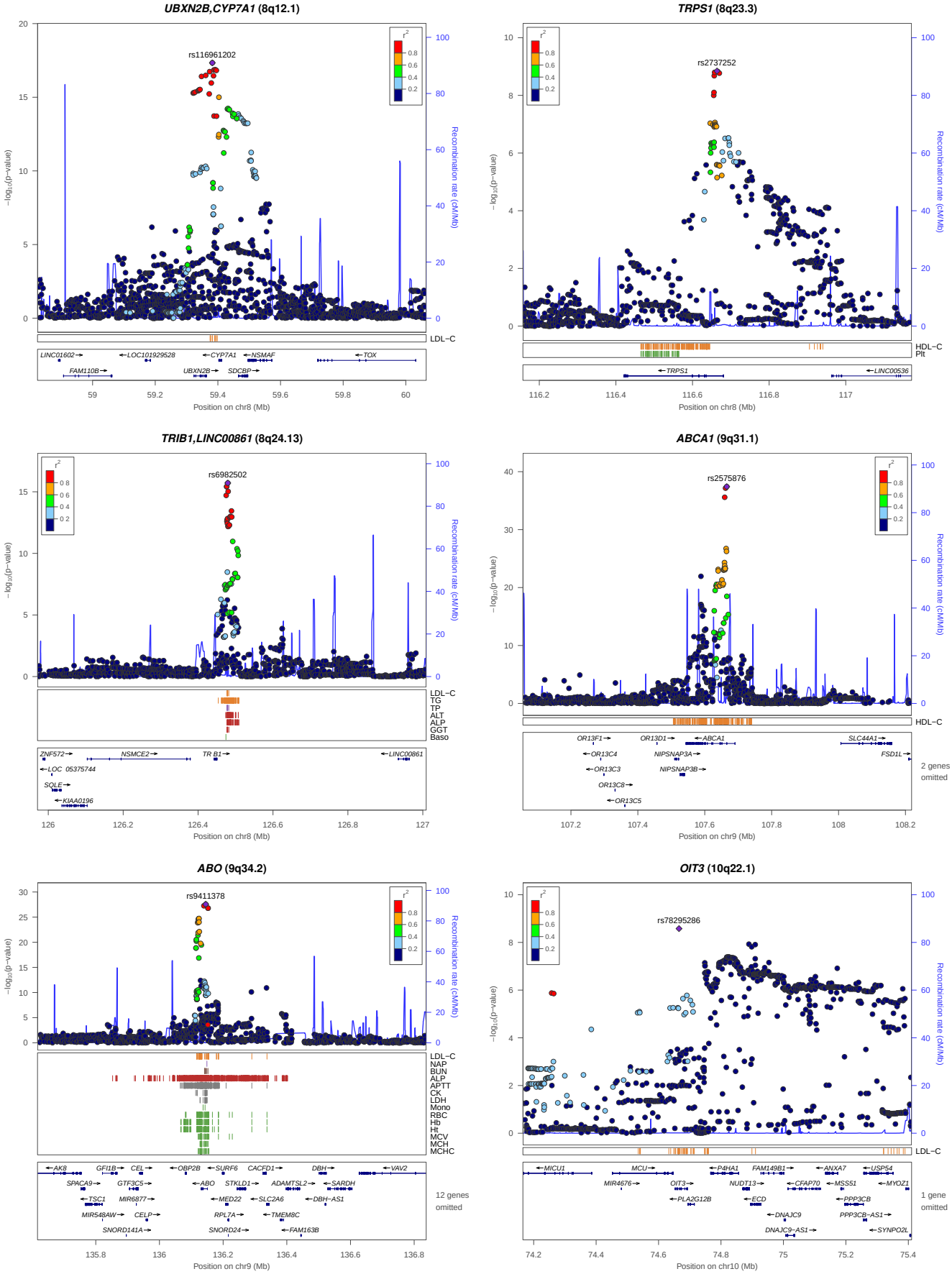


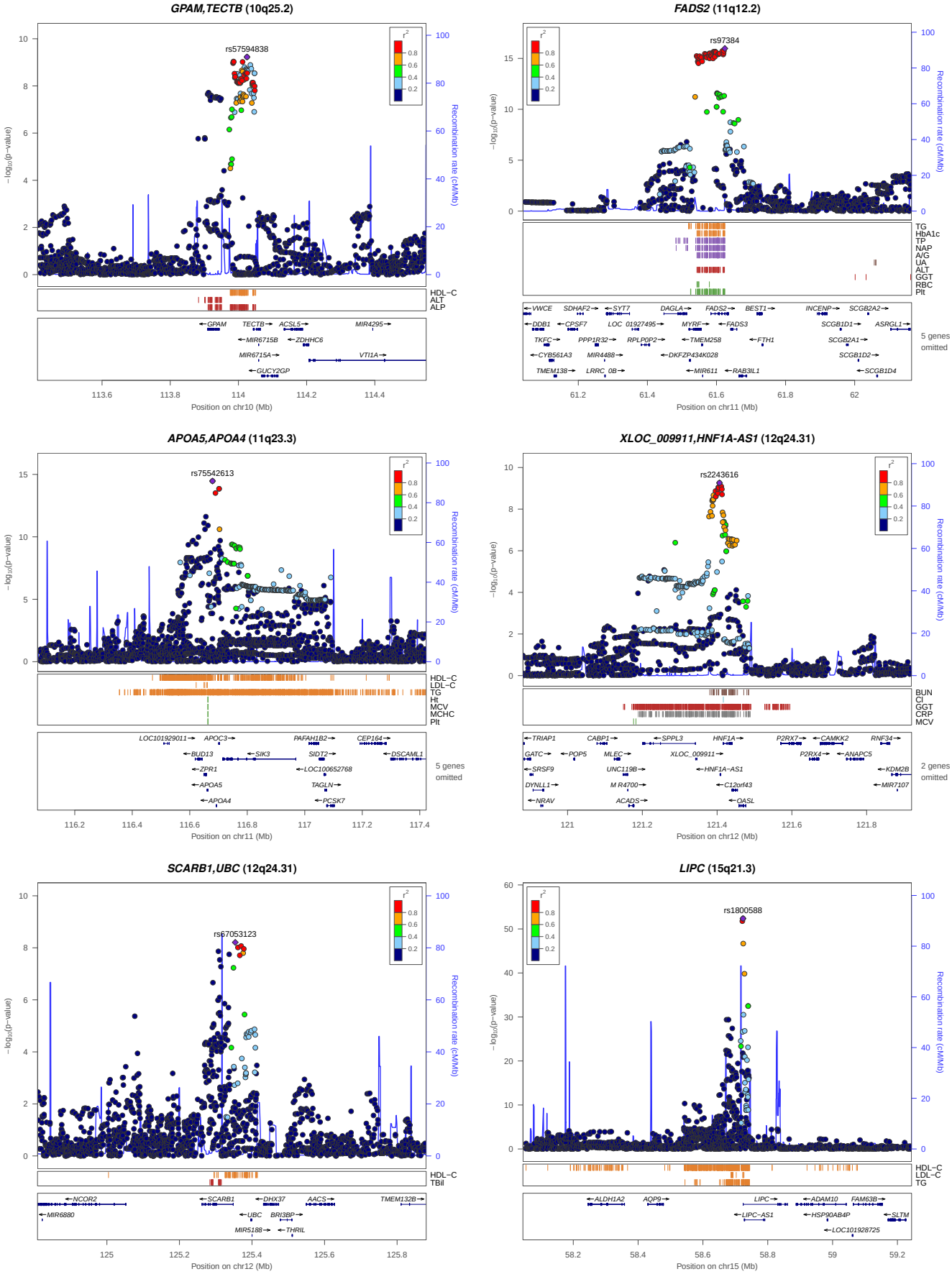
MIR148A,NFE2L3 **(7p15.2)**

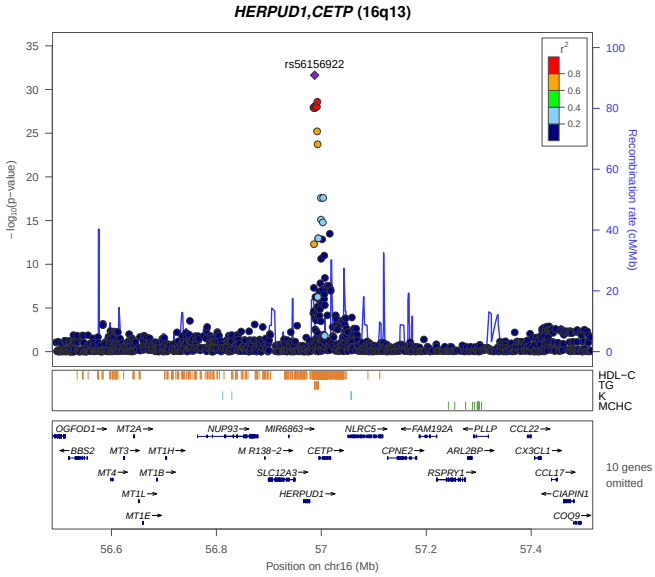


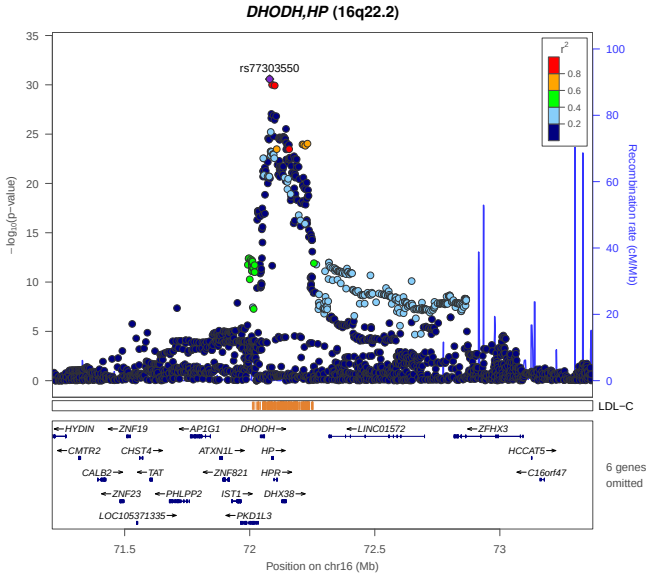
C7orf72,IKZF1 **(7p12.2)**

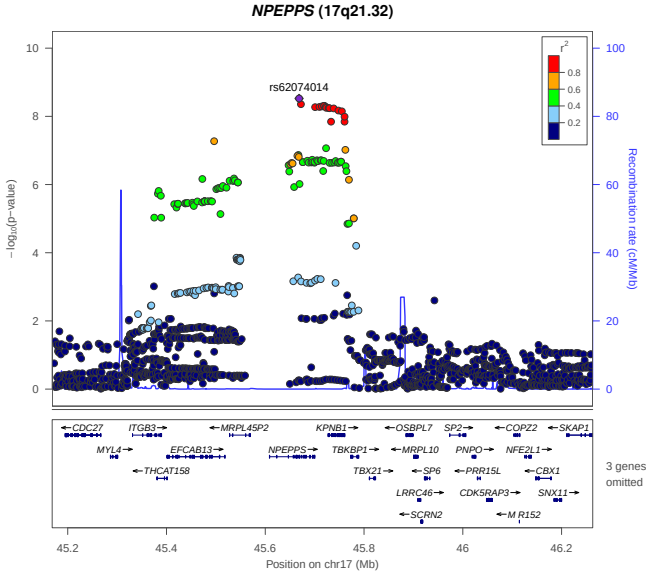


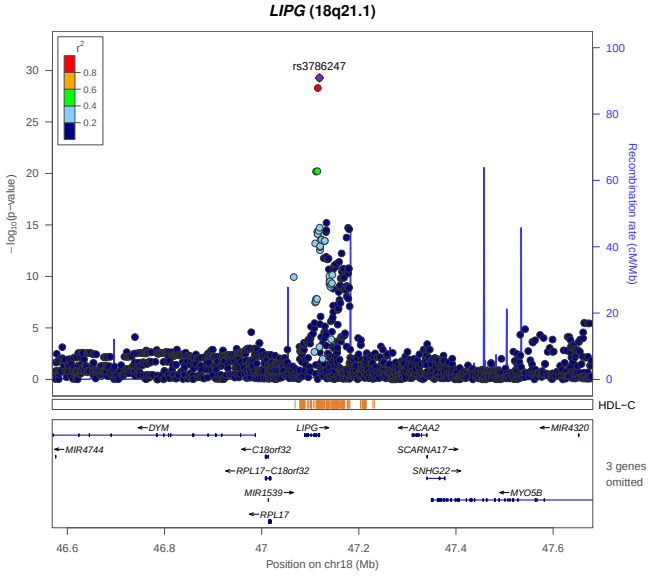

UBXN2B,CYP7A1 (8q12.1)
rs116961202
LDL−C
LINC01602
LOC101929528
CYP7A1
NSMAF
TOX
FAM110B
UBXN2B
SDCBP
Position on chr8 (Mb)
TRPS1 (8q23.3)
rs2737252
HDL−C
Plt
TRPS1
LINC00536
Position on chr8 (Mb)
TRIB1,LINC00861 (8q24.13)
rs6982502
LDL−C
TG
TP
ALT
ALP
GGT
Baso
ZNF572
NSMCE2
TRIB1
LINC00861
LOC 05375744
SOLE
KIAA0196
Position on chr8 (Mb)
ABCA1 (9q31.1)
rs2575876
HDL−C
OR13F1
OR13D1
ABCA1
SLC44A1
OR13C4
NIPSNAP3A
FSD1L
OR13C3
NIPSNAP3B
OR13C8
OR13C5
2 genes omitted
Position on chr9 (Mb)
ABO (9q34.2)
rs9411378
LDL−C
NAP
BUN
ALP
APTT
CK
LDH
Mono
RBC
Hb
Ht
MCV
MCH
MCHC
AK8
GFI1B
CEL
OBP2B
SURF6
CACFD1
DBH
VAV2
SPACA9
GTF3C5
ABO
STKLD1
ADAMTSL2
SARDH
TSC1
MIR6877
MED22
SLC2A6
DBH−AS1
MIR548AW
CELP
RPL7A
TMEM8C
SNORD141A
SNORD24
FAM163B
12 genes omitted
Position on chr9 (Mb)
OIT3 (10q22.1)
rs78295286
LDL−C
MICU1
MCU
P4HA1
FAM149B1
ANXA7
USP54
MIR4676
OIT3
NUDT13
CFAP70
MSS51
MYOZ1
PLA2G12B
ECD
PPP3CB
DNAJC9
PPP3CB−AS1
DNAJC9−AS1
SYNPO2L
1 gene omitted
Position on chr10 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)
r2

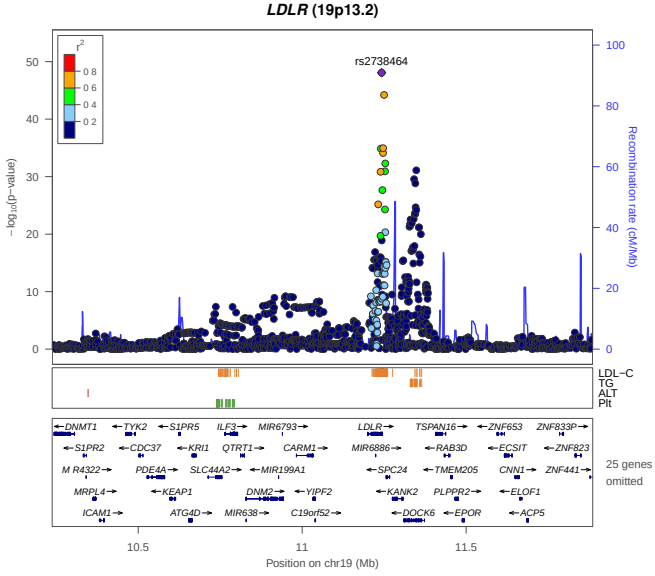

GPAM,TECTB (10q25.2)
rs57594838
HDL−C
ALT
ALP
GPAM
TECTB
ACSL5
MIR4295
MIR6715B
ZDHHC6
MIR6715A
VTI1A
GUCY2GP
Position on chr10 (Mb)
FADS2 (11q12.2)
rs97384
TG
HbA1c
TP
NAP
AG
UA
ALT
GGT
RBC
Plt
5 genes omitted
Position on chr11 (Mb)
APOA5,APOA4 (11q23.3)
rs75542613
HDL−C
LDL−C
TG
Ht
MCV
MCHC
Plt
5 genes omitted
Position on chr11 (Mb)
XLOC_009911,HNF1A-AS1 (12q24.31)
rs2243616
BUN
Cl
GGT
CRP
MCV
2 genes omitted
Position on chr12 (Mb)
SCARB1,UBC (12q24.31)
rs67053123
HDL−C
TBil
Position on chr12 (Mb)
LIPC (15q21.3)
rs1800588
HDL−C
LDL−C
TG
Position on chr15 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

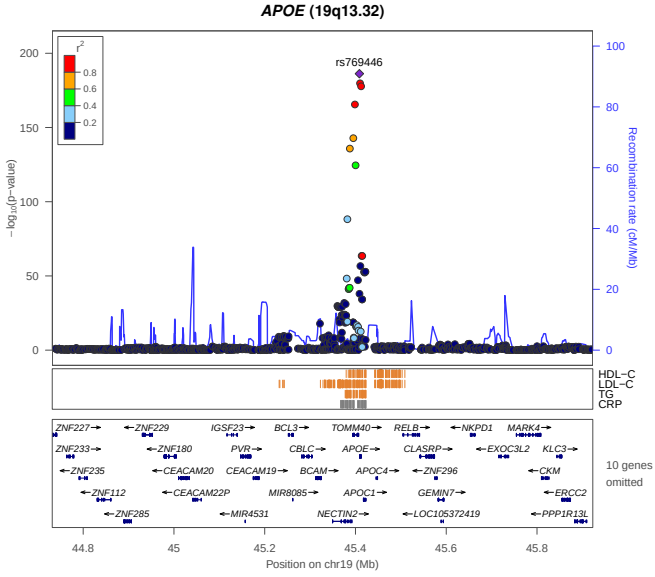

HERPUD1,CETP (16q13)
rs56156922
HDL−C
TG
K
MCHC
10 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

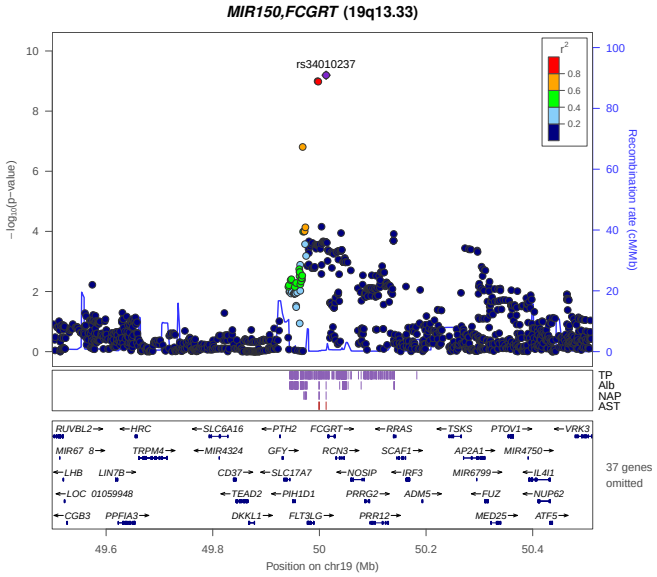

DHODH,HP (16q22.2)
rs77303550
LDL−C
6 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

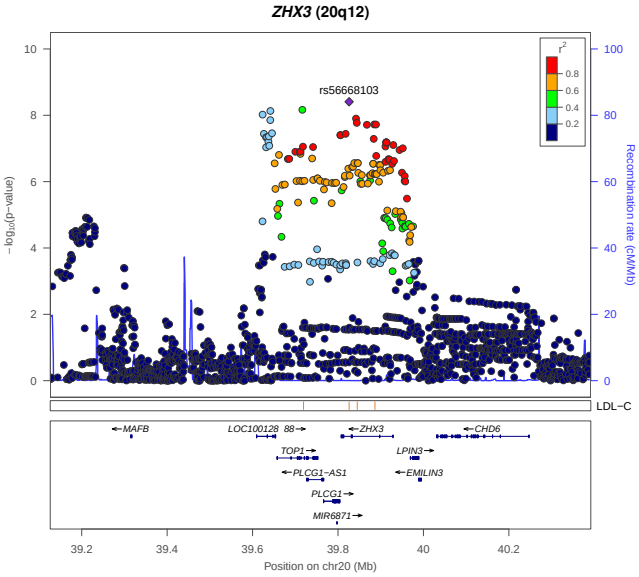

NPEPPS (17q21.32)
rs62074014
3 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)


LIPG (18q21.1)
rs3786247
HDL−C
3 genes omitted
Position on chr18 (Mb)
Recombination rate (cM/Mb)


LDLR (19p13.2)
rs2738464
LDL−C
TG
ALT
Plt
25 genes omitted
Position on chr19 (Mb)
Recombination rate (cM/Mb)

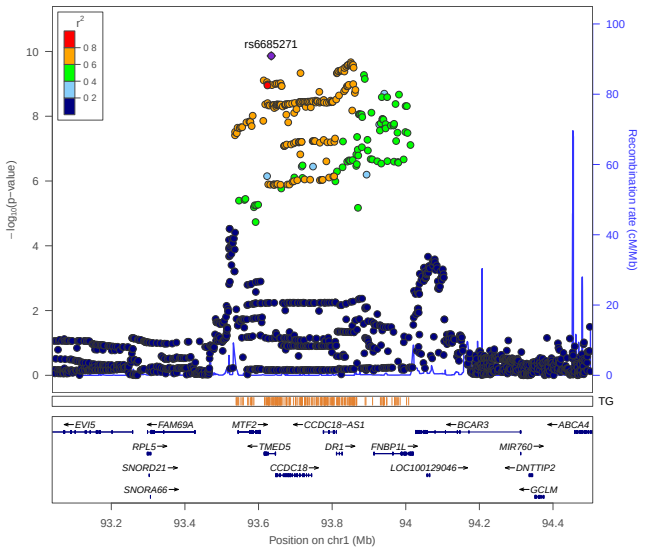

APOE (19q13.32)
rs769446
HDL−C
LDL−C
TG
CRP
10 genes omitted
Position on chr19 (Mb)
Recombination rate (cM/Mb)


MIR150,FCGRT (19q13.33)
rs34010237
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
TP
Alb
NAP
AST
RUVBL2 HRC SLC6A16 PTH2 FCGRT RRAS TSKS PTOV1 VRK3
MIR67 8 TRPM4 MIR4324 GFY RCN3 SCAF1 AP2A1 MIR4750
LHB LIN7B CD37 SLC17A7 NOSIP IRF3 MIR6799 IL4I1
LOC 01059948 TEAD2 PIH1D1 PRRG2 ADM5 FUZ NUP62
CGB3 PPFIA3 DKKL1 FLT3LG PRR12 MED25 ATF5
37 genes omitted
Position on chr19 (Mb)

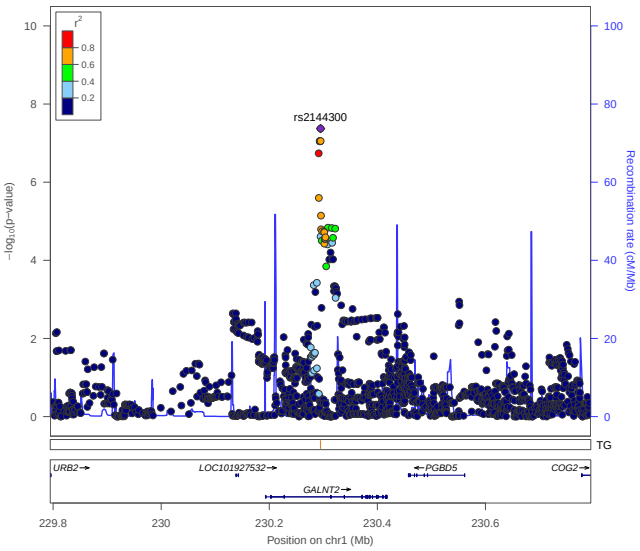

ZHX3 (20q12)
rs56668103
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
LDL−C
MAFB LOC100128 88 ZHX3 CHD6
TOP1 LPIN3
PLCG1−AS1 EMILIN3
PLCG1
MIR6871
Position on chr20 (Mb)

2.2 HDL-C (n = 70,657)

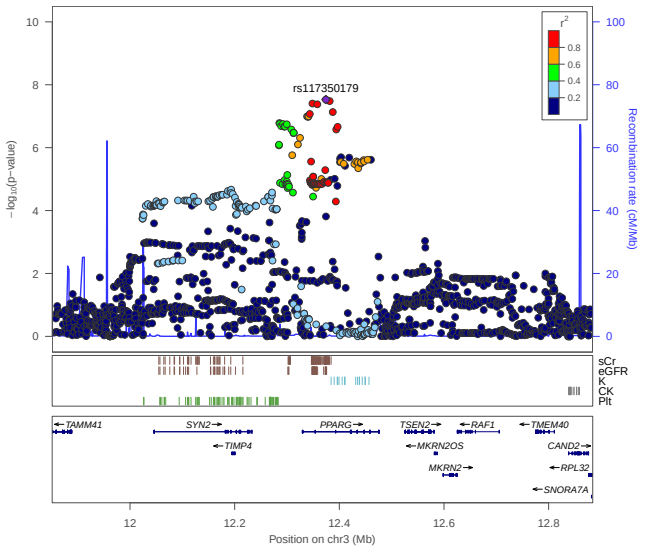
***TMED5* (1p22.1)**



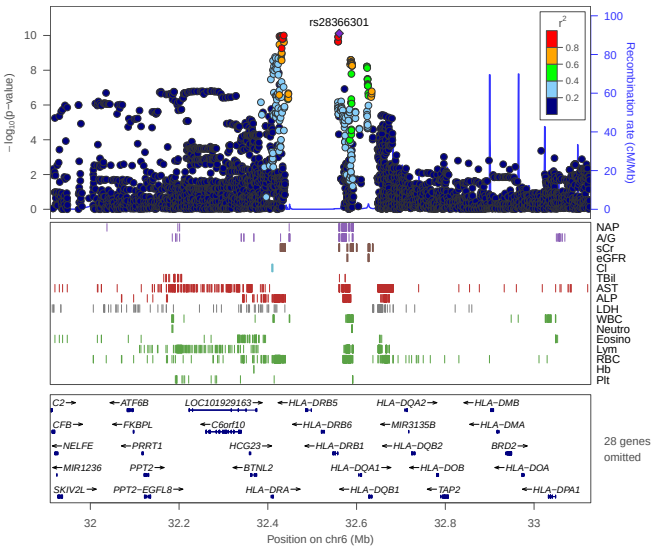
***GALNT2* (1q42.13)**



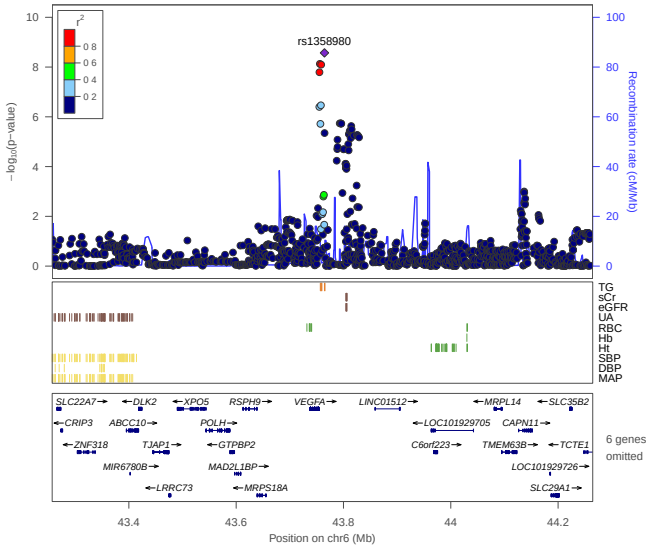
***PPARG* (3p25.2)**



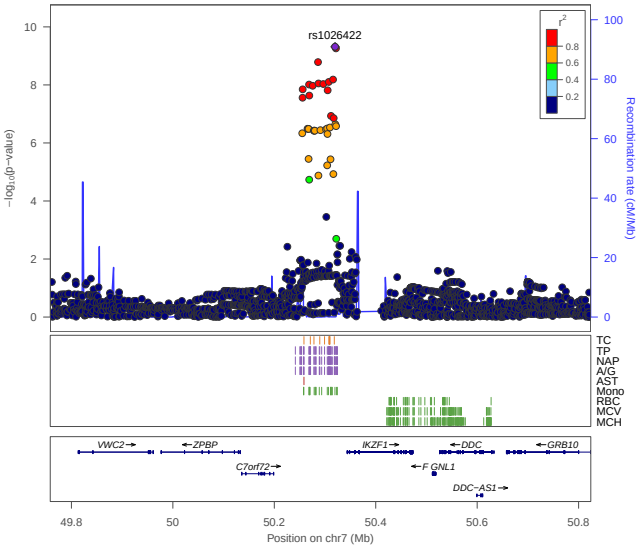
***HLA-DRB1,HLA-DQA1* (6p21.32)**

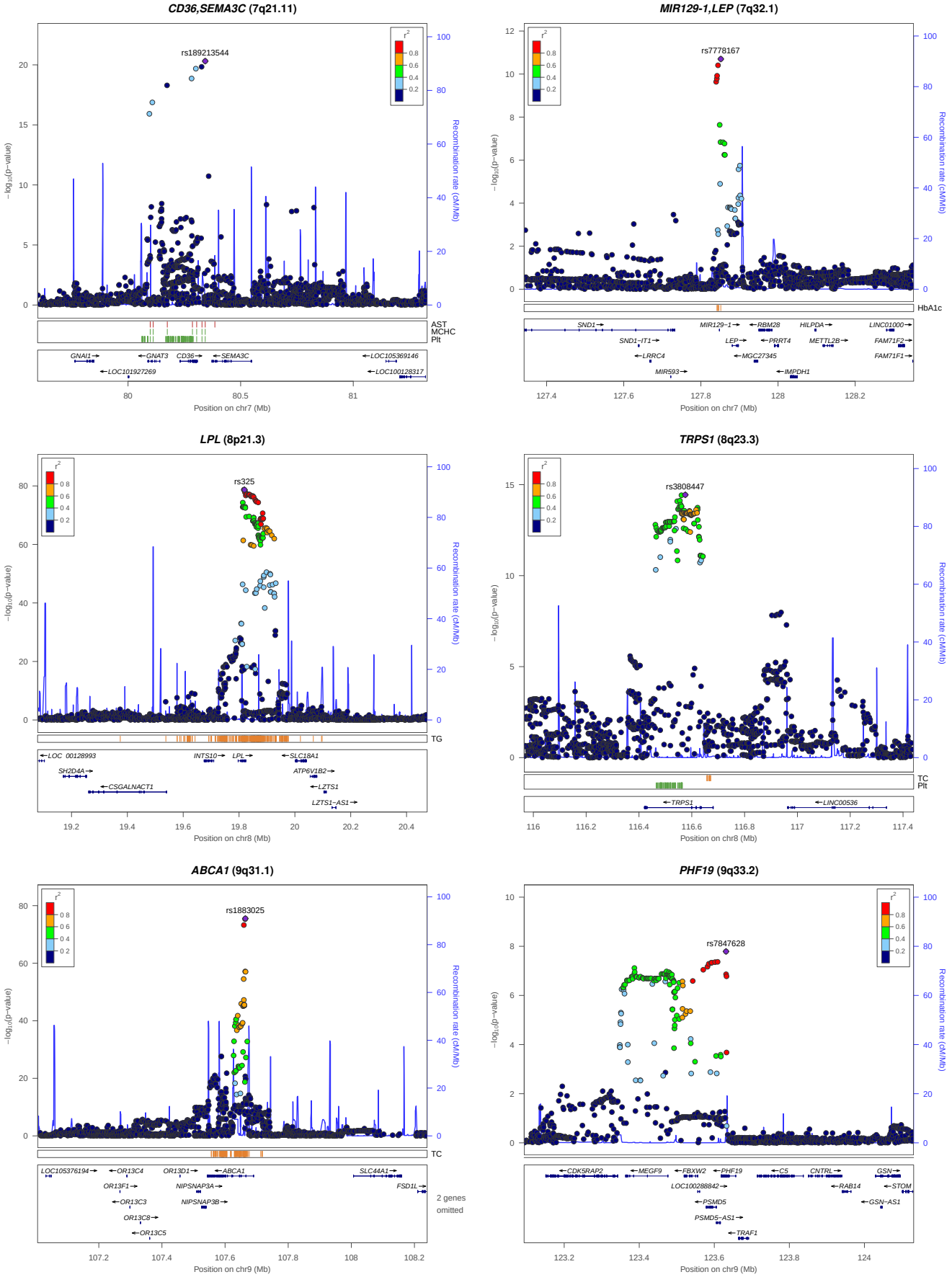


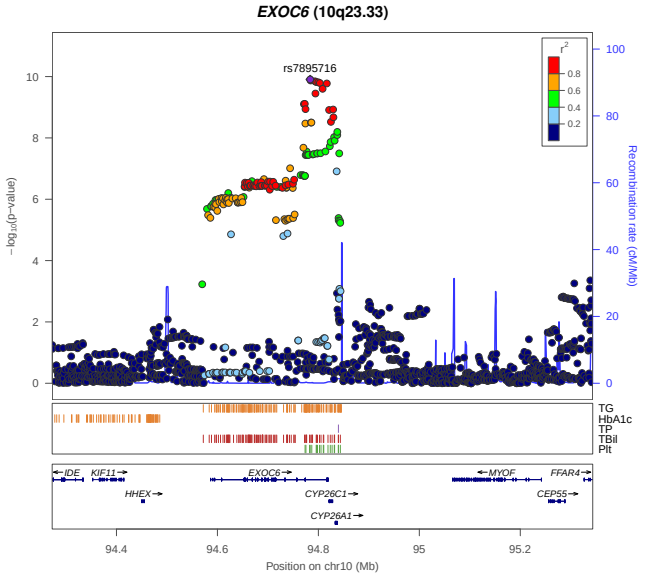
***VEGFA,LINC01512* (6p21.1)**

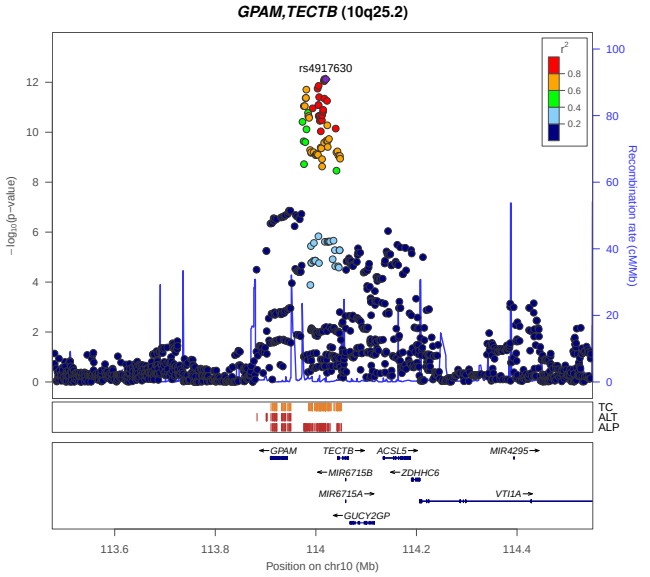


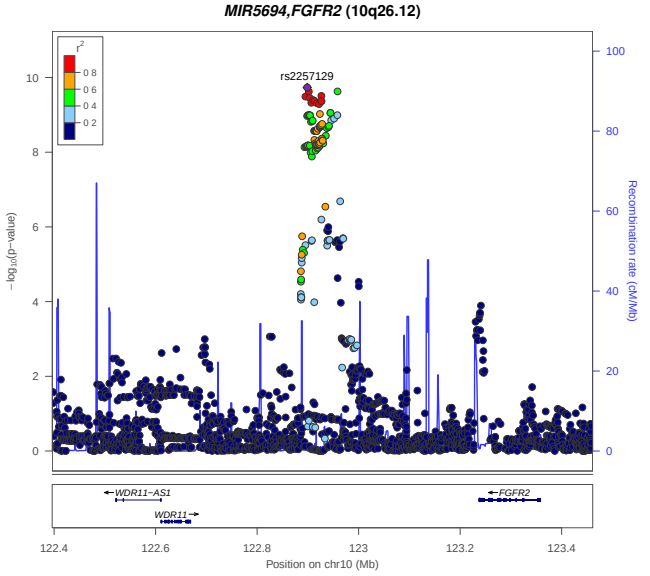
***C7orf72,IKZF1* (7p12.2)**

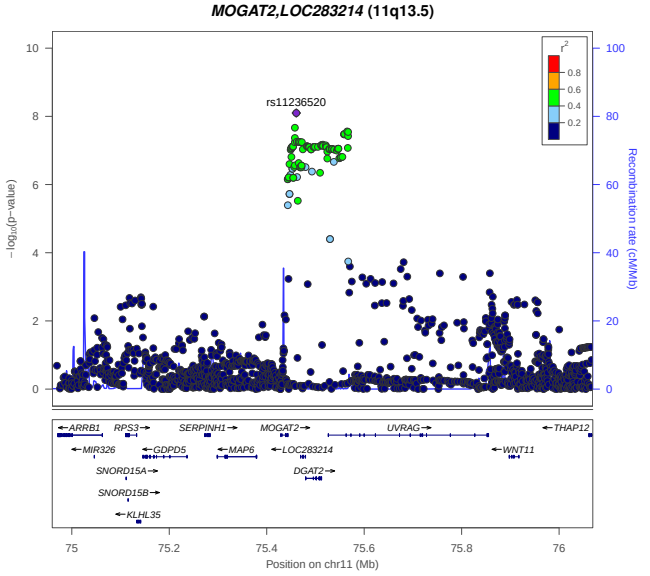


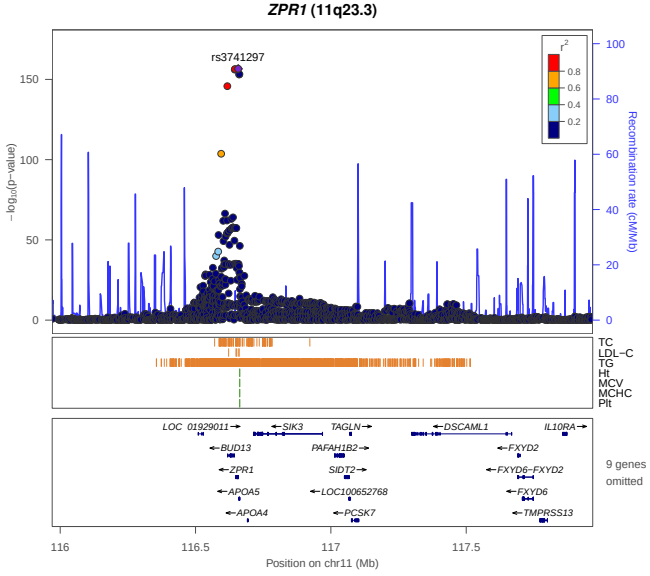

CD36,SEMA3C (7q21.11)
rs189213544
AST
MCHC
Plt
GNAI1
GNAT3
CD36
SEMA3C
LOC105369146
LOC101927269
LOC100128317
Position on chr7 (Mb)
MIR129-1,LEP (7q32.1)
rs7778167
HbA1c
SND1
MIR129-1
RBM28
HILPDA
LINC01000
SND1-IT1
LEP
PRRT4
METTL2B
FAM71F2
LRRC4
MGC27345
FAM71F1
MIR593
IMPDH1
Position on chr7 (Mb)
LPL (8p21.3)
rs325
TG
LOC 00128993
INTS10
LPL
SLC18A1
SH2D4A
ATP6V1B2
CSGALNACT1
LZTS1
LZTS1-AS1
Position on chr8 (Mb)
TRPS1 (8q23.3)
rs3808447
TC
Plt
TRPS1
LINC00536
Position on chr8 (Mb)
ABCA1 (9q31.1)
rs1883025
TC
LOC105376194
OR13C4
OR13D1
ABCA1
SLC44A1
OR13F1
NIPSNAP3A
FSD1L
OR13C3
NIPSNAP3B
OR13C8
OR13C5
2 genes omitted
Position on chr9 (Mb)
PHF19 (9q33.2)
rs7847628
CDK5RAP2
MEGF9
FBXW2
PHF19
C5
CNTRL
GSN
LOC100288842
RAB14
STOM
PSMD5
GSN-AS1
PSMD5-AS1
TRAF1
Position on chr9 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)
r2

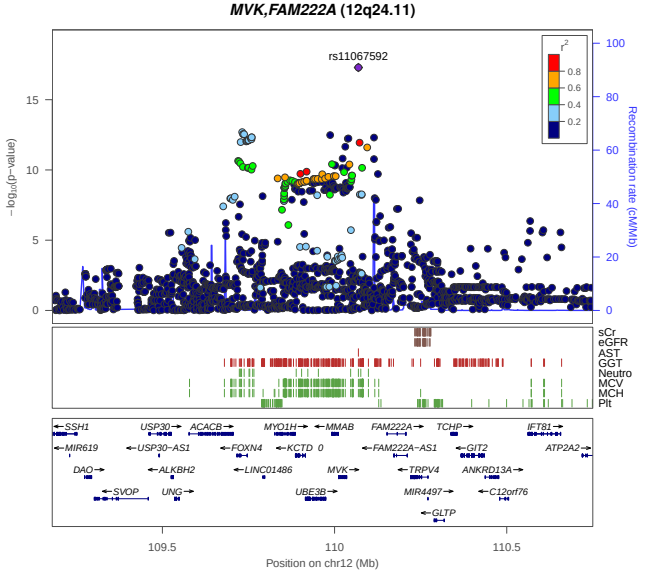

EXOC6 (10q23.33)
rs7895716
TG
HbA1c
TP
TBil
Plt
Position on chr10 (Mb)

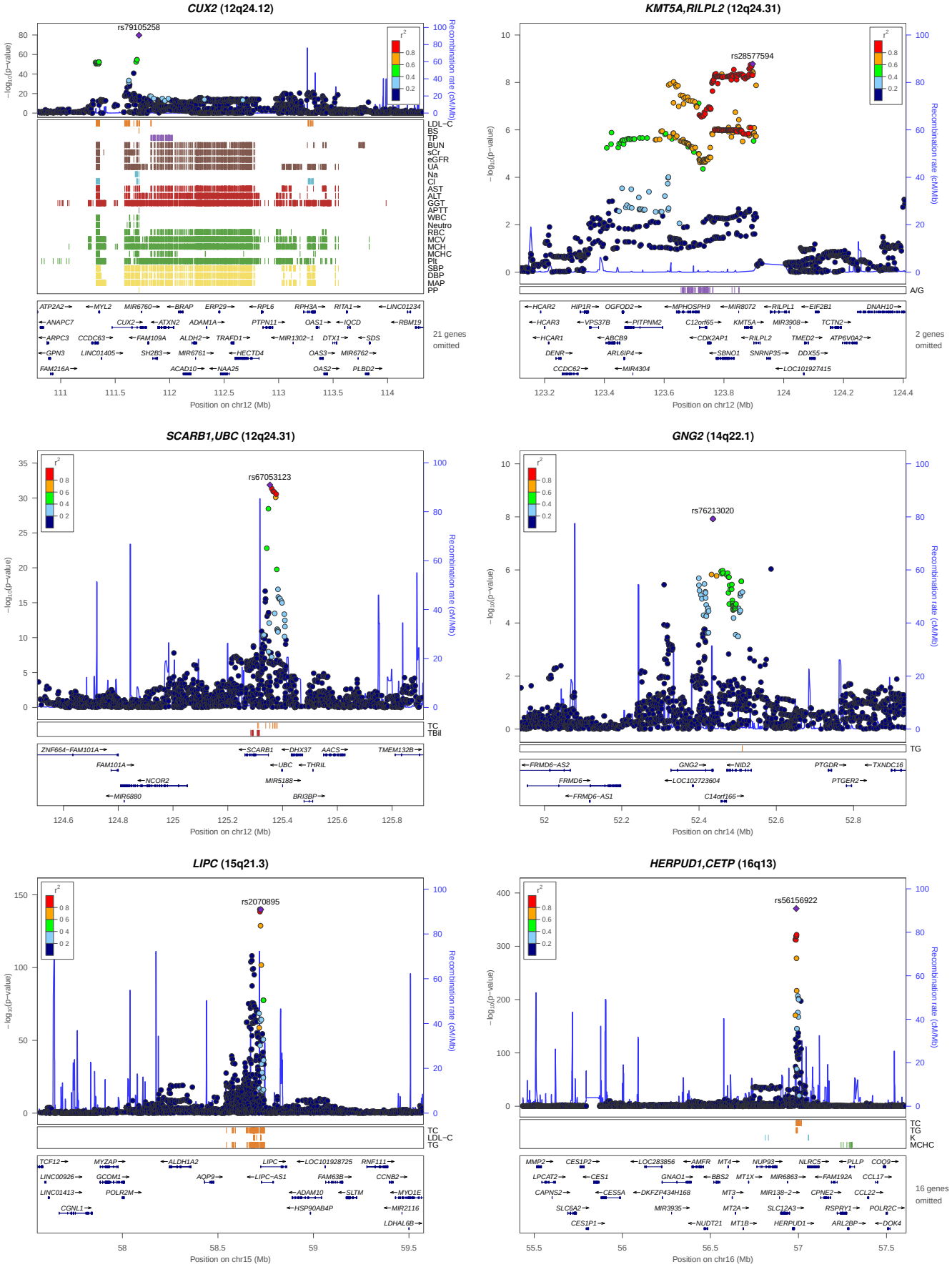

GPAM,TECTB (10q25.2)
rs4917630
TC
ALT
ALP
Position on chr10 (Mb)

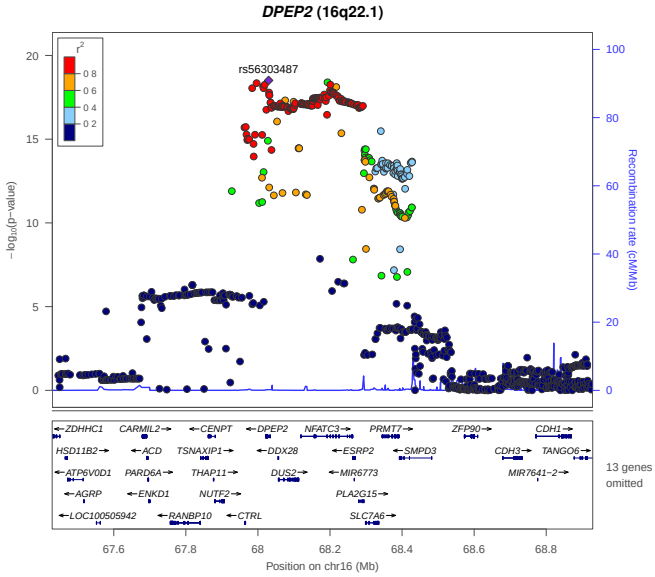

MIR5694,FGFR2 (10q26.12)
rs2257129
Position on chr10 (Mb)

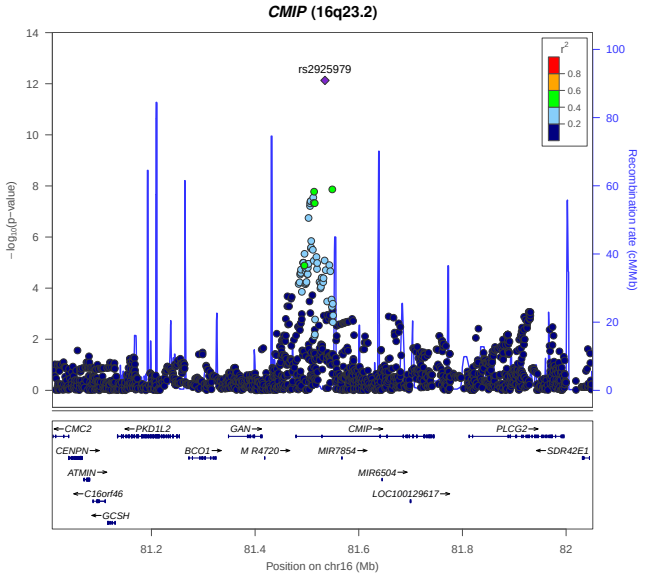

MOGAT2,LOC283214 (11q13.5)
rs11236520
Position on chr11 (Mb)

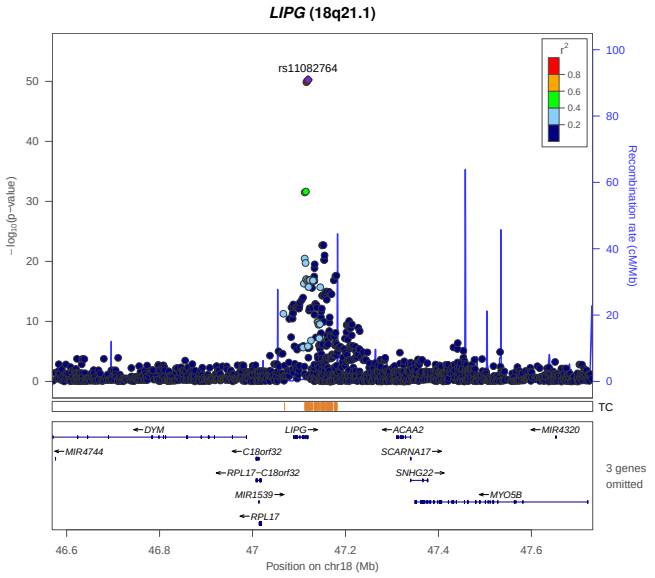

ZPR1 (11q23.3)
rs3741297
TC
LDL−C
TG
Ht
MCV
MCHC
Plt
9 genes omitted
Position on chr11 (Mb)

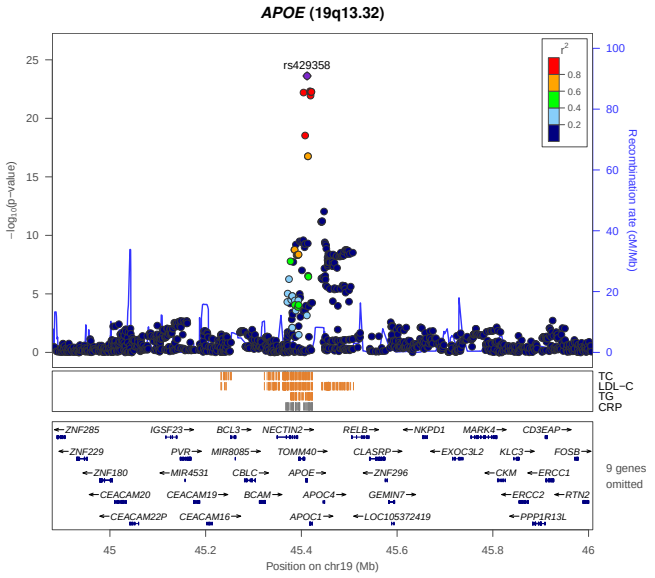

MVK,FAM222A (12q24.11)
rs11067592
sCr
eGFR
AST
GGT
Neutro
MCV
MCH
Plt
Position on chr12 (Mb)

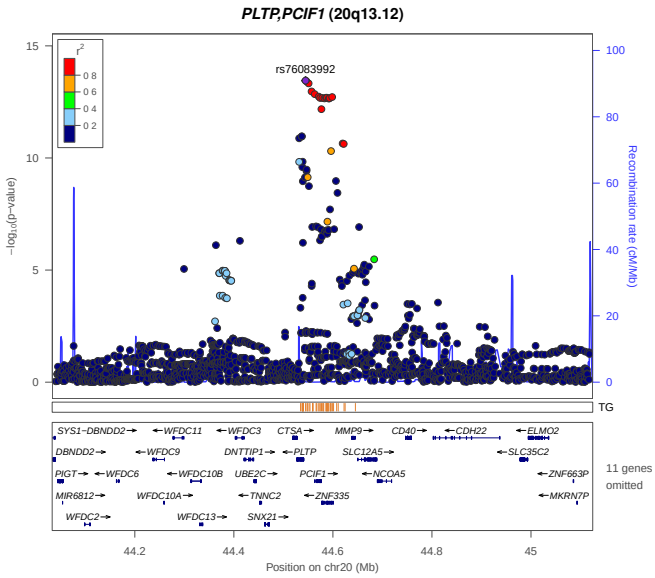

CUX2 (12q24.12)
rs79105258
LDL−C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
21 genes omitted
Position on chr12 (Mb)
KMT5A,RILPL2 (12q24.31)
rs28577594
A/G
2 genes omitted
Position on chr12 (Mb)
SCARB1,UBC (12q24.31)
rs67053123
TC
TBil
Position on chr12 (Mb)
GNG2 (14q22.1)
rs76213020
TG
Position on chr14 (Mb)
LIPC (15q21.3)
rs2070895
TC
LDL−C
TG
Position on chr15 (Mb)
HERPUD1,CETP (16q13)
rs56156922
TC
TG
K
MCHC
16 genes omitted
Position on chr16 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

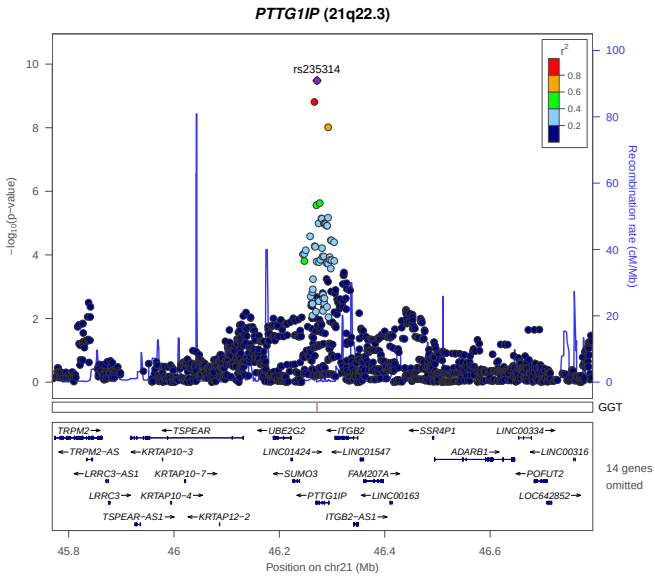

DPEP2 (16q22.1)
rs56303487
13 genes omitted
Position on chr16 (Mb)

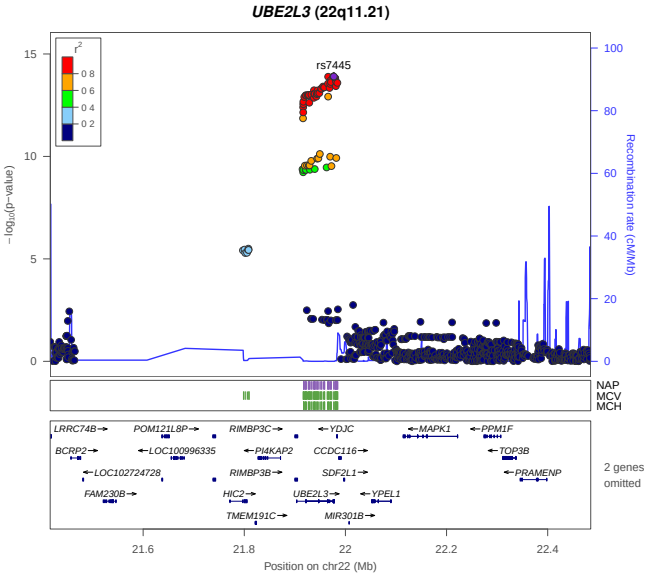

CMIP (16q23.2)
rs2925979
Position on chr16 (Mb)


LIPG (18q21.1)
rs11082764
TC
3 genes omitted
Position on chr18 (Mb)


APOE (19q13.32)
rs429358
TC
LDL–C
TG
CRP
9 genes omitted
Position on chr19 (Mb)

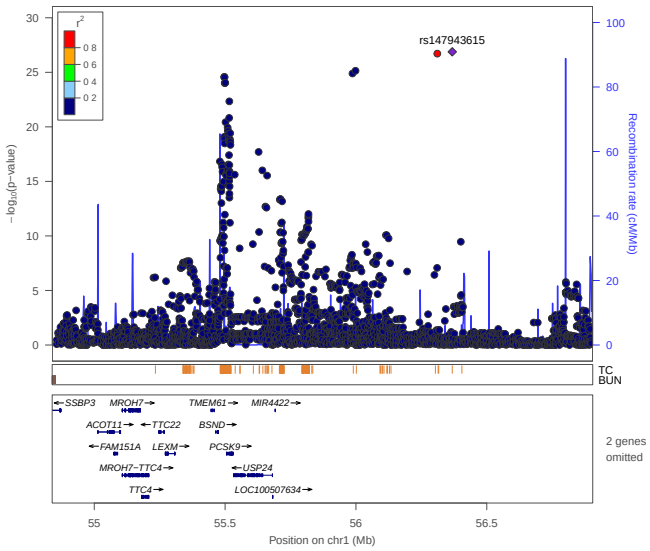

PLTP,PCIF1 (20q13.12)
rs76083992
TG
11 genes omitted
Position on chr20 (Mb)


PTTG1IP (21q22.3)
rs235314
GGT
14 genes omitted
Position on chr21 (Mb)

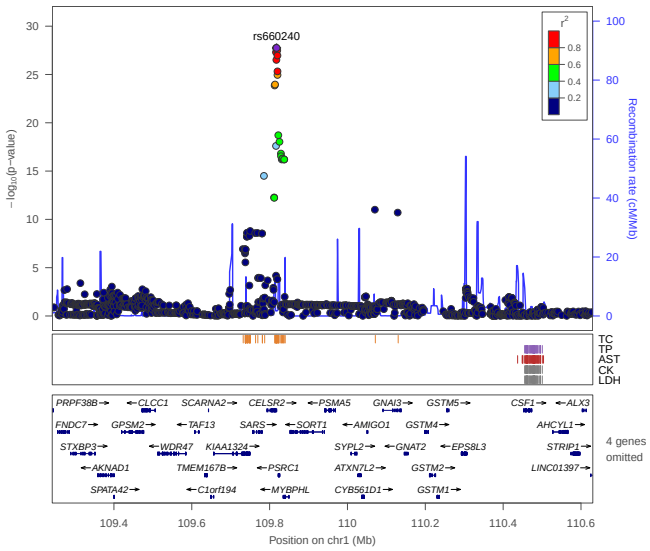

UBE2L3 (22q11.21)
rs7445
r2
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
NAP
MCV
MCH
LRRC74B
POM121L8P
RIMBP3C
YDJC
MAPK1
PPM1F
BCRP2
LOC100996335
PI4KAP2
CCDC116
TOP3B
LOC102724728
RIMBP3B
SDF2L1
PRAMENP
FAM230B
HIC2
UBE2L3
YPEL1
TMEM191C
MIR301B
2 genes omitted
Position on chr22 (Mb)

2.3 LDL-C (n = 72,866)

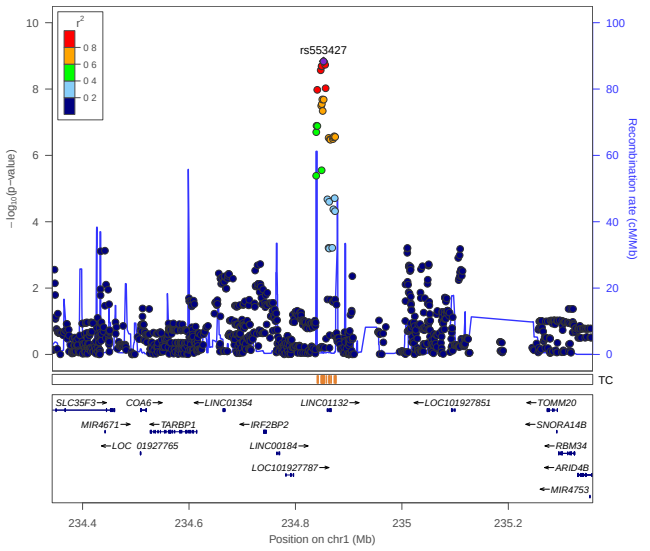
MIR4422,PLPP3 **(1p32.2)**



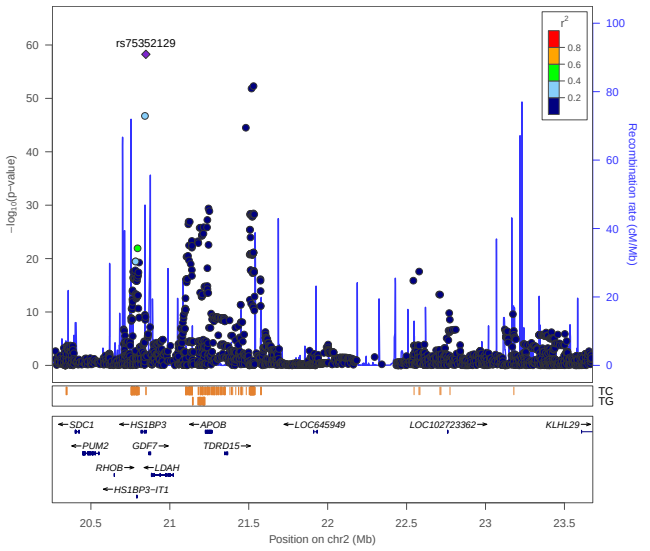
CELSR2 **(1p13.3)**



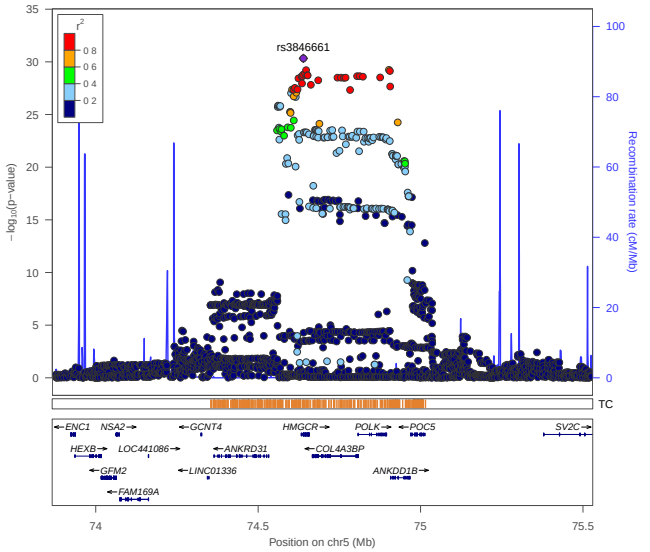
LOC101927787,LINC01132 **(1q42.3)**



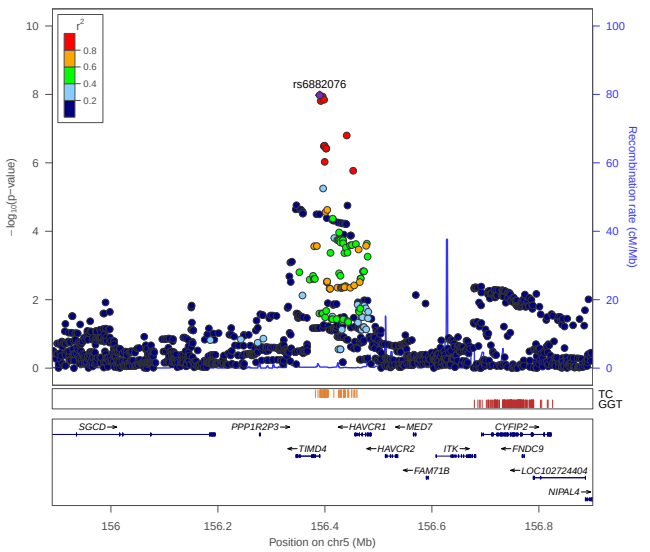
HS1BP3 **(2p24.1)**

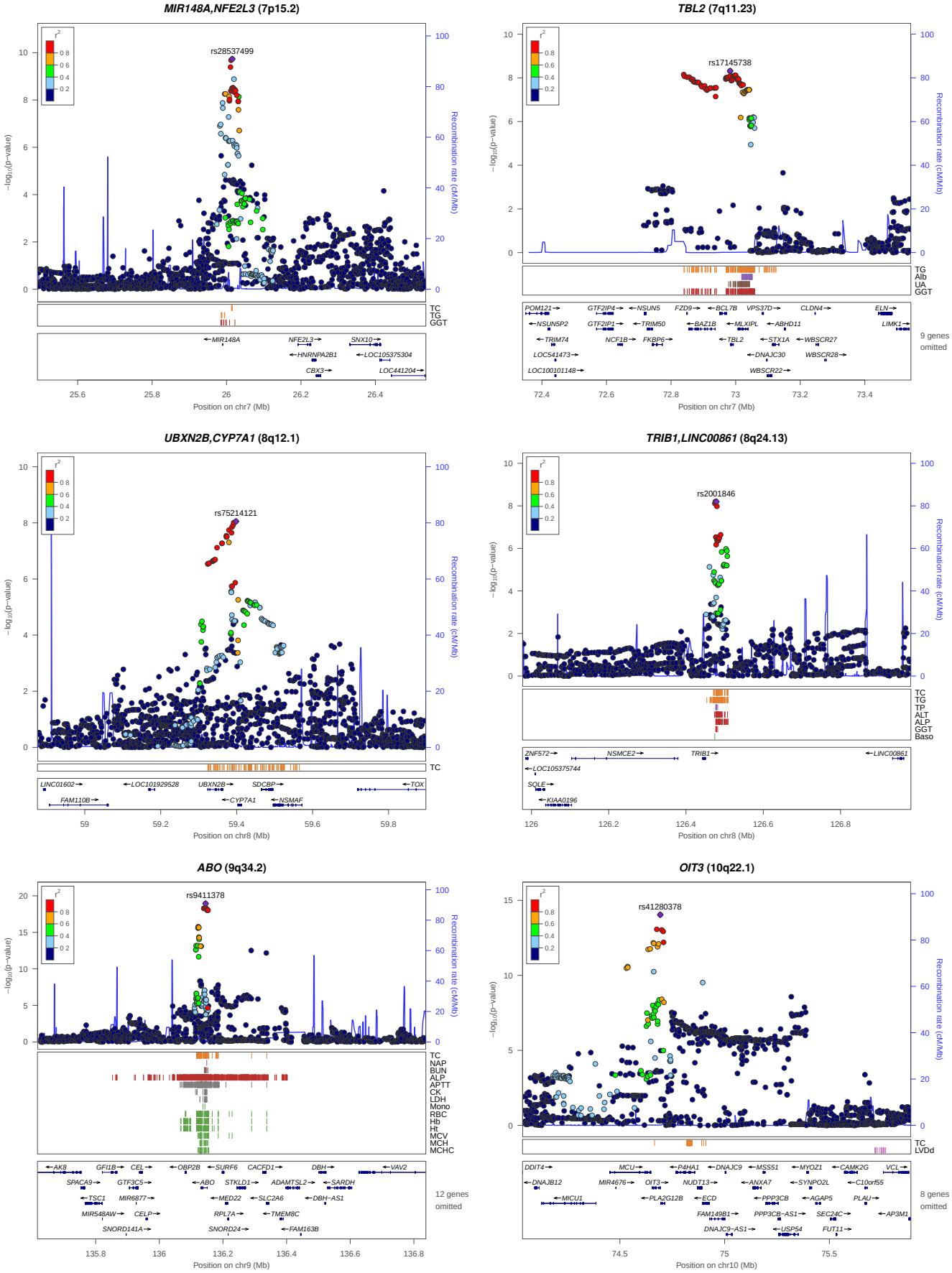


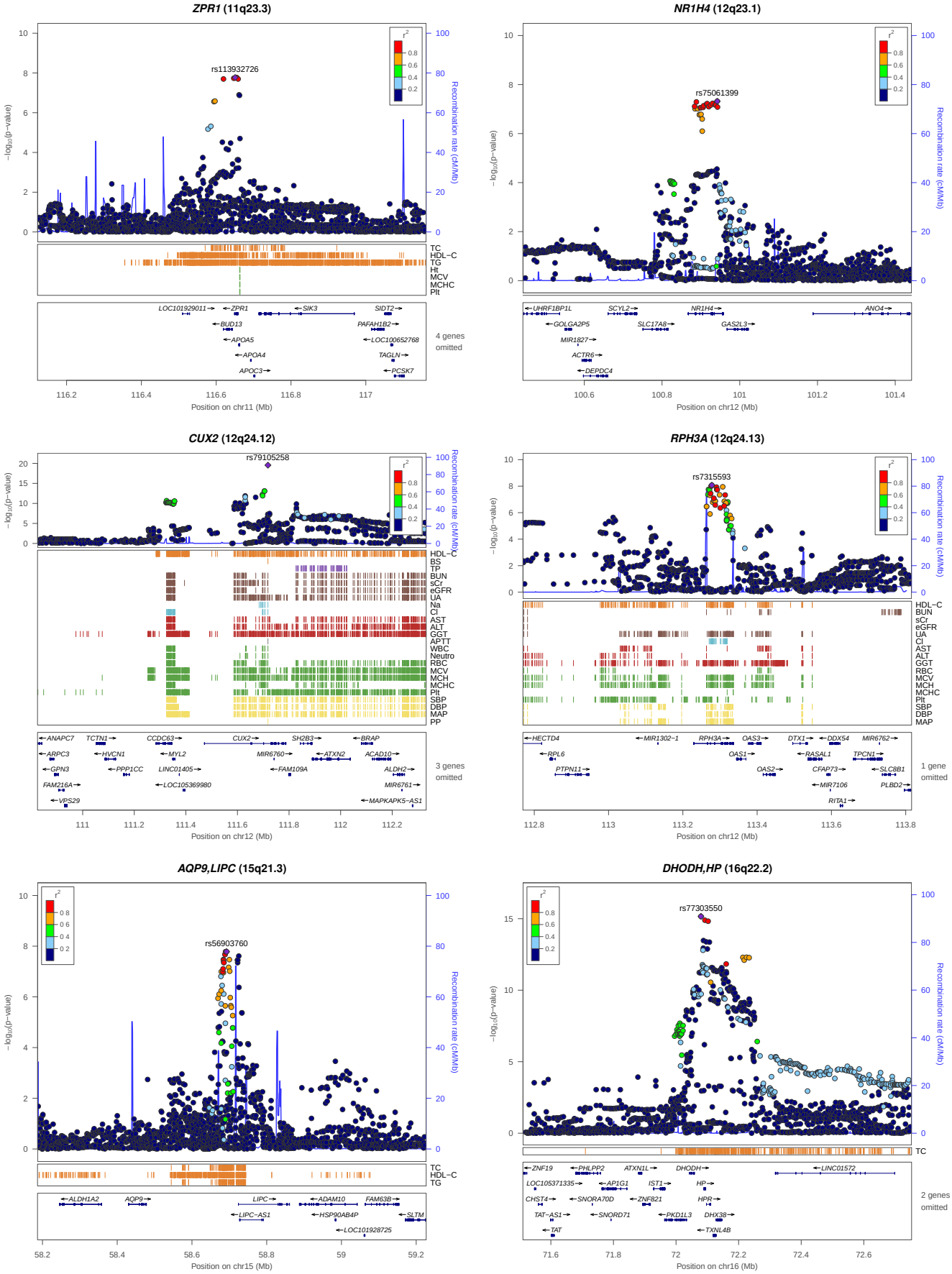
HMGCR **(5q13.3)**

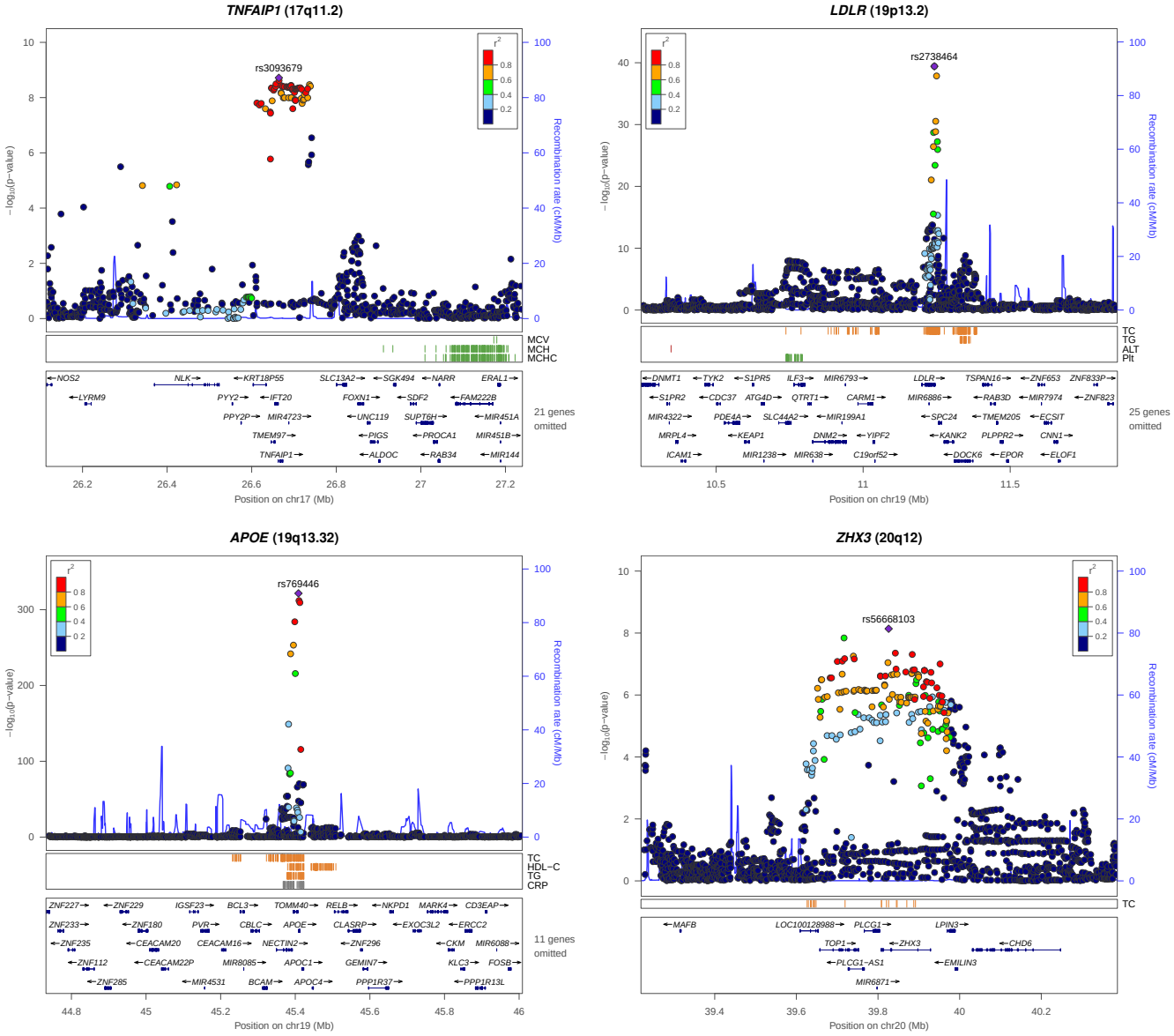


TIMD4 **(5q33.3)**

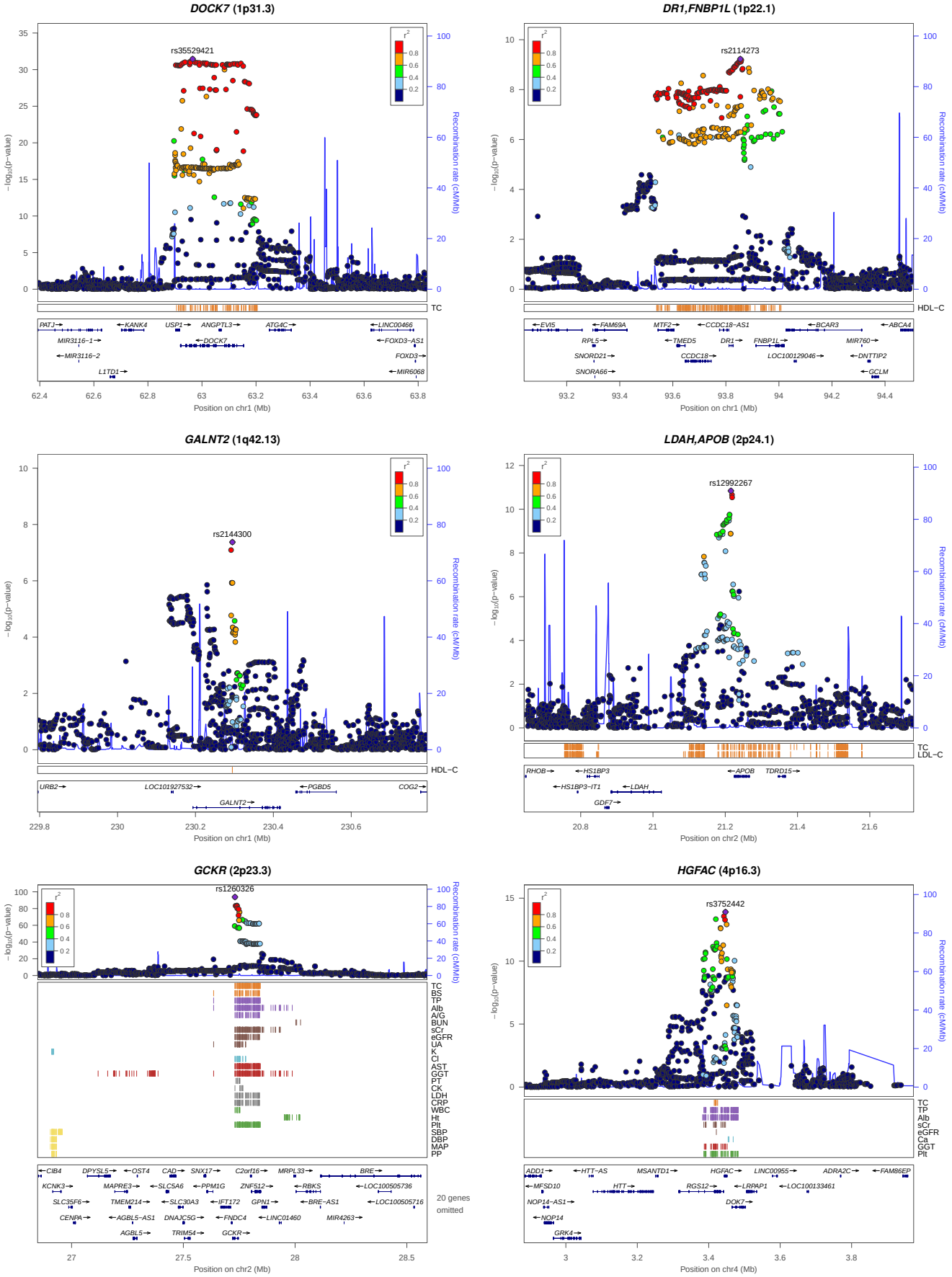


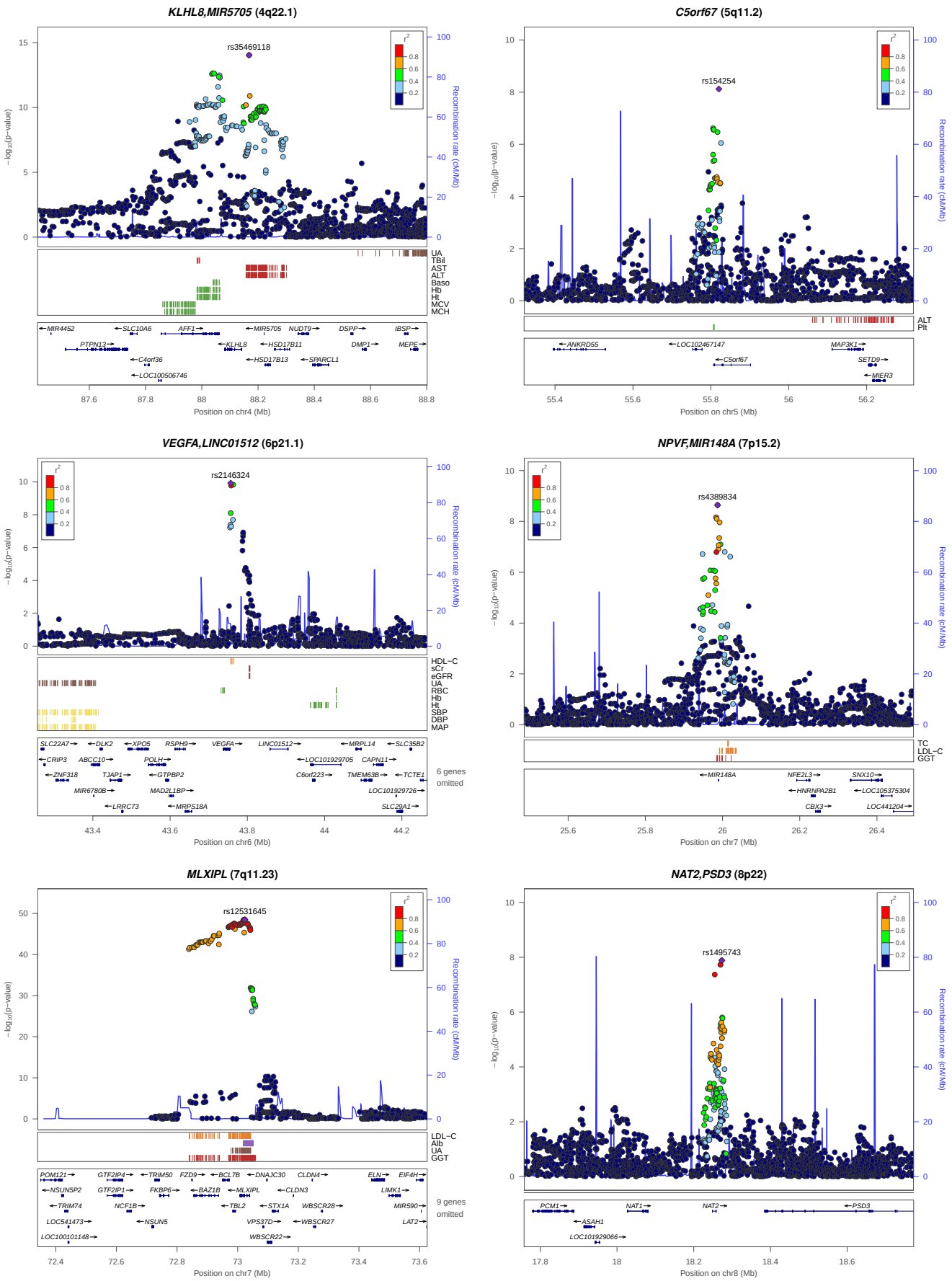

MIR148A,NFE2L3 (7p15.2)
rs28537499
TBL2 (7q11.23)
rs17145738
UBXN2B,CYP7A1 (8q12.1)
rs75214121
TRIB1,LINC00861 (8q24.13)
rs2001846
ABO (9q34.2)
rs9411378
OIT3 (10q22.1)
rs41280378
Recombination rate (cM/Mb)
Position on chr7 (Mb)
Position on chr8 (Mb)
Position on chr9 (Mb)
Position on chr10 (Mb)
9 genes omitted
12 genes omitted
8 genes omitted

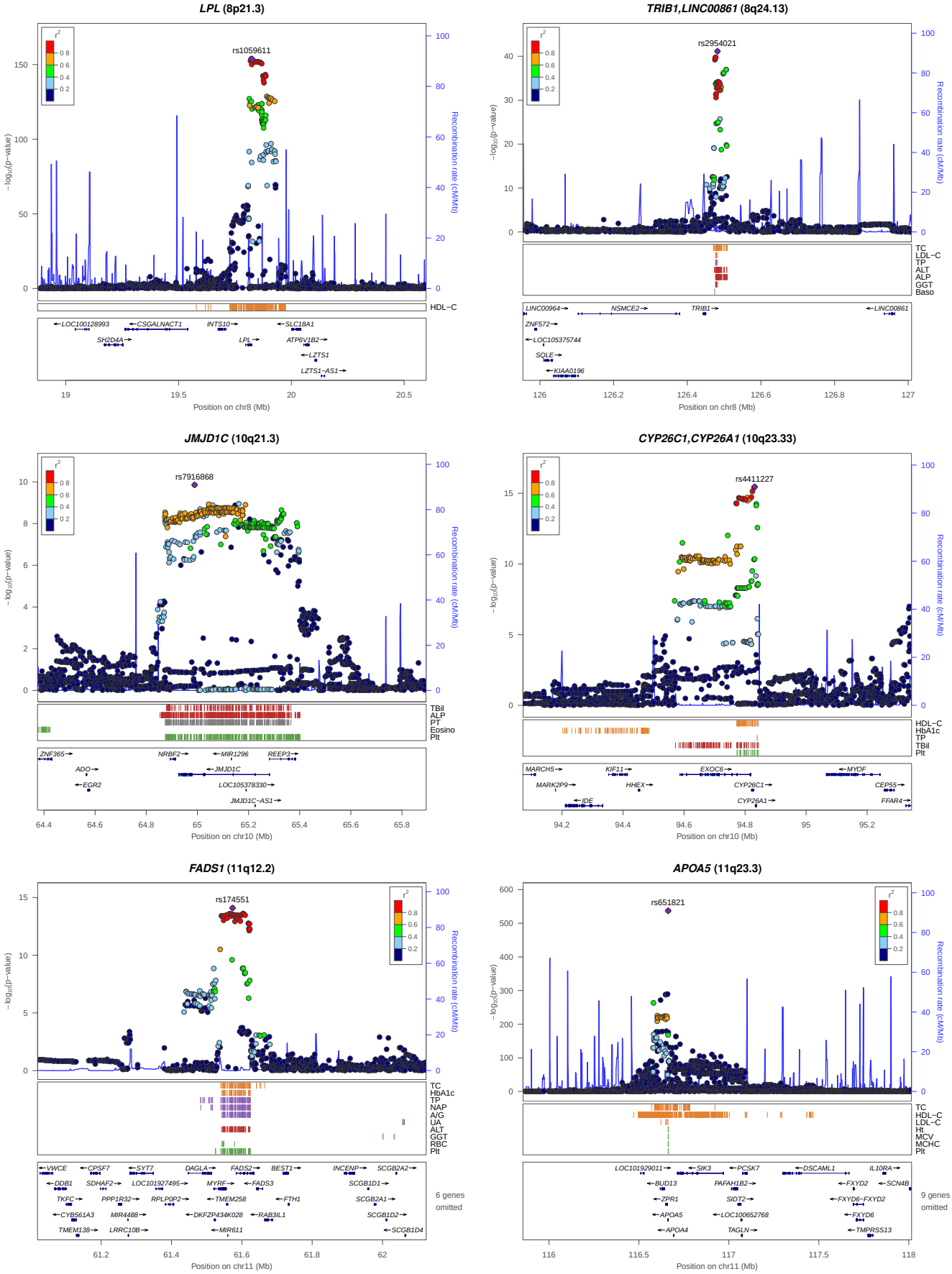

ZPR1 (11q23.3)
rs113932726
TC
HDL−C
TG
Ht
MCV
MCHC
Plt
4 genes omitted
Position on chr11 (Mb)
NR1H4 (12q23.1)
rs75061399
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
HDL−C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
3 genes omitted
Position on chr12 (Mb)
RPH3A (12q24.13)
rs7315593
1 gene omitted
Position on chr12 (Mb)
AQP9,LIPC (15q21.3)
rs56903760
Position on chr15 (Mb)
DHODH,HP (16q22.2)
rs77303550
2 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

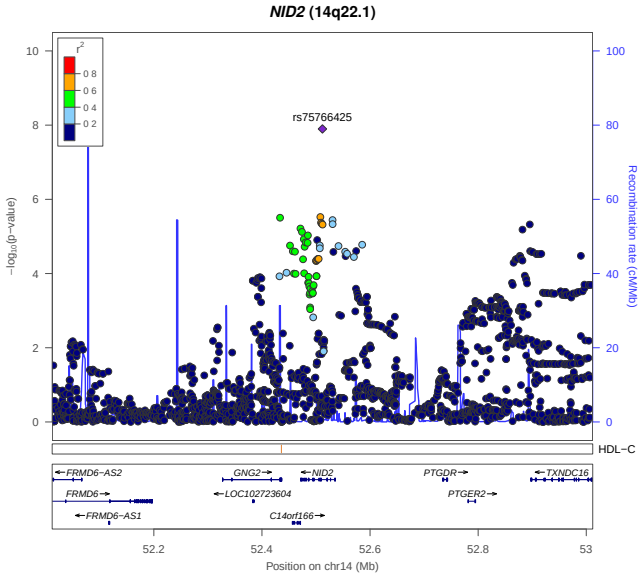

TNFAIP1 (17q11.2)
rs3093679
MCV
MCH
MCHC
21 genes omitted
Position on chr17 (Mb)
LDLR (19p13.2)
rs2738464
TC
TG
ALT
Plt
25 genes omitted
Position on chr19 (Mb)
APOE (19q13.32)
rs769446
TC
HDL−C
TG
CRP
11 genes omitted
Position on chr19 (Mb)
ZHX3 (20q12)
rs56668103
TC
Position on chr20 (Mb)
Recombination rate (cM/Mb)

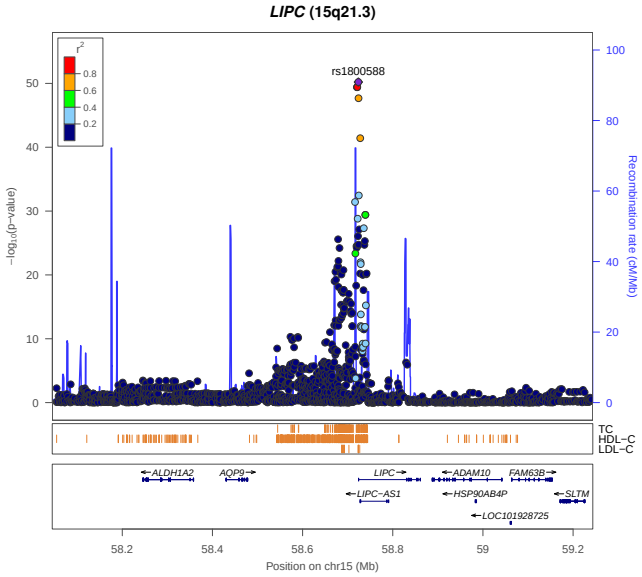
2.4 TG (n = 105,597)

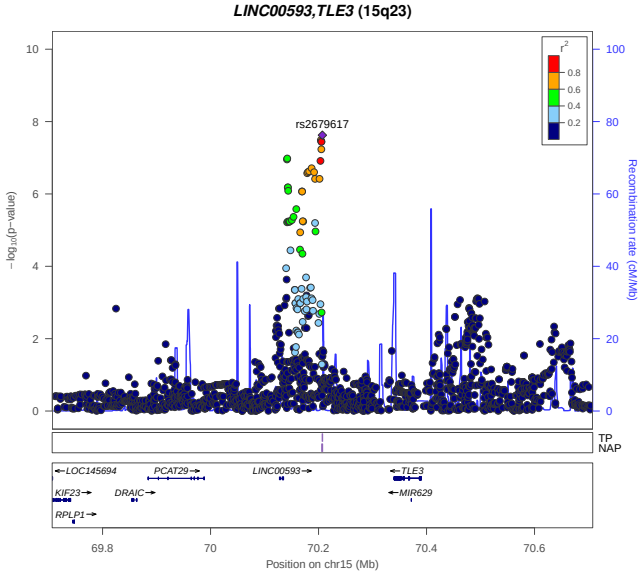


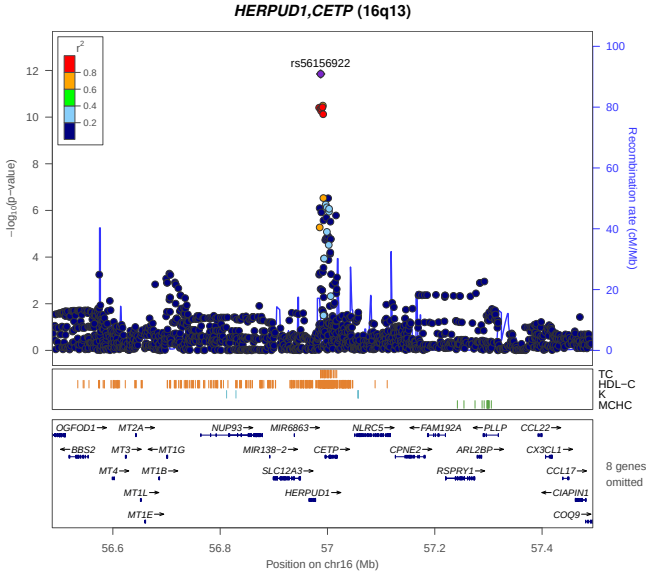

KLHL8,MIR5705 (4q22.1)
rs35469118
Position on chr4 (Mb)
C5orf67 (5q11.2)
rs154254
Position on chr5 (Mb)
VEGFA,LINC01512 (6p21.1)
rs2146324
6 genes omitted
Position on chr6 (Mb)
NPVF,MIR148A (7p15.2)
rs4389834
Position on chr7 (Mb)
MLXIPL (7q11.23)
rs12531645
9 genes omitted
Position on chr7 (Mb)
NAT2,PSD3 (8p22)
rs1495743
Position on chr8 (Mb)
Recombination rate (cM/Mb)

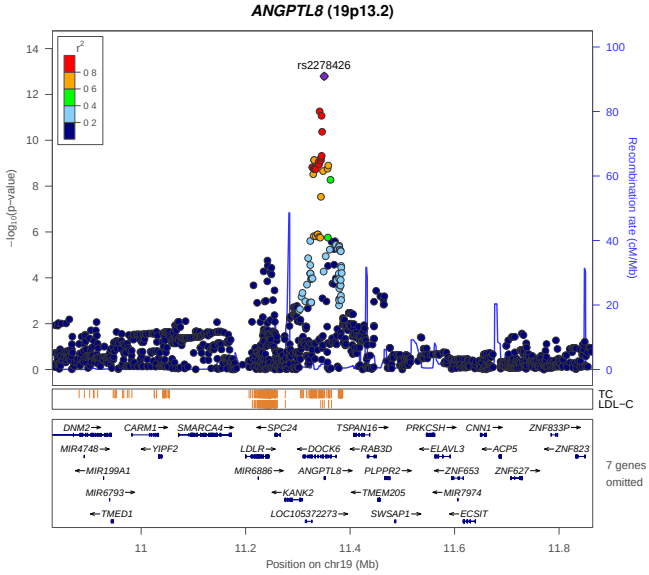

LPL (8p21.3)
rs1059611
HDL−C
TRIB1,LINC00861 (8q24.13)
rs2954021
TC
LDL−C
TP
ALT
ALP
GGT
Baso
JMJD1C (10q21.3)
rs7916868
TBil
ALP
PT
Eosino
Plt
CYP26C1,CYP26A1 (10q23.33)
rs4411227
HDL−C
HbA1c
TP
TBil
Plt
FADS1 (11q12.2)
rs174551
TC
HbA1c
TP
NAP
A/G
UA
ALT
GGT
RBC
Plt
6 genes omitted
APOA5 (11q23.3)
rs651821
TC
HDL−C
LDL−C
Ht
MCV
MCHC
Plt
9 genes omitted
−log10(p−value)
Recombination rate (cM/Mb)
Position on chr8 (Mb)
Position on chr10 (Mb)
Position on chr11 (Mb)

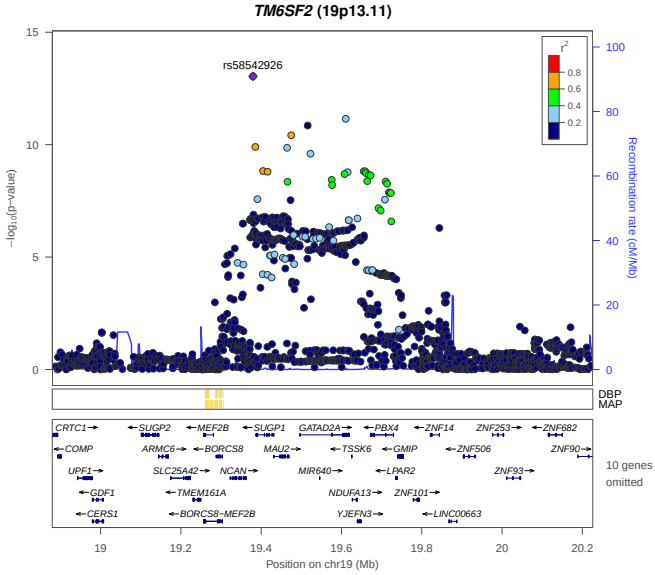

NID2 (14q22.1)
rs75766425
HDL−C
Position on chr14 (Mb)

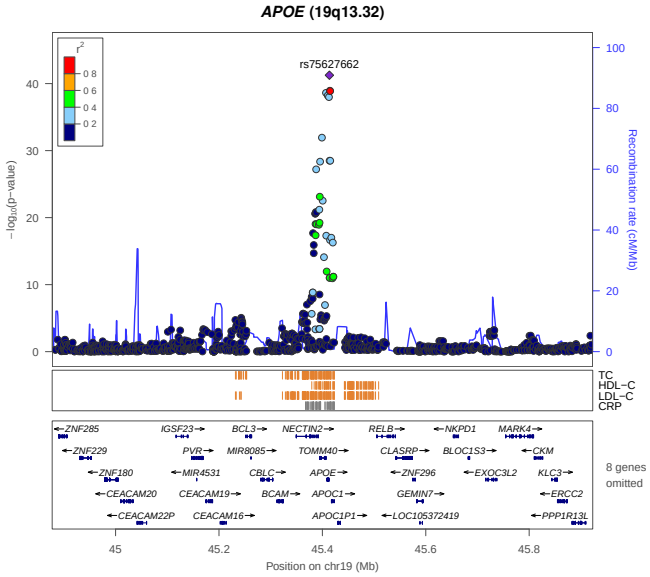

LIPC (15q21.3)
rs1800588
TC
HDL−C
LDL−C
Position on chr15 (Mb)

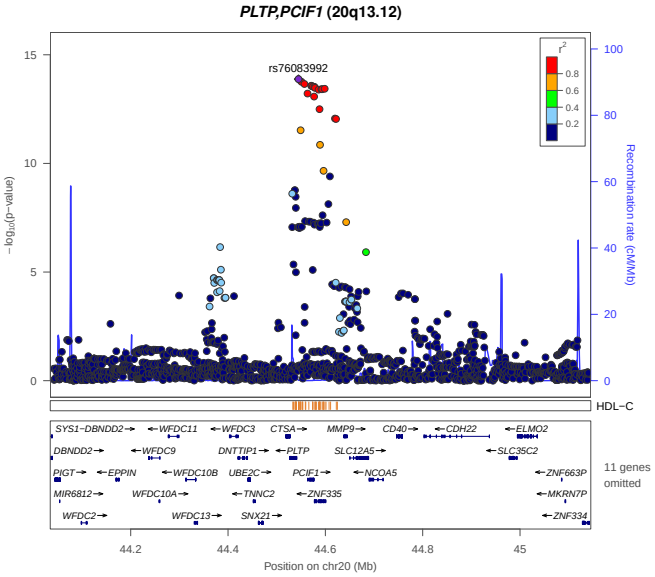

LINC00593,TLE3 (15q23)
rs2679617
TP
NAP
Position on chr15 (Mb)


HERPUD1,CETP (16q13)
rs56156922
TC
HDL−C
K
MCHC
8 genes
omitted
Position on chr16 (Mb)

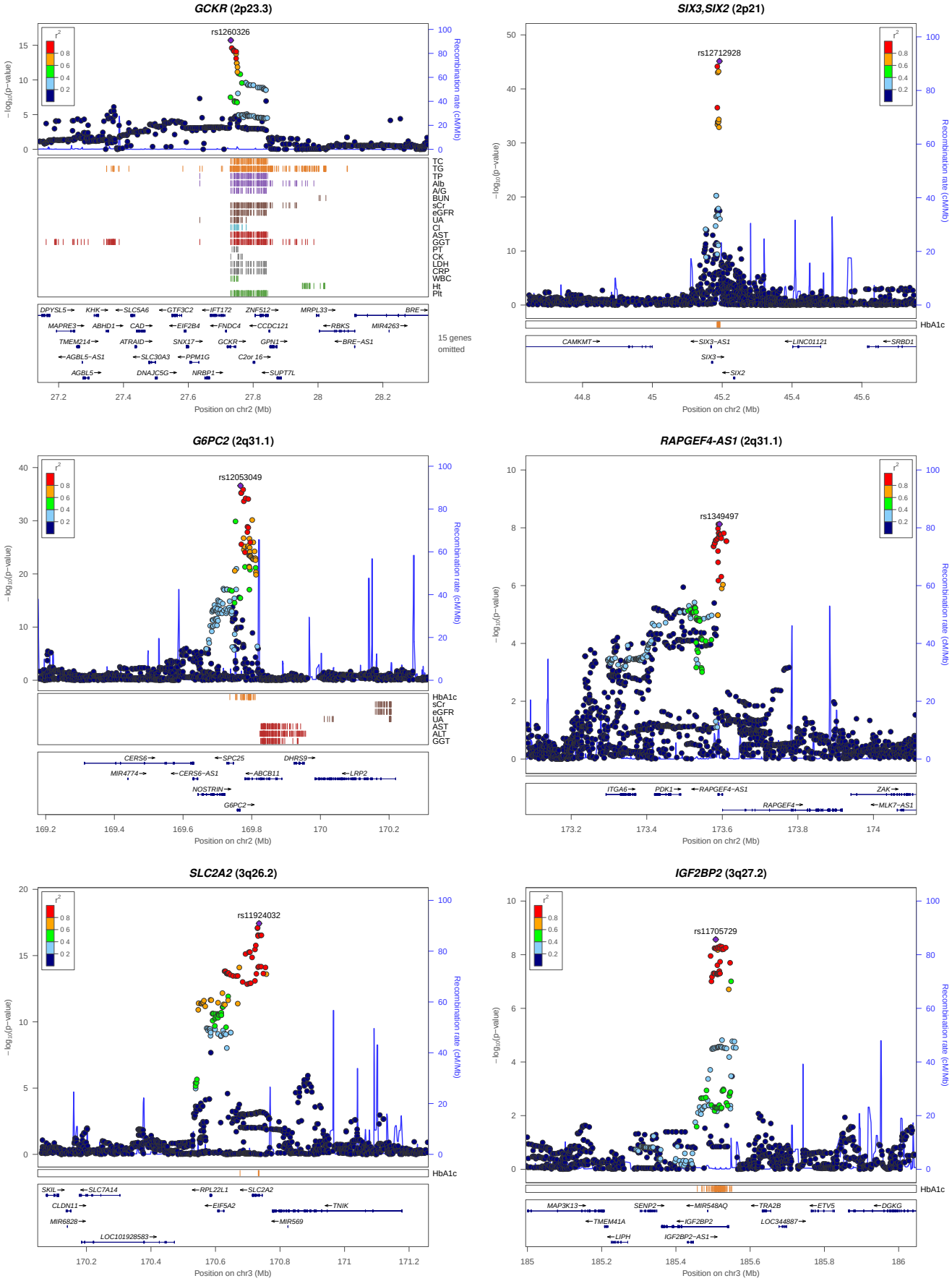

ANGPTL8 (19p13.2)
rs2278426
TC
LDL−C
7 genes
omitted
Position on chr19 (Mb)

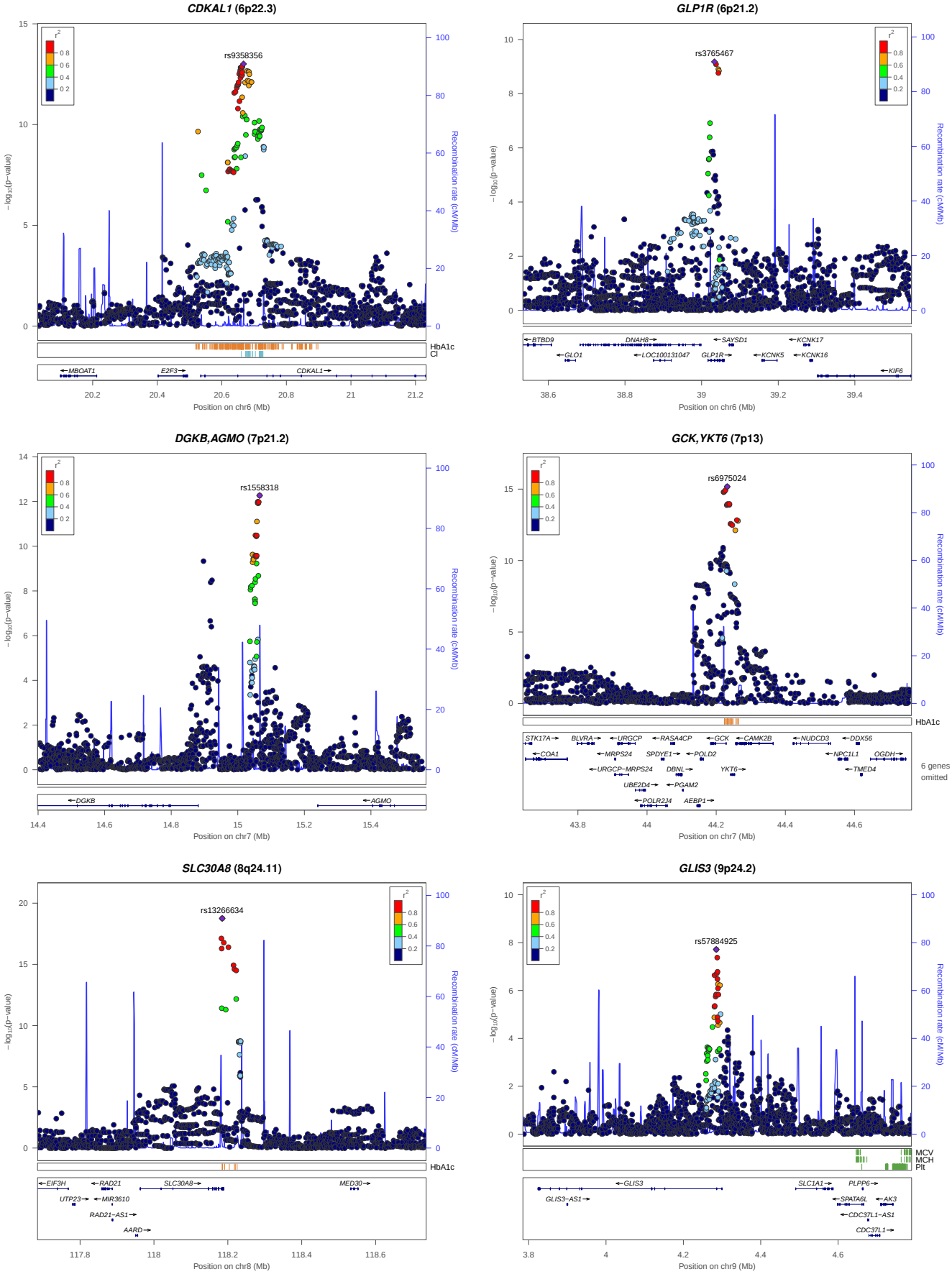

TM6SF2 (19p13.11)
rs58542926
DBP
MAP
10 genes
omitted
Position on chr19 (Mb)

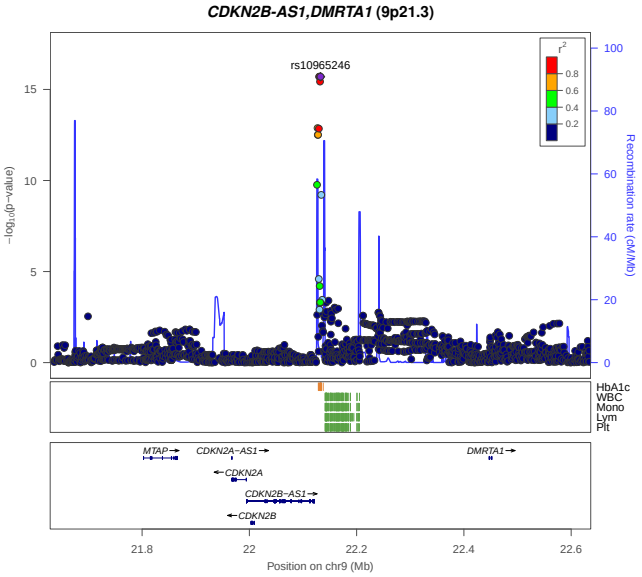

APOE (19q13.32)
rs75627662
r2
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
TC
HDL−C
LDL−C
CRP
8 genes omitted
Position on chr19 (Mb)

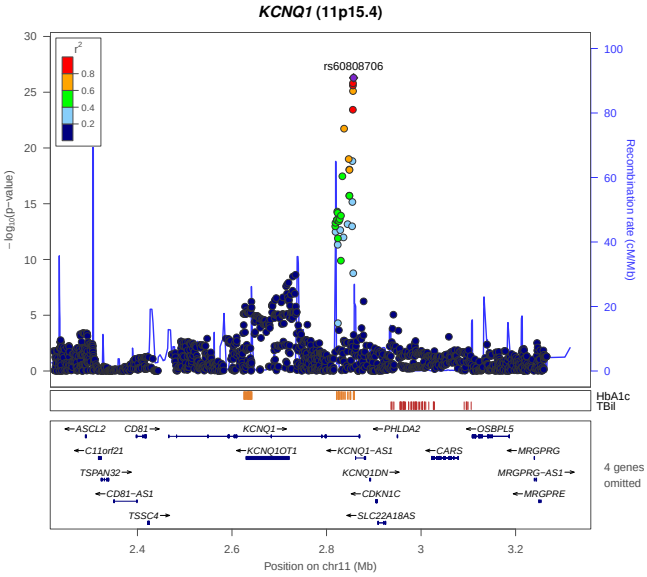

PLTP,PCIF1 (20q13.12)
rs76083992
r2
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
HDL−C
11 genes omitted
Position on chr20 (Mb)

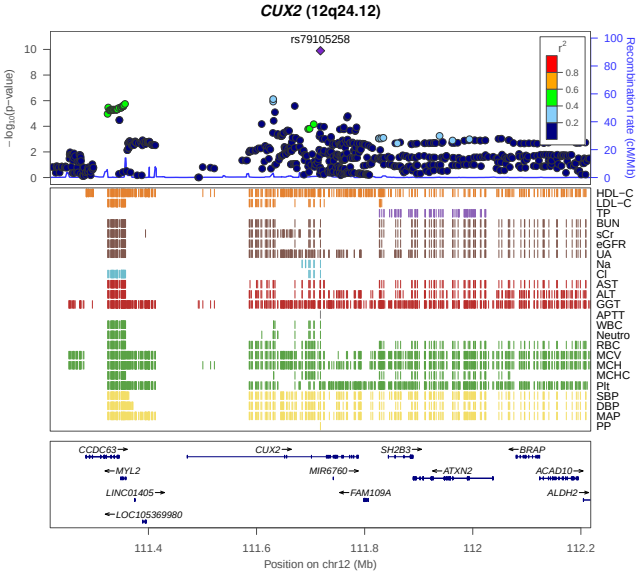
2.5 BS (n = 93,146)

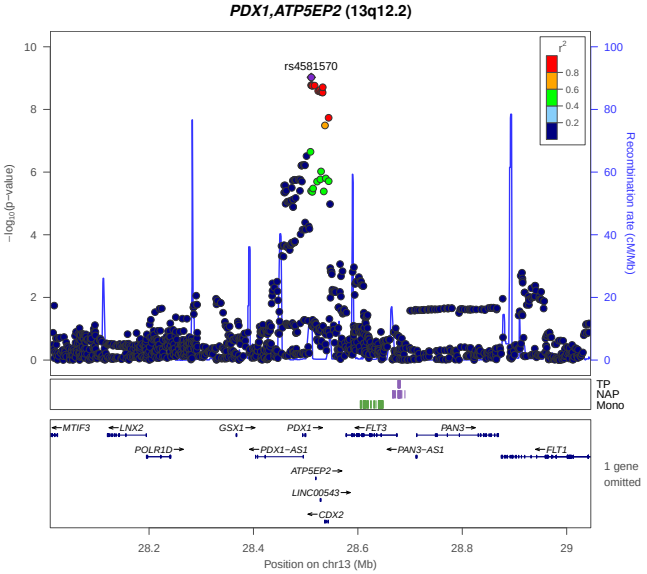

GCKR (2p23.3)
rs1260326
Recombination rate (cM/Mb)
TC
TG
TP
Alb
A/G
BUN
sCr
eGFR
UA
Cl
AST
GGT
PT
CK
LDH
CRP
WBC
Ht
Plt
15 genes omitted
Position on chr2 (Mb)
SIX3,SIX2 (2p21)
rs12712928
HbA1c
Position on chr2 (Mb)
G6PC2 (2q31.1)
rs12053049
HbA1c
sCr
eGFR
UA
AST
ALT
GGT
Position on chr2 (Mb)
RAPGEF4-AS1 (2q31.1)
rs1349497
Position on chr2 (Mb)
SLC2A2 (3q26.2)
rs11924032
HbA1c
Position on chr3 (Mb)
IGF2BP2 (3q27.2)
rs11705729
HbA1c
Position on chr3 (Mb)

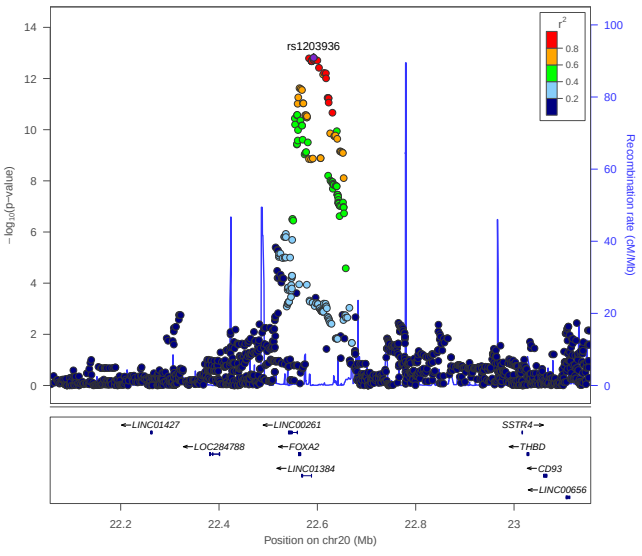

CDKAL1 (6p22.3)
rs9358356
HbA1c
CI
MBOAT1
E2F3
CDKAL1
Position on chr6 (Mb)
GLP1R (6p21.2)
rs3765467
BTBD9
DNAH8
SAYSD1
KCNK17
GLO1
LOC100131047
GLP1R
KCNK5
KCNK16
KIF6
Position on chr6 (Mb)
DGKB,AGMO (7p21.2)
rs1558318
DGKB
AGMO
Position on chr7 (Mb)
GCK,YKT6 (7p13)
rs6975024
HbA1c
STK17A
BLVRA
URGCP
RASA4CP
GCK
CAMK2B
NUDCD3
DDX56
COA1
MRPS24
SPDYE1
POLD2
NPC1L1
OGDH
URGCP-MRPS24
DBNL
YKT6
TMED4
UBE2D4
PGAM2
POLR2J4
AEBP1
6 genes omitted
Position on chr7 (Mb)
SLC30A8 (8q24.11)
rs13266634
HbA1c
EIF3H
RAD21
SLC30A8
MED30
UTP23
MIR3610
RAD21-AS1
AARD
Position on chr8 (Mb)
GLIS3 (9p24.2)
rs57884925
MCV
MCH
Plt
GLIS3
SLC1A1
PLPP6
GLIS3-AS1
SPATA6L
AK3
CDC37L1-AS1
CDC37L1
Position on chr9 (Mb)
Recombination rate (cM/Mb)
−log10(p-value)


CDKN2B-AS1,DMRTA1 (9p21.3)
rs10965246
−log10(p-value)
Recombination rate (cM/Mb)
r2
HbA1c
WBC
Mono
Lym
Plt
MTAP
CDKN2A-AS1
DMRTA1
CDKN2A
CDKN2B-AS1
CDKN2B
Position on chr9 (Mb)

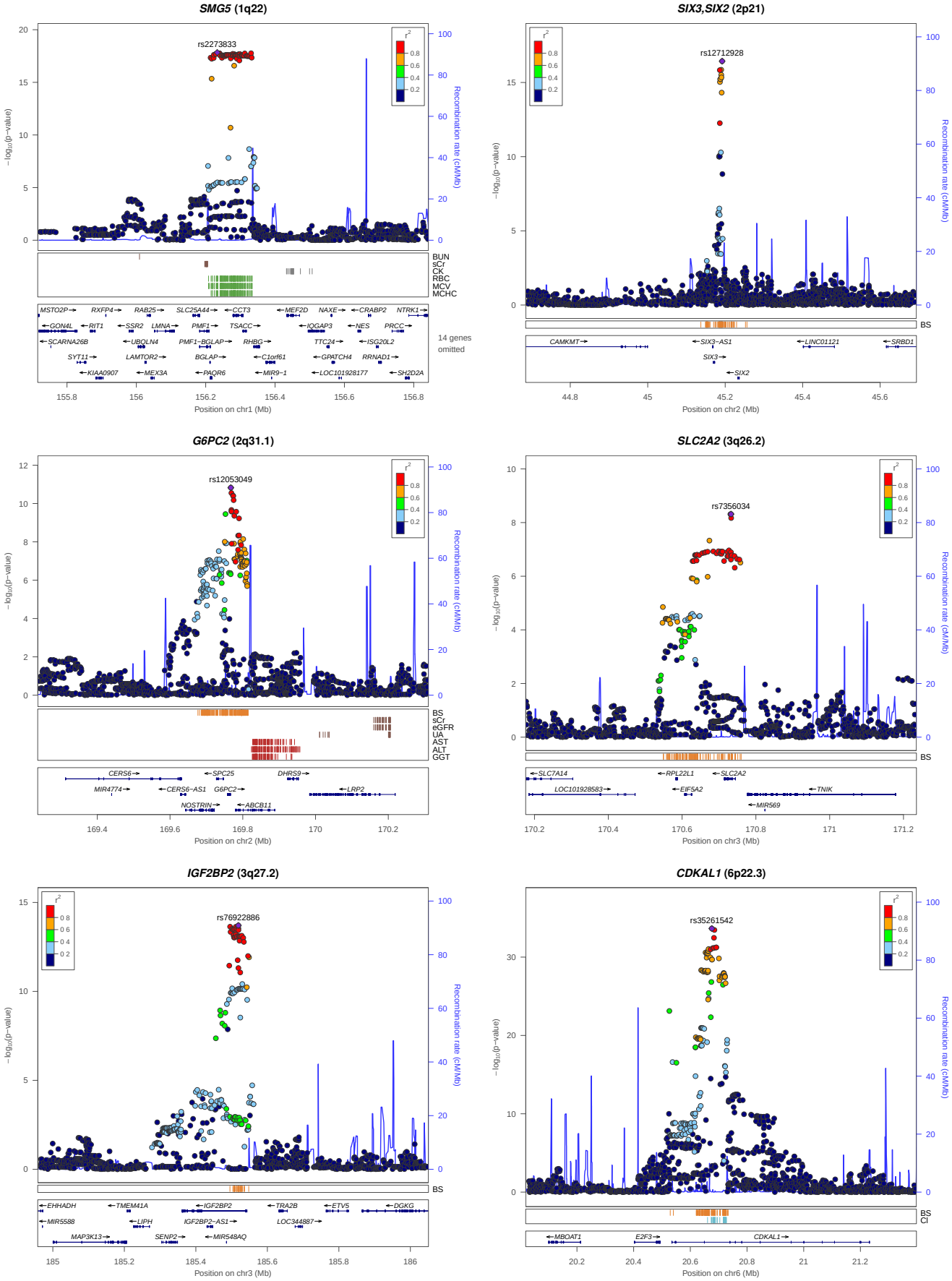

KCNQ1 (11p15.4)
rs60808706
−log10(p-value)
Recombination rate (cM/Mb)
r2
HbA1c
TBil
ASCL2
CD81
KCNQ1
PHLDA2
OSBPL5
C11orf21
KCNQ1OT1
KCNQ1-AS1
CARS
MRGPRG
TSPAN32
KCNQ1DN
MRGPRG-AS1
CD81-AS1
CDKN1C
MRGPRE
TSSC4
SLC22A18AS
4 genes omitted
Position on chr11 (Mb)

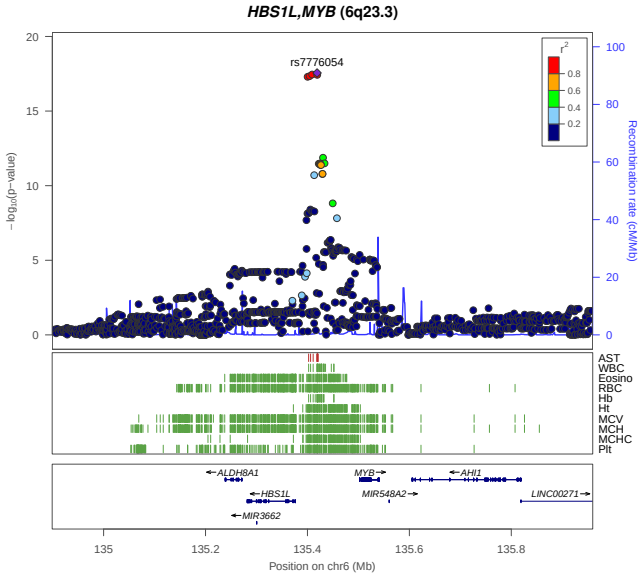

CUX2 (12q24.12)
rs79105258
−log10(p-value)
Recombination rate (cM/Mb)
r2
HDL-C
LDL-C
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
CCDC63
CUX2
SH2B3
BRAP
MYL2
MIR6760
ATXN2
ACAD10
LINC01405
FAM109A
ALDH2
LOC105369980
Position on chr12 (Mb)

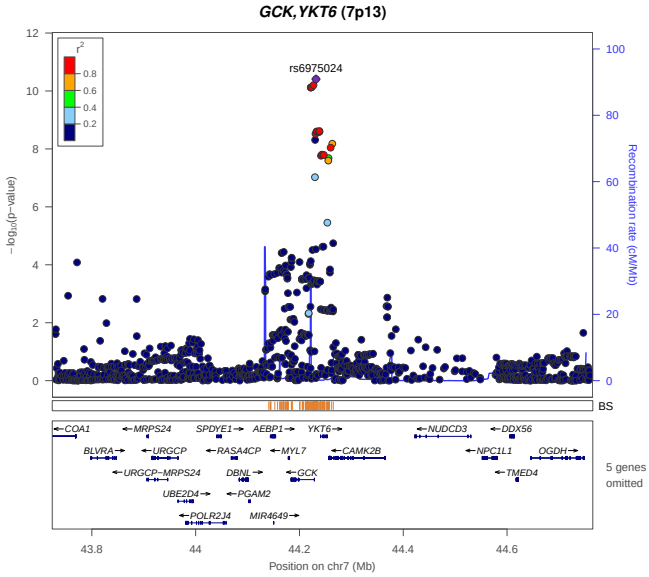

PDX1,ATP5EP2 (13q12.2)
rs4581570
−log10(p-value)
Recombination rate (cM/Mb)
r2
TP
NAP
Mono
MTIF3
LNX2
GSX1
PDX1
FLT3
PAN3
POLR1D
PDX1-AS1
PAN3-AS1
FLT1
ATP5EP2
LINC00543
CDX2
1 gene omitted
Position on chr13 (Mb)

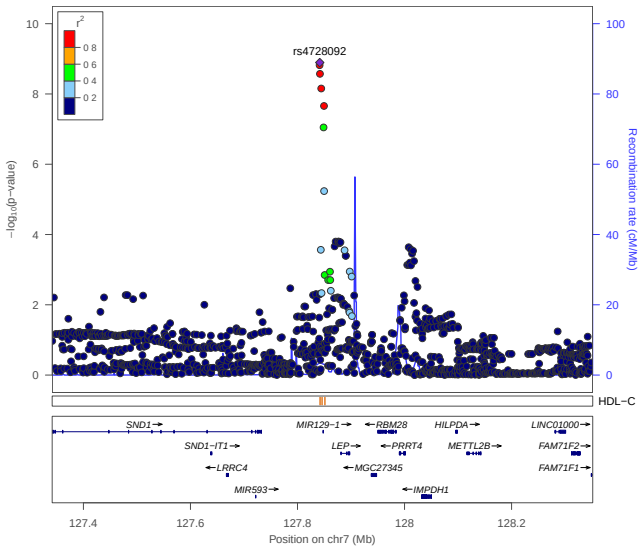

LINC01384,SSTR4 (20p11.21)
rs1203936
−log10(p-value)
Recombination rate (cM/Mb)
r2
LINC01427
LINC00261
SSTR4
LOC284788
FOXA2
THBD
LINC01384
CD93
LINC00656
Position on chr20 (Mb)

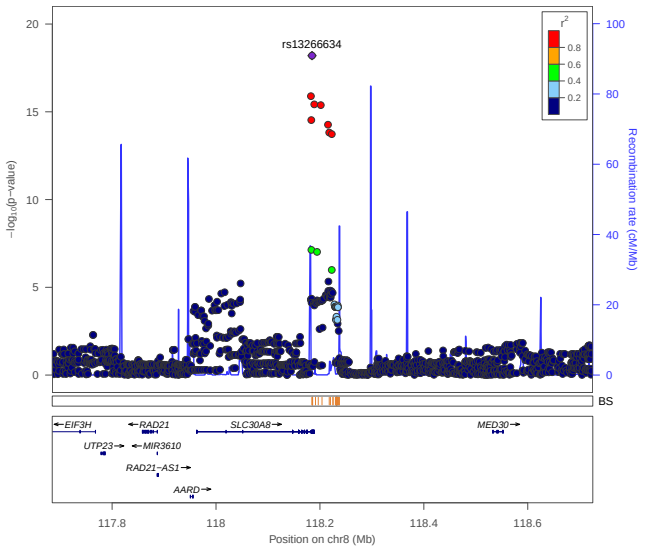
2.6 HbA1c (n = 42,790)

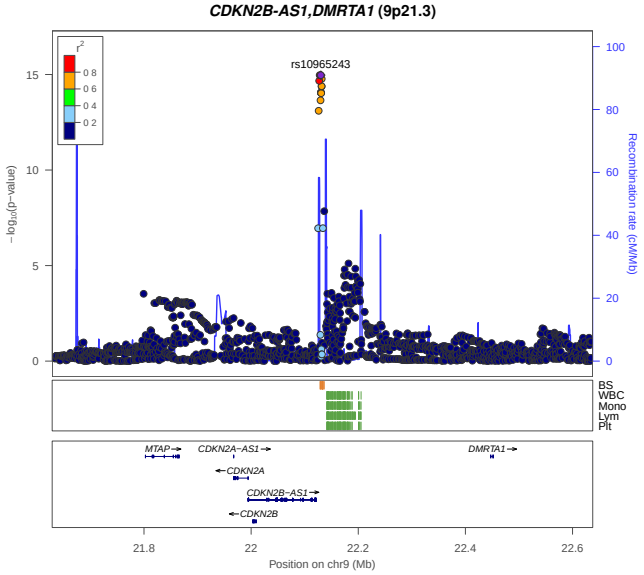


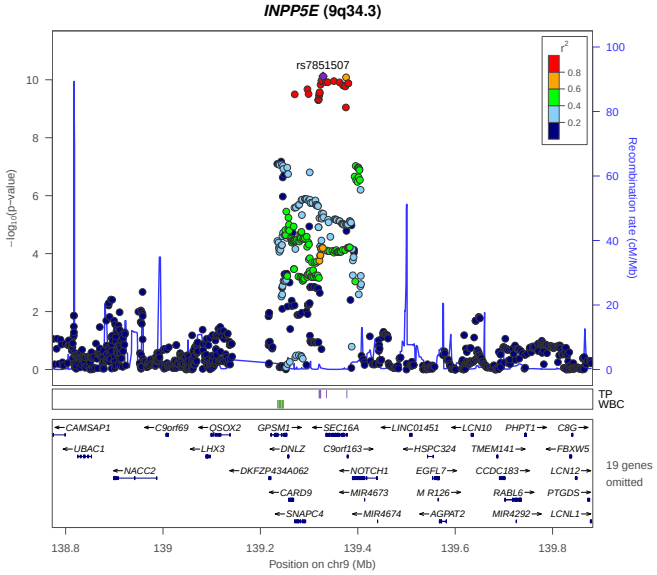

HBS1L,MYB (6q23.3)
rs7776054
AST
WBC
Eosino
RBC
Hb
Ht
MCV
MCH
MCHC
Plt
ALDH8A1
MYB
AHI1
HBS1L
MIR548A2
LINC00271
MIR3662
Position on chr6 (Mb)
Recombination rate (cM/Mb)

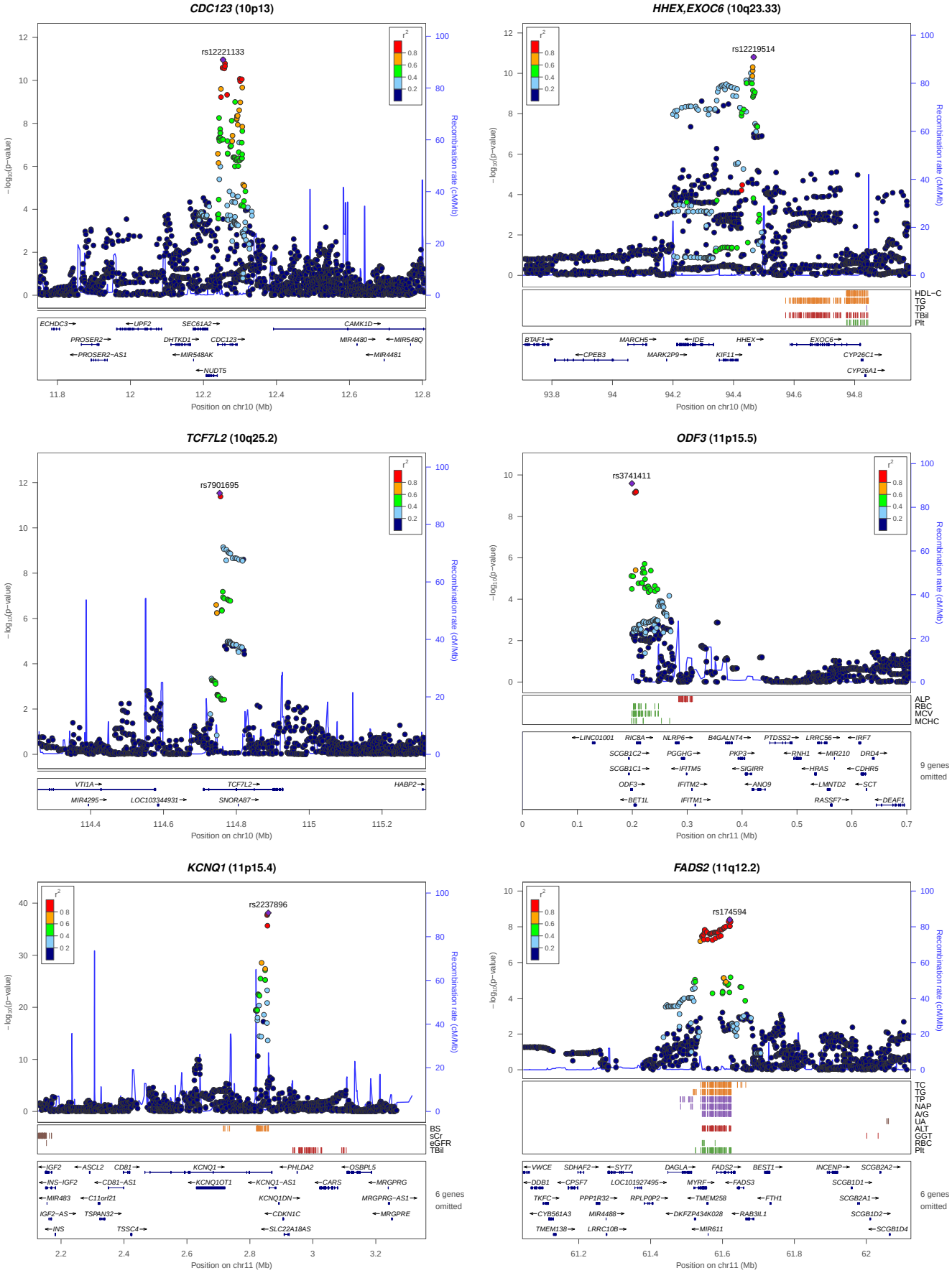

GCK,YKT6 (7p13)
rs6975024
BS
COA1
MRPS24
SPDYE1
AEBP1
YKT6
NUDCD3
DDX56
BLVRA
URGCP
RASA4CP
MYL7
CAMK2B
NPC1L1
OGDH
URGCP-MRPS24
DBNL
GCK
TMED4
UBE2D4
PGAM2
POLR2J4
MIR4649
5 genes omitted
Position on chr7 (Mb)
Recombination rate (cM/Mb)


SND1,MIR129-1 (7q32.1)
rs4728092
HDL-C
SND1
MIR129-1
RBM28
HILPDA
LINC01000
SND1-IT1
LEP
PRRT4
METTL2B
FAM71F2
LRRC4
MGC27345
FAM71F1
MIR593
IMPDH1
Position on chr7 (Mb)
Recombination rate (cM/Mb)

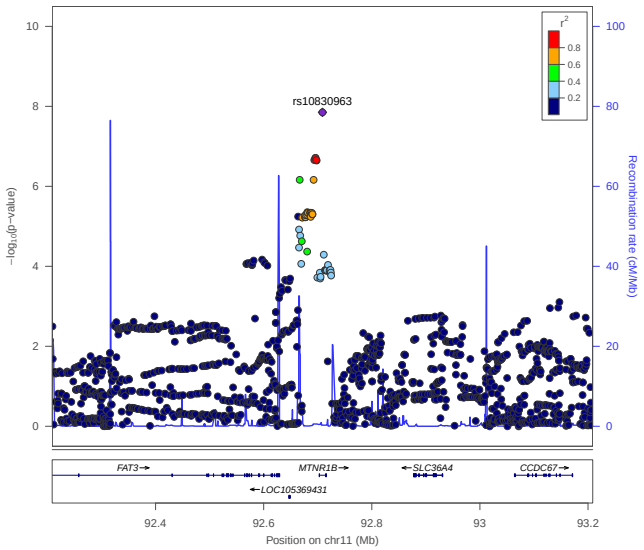

SLC30A8 (8q24.11)
rs13266634
BS
EIF3H
RAD21
SLC30A8
MED30
UTP23
MIR3610
RAD21-AS1
AARD
Position on chr8 (Mb)
Recombination rate (cM/Mb)


CDKN2B-AS1,DMRTA1 (9p21.3)
rs10965243
BS
WBC
Mono
Lym
Plt
MTAP
CDKN2A-AS1
DMRTA1
CDKN2A
CDKN2B-AS1
CDKN2B
Position on chr9 (Mb)
Recombination rate (cM/Mb)

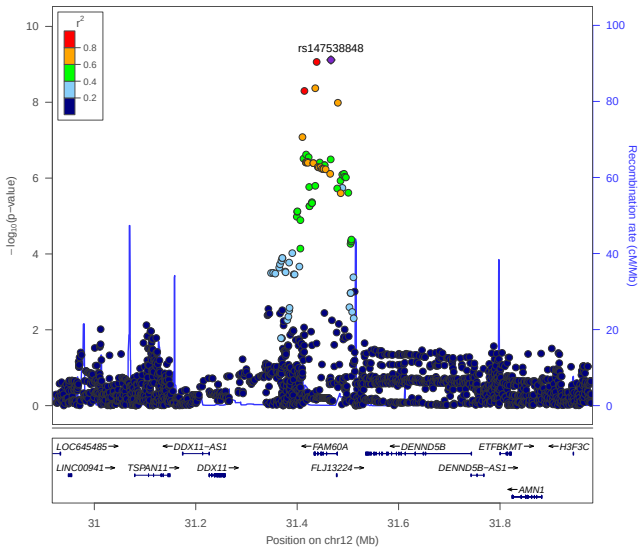

INPP5E (9q34.3)
rs7851507
TP
WBC
CAMSAP1
C9orf69
OSOX2
GPSM1
SEC16A
LINC01451
LCN10
PHPT1
C8G
UBAC1
LHX3
DNLZ
C9orf163
HSPC324
TMEM141
FBXW5
NACC2
DKFZP434A062
NOTCH1
EGFL7
CCDC183
LCN12
CARD9
MIR4673
M R126
RABL6
PTGDS
SNAPC4
MIR4674
AGPAT2
MIR4292
LCNL1
19 genes omitted
Position on chr9 (Mb)
Recombination rate (cM/Mb)


CDC123 (10p13)
rs12221133
Position on chr10 (Mb)
HHEX,EXOC6 (10q23.33)
rs12219514
HDL−C
TG
TP
TBil
Plt
Position on chr10 (Mb)
TCF7L2 (10q25.2)
rs7901695
Position on chr10 (Mb)
ODF3 (11p15.5)
rs3741411
ALP
RBC
MCV
MCHC
9 genes omitted
Position on chr11 (Mb)
KCNQ1 (11p15.4)
rs2237896
BS
sCr
eGFR
TBil
6 genes omitted
Position on chr11 (Mb)
FADS2 (11q12.2)
rs174594
TC
TG
TP
NAP
A/G
UA
ALT
GGT
RBC
Plt
6 genes omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)
−log10(p-value)

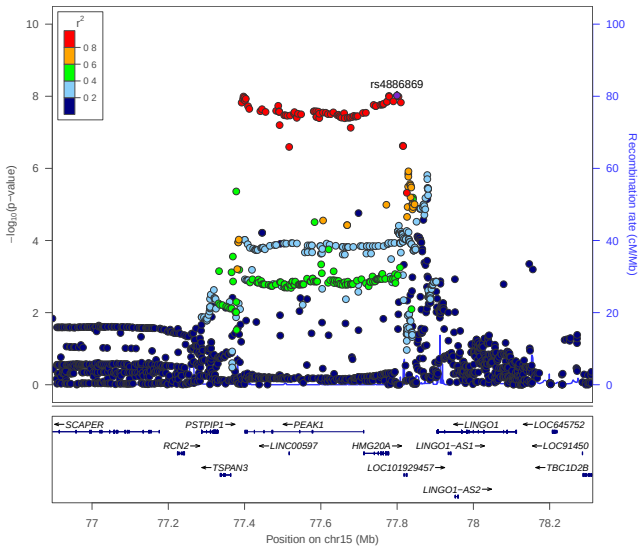
MTNR1B **(11q14.3)**



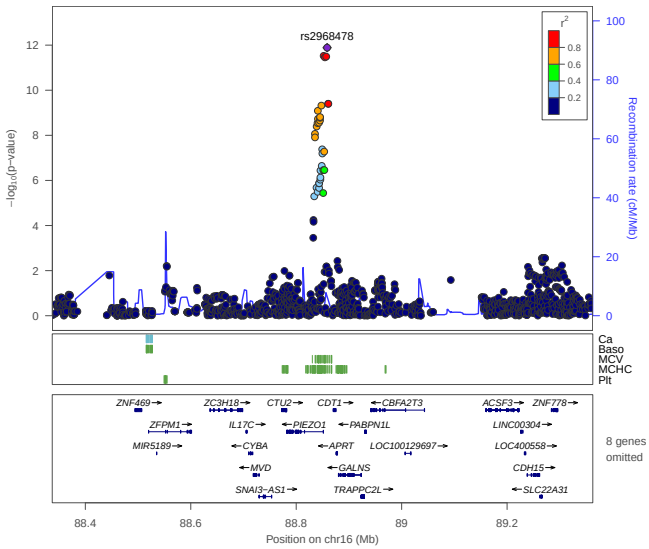
FAM60A **(12p11.21)**



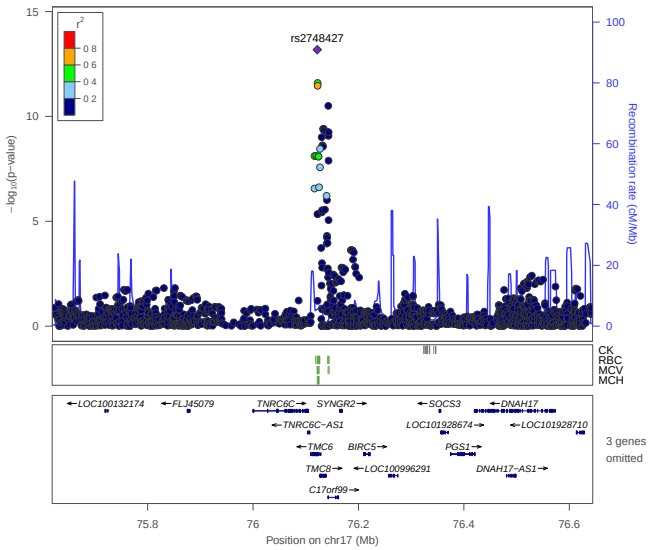
HMG20A,LINGO1 **(15q24.3)**



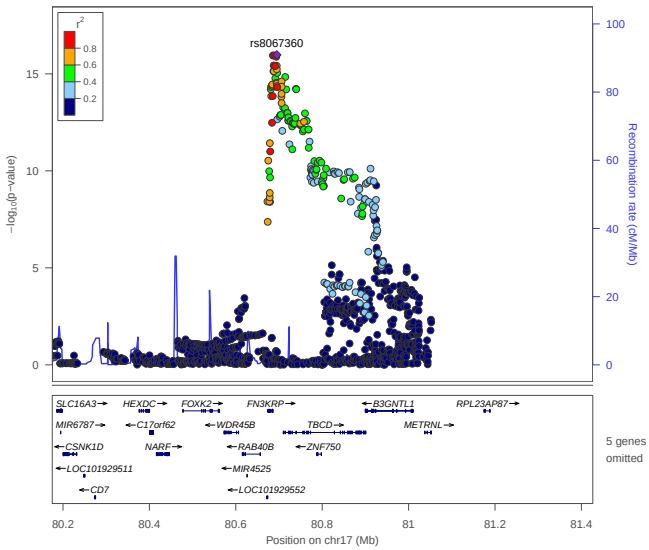
PIEZO1,CDT1 **(16q24.3)**

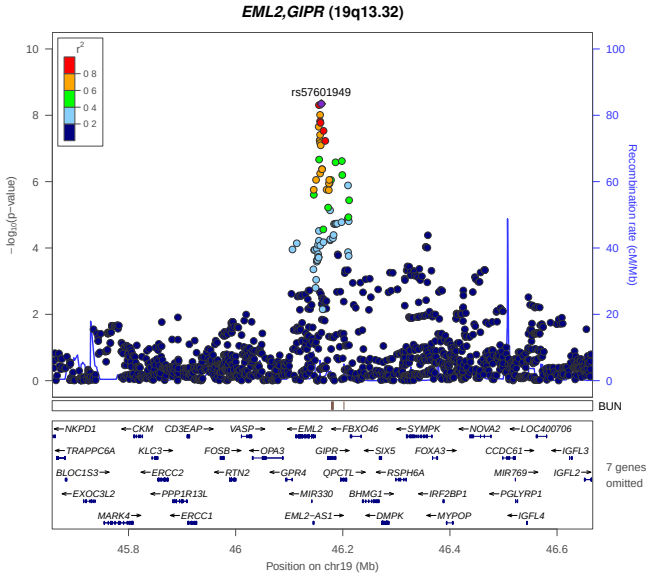


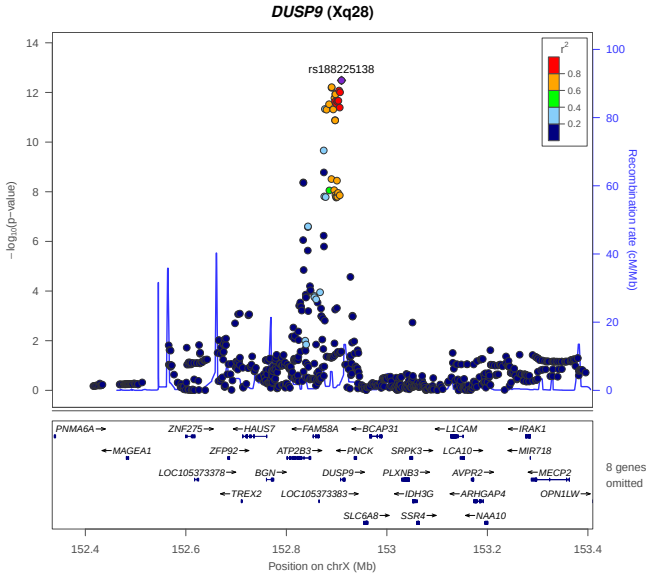
TMC6 **(17q25.3)**



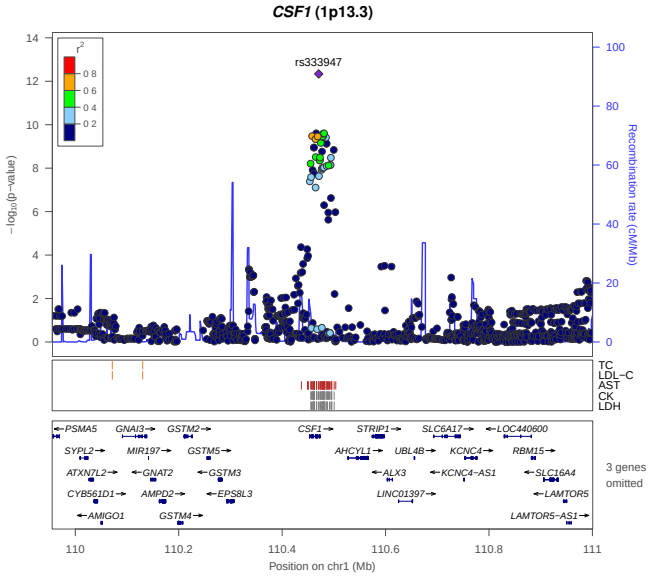
FN3K **(17q25.3)**

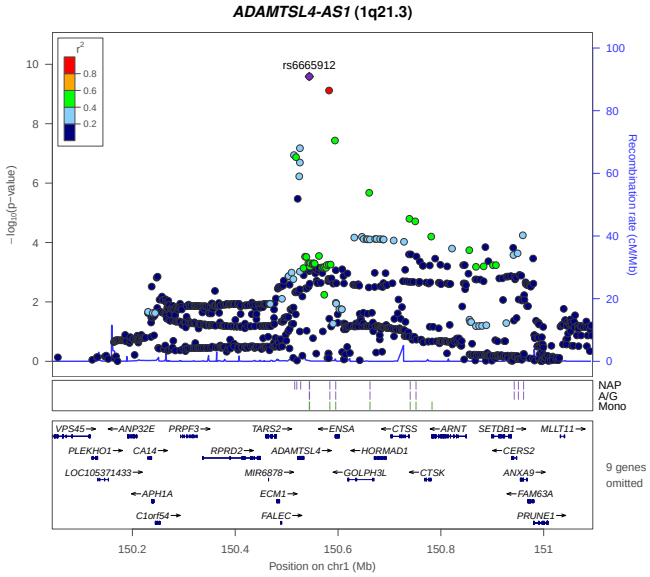


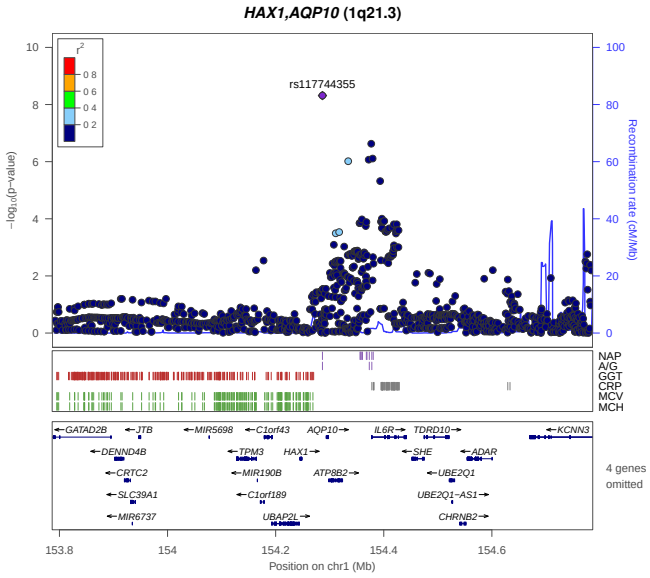

EML2,GIPR (19q13.32)
rs57601949
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
BUN
NKPD1 CKM CD3EAP VASP EML2 FBXO46 SYMPK NOVA2 LOC400706
TRAPPC6A KLC3 FOSB OPA3 GIPR SIX5 FOXA3 CCDC61 IGFL3
BLOC1S3 ERCC2 RTN2 GPR4 QPCTL RSPH6A MIR769 IGFL2
EXOC3L2 PPP1R13L MIR330 BHMG1 IRF2BP1 PGLYRP1
MARK4 ERCC1 EML2-AS1 DMPK MYPOP IGFL4
7 genes omitted
45.8 46 46.2 46.4 46.6
Position on chr19 (Mb)

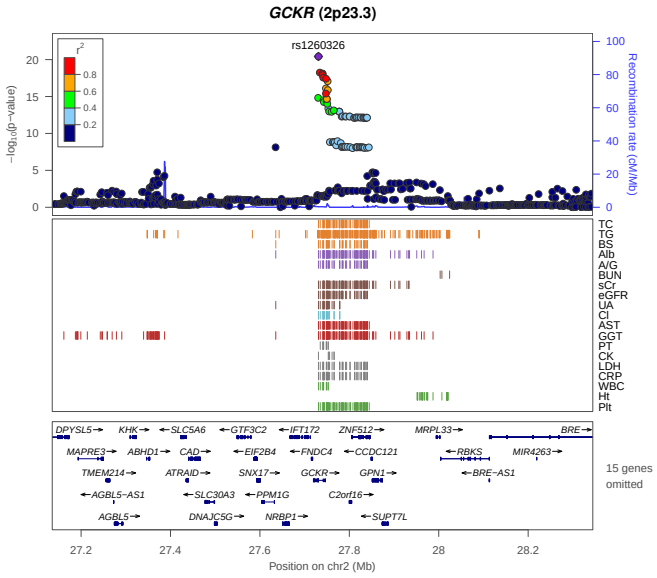

DUSP9 (Xq28)
rs188225138
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
PNMA6A ZNF275 HAUS7 FAM58A BCAP31 L1CAM IRAK1
MAGEA1 ZFP92 ATP2B3 PNCK SRPK3 LCA10 MIR718
LOC105373378 BGN DUSP9 PLXNB3 AVPR2 MECP2
TREX2 LOC105373383 IDH3G ARHGAP4 OPN1LW
SLC6A8 SSR4 NAA10
8 genes omitted
152.4 152.6 152.8 153 153.2 153.4
Position on chrX (Mb)

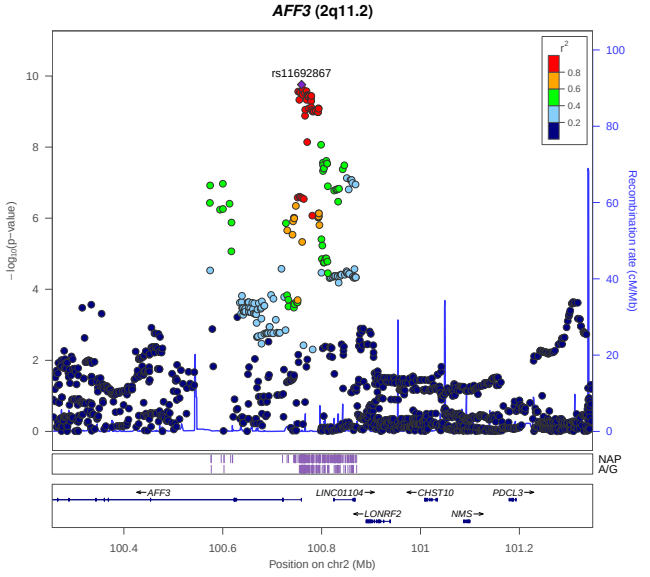
2.7 TP (n = 113,509)

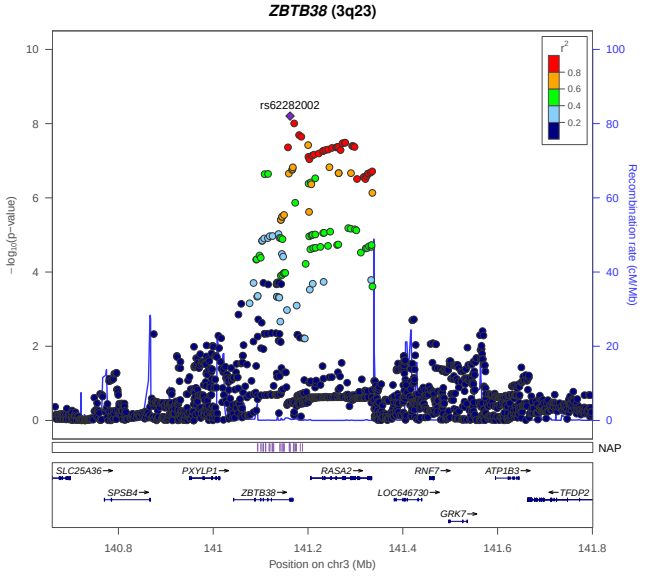




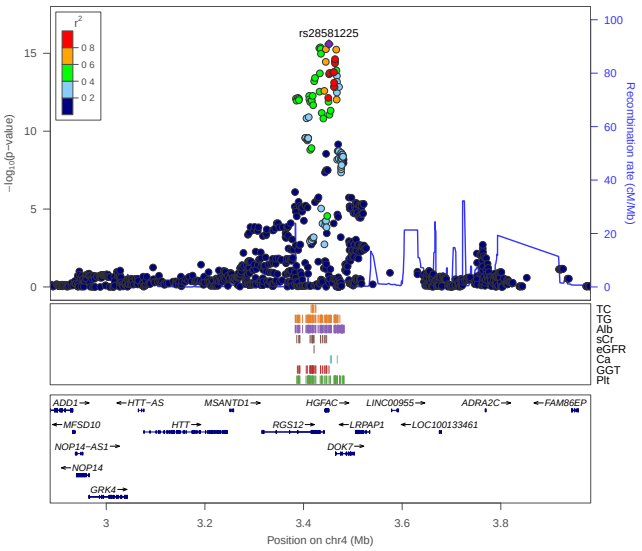




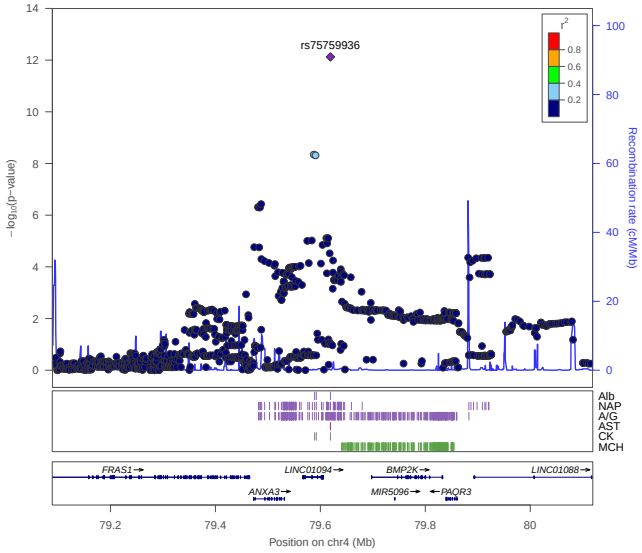




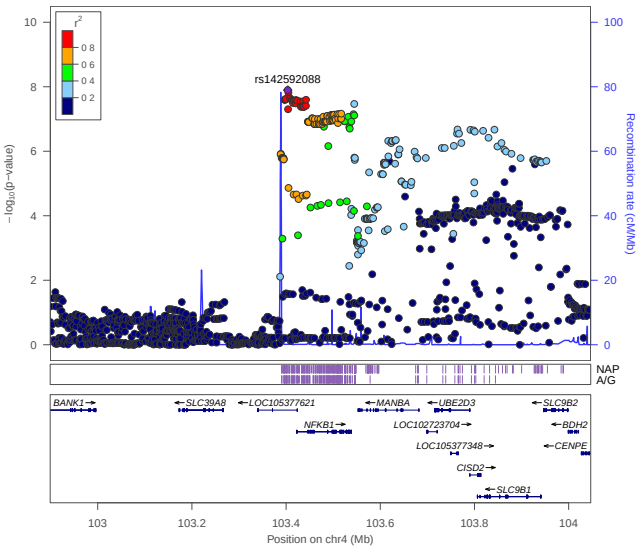
***HGFAC* (4p16.3)**



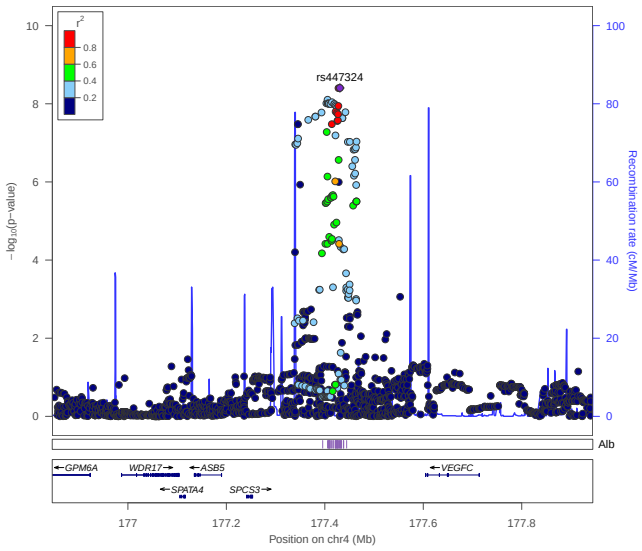
***LINC01094,BMP2K* (4q21.21)**



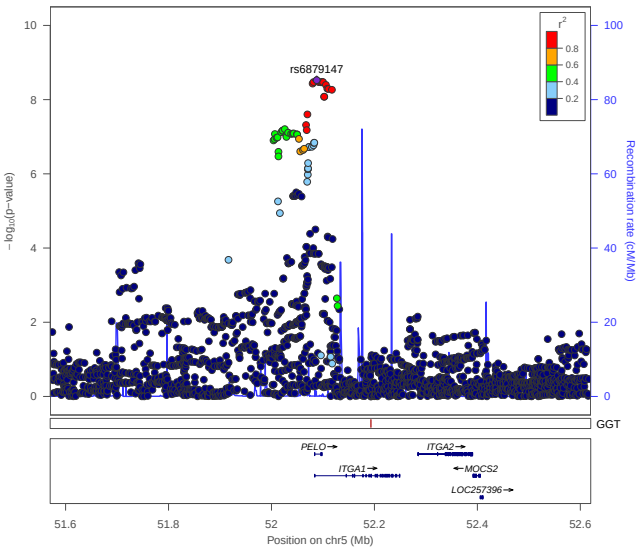
***SLC39A8,NFKB1* (4q24)**



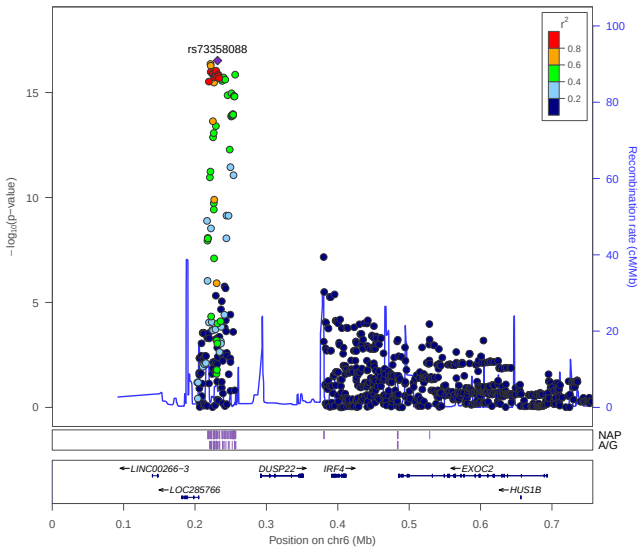
***SPCS3,VEGFC* (4q34.2)**

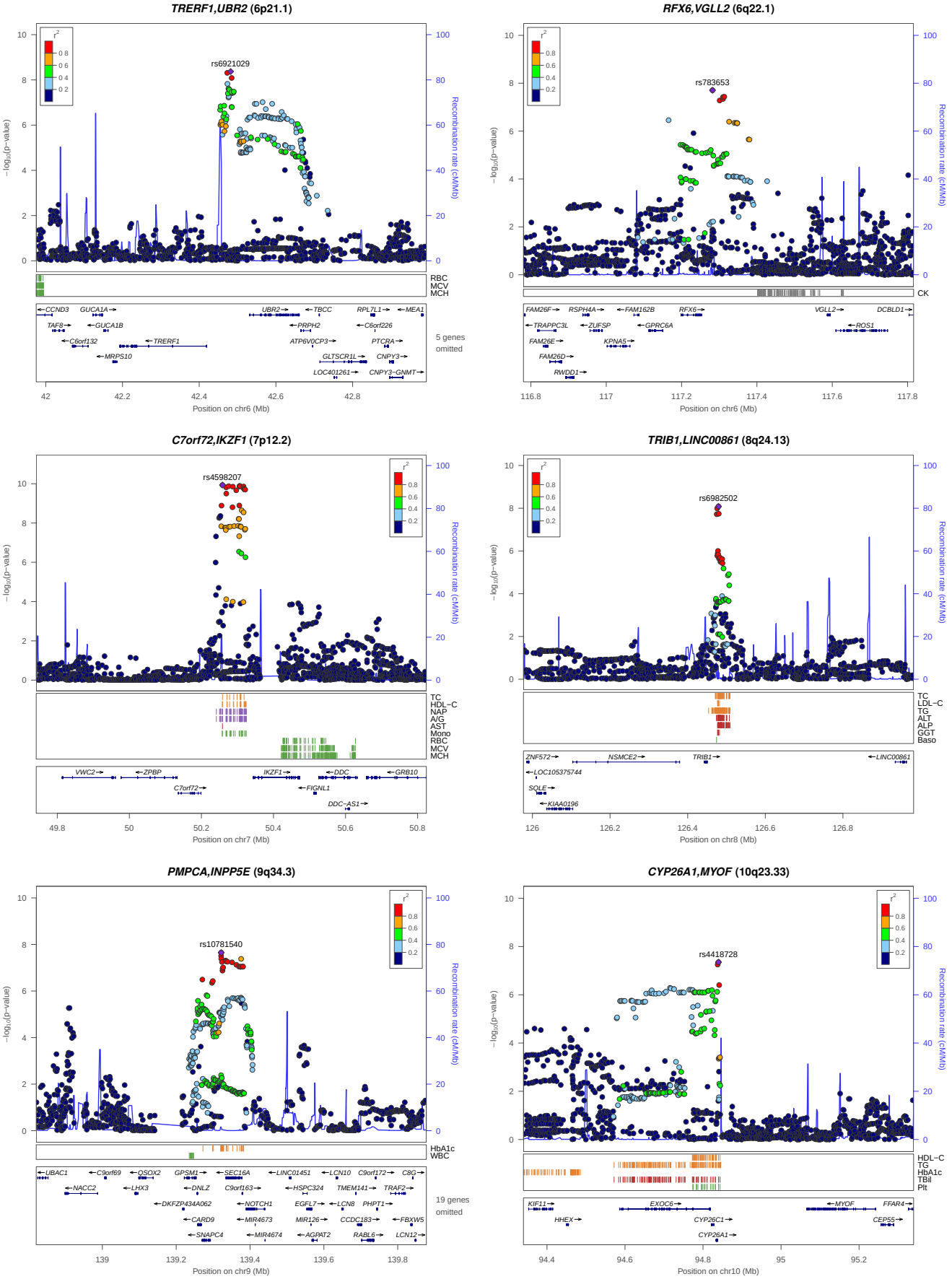


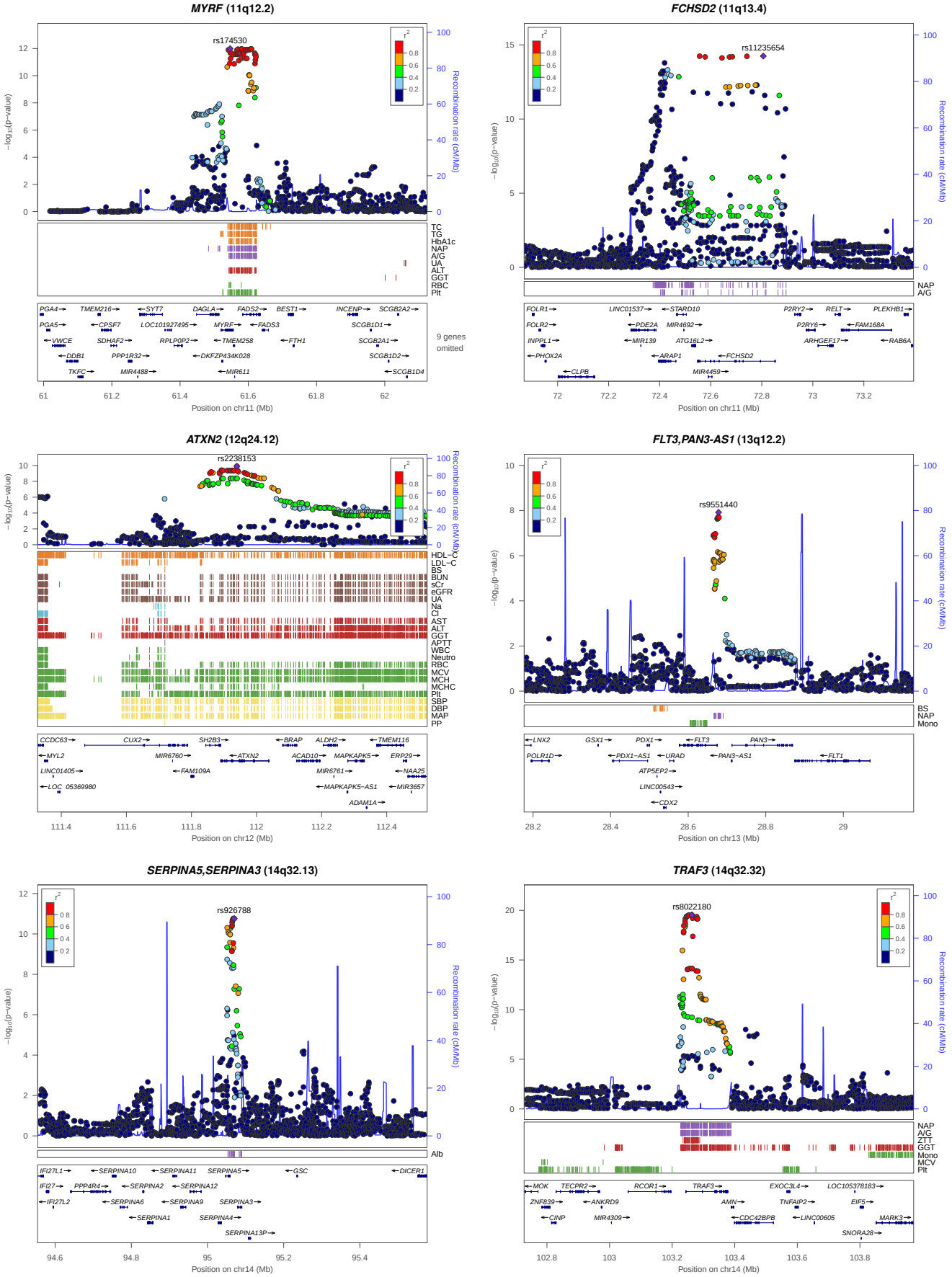
***ITGA1,PELO* (5q11.2)**



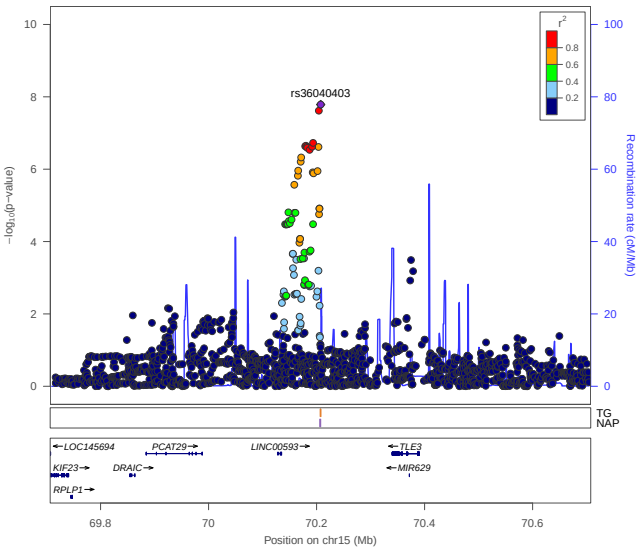
***LOC285766,DUSP22* (6p25.3)**



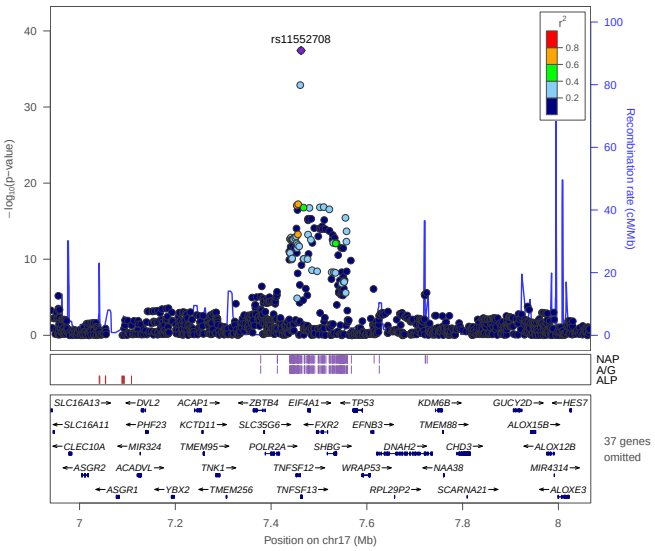

TRERF1,UBR2 (6p21.1)
rs6921029
RBC
MCV
MCH
5 genes omitted
Position on chr6 (Mb)
RFX6,VGLL2 (6q22.1)
rs783653
CK
Position on chr6 (Mb)
C7orf72,IKZF1 (7p12.2)
rs4598207
TC
HDL−C
NAP
A/G
AST
Mono
RBC
MCV
MCH
Position on chr7 (Mb)
TRIB1,LINC00861 (8q24.13)
rs6982502
TC
LDL−C
TG
ALT
ALP
GGT
Baso
Position on chr8 (Mb)
PMPCA,INPP5E (9q34.3)
rs10781540
HbA1c
WBC
19 genes omitted
Position on chr9 (Mb)
CYP26A1,MYOF (10q23.33)
rs4418728
HDL−C
TG
HbA1c
TBil
Plt
Position on chr10 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)


MYRF (11q12.2)
rs174530
TC
TG
HbA1c
NAP
A/G
UA
ALT
GGT
RBC
Plt
9 genes omitted
Position on chr11 (Mb)
FCHSD2 (11q13.4)
rs11235654
NAP
A/G
Position on chr11 (Mb)
ATXN2 (12q24.12)
rs2238153
HDL_C
LDL_C
BS
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
Position on chr12 (Mb)
FLT3,PAN3-AS1 (13q12.2)
rs9551440
BS
NAP
Mono
Position on chr13 (Mb)
SERPINA5,SERPINA3 (14q32.13)
rs926788
Alb
Position on chr14 (Mb)
TRAF3 (14q32.32)
rs8022180
NAP
A/G
ZTT
GGT
Mono
MCV
Plt
Position on chr14 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

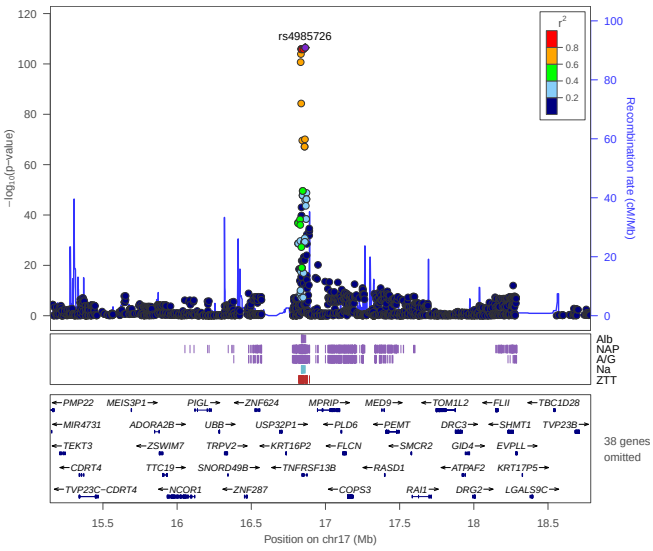
LINC00593,TLE3 **(15q23)**



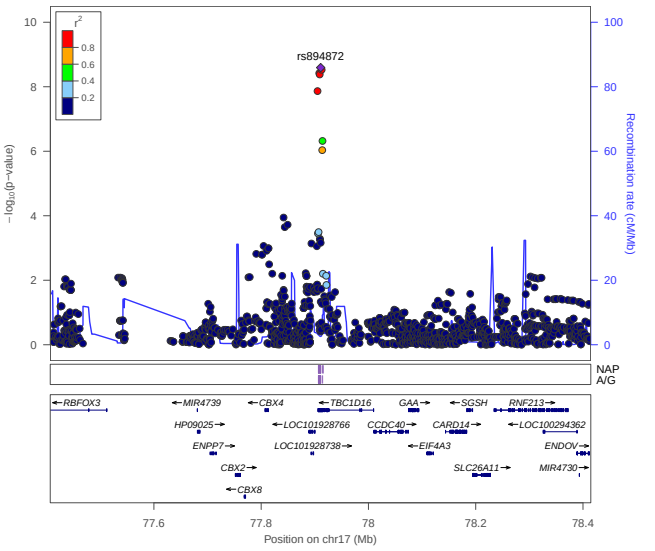
TNFSF13 **(17p13.1)**



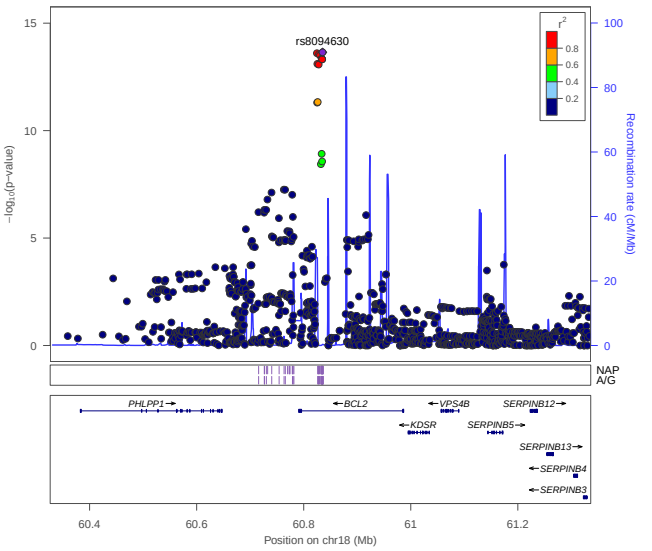
TNFRSF13B **(17p11.2)**



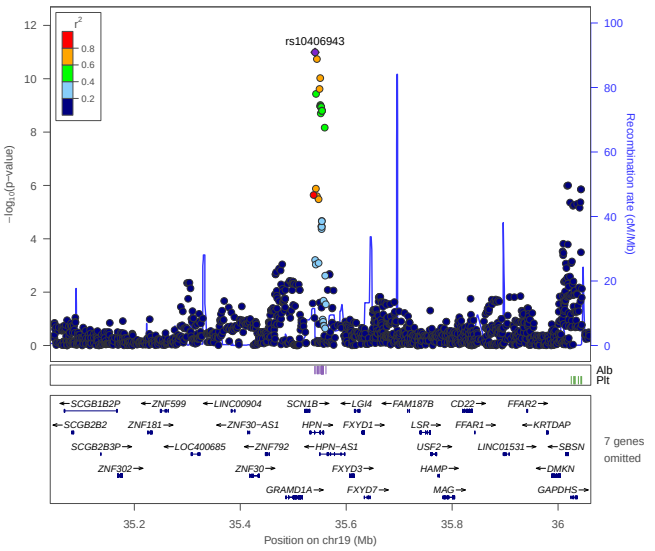
TBC1D16 **(17q25.3)**

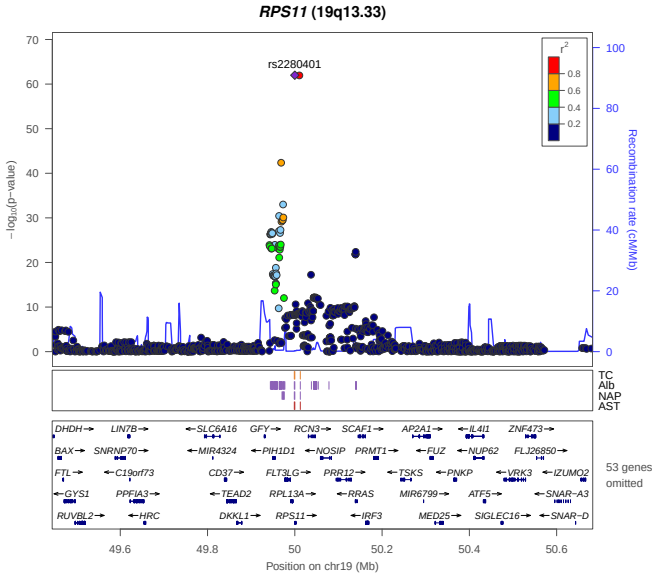


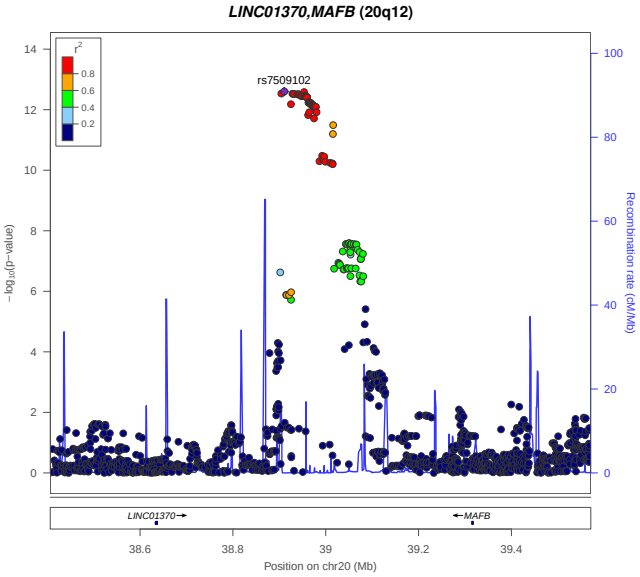
BCL2 **(18q21.33)**



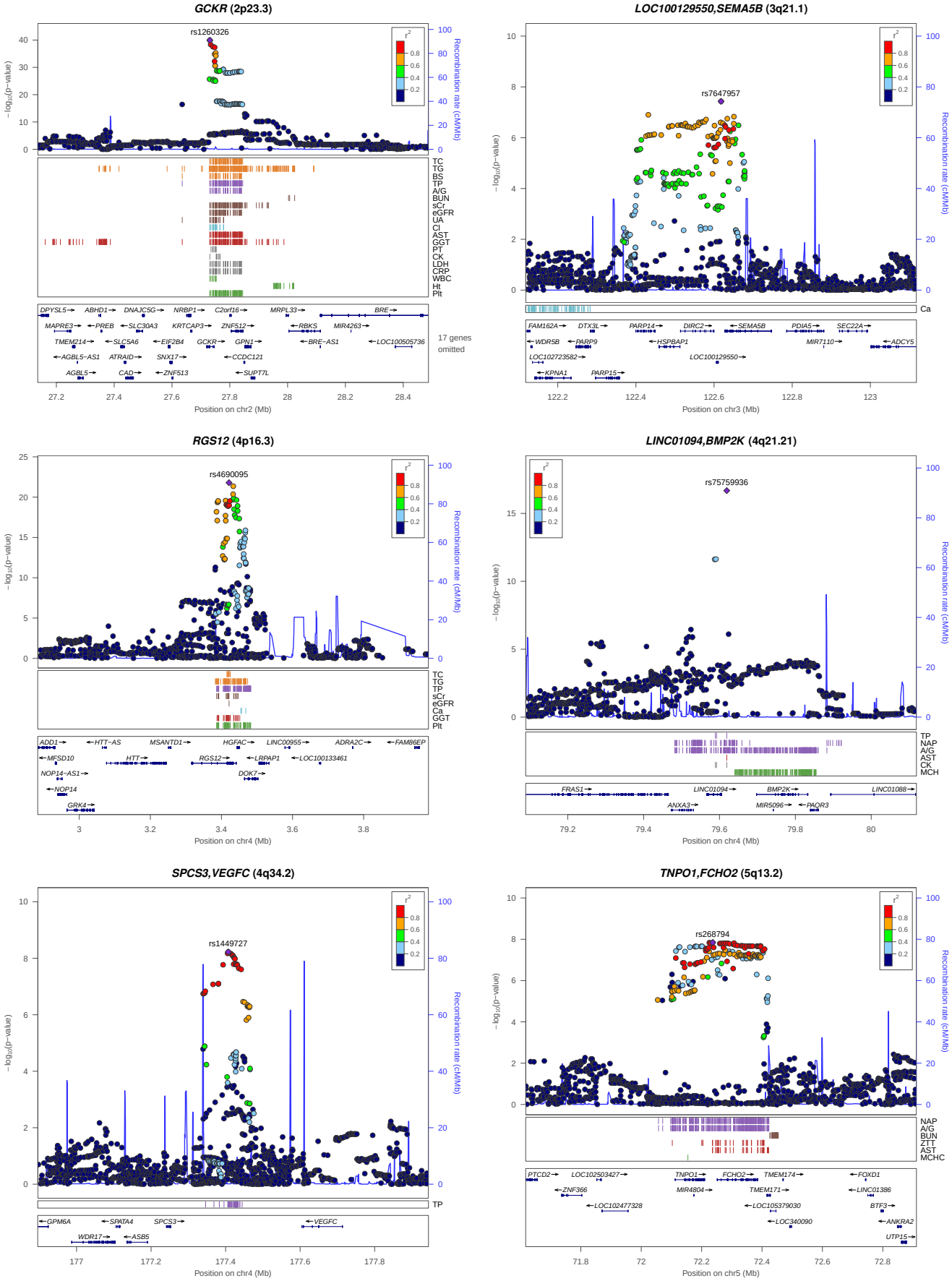
HPN **(19q13.12)**

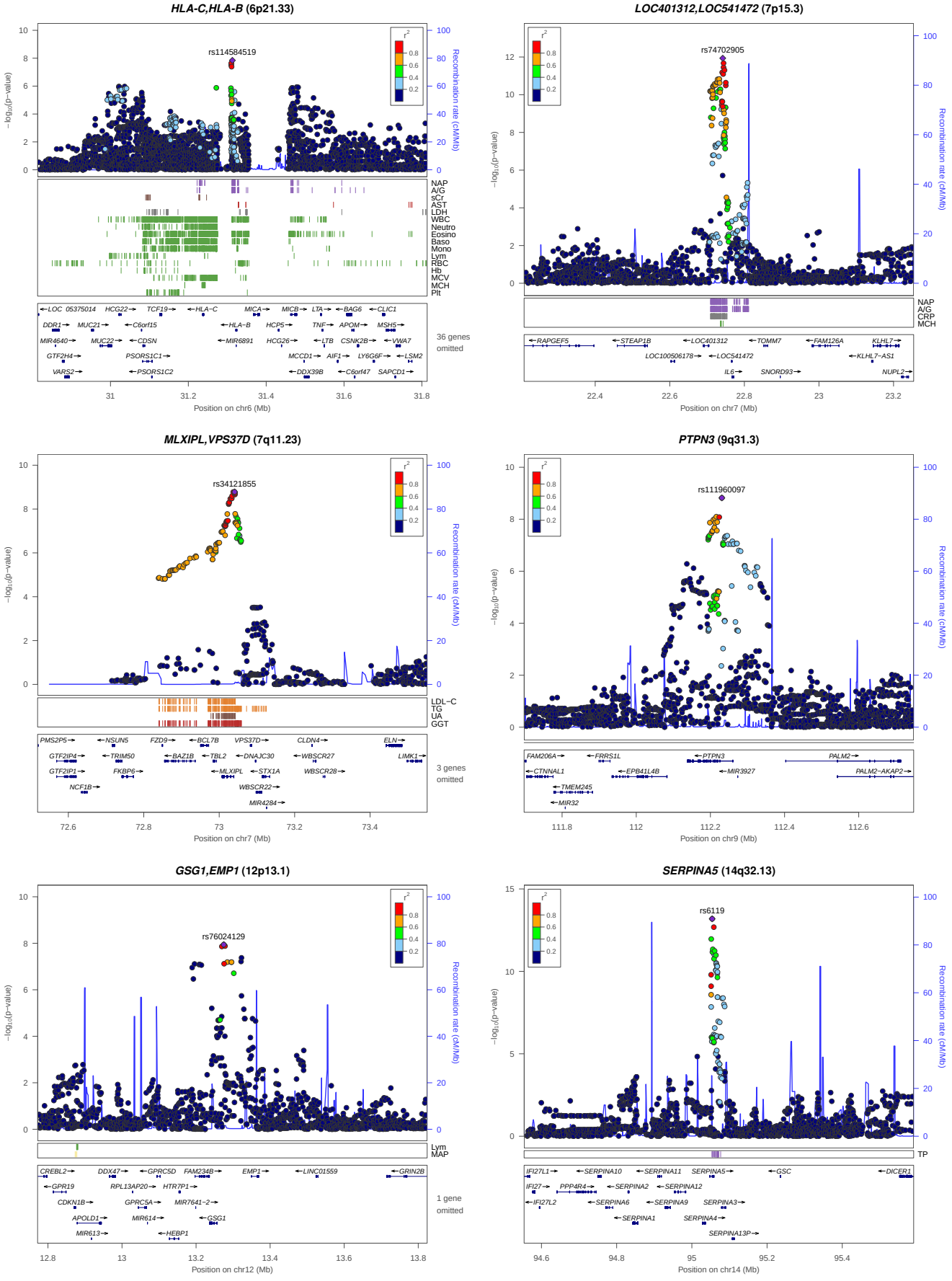



RPS11 (19q13.33)
rs2280401
r²
0.8
0.6
0.4
0.2
− log10(p−value)
Recombination rate (cM/Mb)
TC
Alb
NAP
AST
DHDH
LIN7B
SLC6A16
GFY
RCN3
SCAF1
AP2A1
IL4I1
ZNF473
BAX
SNRNP70
MIR4324
PIH1D1
NOSIP
PRMT1
FUZ
NUP62
FLJ26850
FTL
C19orf73
CD37
FLT3LG
PRR12
TSKS
PINKP
VRK3
IZUMO2
GYS1
PPFIA3
TEAD2
RPL13A
RRAS
MIR6799
ATF5
SNAR−A3
RUVBL2
HRC
DKKL1
RPS11
IRF3
MED25
SIGLEC16
SNAR−D
53 genes omitted
Position on chr19 (Mb)

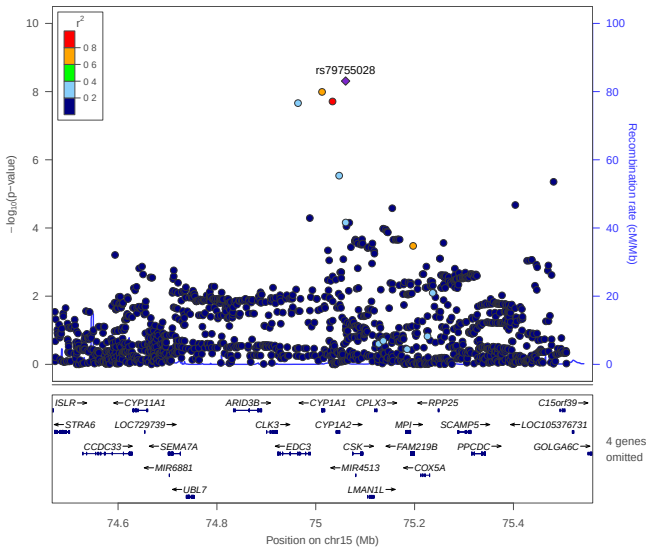

LINC01370,MAFB (20q12)
rs7509102
r²
0.8
0.6
0.4
0.2
− log10(p−value)
Recombination rate (cM/Mb)
LINC01370
MAFB
Position on chr20 (Mb)

2.8 Alb (n = 102,223)

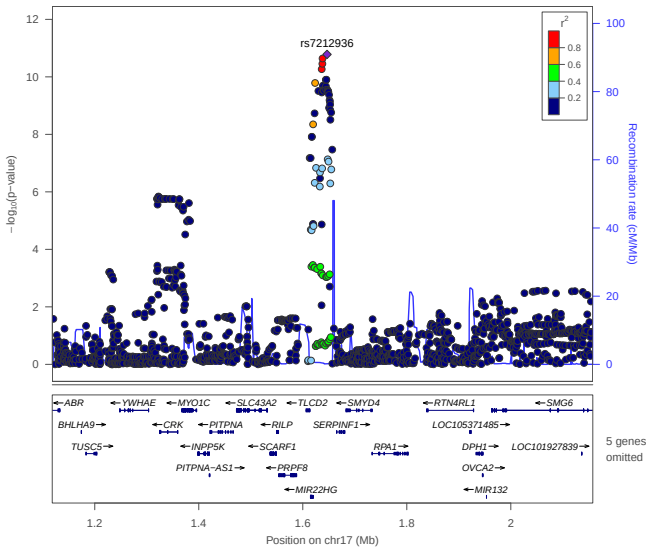



HLA-C,HLA-B (6p21.33)
rs114584519
LOC401312,LOC541472 (7p15.3)
rs74702905
MLXIPL,VPS37D (7q11.23)
rs34121855
PTPN3 (9q31.3)
rs111960097
GSG1,EMP1 (12p13.1)
rs76024129
SERPINA5 (14q32.13)
rs6119
Position on chr6 (Mb)
Position on chr7 (Mb)
Position on chr7 (Mb)
Position on chr9 (Mb)
Position on chr12 (Mb)
Position on chr14 (Mb)
Recombination rate (cM/Mb)
36 genes omitted
3 genes omitted
1 gene omitted

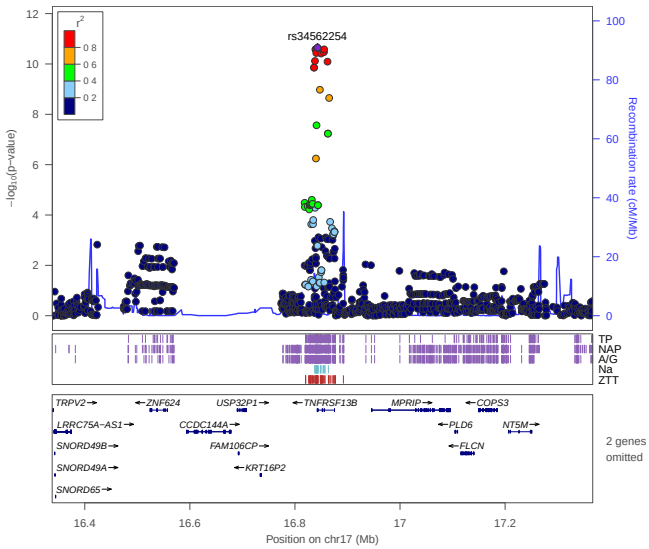
CYP1A2,CSK **(15q24.1)**



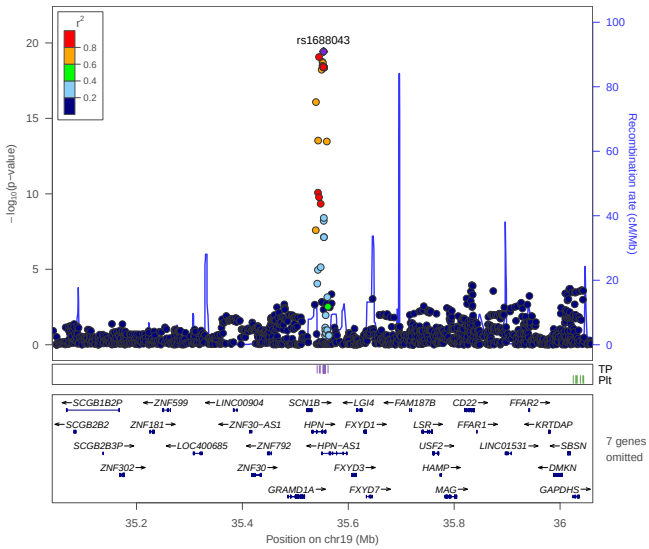
SERPINF2 **(17p13.3)**



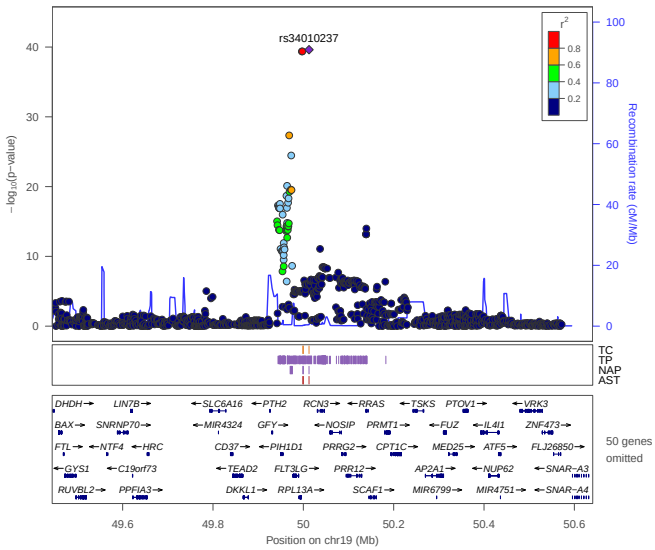
TNFRSF13B **(17p11.2)**



HPN-AS1 **(19q13.12)**

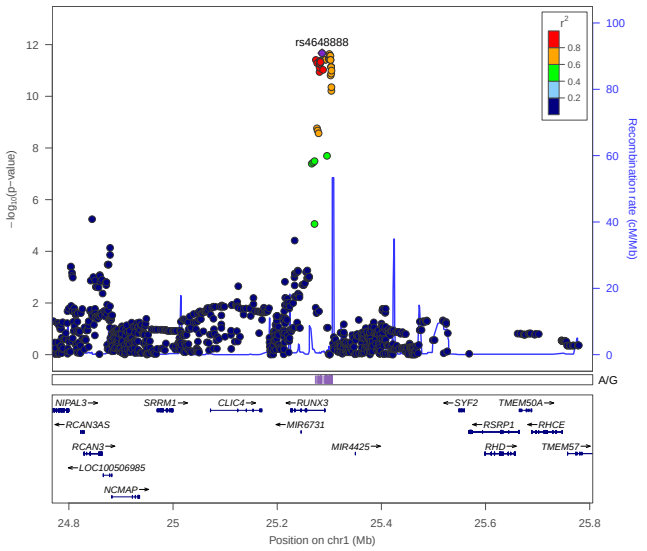


MIR150,FCGRT **(19q13.33)**

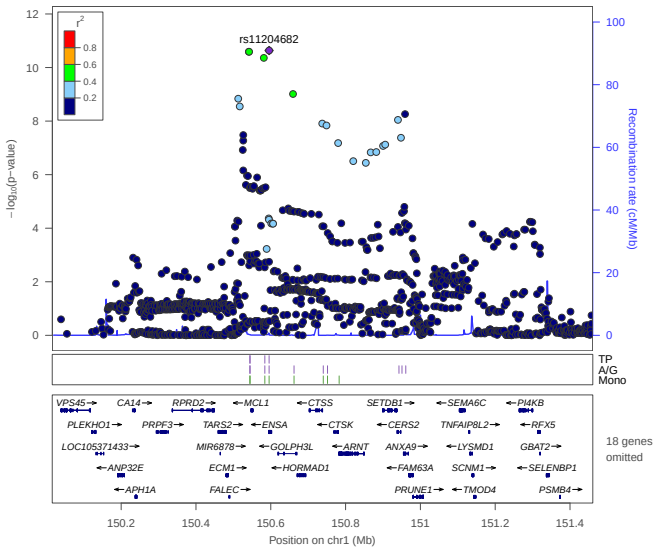


2.9 NAP (n = 98,538)

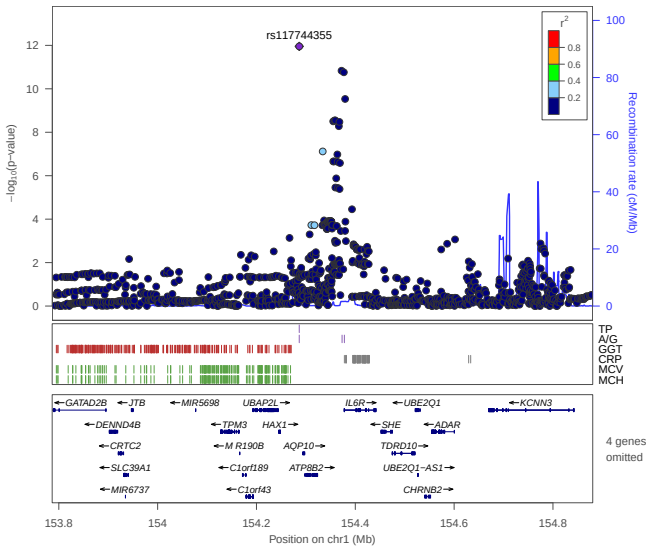
RUNX3 **(1p36.11)**



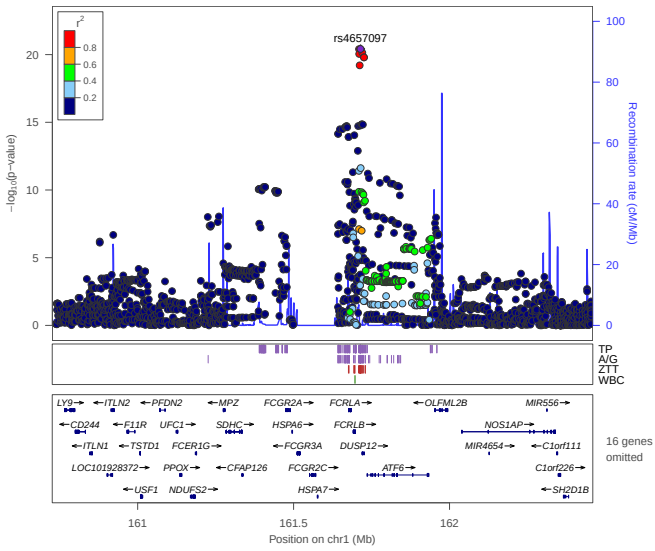
ENSA **(1q21.3)**



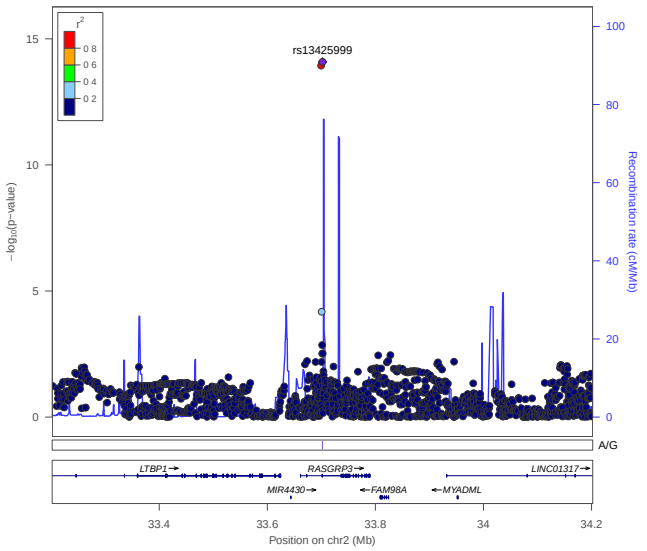
HAX1,AQP10 **(1q21.3)**



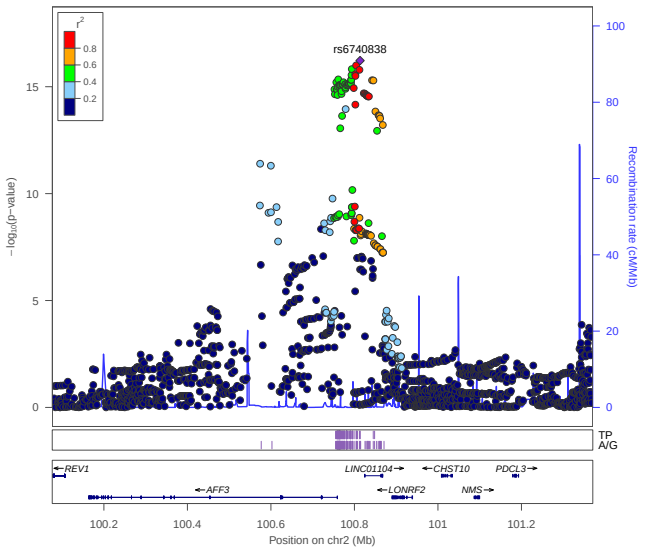
FCRLB,DUSP12 **(1q23.3)**

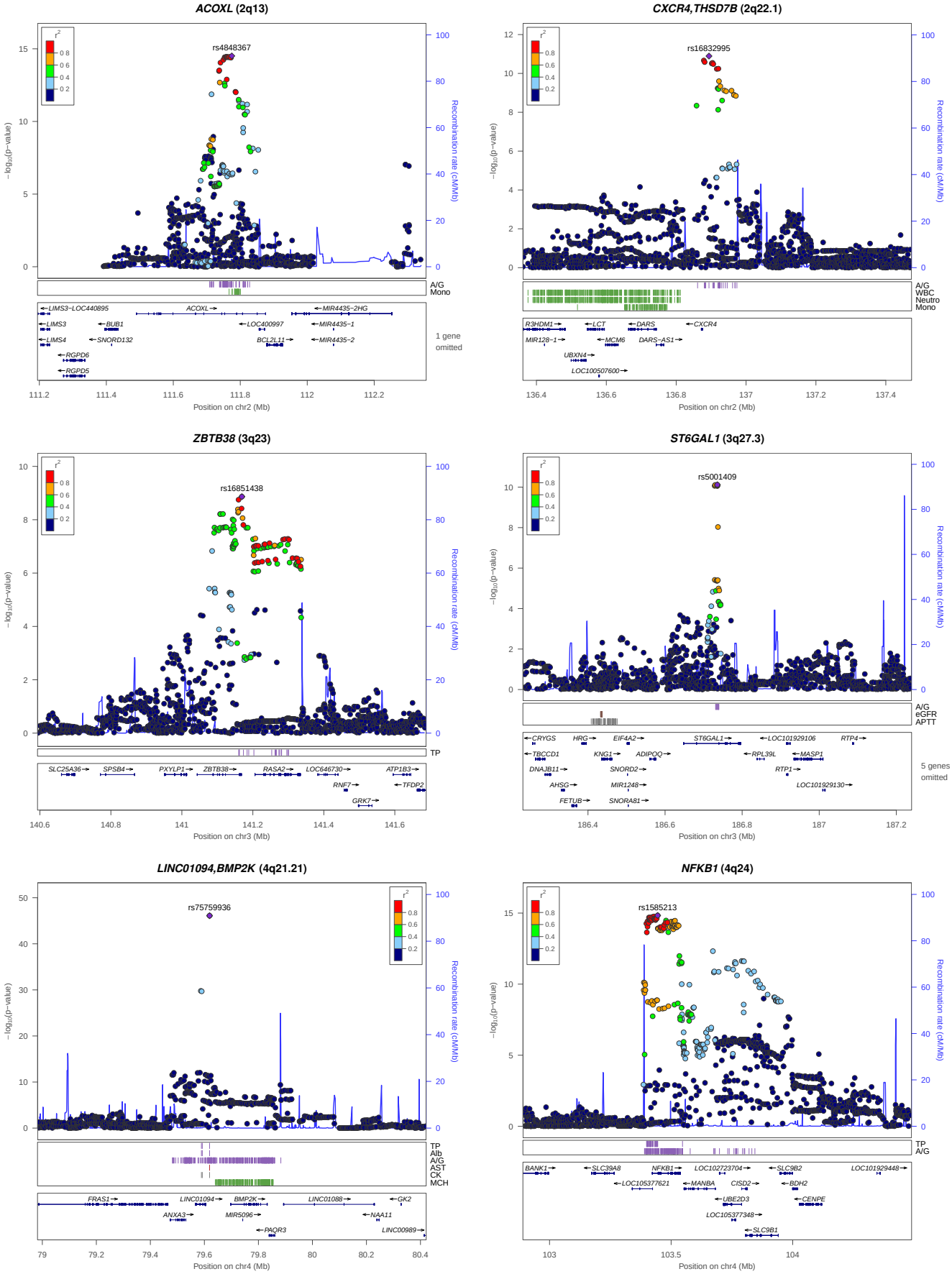


RASGRP3 **(2p22.3)**

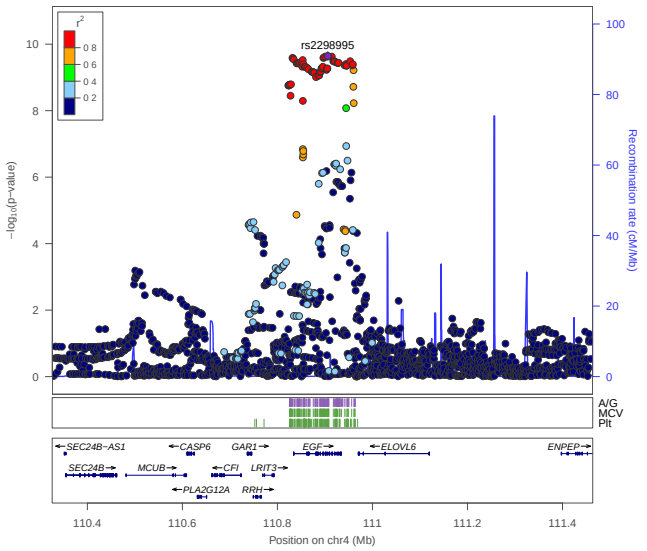


AFF3,LINC01104 **(2q11.2)**

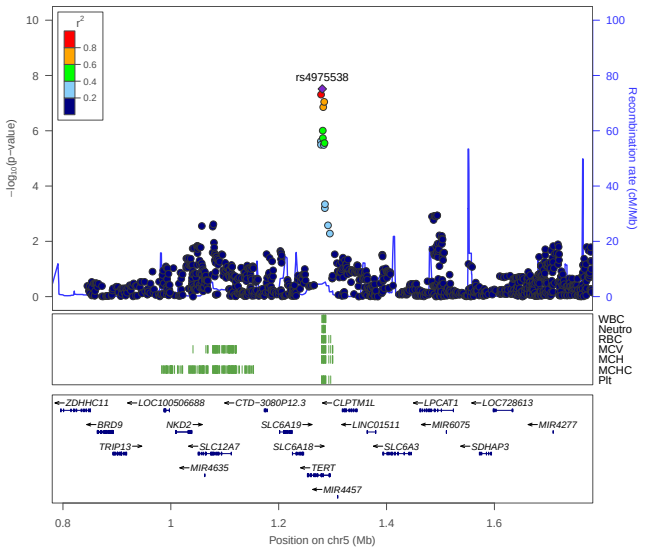



ACOXL (2q13)
rs4848367
A/G
Mono
1 gene
omitted
Position on chr2 (Mb)
CXCR4,THSD7B (2q22.1)
rs16832995
A/G
WBC
Neutro
Mono
Position on chr2 (Mb)
ZBTB38 (3q23)
rs16851438
TP
Position on chr3 (Mb)
ST6GAL1 (3q27.3)
rs5001409
A/G
eGFR
APTT
5 genes
omitted
Position on chr3 (Mb)
LINC01094,BMP2K (4q21.21)
rs75759936
TP
Alb
A/G
AST
CK
MCH
Position on chr4 (Mb)
NFKB1 (4q24)
rs1585213
TP
A/G
Position on chr4 (Mb)
Recombination rate (cM/Mb)

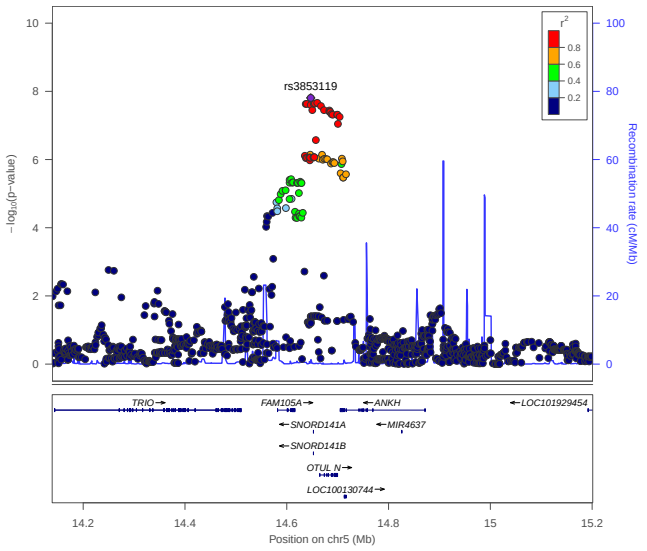
***EGF* (4q25)**



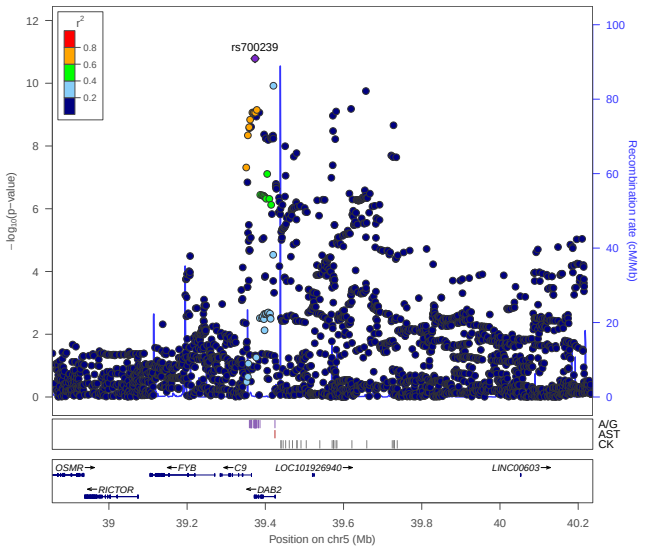
***TERT* (5p15.33)**



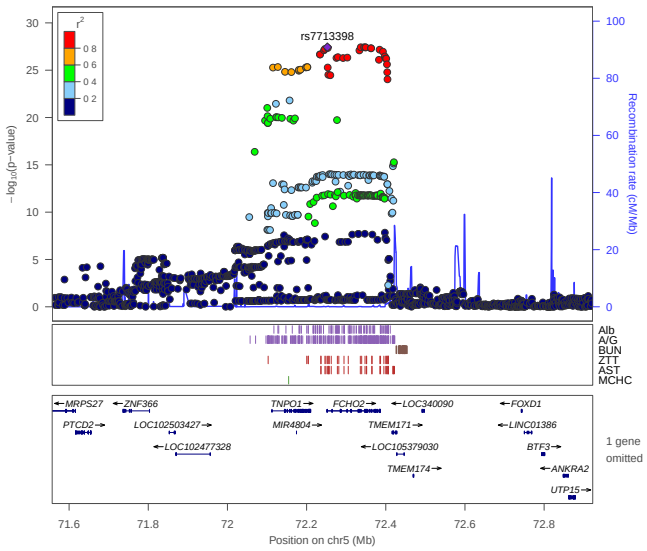
***FAM105A,SNORD141A* (5p15.2)**



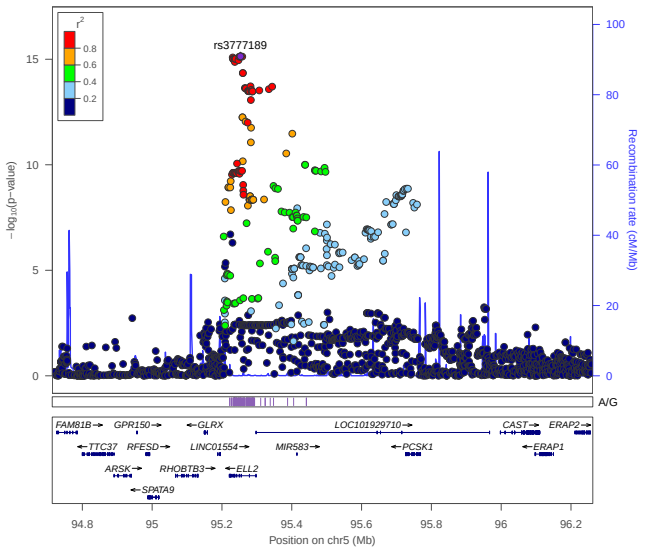
***DAB2* (5p13.1)**



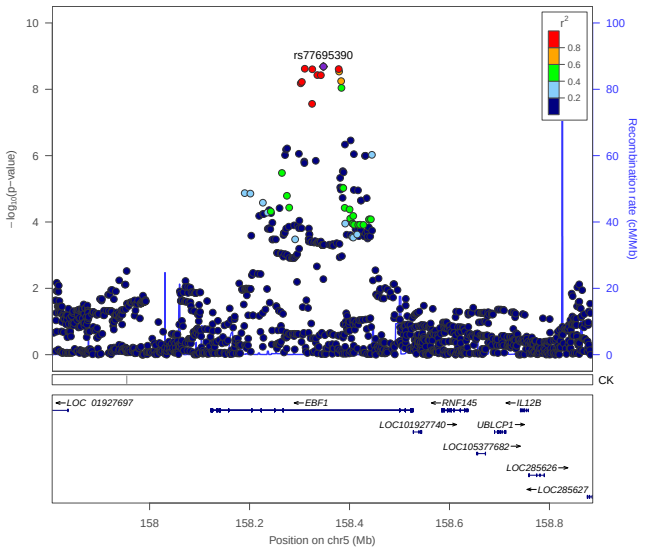
***FCHO2* (5q13.2)**



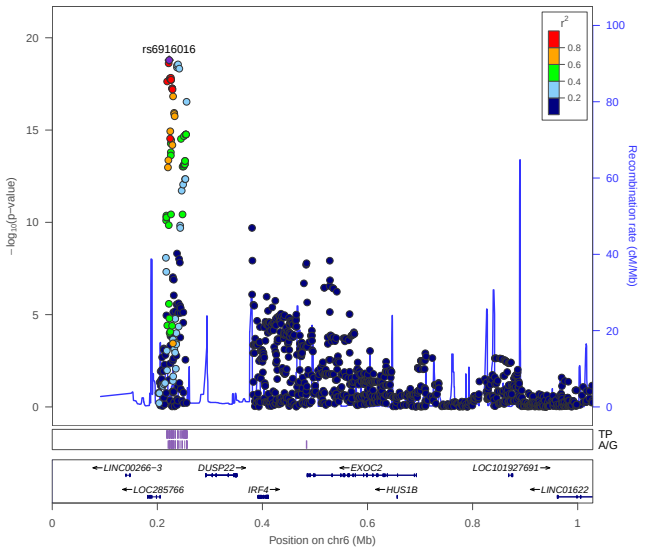
***ELL2* (5q15)**



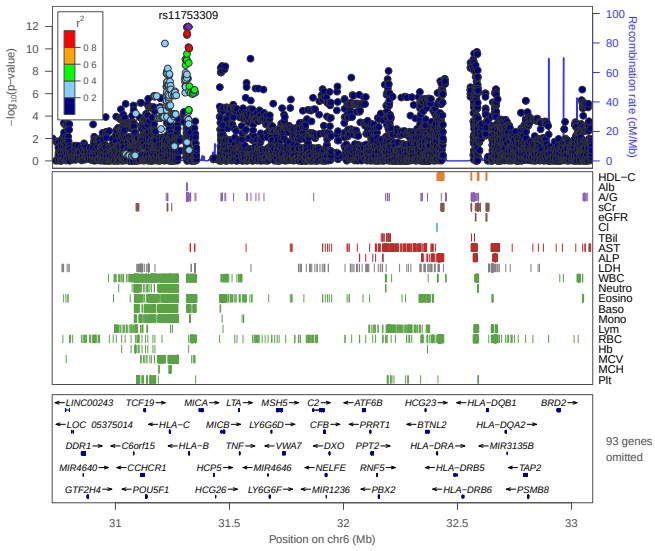
EBF1 **(5q33.3)**



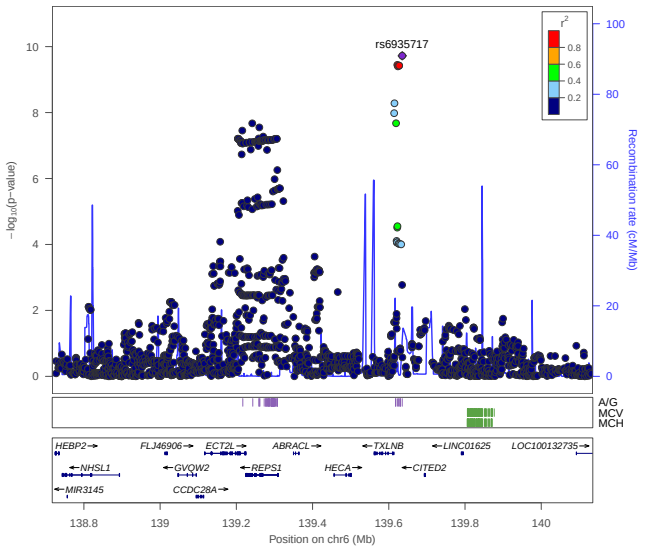
LOC285766,DUSP22 **(6p25.3)**



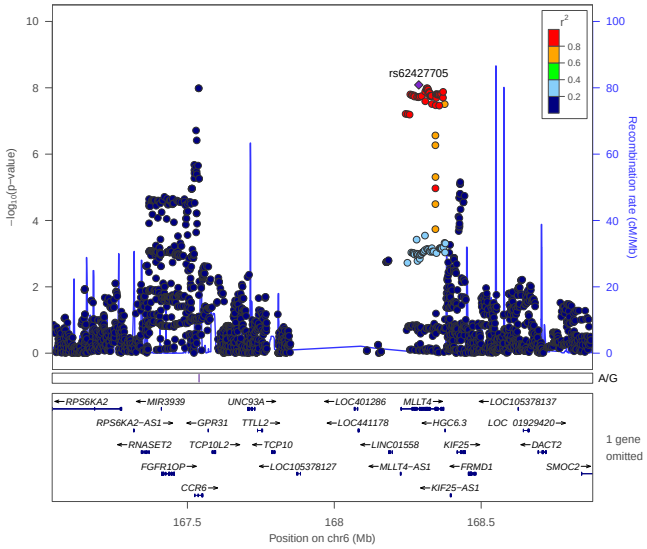
HLA-C,HLA-B **(6p21.33)**



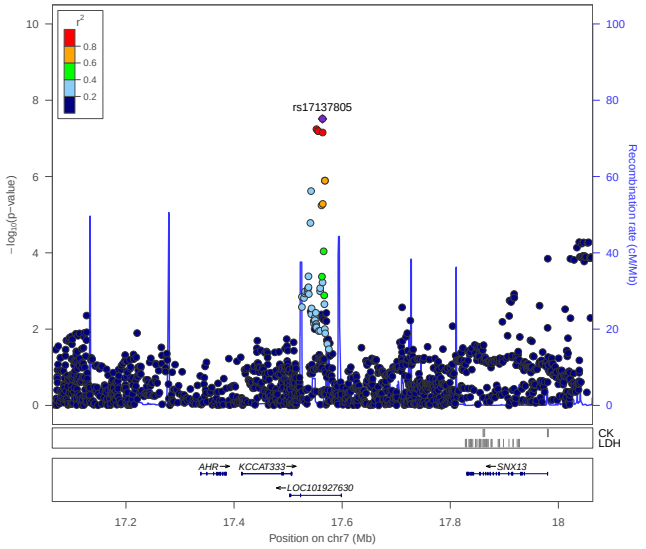
TXLNB,CITED2 **(6q24.1)**



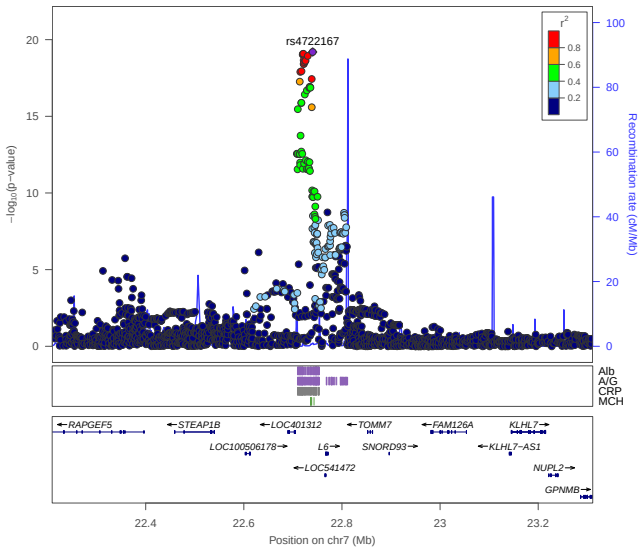
MLLT4 **(6q27)**



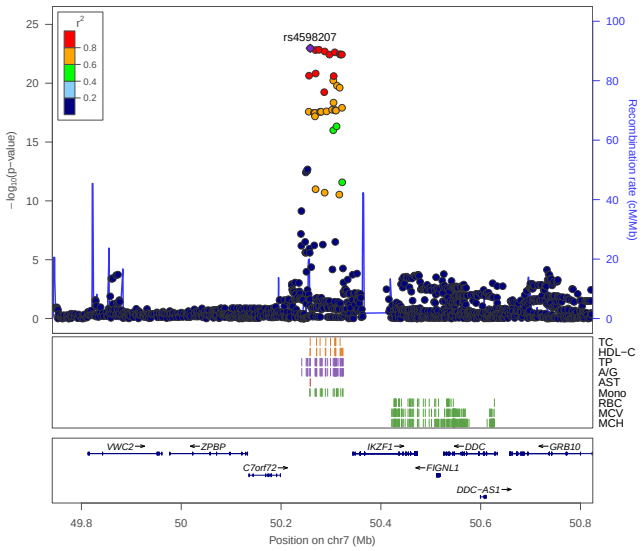
LOC101927630 **(7p21.1)**



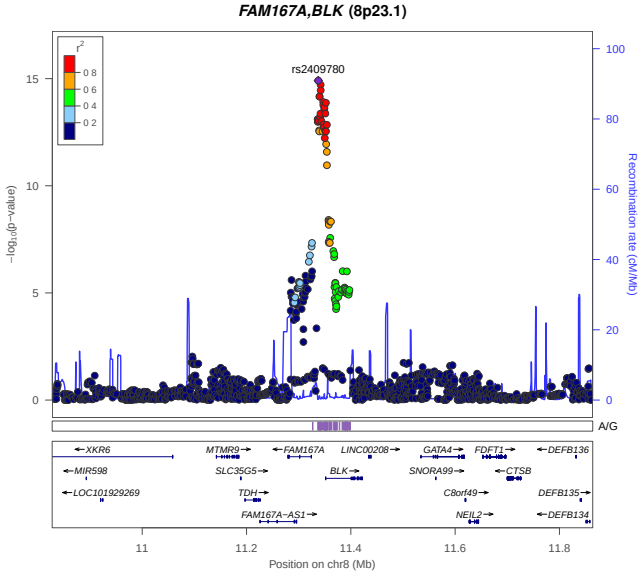
LOC401312,LOC541472 **(7p15.3)**



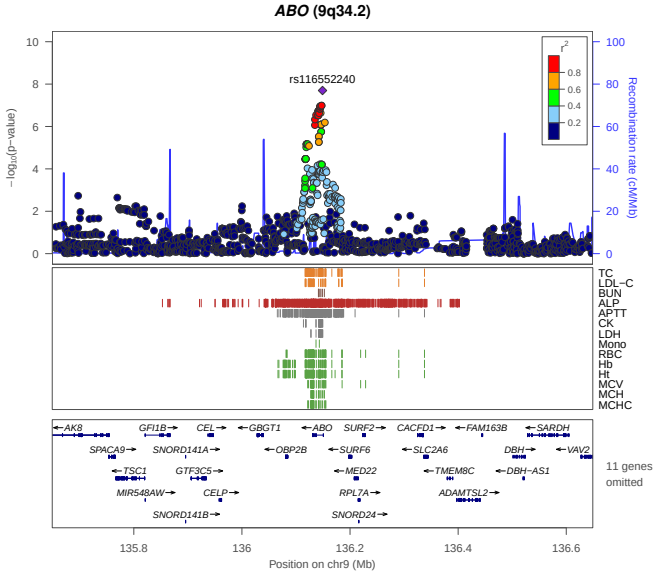
C7orf72,IKZF1 **(7p12.2)**



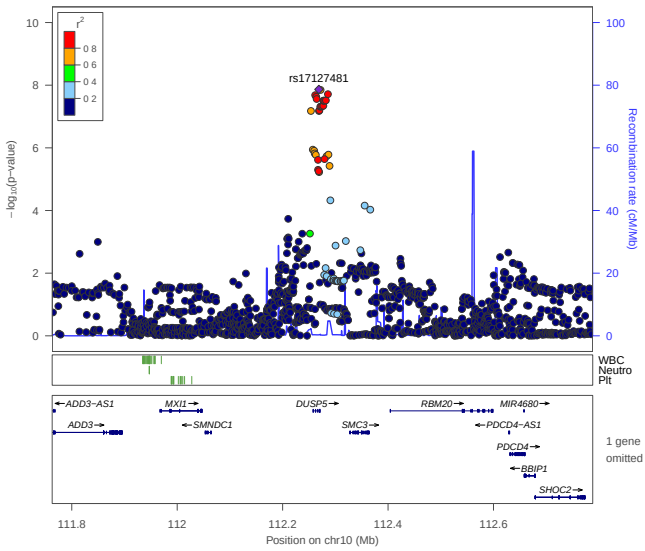
FAM167A,BLK **(8p23.1)**



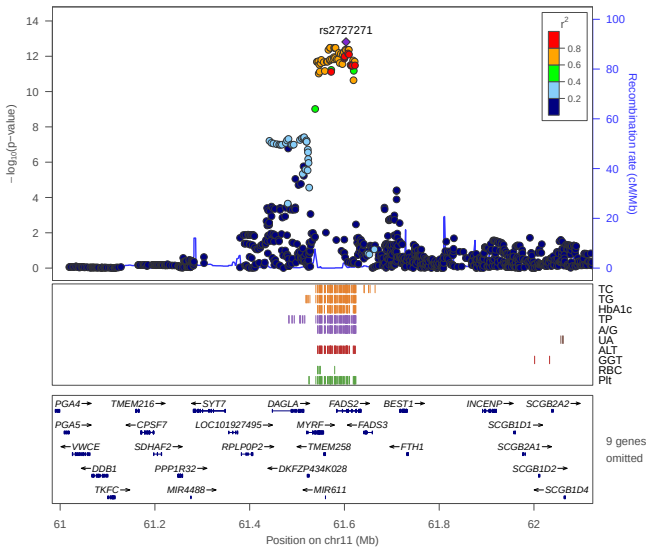
ABO **(9q34.2)**



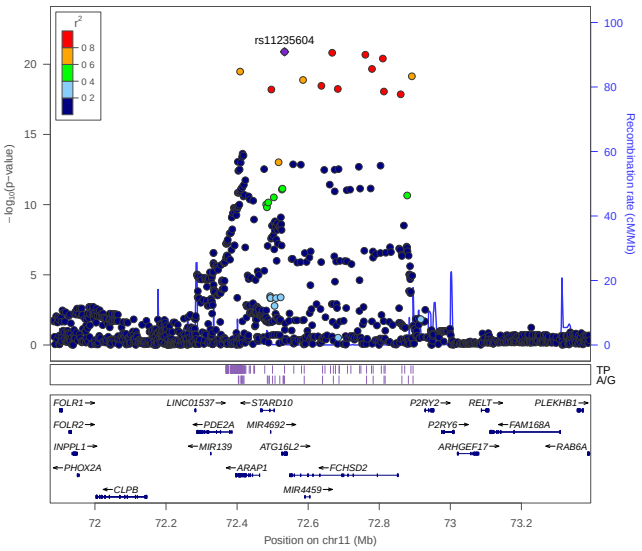
DUSP5 **(10q25.2)**



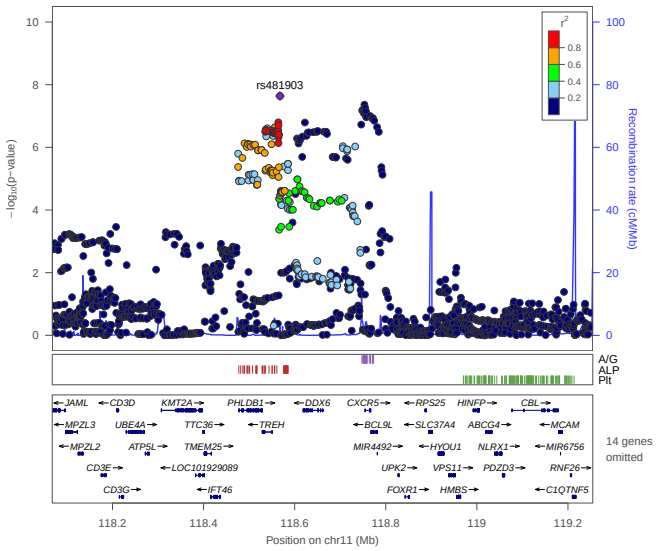
FADS2 **(11q12.2)**



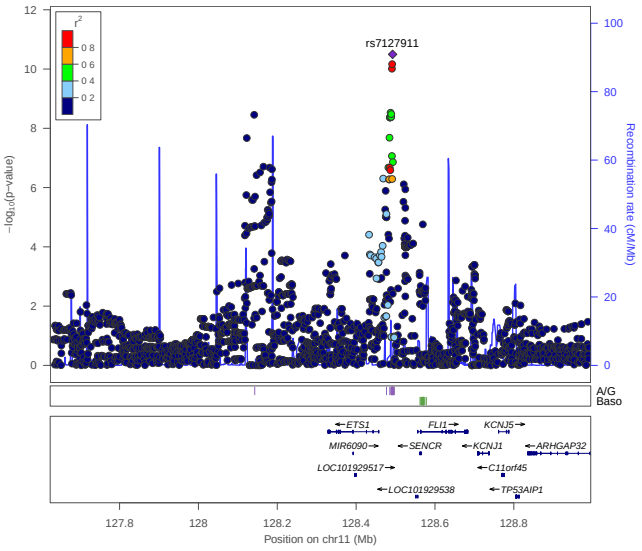
ATG16L2 **(11q13.4)**



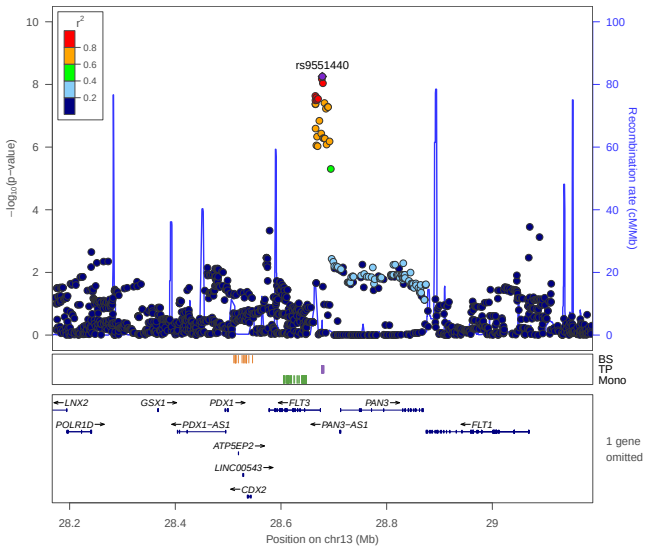
TREH,DDX6 **(11q23.3)**



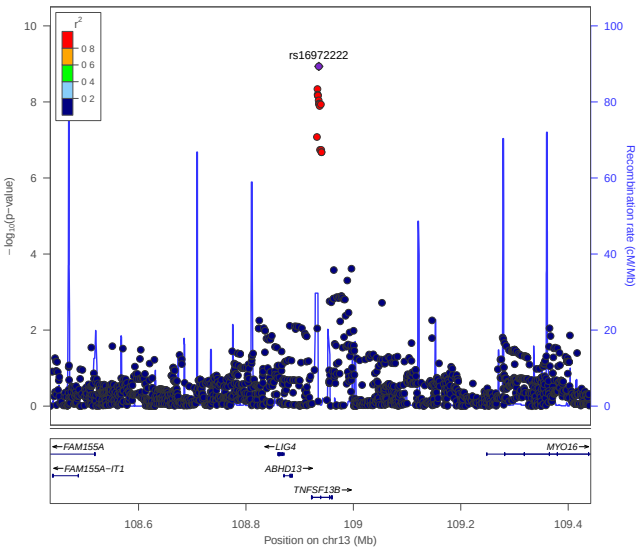
ETS1,FLI1 **(11q24.3)**



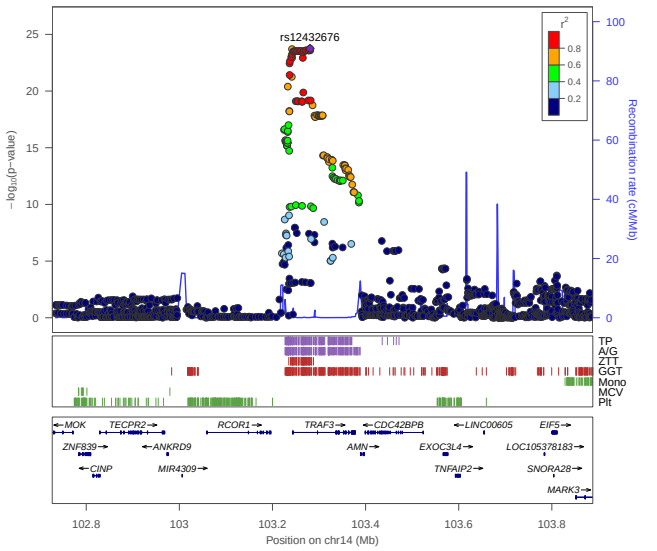
FLT3,PAN3-AS1 **(13q12.2)**



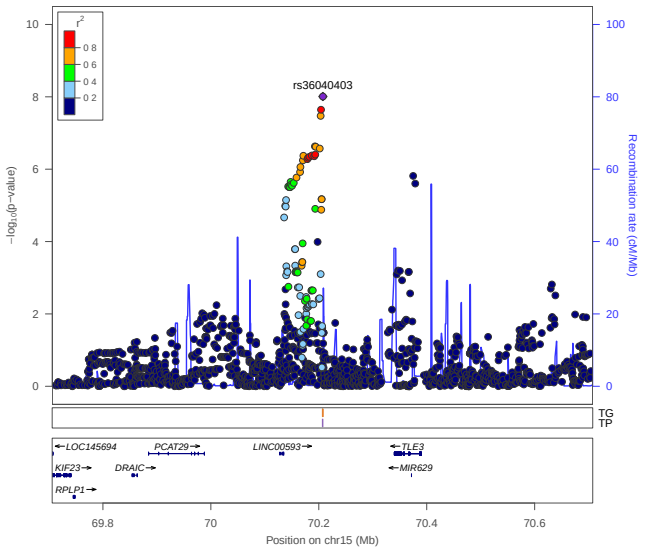
TNFSF13B **(13q33.3)**



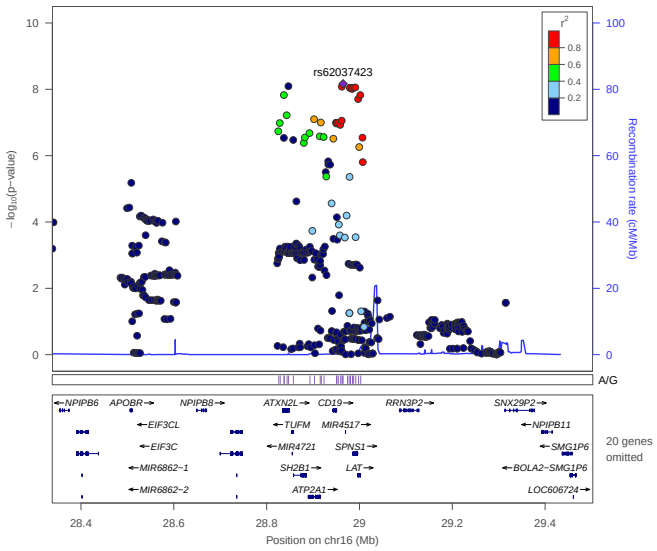
TRAF3 **(14q32.32)**



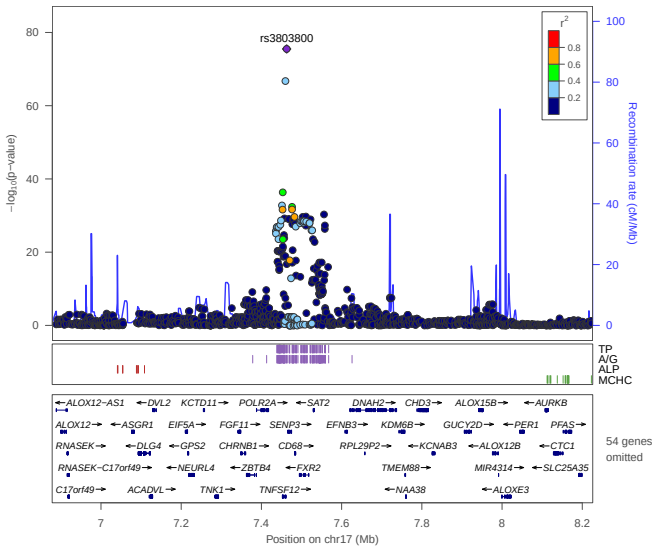
LINC00593,TLE3 **(15q23)**



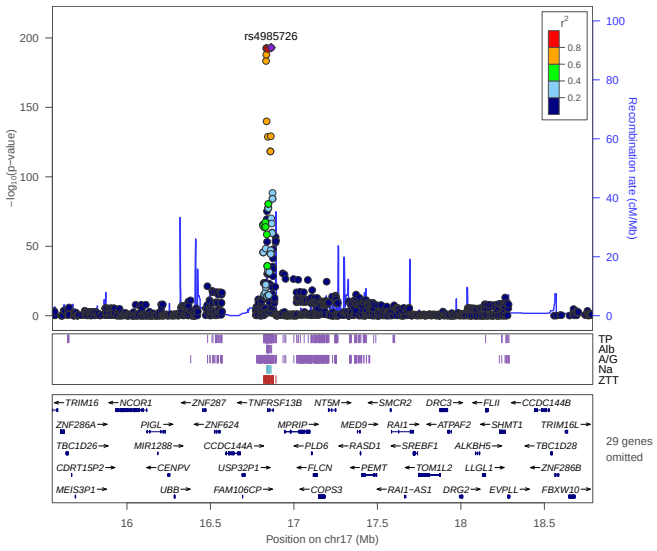
NFATC2IP **(16p11.2)**



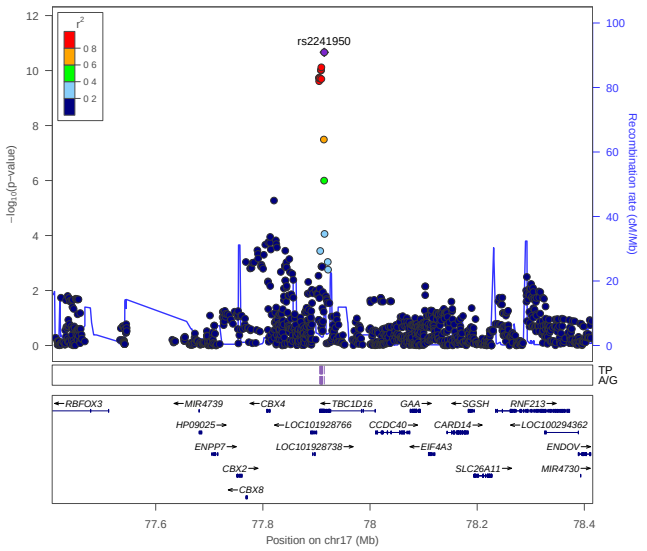
TNFSF12-TNFSF13,TNFSF13 **(17p13.1)**



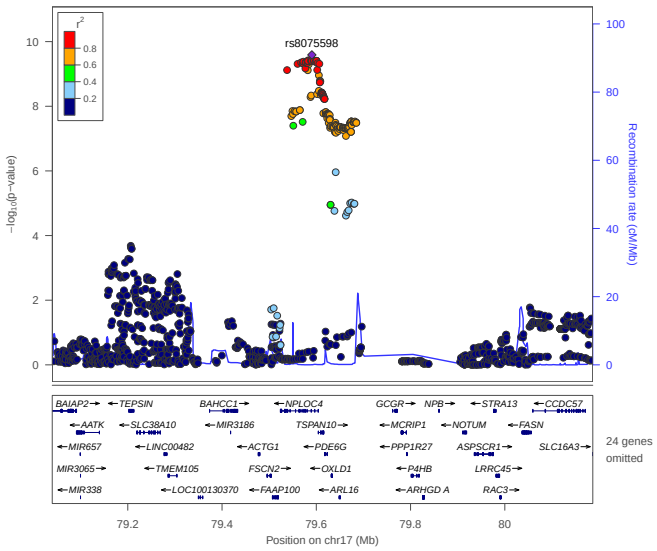
TNFRSF13B **(17p11.2)**



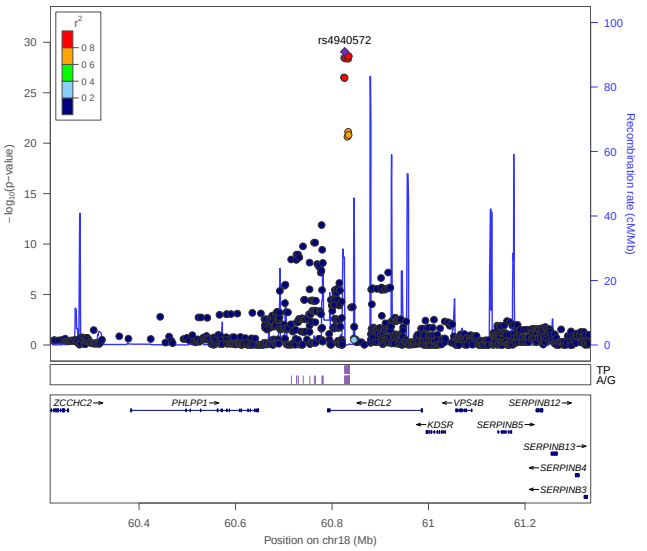
TBC1D16 **(17q25.3)**



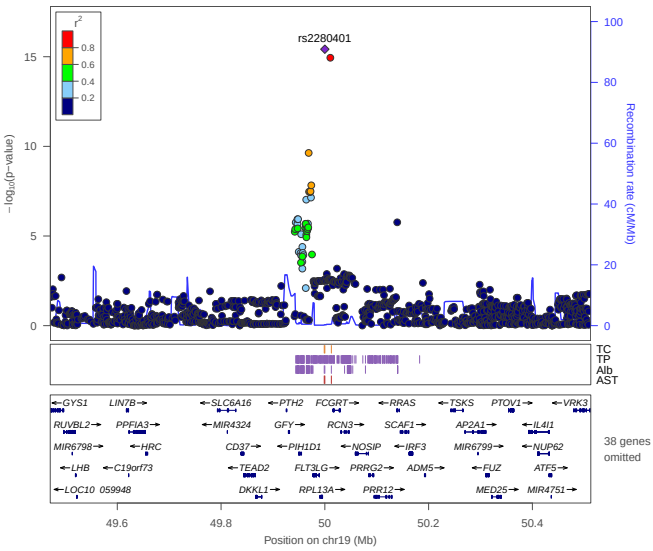
NPLOC4 **(17q25.3)**



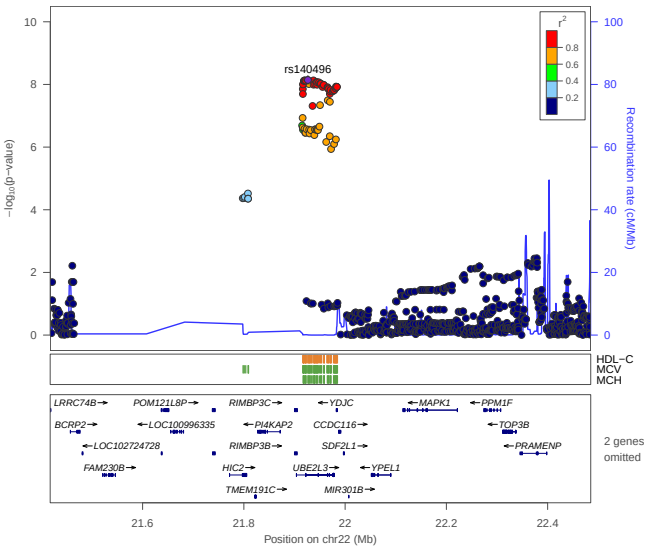
***BCL2* (18q21.33)**



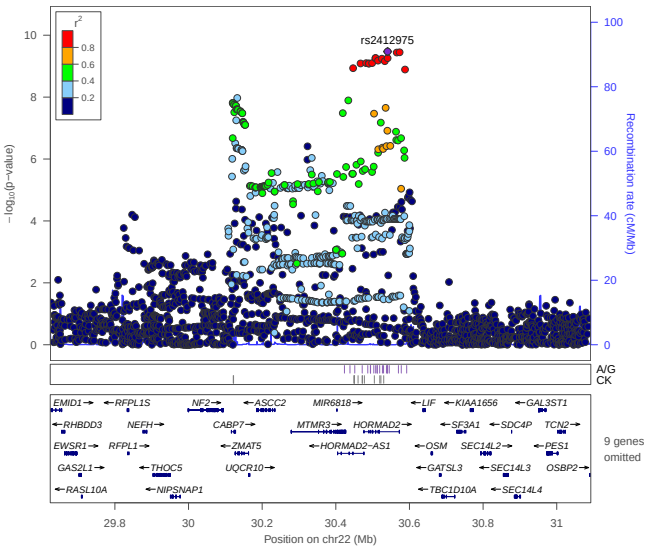
***RPS11* (19q13.33)**



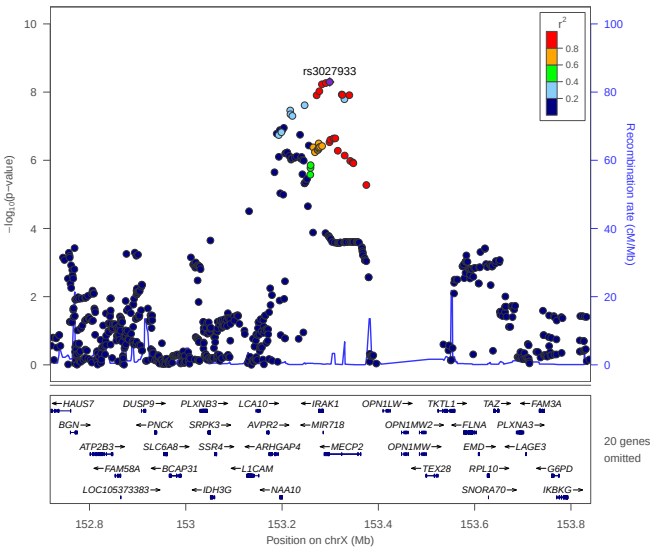
***UBE2L3* (22q11.21)**



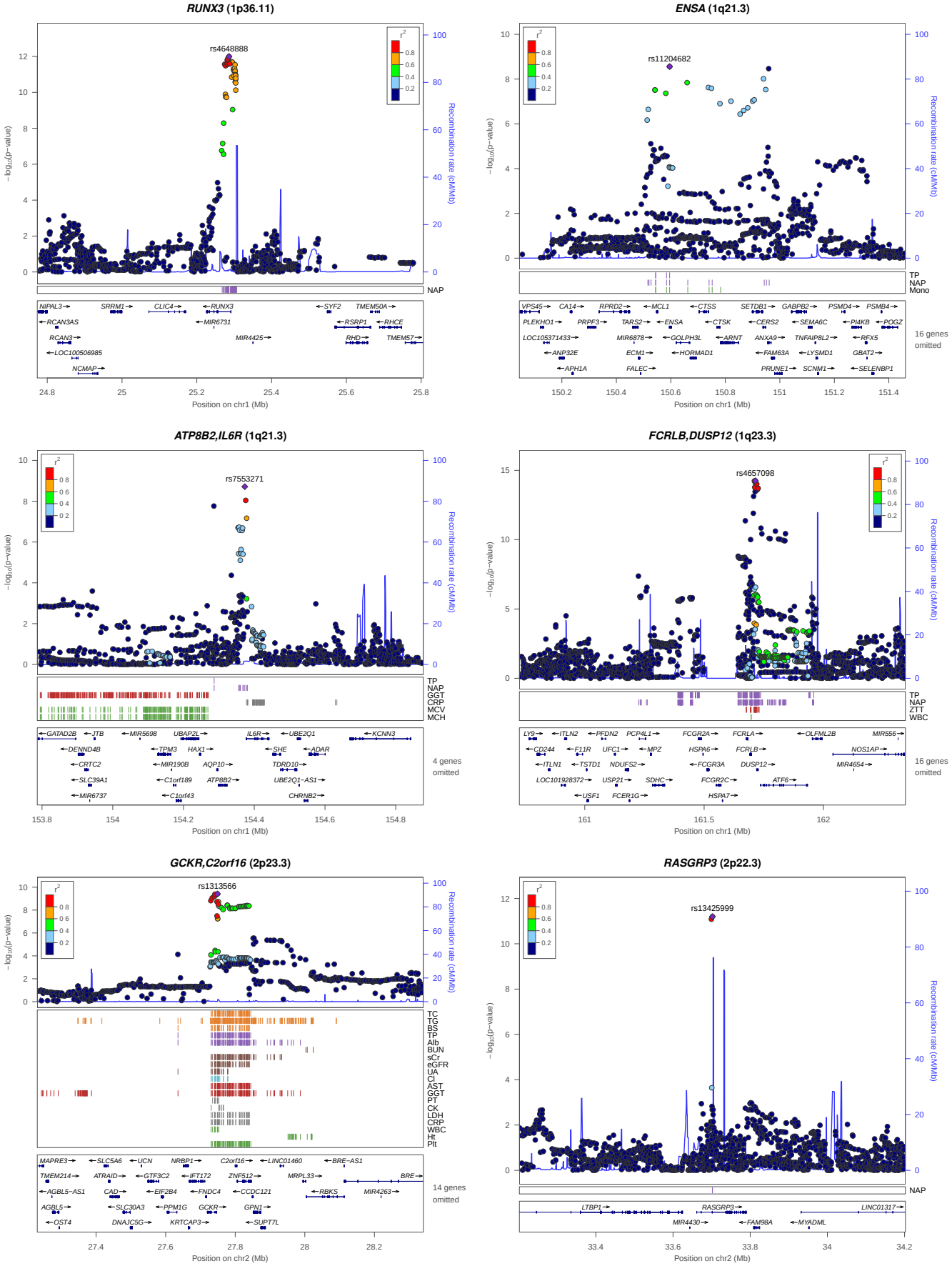
***HORMAD2* (22q12.2)**

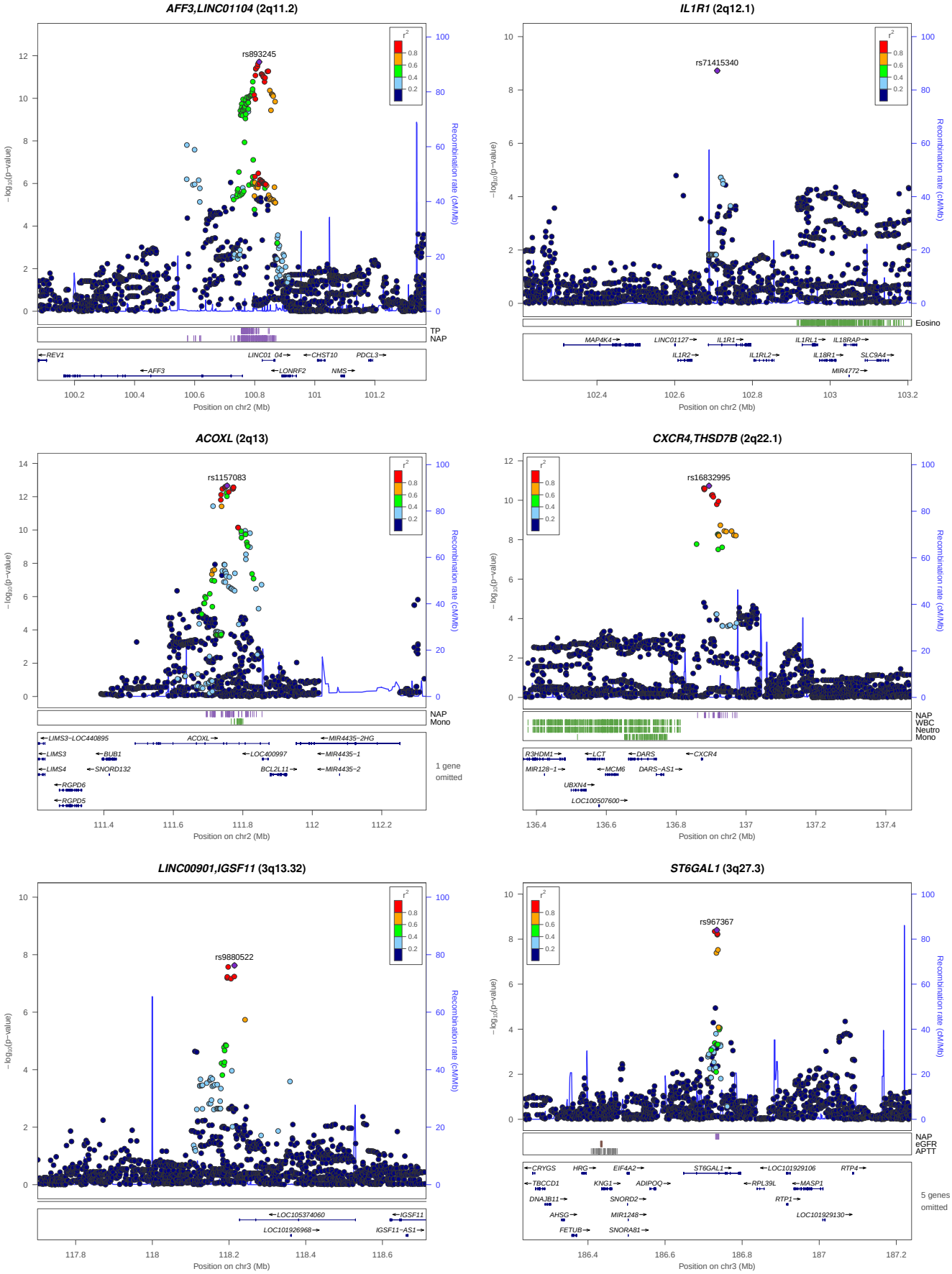


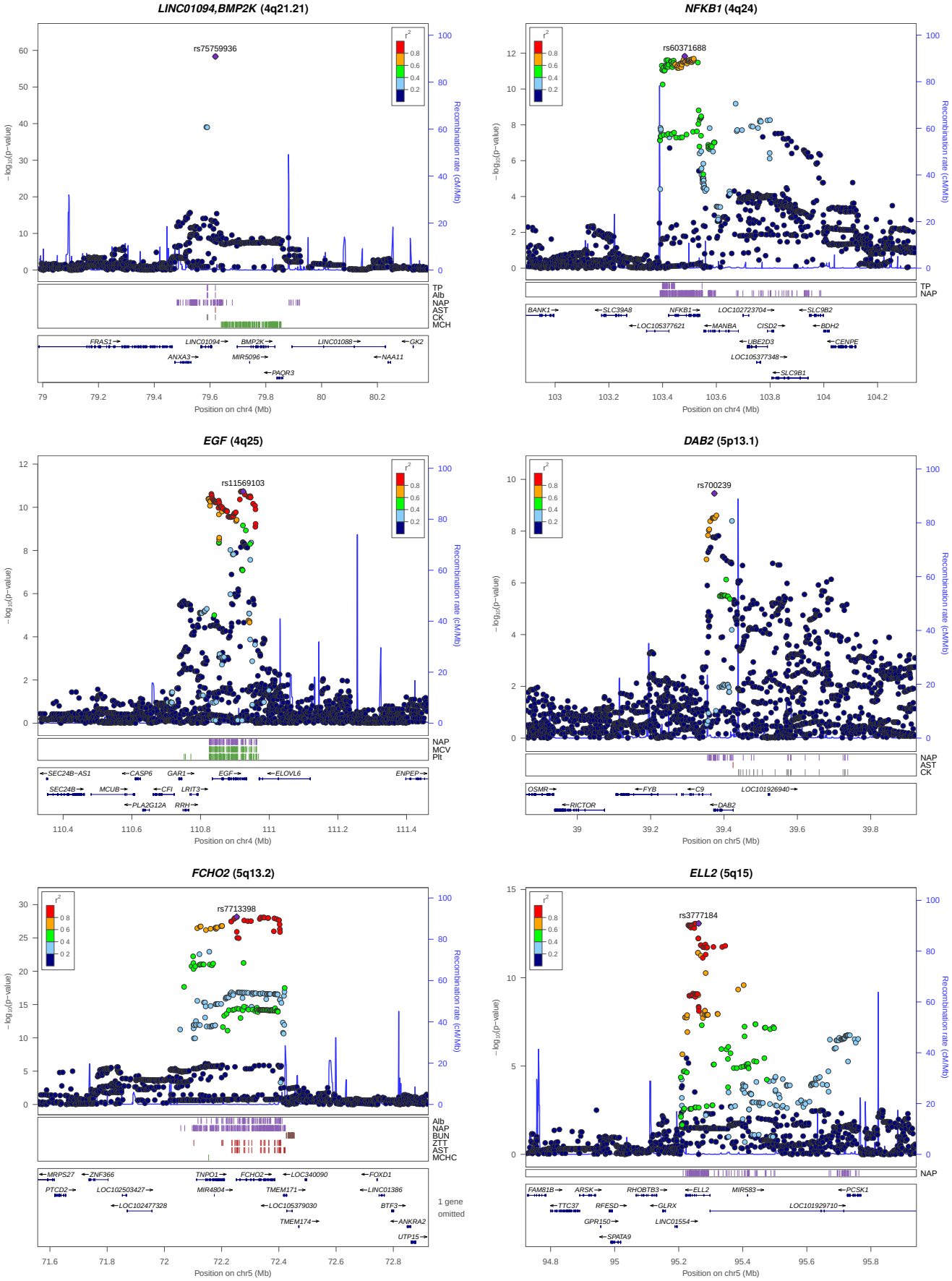
***MECP2* (Xq28)**



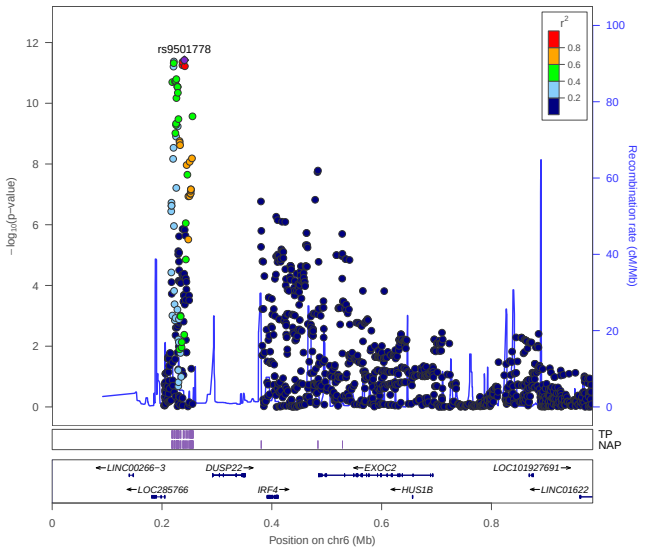
2.10 A/G (n = 0)


RUNX3 (1p36.11)
rs4648888
ENSA (1q21.3)
rs11204682
ATP8B2,IL6R (1q21.3)
rs7553271
FCRLB,DUSP12 (1q23.3)
rs4657098
GCKR,C2orf16 (2p23.3)
rs1313566
RASGRP3 (2p22.3)
rs13425999
Position on chr1 (Mb)
Position on chr2 (Mb)
Recombination rate (cM/Mb)
16 genes omitted
4 genes omitted
14 genes omitted

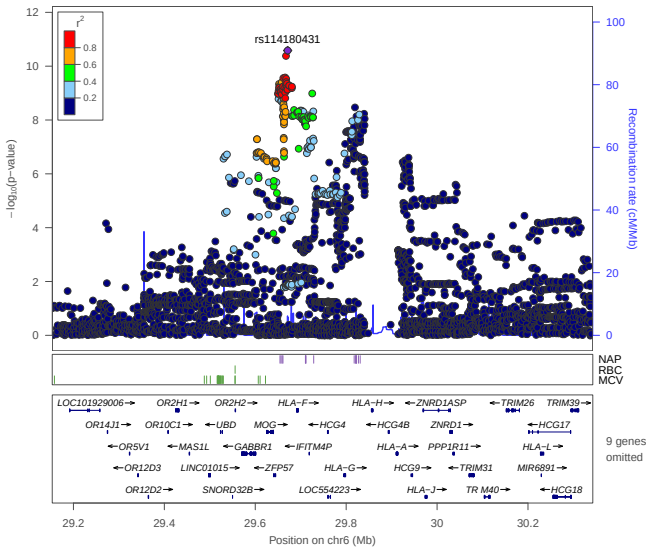

AFF3,LINC01104 (2q11.2)
rs893245
TP
NAP
REV1
LINC01104
CHST10
PDCL3
AFF3
LONRF2
NMS
Position on chr2 (Mb)
IL1R1 (2q12.1)
rs71415340
Eosino
MAP4K4
LINC01127
IL1R1
IL1RL1
IL18RAP
IL1R2
IL1RL2
IL18R1
SLC9A4
MIR4772
Position on chr2 (Mb)
ACOXL (2q13)
rs1157083
NAP
Mono
LIMS3-LOC440895
ACOXL
MIR4435-2HG
LIMS3
BUB1
LOC400997
MIR4435-1
LIMS4
SNORD132
BCL2L11
MIR4435-2
RGPD6
RGPD5
1 gene omitted
Position on chr2 (Mb)
CXCR4,THSD7B (2q22.1)
rs16832995
NAP
WBC
Neutro
Mono
R3HDM1
LCT
DARS
CXCR4
MIR128-1
MCM6
DARS-AS1
UBXN4
LOC100507600
Position on chr2 (Mb)
LINC00901,IGSF11 (3q13.32)
rs9880522
LOC105374060
IGSF11
LOC101926968
IGSF11-AS1
Position on chr3 (Mb)
ST6GAL1 (3q27.3)
rs967367
NAP
eGFR
APTT
CRYGS
HRG
EIF4A2
ST6GAL1
LOC101929106
RTP4
TBCCD1
KNG1
ADIPOQ
RPL39L
MASP1
DNAJB11
SNORD2
RTP1
AHSG
MIR1248
LOC101929130
FETUB
SNORA81
5 genes omitted
Position on chr3 (Mb)
Recombination rate (cM/Mb)


LINC01094,BMP2K (4q21.21)
rs75759936
NFKB1 (4q24)
rs60371688
EGF (4q25)
rs11569103
DAB2 (5p13.1)
rs700239
FCHO2 (5q13.2)
rs7713398
ELL2 (5q15)
rs3777184
Recombination rate (cM/Mb)
Position on chr4 (Mb)
Position on chr5 (Mb)
1 gene omitted

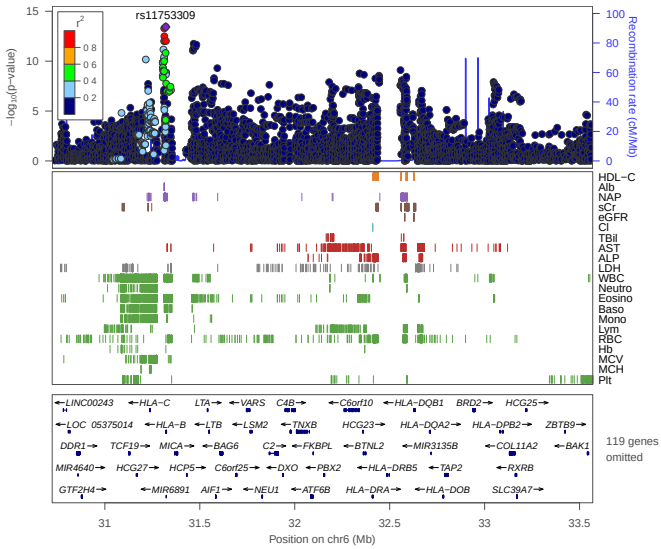
LOC285766,DUSP22 **(6p25.3)**



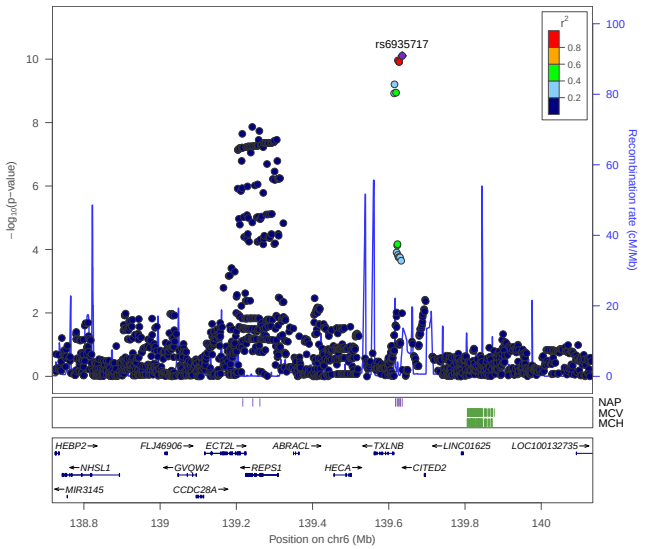
ZFP57,HLA-F **(6p22.1)**



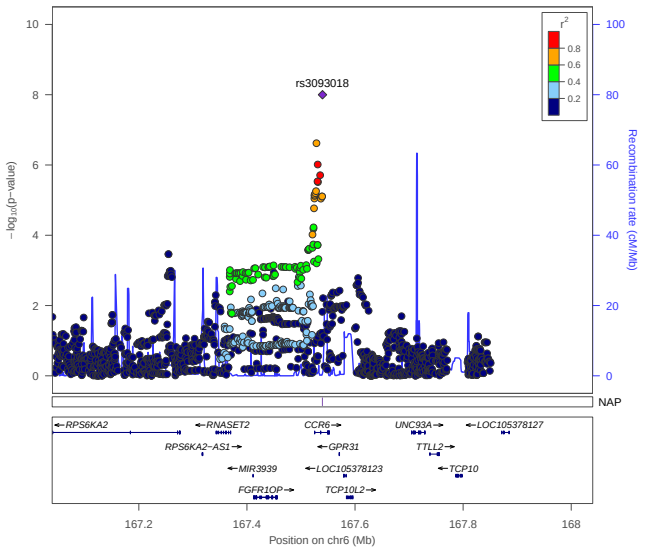
HLA-C,HLA-B **(6p21.33)**



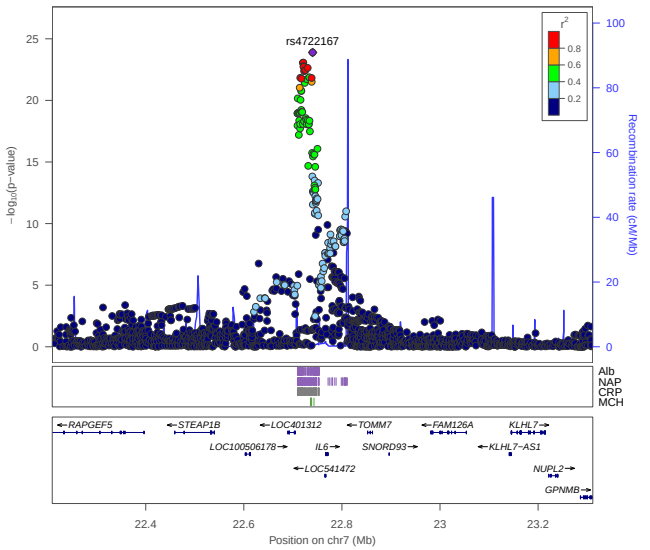
TXLNB,CITED2 **(6q24.1)**

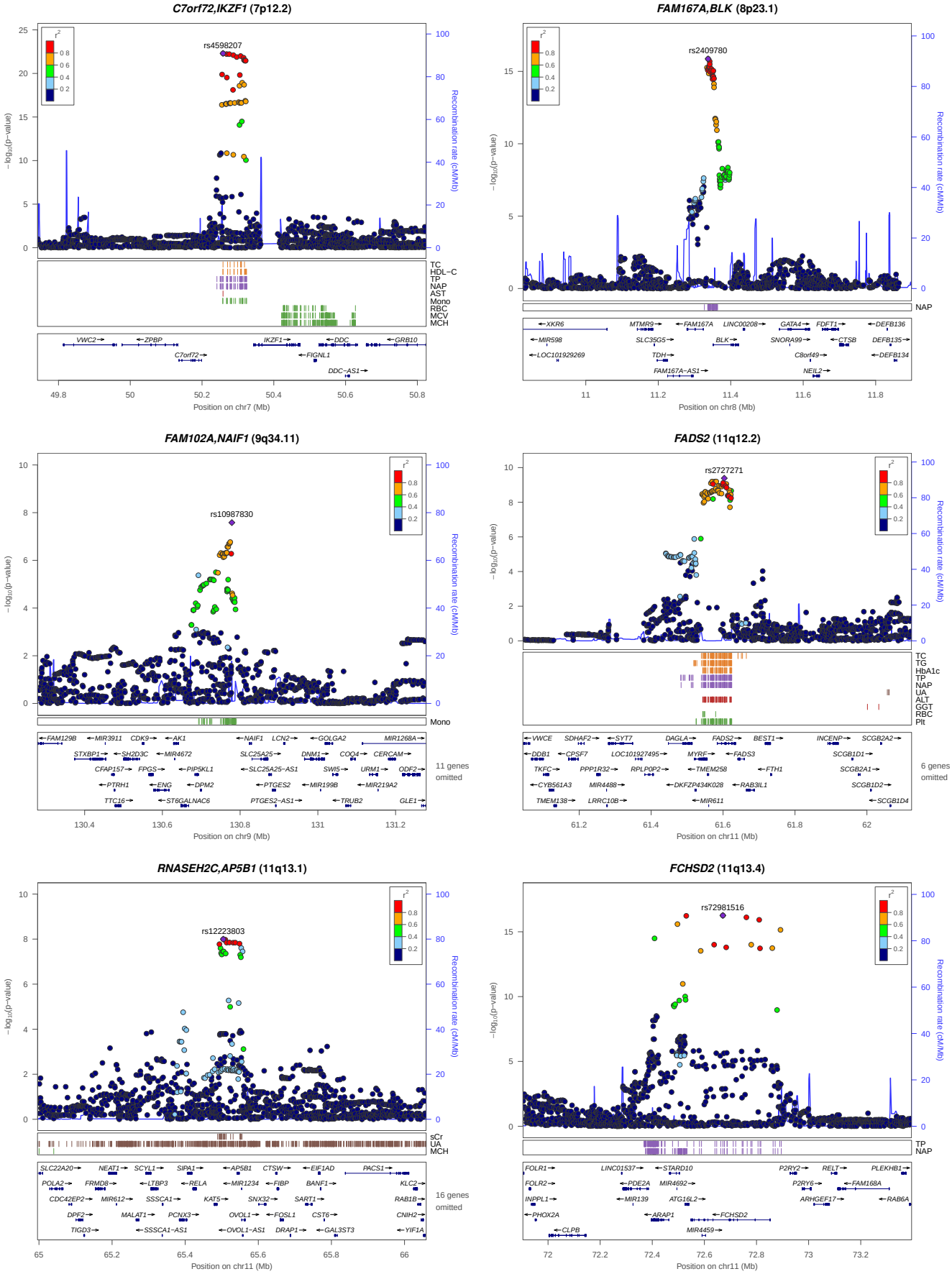


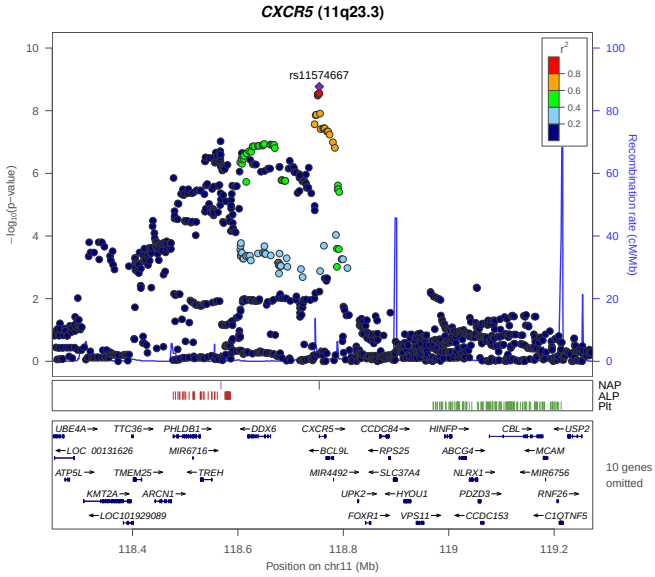
CCR6 **(6q27)**

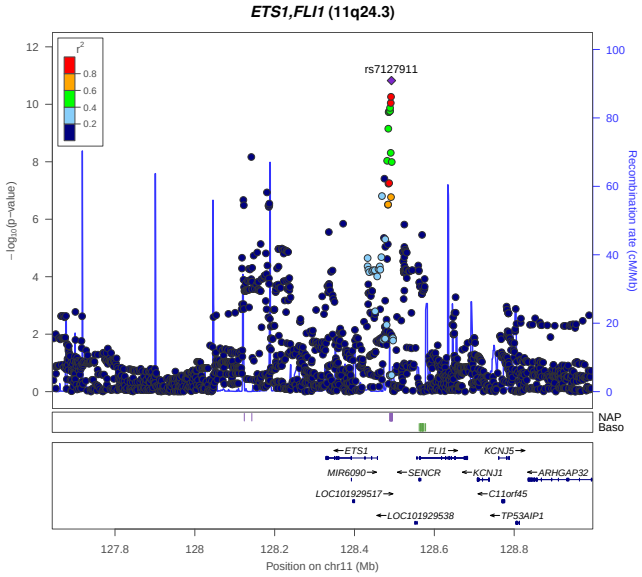


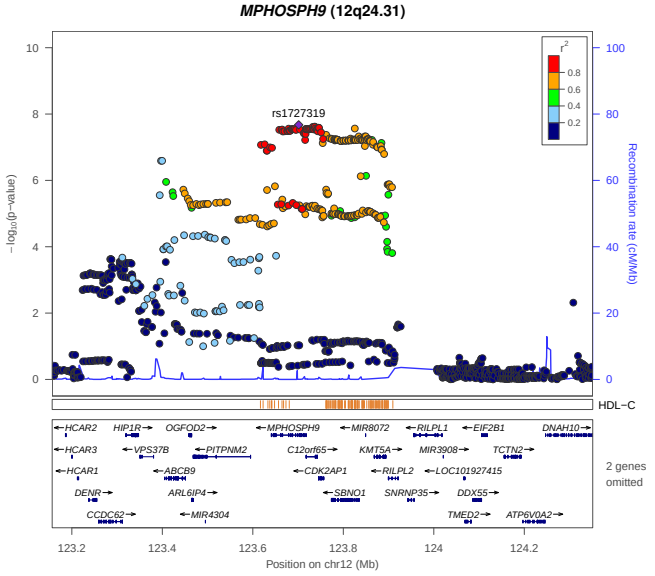
LOC401312,LOC541472 **(7p15.3)**

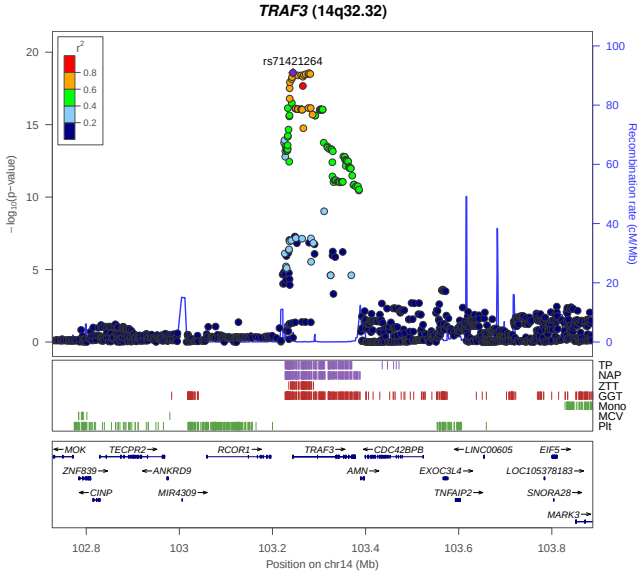


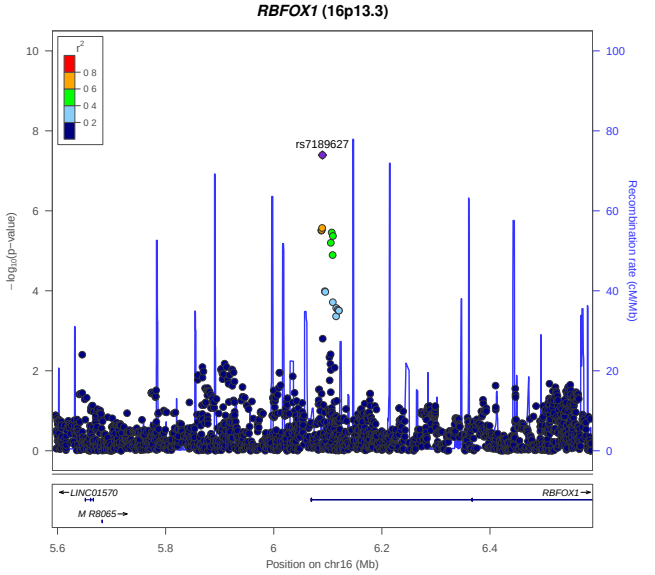

C7orf72,IKZF1 (7p12.2)
rs4598207
TC
HDL−C
TP
NAP
AST
Mono
RBC
MCV
MCH
Position on chr7 (Mb)
FAM167A,BLK (8p23.1)
rs2409780
NAP
Position on chr8 (Mb)
FAM102A,NAIF1 (9q34.11)
rs10987830
Mono
11 genes omitted
Position on chr9 (Mb)
FADS2 (11q12.2)
rs2727271
TC
TG
HbA1c
TP
NAP
UA
ALT
GGT
RBC
Plt
6 genes omitted
Position on chr11 (Mb)
RNASEH2C,AP5B1 (11q13.1)
rs12223803
sCr
UA
MCH
16 genes omitted
Position on chr11 (Mb)
FCHSD2 (11q13.4)
rs72981516
TP
NAP
Position on chr11 (Mb)
Recombination rate (cM/Mb)

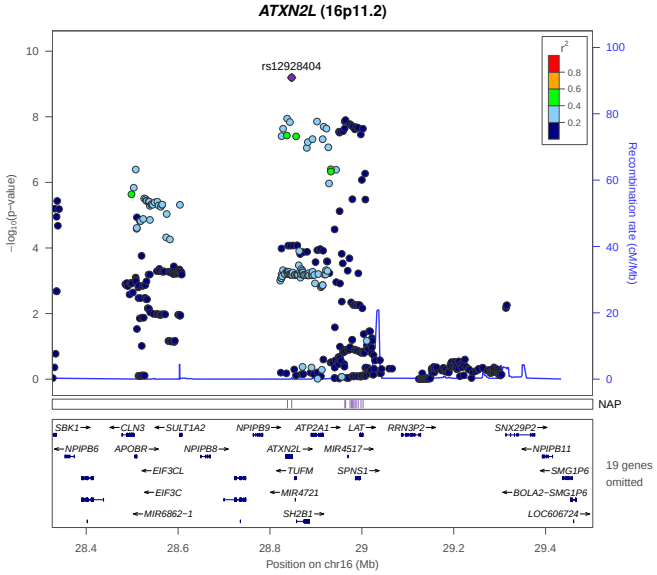

CXCR5 (11q23.3)
rs11574667
NAP
ALP
Plt
10 genes
omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)

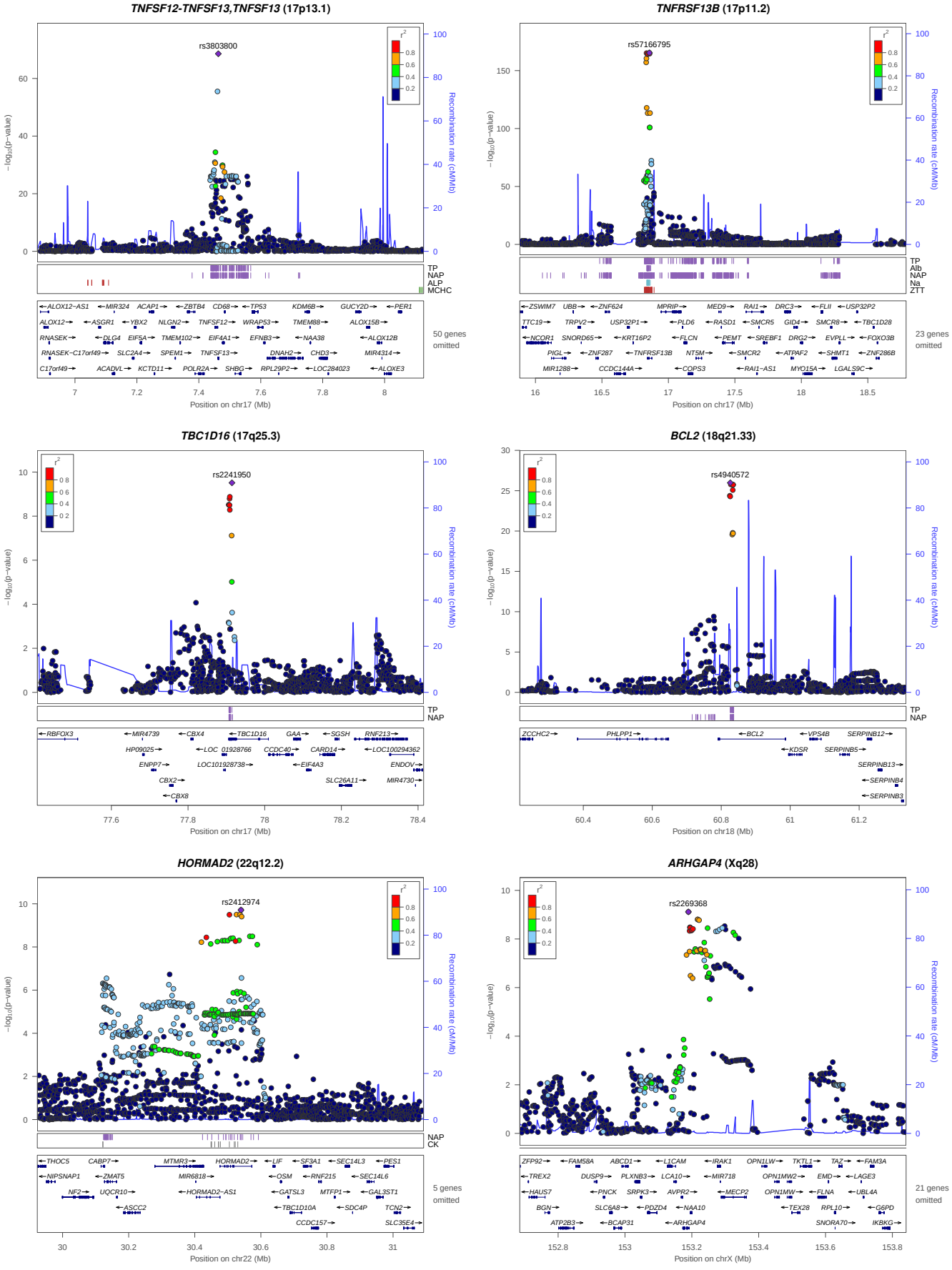

ETS1,FLI1 (11q24.3)
rs7127911
NAP
Baso
Position on chr11 (Mb)
Recombination rate (cM/Mb)


MPHOSPH9 (12q24.31)
rs1727319
HDL−C
2 genes
omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

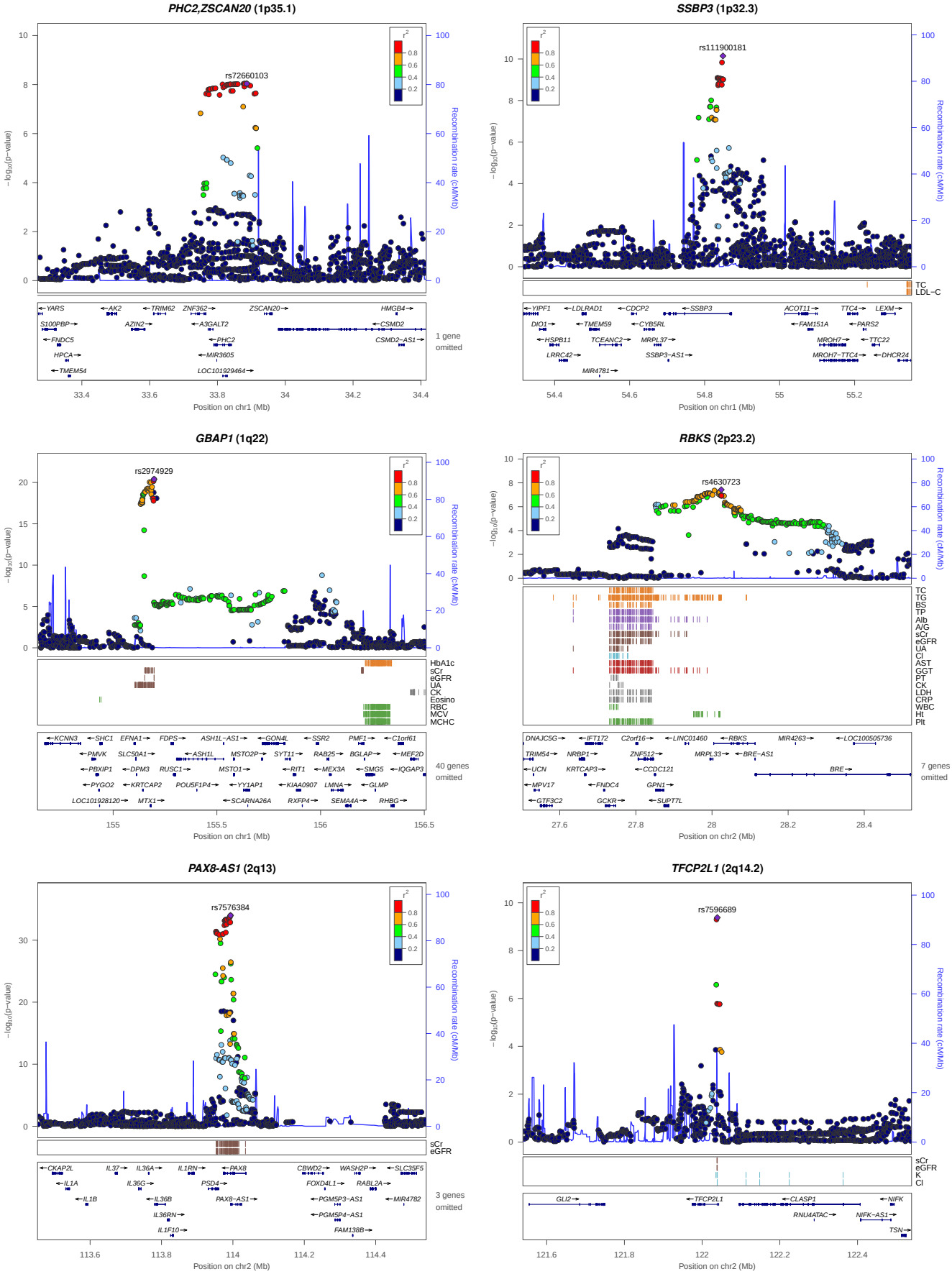

TRAF3 (14q32.32)
rs71421264
TP
NAP
ZTT
GGT
Mono
MCV
Plt
Position on chr14 (Mb)
Recombination rate (cM/Mb)

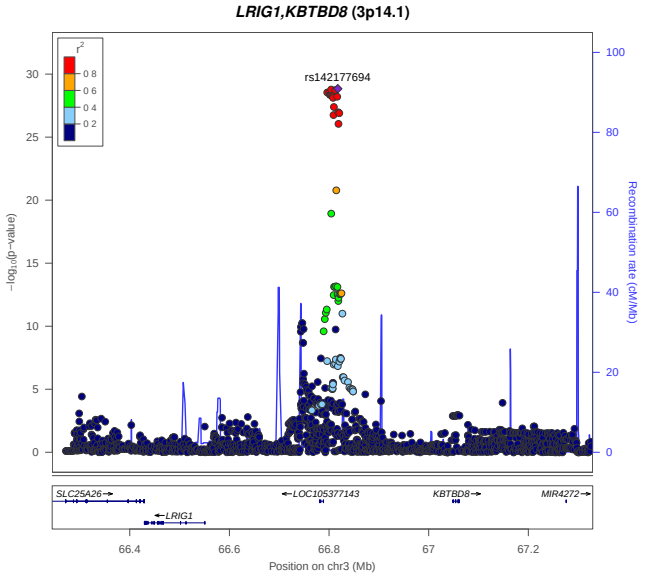

RBFOX1 (16p13.3)
rs7189627
Position on chr16 (Mb)
Recombination rate (cM/Mb)

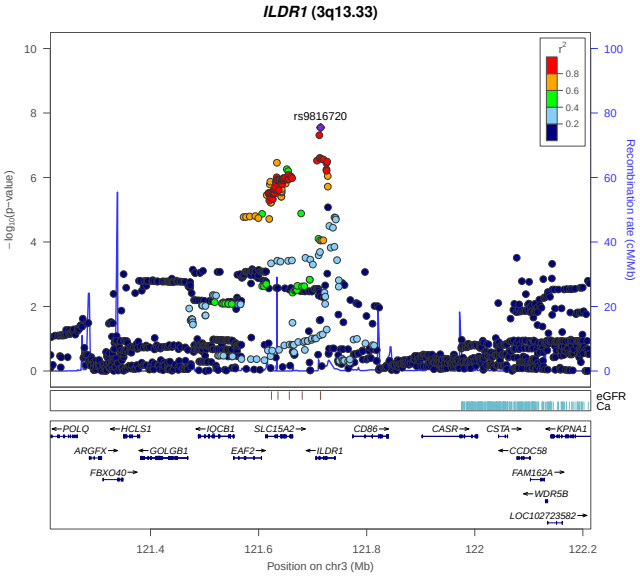

ATXN2L (16p11.2)
rs12928404
NAP
19 genes
omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

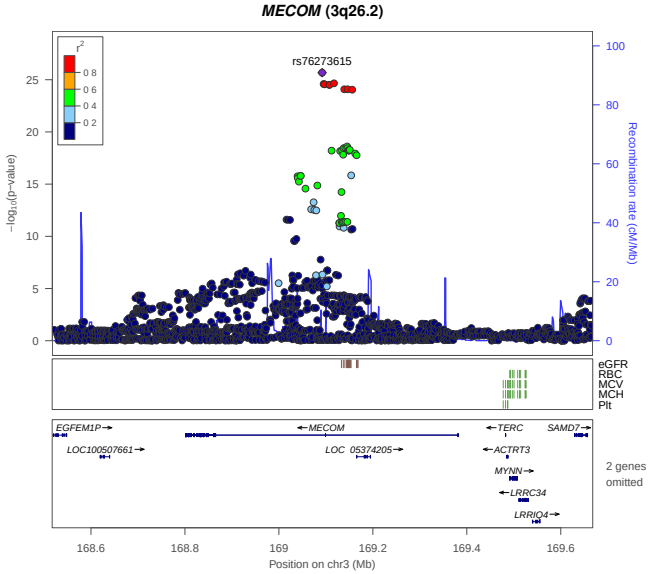

TNFSF12-TNFSF13,TNFSF13 (17p13.1)
rs3803800
TNFRSF13B (17p11.2)
rs57166795
TBC1D16 (17q25.3)
rs2241950
BCL2 (18q21.33)
rs4940572
HORMAD2 (22q12.2)
rs2412974
ARHGAP4 (Xq28)
rs2269368
Recombination rate (cM/Mb)
50 genes omitted
23 genes omitted
5 genes omitted
21 genes omitted
Position on chr17 (Mb)
Position on chr18 (Mb)
Position on chr22 (Mb)
Position on chrX (Mb)

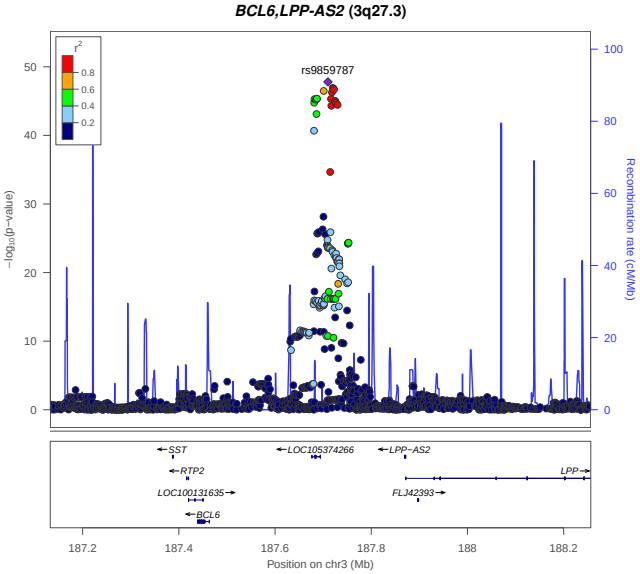
2.11 BUN (n = 139,818)

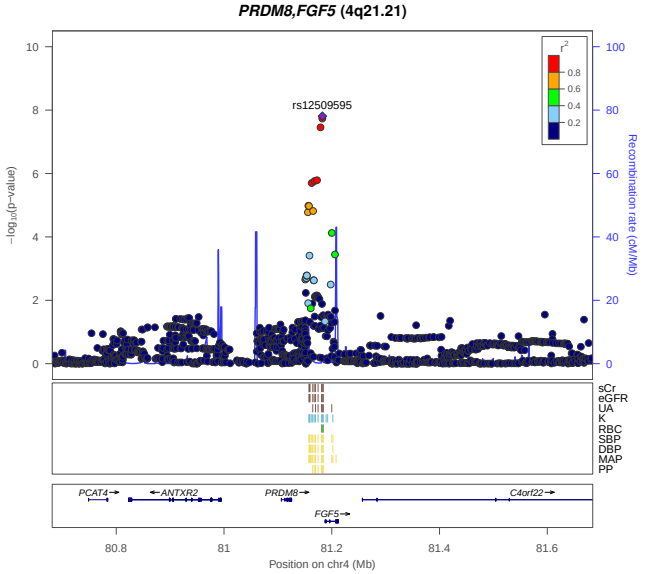


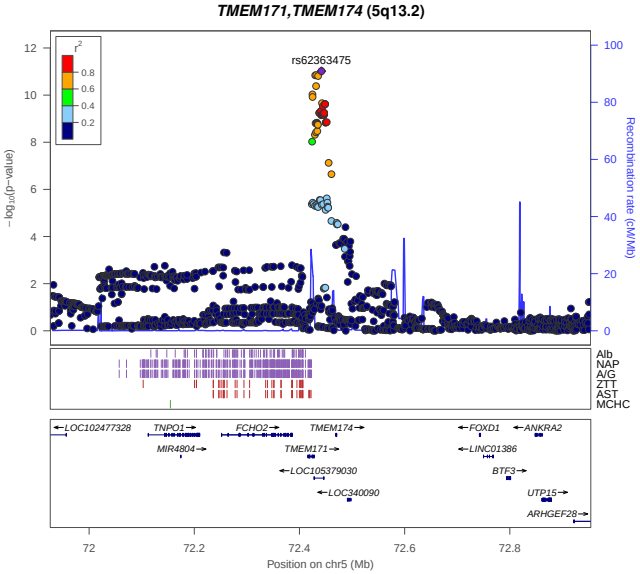

LRIG1,KBTBD8 (3p14.1)
rs142177694
SLC25A26
LOC105377143
KBTBD8
MIR4272
LRIG1
Position on chr3 (Mb)
Recombination rate (cM/Mb)

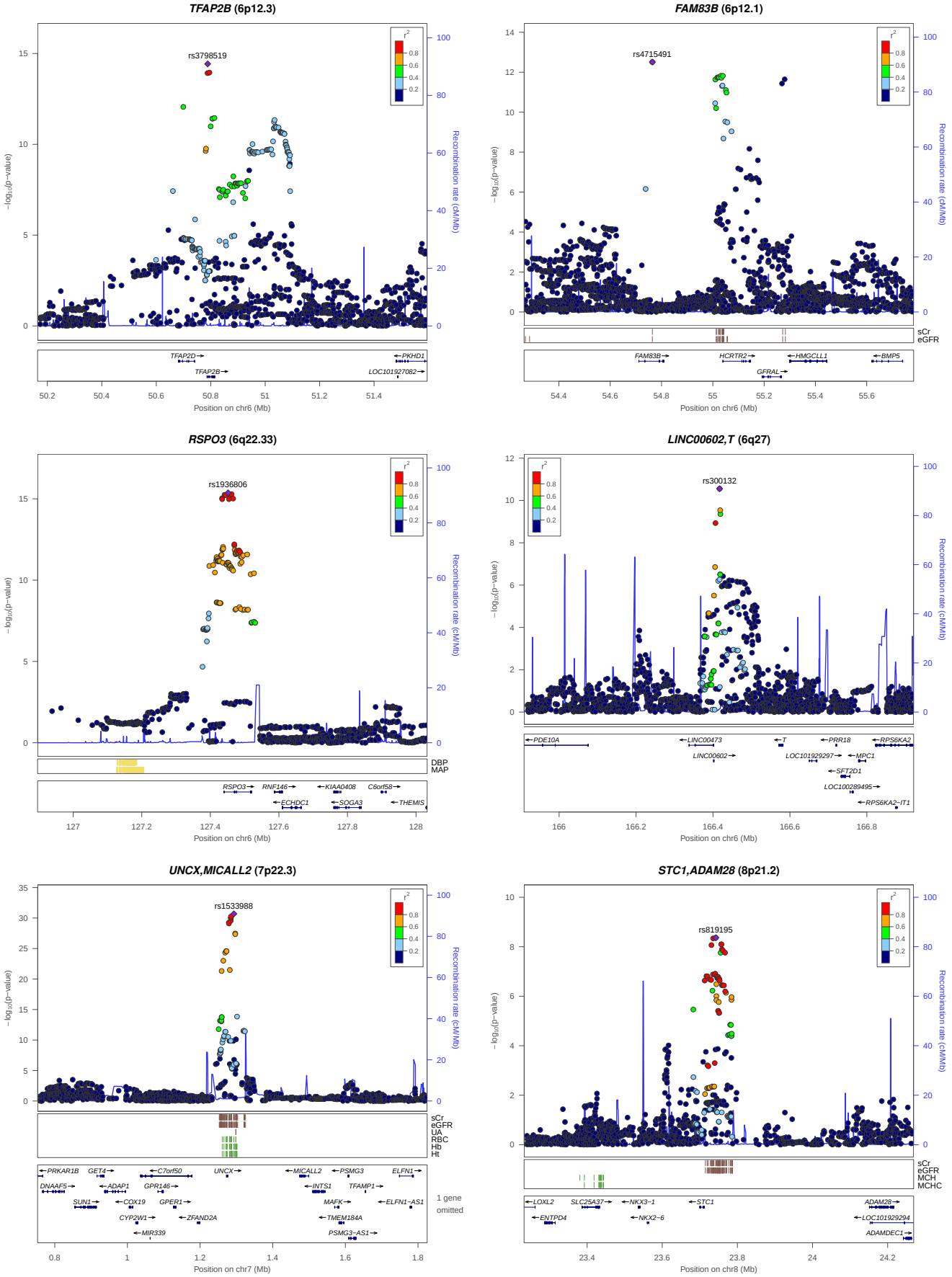

ILDR1 (3q13.33)
rs9816720
eGFR
Ca
POLQ
HCLS1
IQCB1
SLC15A2
CD86
CASR
CSTA
KPNA1
ARGFX
GOLGB1
EAF2
ILDR1
CCDC58
FBXO40
FAM162A
WDR5B
LOC102723582
Position on chr3 (Mb)
Recombination rate (cM/Mb)

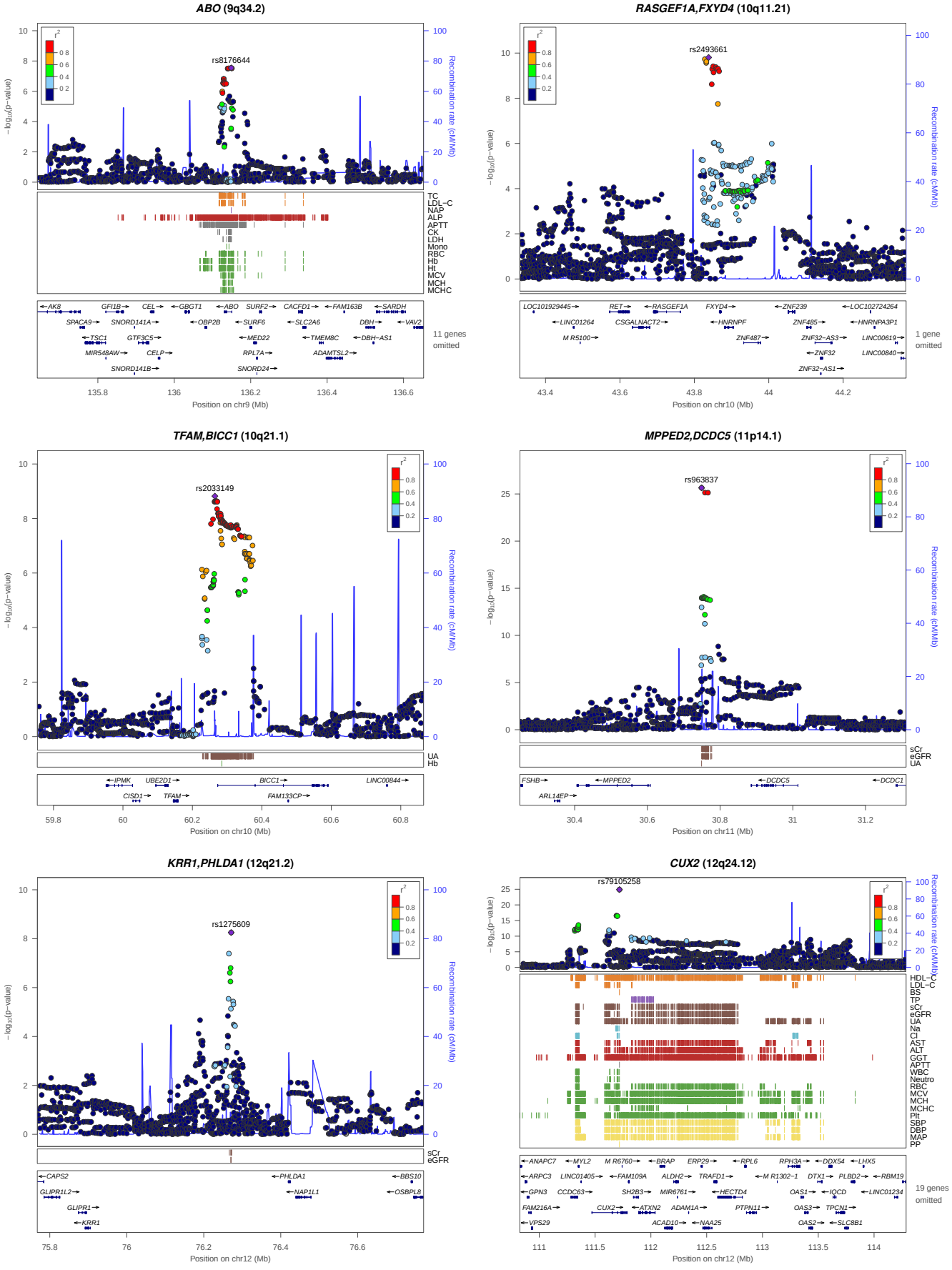

MECOM (3q26.2)
rs76273615
eGFR
RBC
MCV
MCH
Plt
EGFEM1P
MECOM
TERC
SAMD7
LOC100507661
LOC 05374205
ACTRT3
MYNN
LRRC34
LRRIQ4
2 genes
omitted
Position on chr3 (Mb)
Recombination rate (cM/Mb)

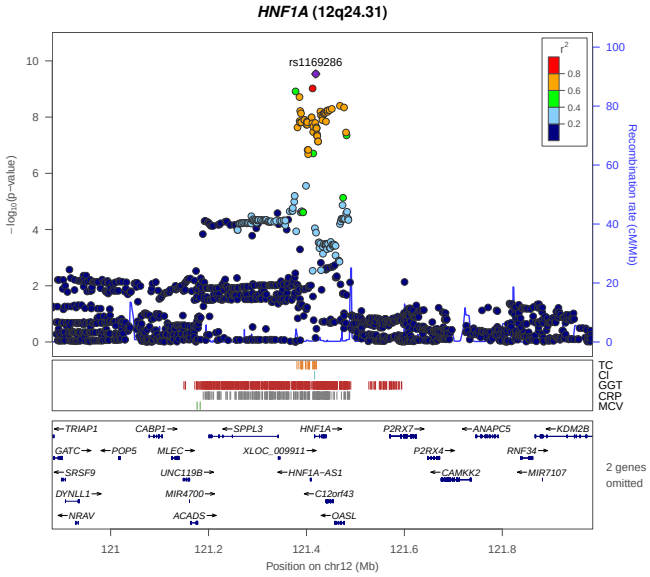

BCL6,LPP-AS2 (3q27.3)
rs9859787
SST
LOC105374266
LPP-AS2
RTP2
LPP
LOC100131635
FLJ42393
BCL6
Position on chr3 (Mb)
Recombination rate (cM/Mb)

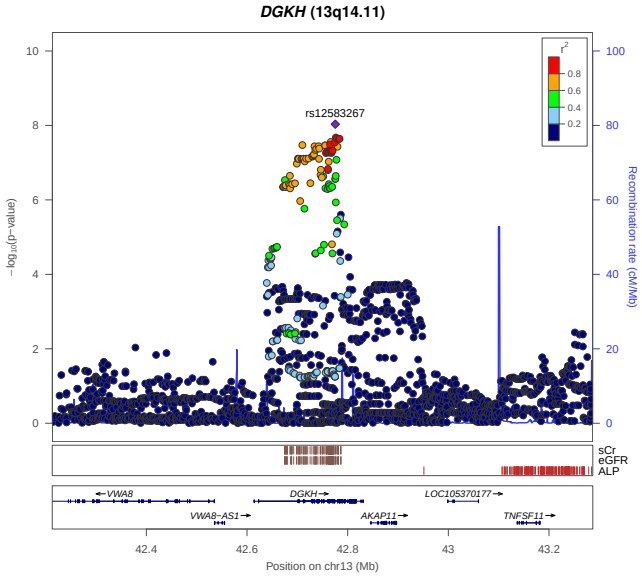

PRDM8,FGF5 (4q21.21)
rs12509595
sCr
eGFR
UA
K
RBC
SBP
DBP
MAP
PP
PCAT4
ANTXR2
PRDM8
C4orf22
FGF5
Position on chr4 (Mb)
Recombination rate (cM/Mb)

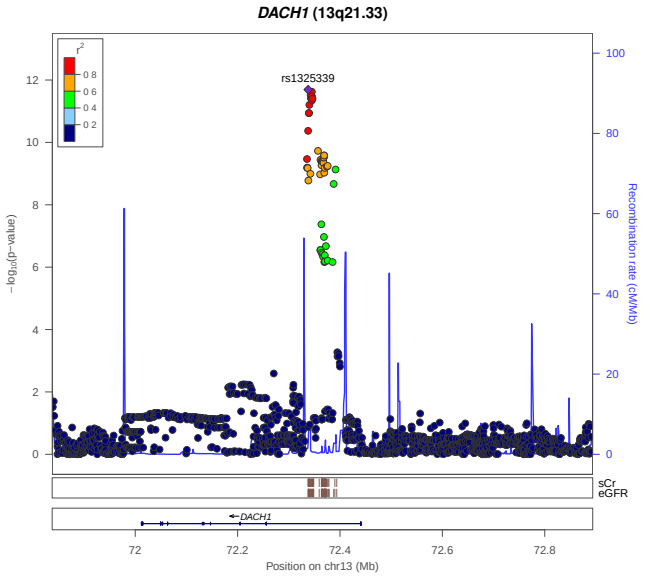

TMEM171,TMEM174 (5q13.2)
rs62363475
Alb
NAP
AG
ZTT
AST
MCHC
LOC102477328
TNPO1
FCHO2
TMEM174
FOXD1
ANKRA2
MIR4804
TMEM171
LINC01386
LOC105379030
BTF3
LOC340090
UTP15
ARHGEF28
Position on chr5 (Mb)
Recombination rate (cM/Mb)

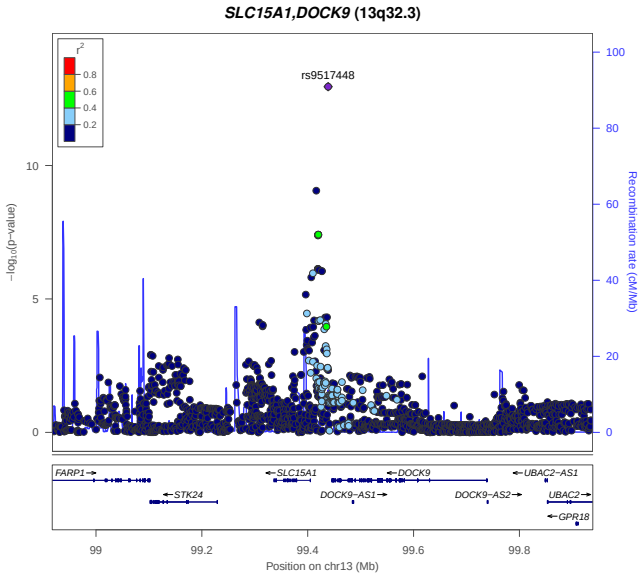

TFAP2B (6p12.3)
rs3798519
FAM83B (6p12.1)
rs4715491
RSPO3 (6q22.33)
rs1936806
LINC00602,T (6q27)
rs300132
UNCX,MICALL2 (7p22.3)
rs1533988
STC1,ADAM28 (8p21.2)
rs819195
Recombination rate (cM/Mb)
Position on chr6 (Mb)
Position on chr7 (Mb)
Position on chr8 (Mb)
1 gene omitted

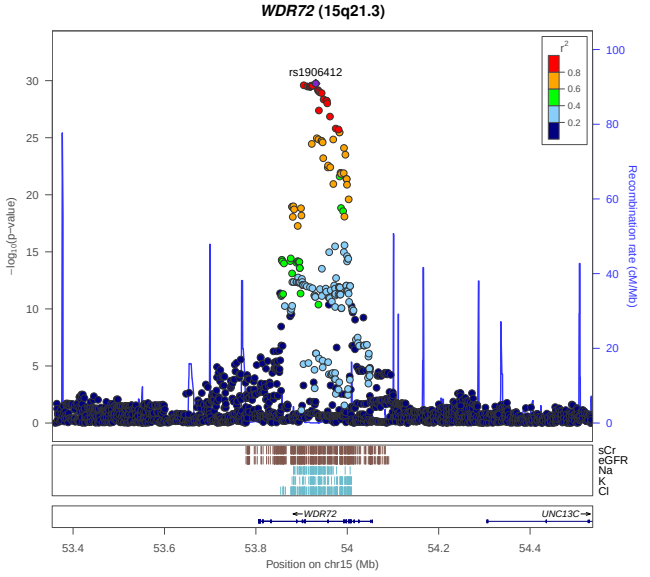

ABO (9q34.2)
rs8176644
RASGEF1A,FXYD4 (10q11.21)
rs2493661
TFAM,BICC1 (10q21.1)
rs2033149
MPPED2,DCDC5 (11p14.1)
rs963837
KRR1,PHLDA1 (12q21.2)
rs1275609
CUX2 (12q24.12)
rs79105258
Recombination rate (cM/Mb)
Position on chr9 (Mb)
Position on chr10 (Mb)
Position on chr11 (Mb)
Position on chr12 (Mb)
11 genes omitted
1 gene omitted
19 genes omitted

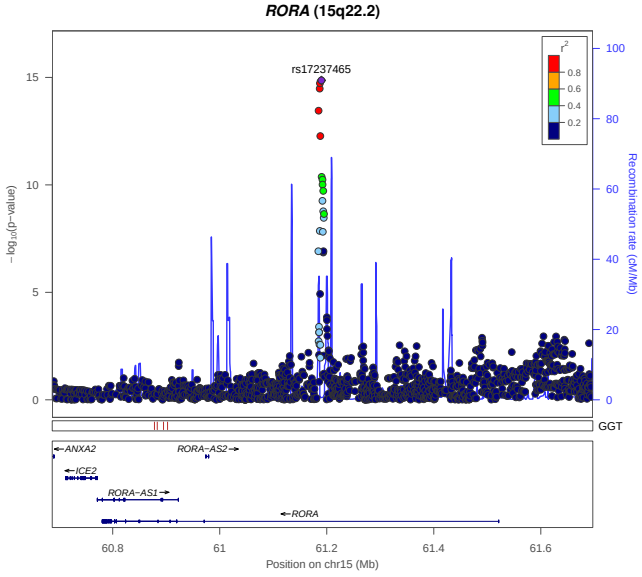

HNF1A (12q24.31)
rs1169286
TC
Cr
GGT
CRP
MCV
2 genes omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

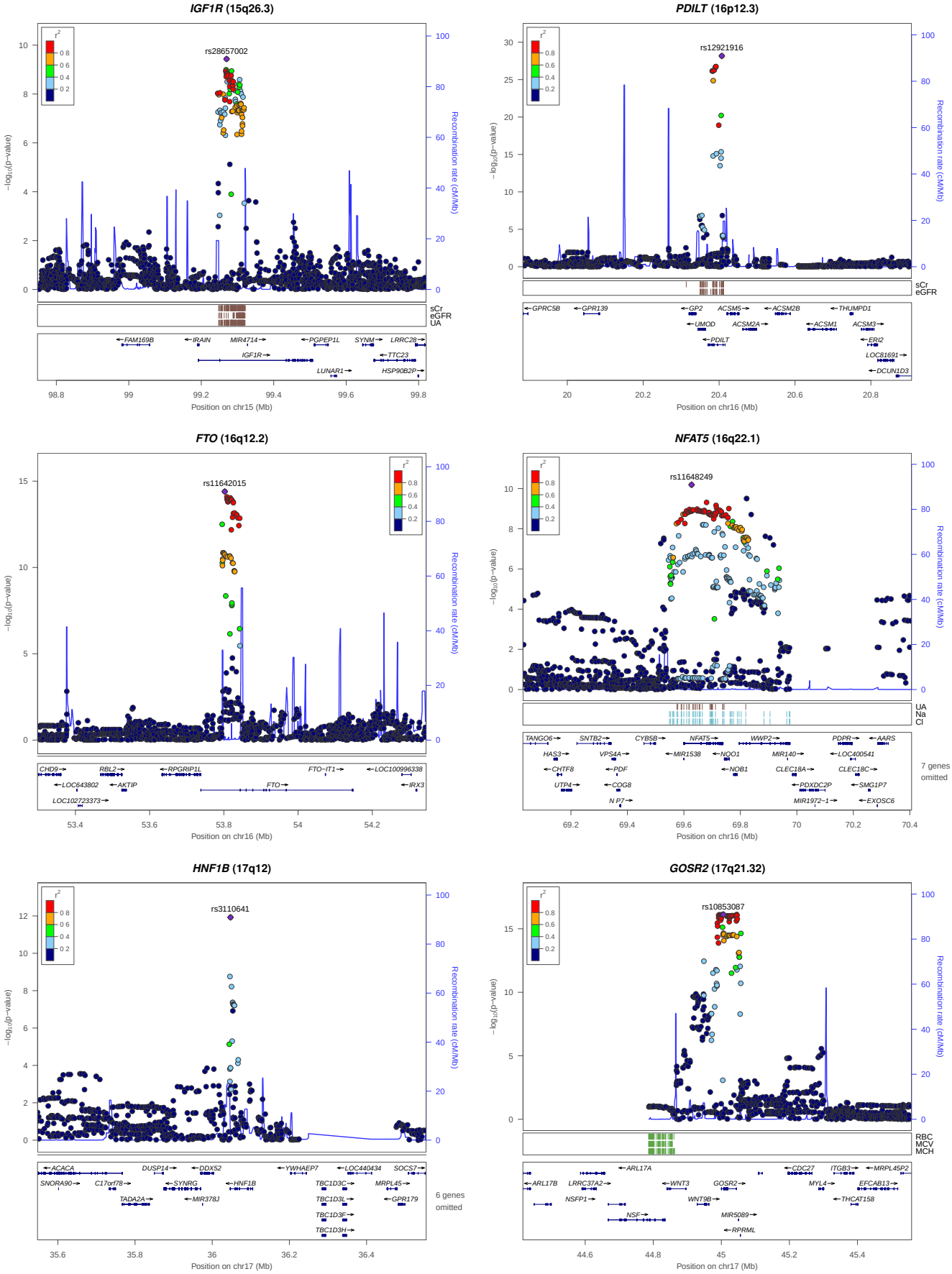

DGKH (13q14.11)
rs12583267
sCr
eGFR
ALP
Position on chr13 (Mb)
Recombination rate (cM/Mb)

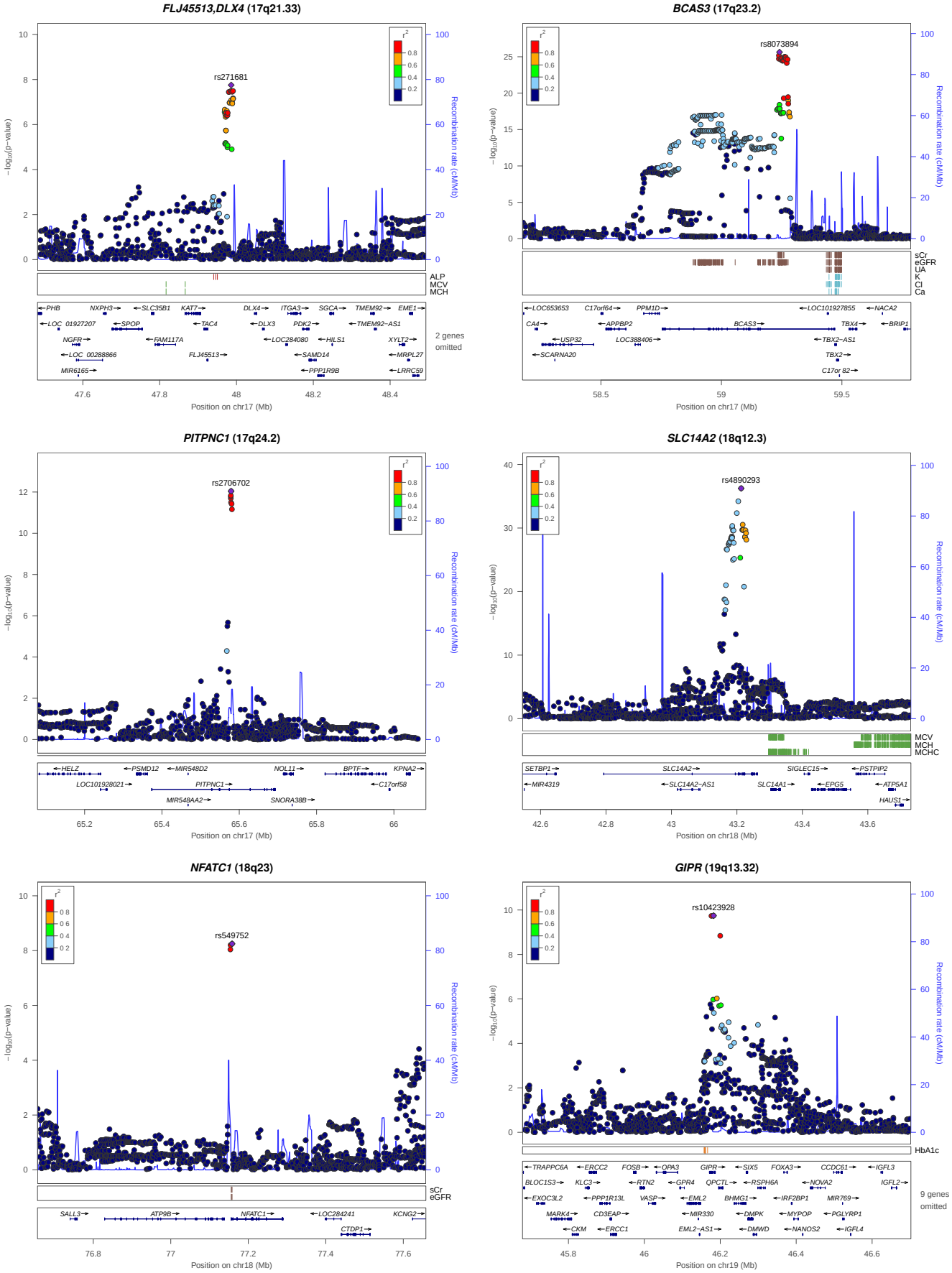

DACH1 (13q21.33)
rs1325339
sCr
eGFR
Position on chr13 (Mb)
Recombination rate (cM/Mb)

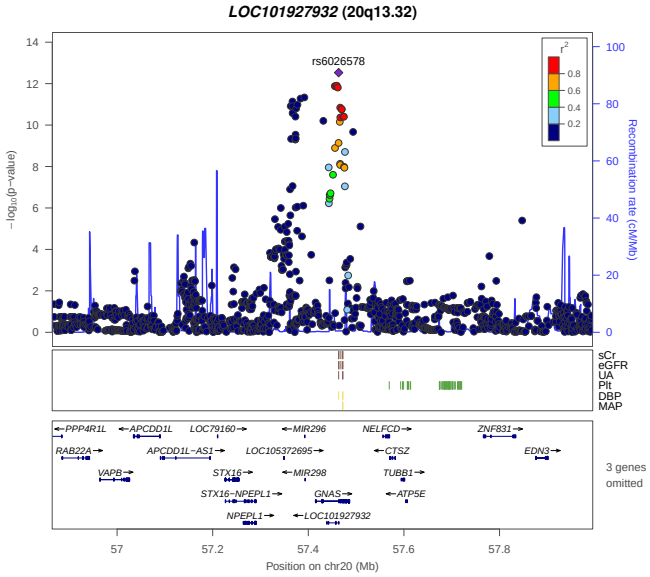

SLC15A1,DOCK9 (13q32.3)
rs9517448
Position on chr13 (Mb)
Recombination rate (cM/Mb)


WDR72 (15q21.3)
rs1906412
sCr
eGFR
Na
K
Cl
Position on chr15 (Mb)
Recombination rate (cM/Mb)

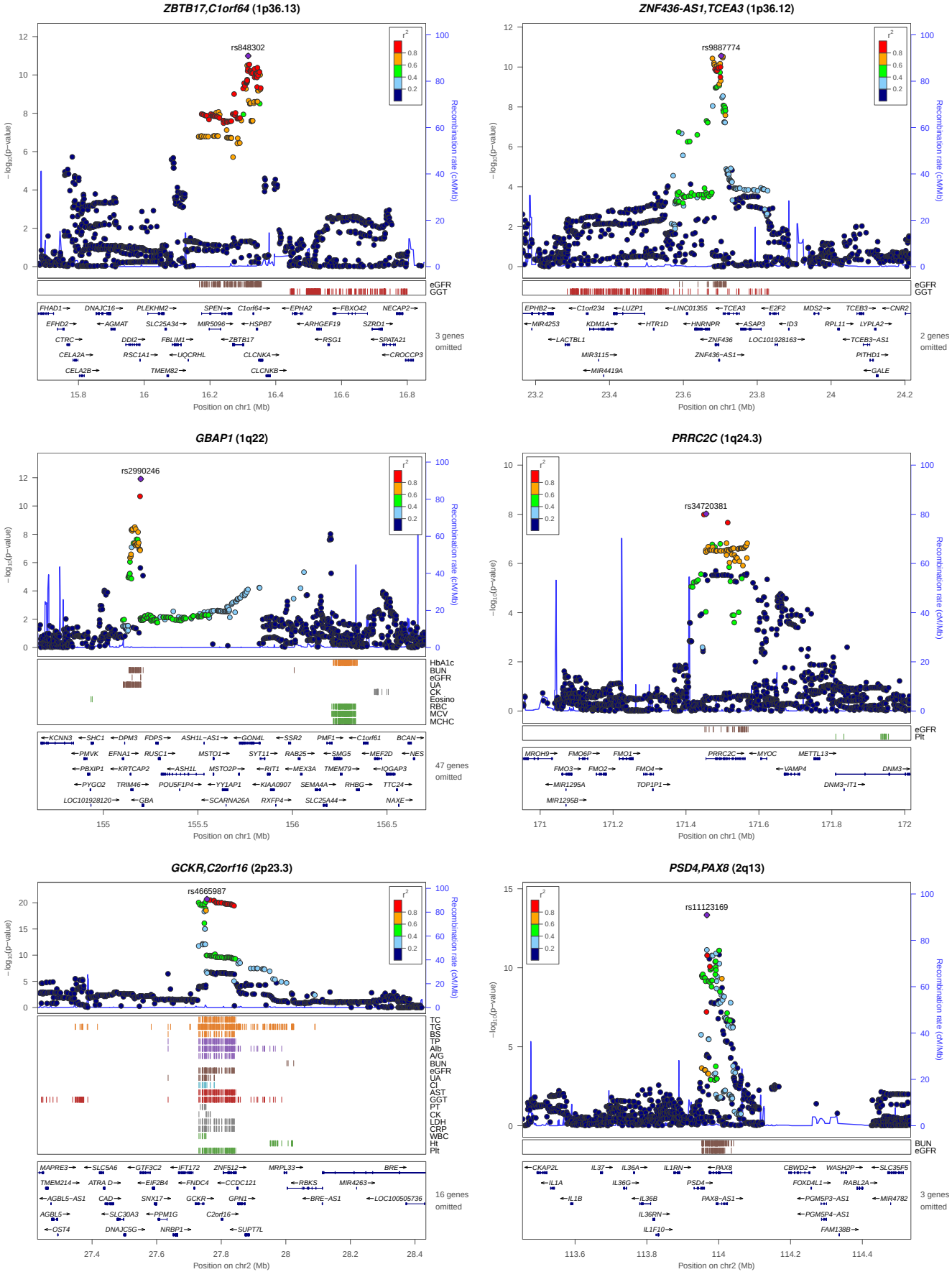

RORA (15q22.2)
rs17237465
GGT
Position on chr15 (Mb)
Recombination rate (cM/Mb)

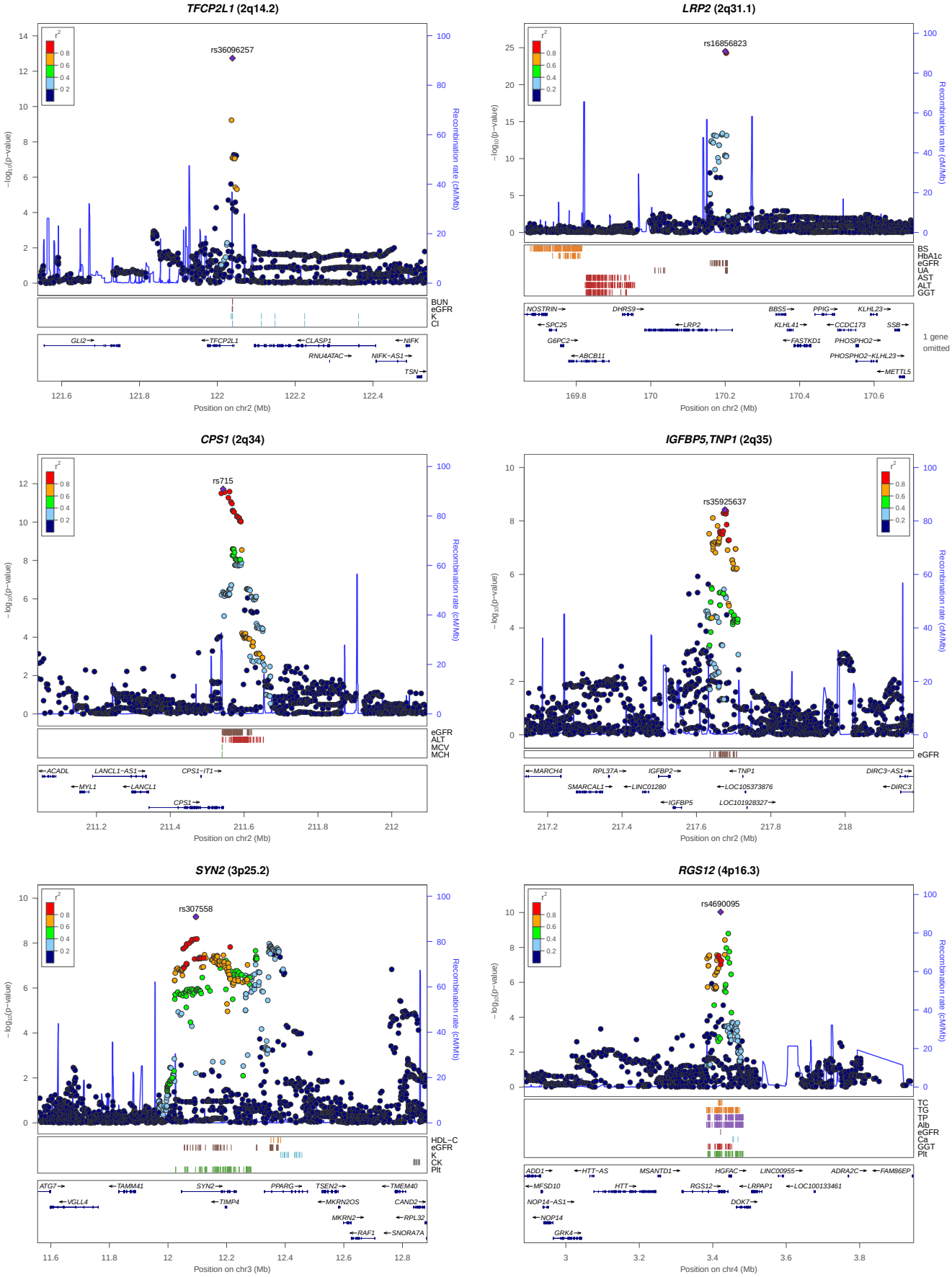

IGF1R (15q26.3)
rs28657002
sCr
eGFR
UA
FAM169B
IRAIN
MIR4714
PGPEP1L
SYNM
LRRC28
IGF1R
TTC23
LUNAR1
HSP90B2P
Position on chr15 (Mb)
PDILT (16p12.3)
rs12921916
GPRC5B
GPR139
GP2
ACSM5
ACSM2B
THUMPD1
UMOD
ACSM2A
ACSM1
ACSM3
PDILT
ERI2
LOC81691
DCUN1D3
Position on chr16 (Mb)
FTO (16q12.2)
rs11642015
CHD9
RBL2
RPGRIP1L
FTO-IT1
LOC100996338
LOC643802
AKTIP
FTO
IRX3
LOC102723373
Position on chr16 (Mb)
NFAT5 (16q22.1)
rs11648249
UA
Na
Cl
TANGO6
SNTB2
CYB5B
NFAT5
WWP2
PDPR
AARS
HAS3
VPS4A
MIR1538
NQO1
MIR140
LOC400541
CHTF8
PDF
NOB1
CLEC18A
CLEC18C
UTP4
COG8
PDXDC2P
SMG1P7
N P7
MIR1972-1
EXOSC6
7 genes omitted
Position on chr16 (Mb)
HNF1B (17q12)
rs3110641
ACACA
DUSP14
DDX52
YWHAEP7
LOC440434
SOCS7
SNORA90
C17orf78
SYNRG
HNF1B
TBC1D3C
MRPL45
TADA2A
MIR378J
TBC1D3L
GPR179
TBC1D3F
TBC1D3H
6 genes omitted
Position on chr17 (Mb)
GOSR2 (17q21.32)
rs10853087
RBC
MCV
MCH
ARL17A
CDC27
ITGB3
MRPL45P2
ARL17B
LRRC37A2
WNT3
GOSR2
MYL4
EFCAB13
NSFP1
WNT9B
THCAT158
NSF
MIR5089
RPRML
Position on chr17 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)


FLJ45513,DLX4 (17q21.33)
rs271681
ALP
MCV
MCH
2 genes omitted
Position on chr17 (Mb)
BCAS3 (17q23.2)
rs8073894
sCr
eGFR
UA
K
Cl
Ca
Position on chr17 (Mb)
PITPNC1 (17q24.2)
rs2706702
Position on chr17 (Mb)
SLC14A2 (18q12.3)
rs4890293
MCV
MCH
MCHC
Position on chr18 (Mb)
NFATC1 (18q23)
rs549752
sCr
eGFR
Position on chr18 (Mb)
GIPR (19q13.32)
rs10423928
HbA1c
9 genes omitted
Position on chr19 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

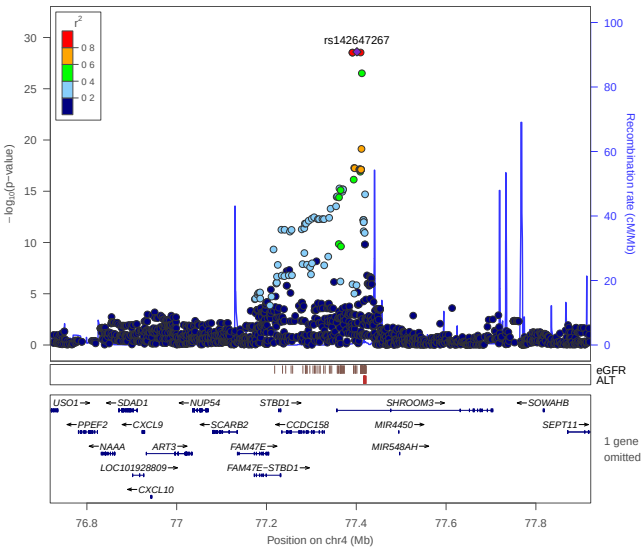

LOC101927932 (20q13.32)
rs6026578
r2
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
sCr
eGFR
UA
Plt
DBP
MAP
PPP4R1L
APCDD1L
LOC79160
MIR296
NELFCD
ZNF831
RAB22A
APCDD1L−AS1
LOC105372695
CTSZ
EDN3
VAPB
STX16
MIR298
TUBB1
STX16−NPEPL1
GNAS
ATP5E
NPEPL1
LOC101927932
3 genes omitted
Position on chr20 (Mb)

2.12 sCr (n = 142,097)

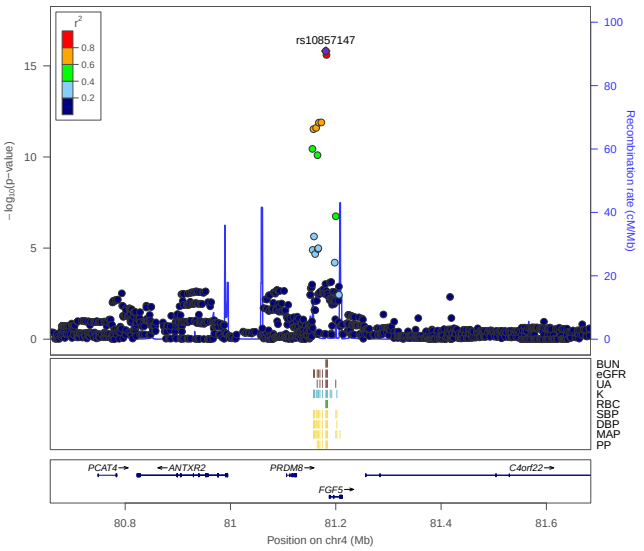



TFCP2L1 (2q14.2)
rs36096257
BUN
eGFR
K
Cl
GLI2
TFCP2L1
CLASP1
NIFK
RNU4ATAC
NIFK-AS1
TSN
Position on chr2 (Mb)
LRP2 (2q31.1)
rs16856823
BS
HbA1c
eGFR
UA
AST
ALT
GGT
NOSTRIN
DHRS9
BBS5
PPIG
KLHL23
SPC25
LRP2
KLHL41
CCDC173
SSB
G6PC2
FASTKD1
PHOSPHO2
ABCB11
PHOSPHO2-KLHL23
METTL5
1 gene omitted
Position on chr2 (Mb)
CPS1 (2q34)
rs715
eGFR
ALT
MCV
MCH
ACADL
LANCL1-AS1
CPS1-IT1
MYL1
LANCL1
CPS1
Position on chr2 (Mb)
IGFBP5,TNP1 (2q35)
rs35925637
eGFR
MARCH4
RPL37A
IGFBP2
TNP1
DIRC3-AS1
SMARCAL1
LINC01280
LOC105373876
DIRC3
IGFBP5
LOC101928327
Position on chr2 (Mb)
SYN2 (3p25.2)
rs307558
HDL-C
eGFR
K
CK
Plt
ATG7
TAMM41
SYN2
PPARG
TSEN2
TMEM40
VGLL4
TIMP4
MKRN2OS
CAND2
MKRN2
RPL32
RAF1
SNORA7A
Position on chr3 (Mb)
RGS12 (4p16.3)
rs4690095
TC
TG
TP
Alb
eGFR
Ca
GGT
Plt
ADD1
HTT-AS
MSANTD1
HGFAC
LINC00955
ADRA2C
FAM86EP
MFSD10
HTT
RGS12
LRRAP1
LOC100133461
NOP14-AS1
DOK7
NOP14
GRK4
Position on chr4 (Mb)
Recombination rate (cM/Mb)
−log10(p-value)
r2

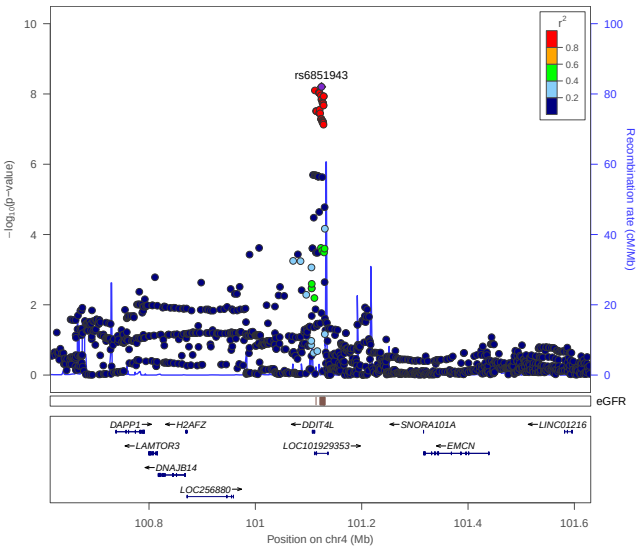
***SHROOM3* (4q21.1)**



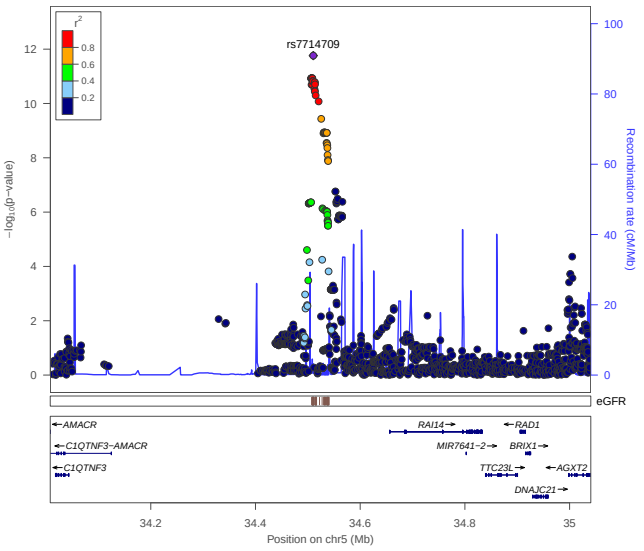
***PRDM8,FGF5* (4q21.21)**



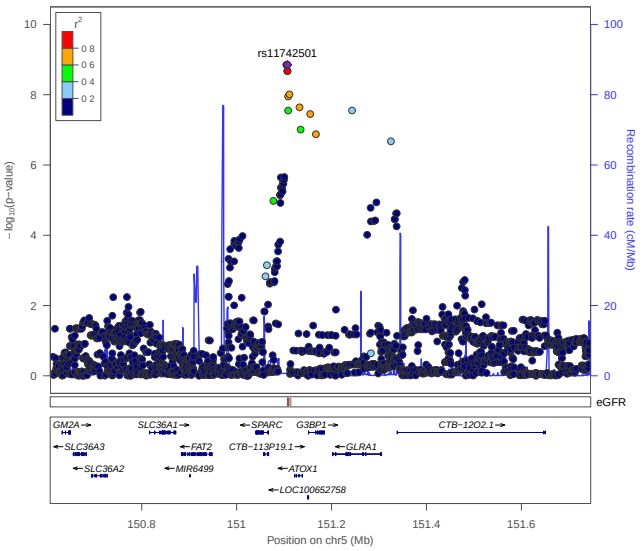
***LOC101929353* (4q24)**



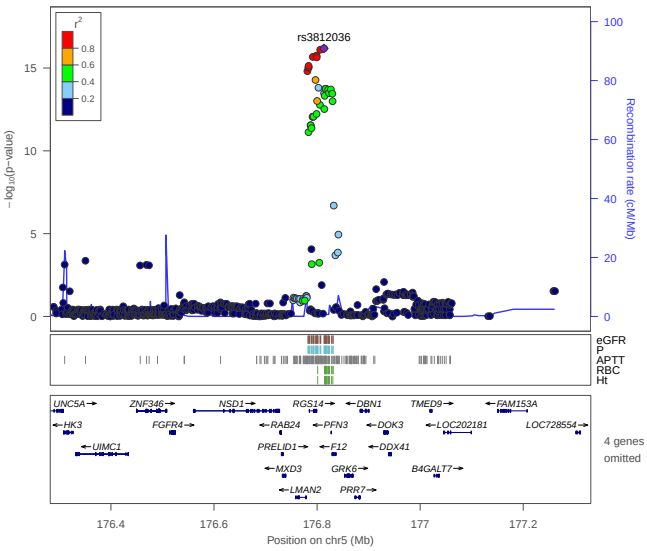
***C1QTNF3-AMACR,RAI14* (5p13.2)**

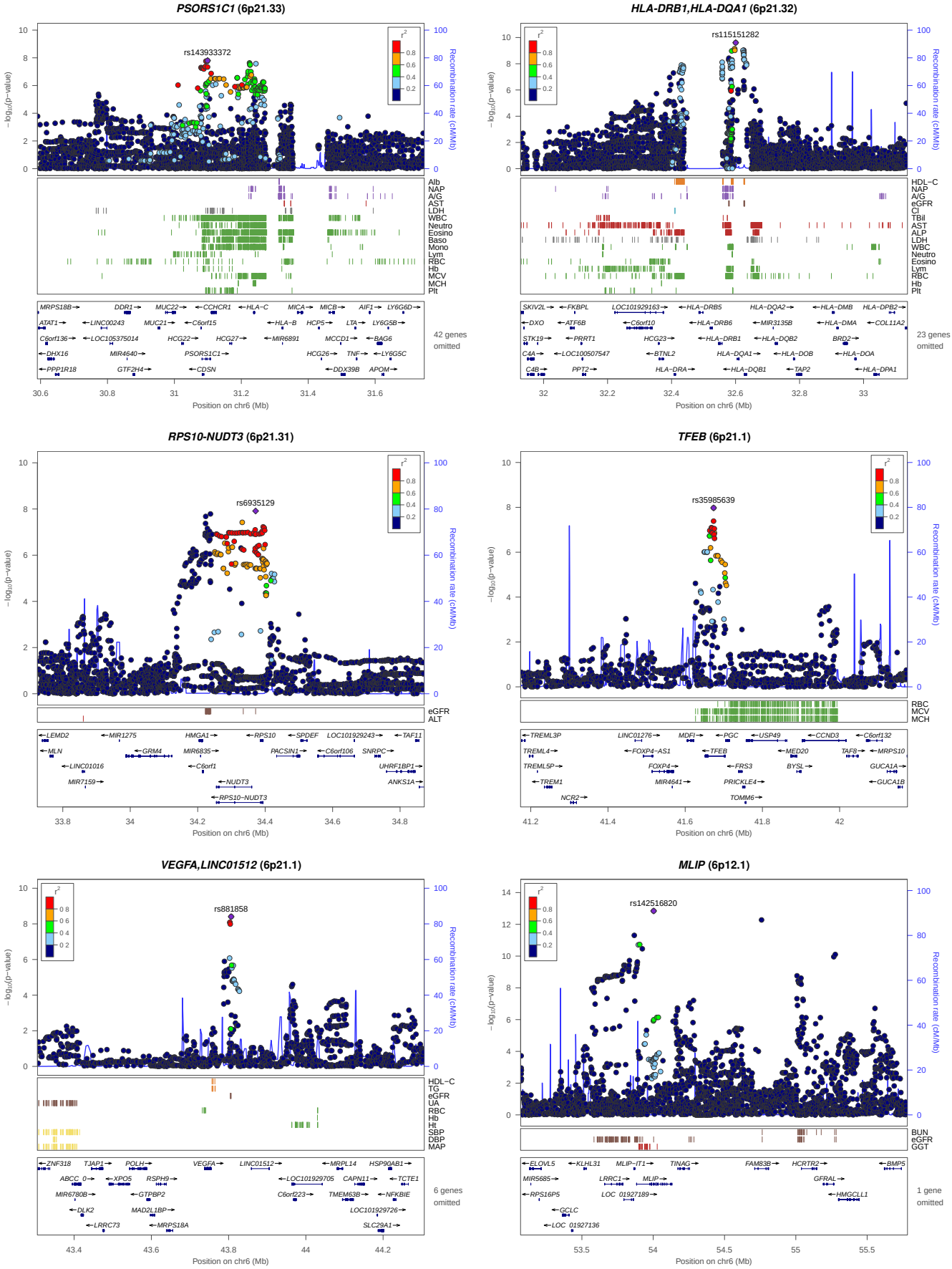


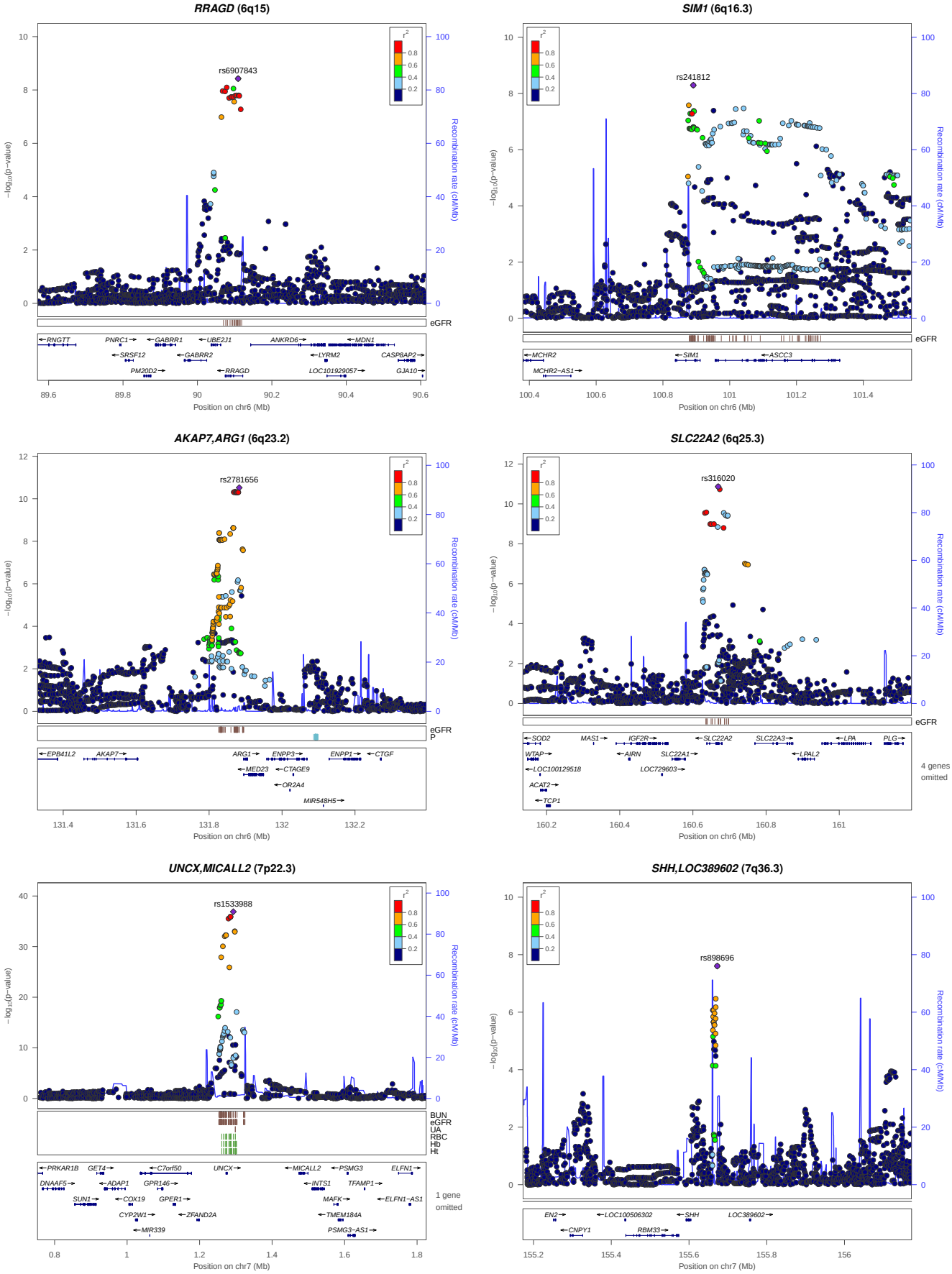
***CTB-113P19.1,ATOX1* (5q33.1)**

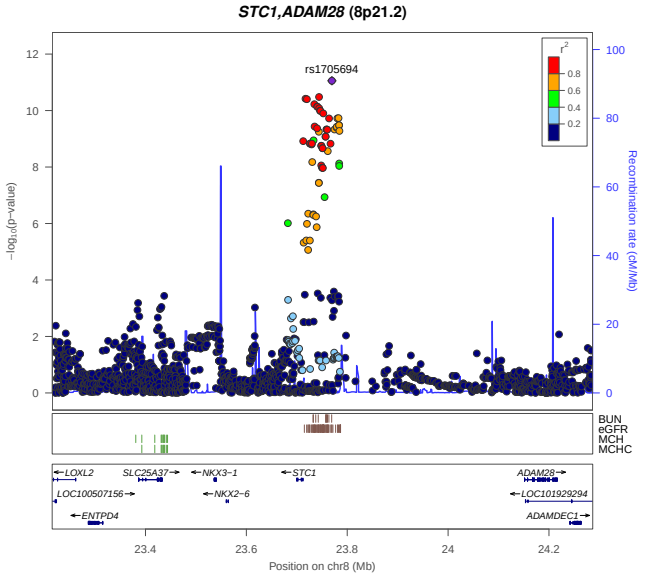


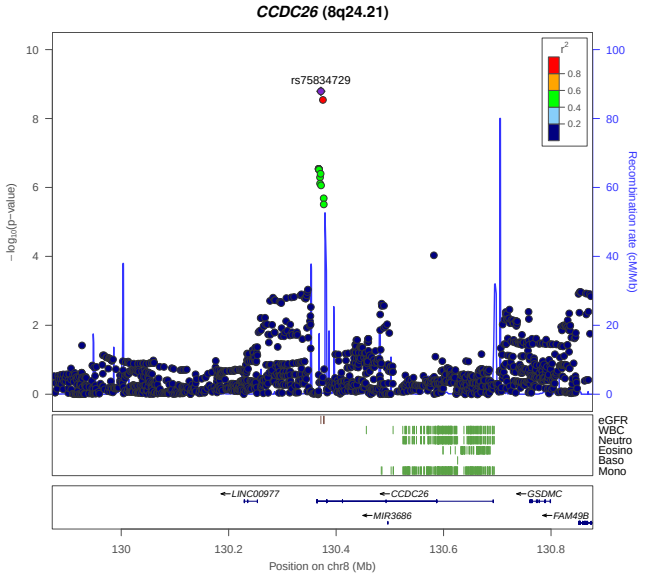
***SLC34A1* (5q35.3)**

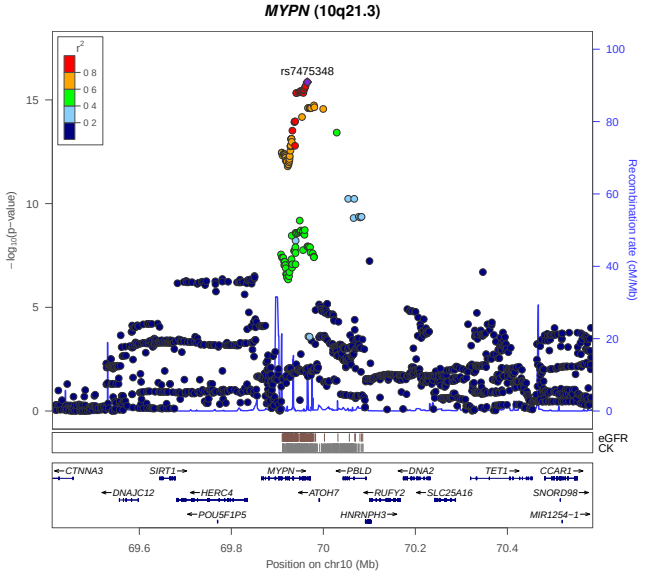


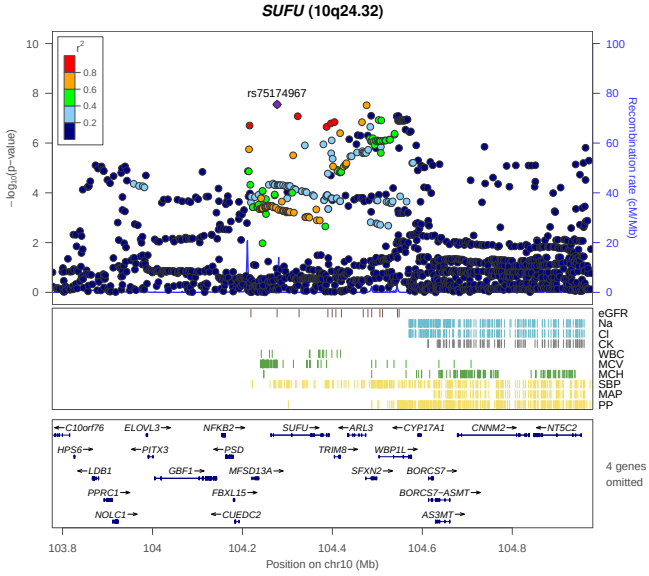

PSORS1C1 (6p21.33)
rs143933372
HLA-DRB1,HLA-DQA1 (6p21.32)
rs115151282
RPS10-NUDT3 (6p21.31)
rs6935129
TFEB (6p21.1)
rs35985639
VEGFA,LINC01512 (6p21.1)
rs881858
MLIP (6p12.1)
rs142516820
−log10(p-value)
Recombination rate (cM/Mb)
Position on chr6 (Mb)
42 genes omitted
23 genes omitted
6 genes omitted
1 gene omitted

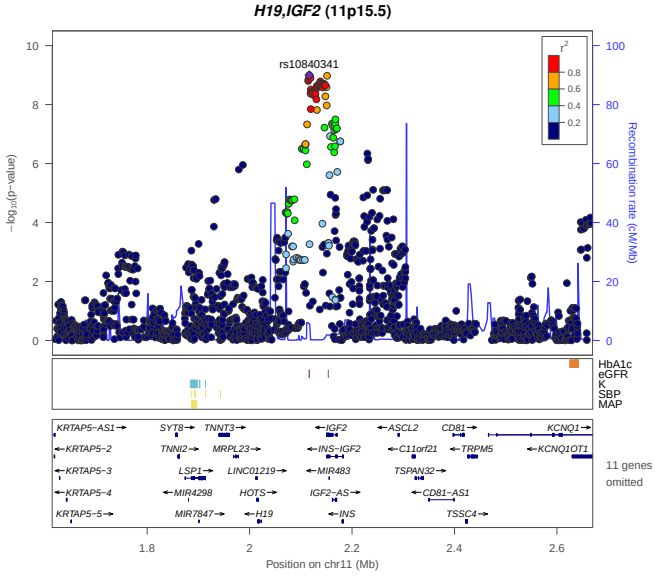

RRAGD (6q15)
rs6907843
eGFR
Position on chr6 (Mb)
SIM1 (6q16.3)
rs241812
eGFR
Position on chr6 (Mb)
AKAP7,ARG1 (6q23.2)
rs2781656
eGFR
P
Position on chr6 (Mb)
SLC22A2 (6q25.3)
rs316020
eGFR
4 genes omitted
Position on chr6 (Mb)
UNCX,MICALL2 (7p22.3)
rs1533988
BUN
eGFR
UA
RBC
Hb
Ht
1 gene omitted
Position on chr7 (Mb)
SHH,LOC389602 (7q36.3)
rs898696
Position on chr7 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)
r2

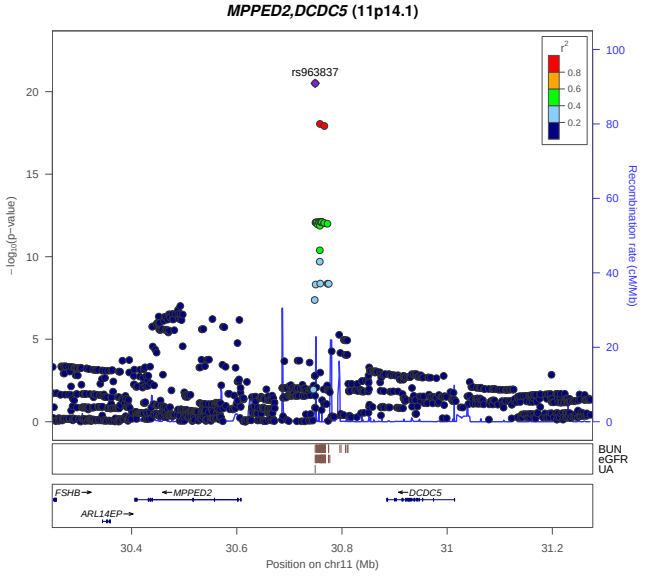

STC1,ADAM28 (8p21.2)
rs1705694
BUN
eGFR
MCH
MCHC
LOXL2
SLC25A37
NKX3-1
STC1
ADAM28
LOC100507156
NKX2-6
LOC101929294
ENTPD4
ADAMDEC1
Position on chr8 (Mb)
Recombination rate (cM/Mb)

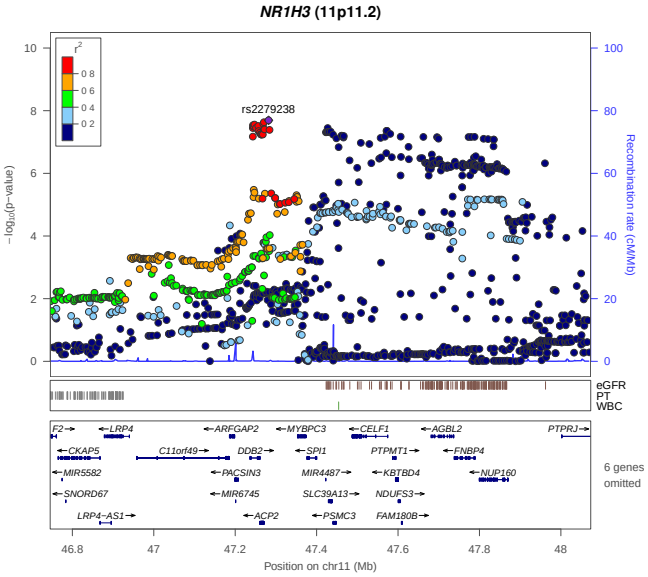

CCDC26 (8q24.21)
rs75834729
eGFR
WBC
Neutro
Eosino
Baso
Mono
LINC00977
CCDC26
GSDMC
MIR3686
FAM49B
Position on chr8 (Mb)
Recombination rate (cM/Mb)


MYPN (10q21.3)
rs7475348
eGFR
CK
CTNNA3
SIRT1
MYPN
PBLD
DNA2
TET1
CCAR1
DNAJC12
HERC4
ATOH7
RUFY2
SLC25A16
SNORD98
POU5F1P5
HNRNPH3
MIR1254-1
Position on chr10 (Mb)
Recombination rate (cM/Mb)

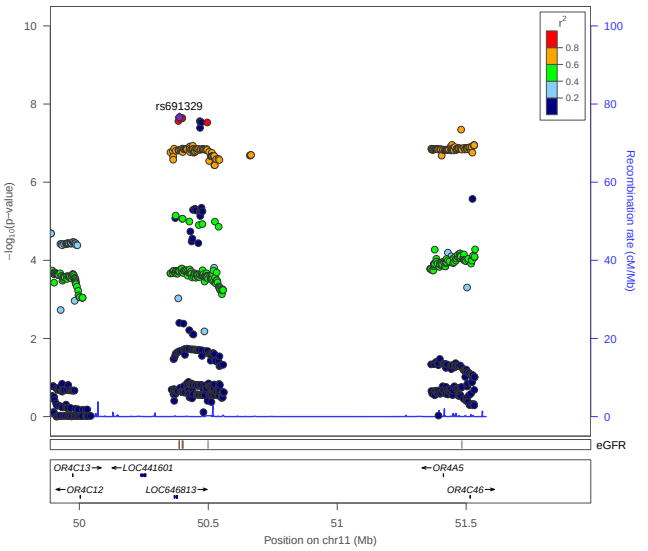

SUFU (10q24.32)
rs75174967
eGFR
Na
Cl
CK
WBC
MCV
MCH
SBP
MAP
PP
C10orf76
ELOVL3
NFKB2
SUFU
ARL3
CYP17A1
CNNM2
NT5C2
HPS6
PITX3
PSD
TRIM8
WBP1L
LDB1
GBF1
MFSD13A
SFXN2
BORCS7
PPRC1
FBXL15
BORCS7-ASMT
NOLC1
CUEDC2
AS3MT
4 genes
omitted
Position on chr10 (Mb)
Recombination rate (cM/Mb)


H19,IGF2 (11p15.5)
rs10840341
HbA1c
eGFR
K
SBP
MAP
KRTAP5-AS1
SYT8
TNNT3
IGF2
ASCL2
CD81
KCNQ1
KRTAP5-2
TNNI2
MRPL23
INS-IGF2
C11orf21
TRPM5
KCNQ1OT1
KRTAP5-3
LSP1
LINC01219
MIR483
TSPAN32
KRTAP5-4
MIR4298
HOTS
IGF2-AS
CD81-AS1
KRTAP5-5
MIR7847
H19
INS
TSSC4
11 genes
omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)

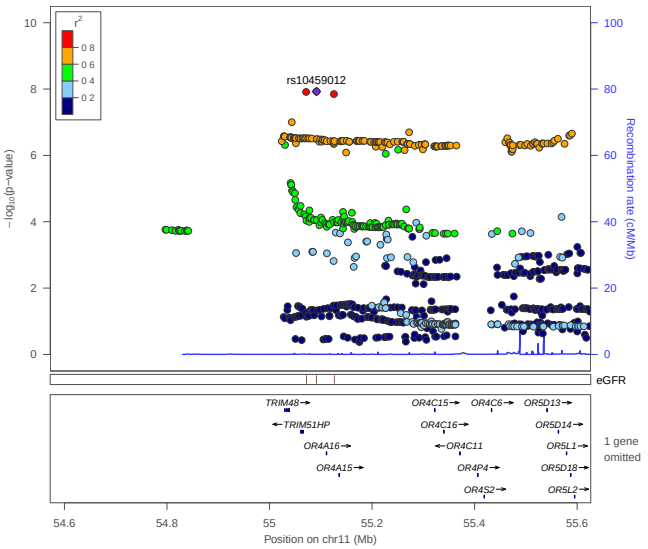

MPPED2,DCDC5 (11p14.1)
rs963837
BUN
eGFR
UA
FSHB
MPPED2
DCDC5
ARL14EP
Position on chr11 (Mb)
Recombination rate (cM/Mb)



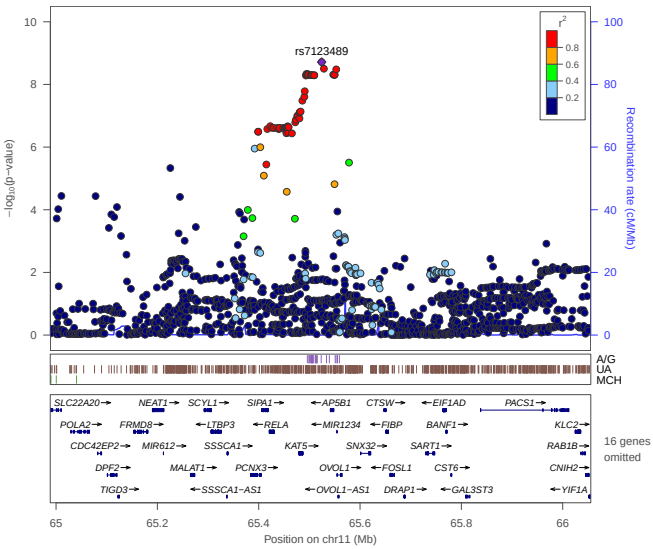
***NR1H3* (11p11.2)**



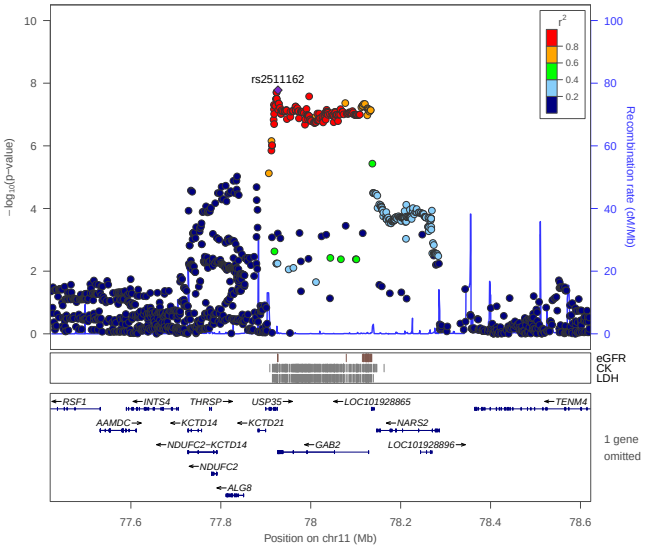
***LOC646813,OR4A5* (11p11.12)**



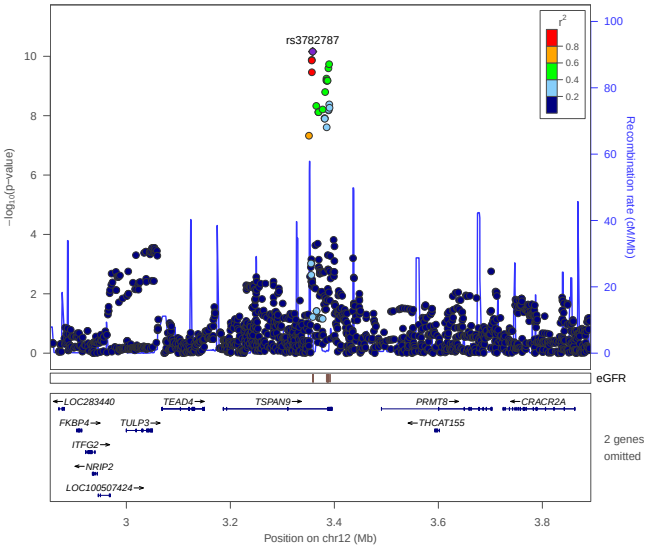
***TRIM51HP,OR4A16* (11q11)**



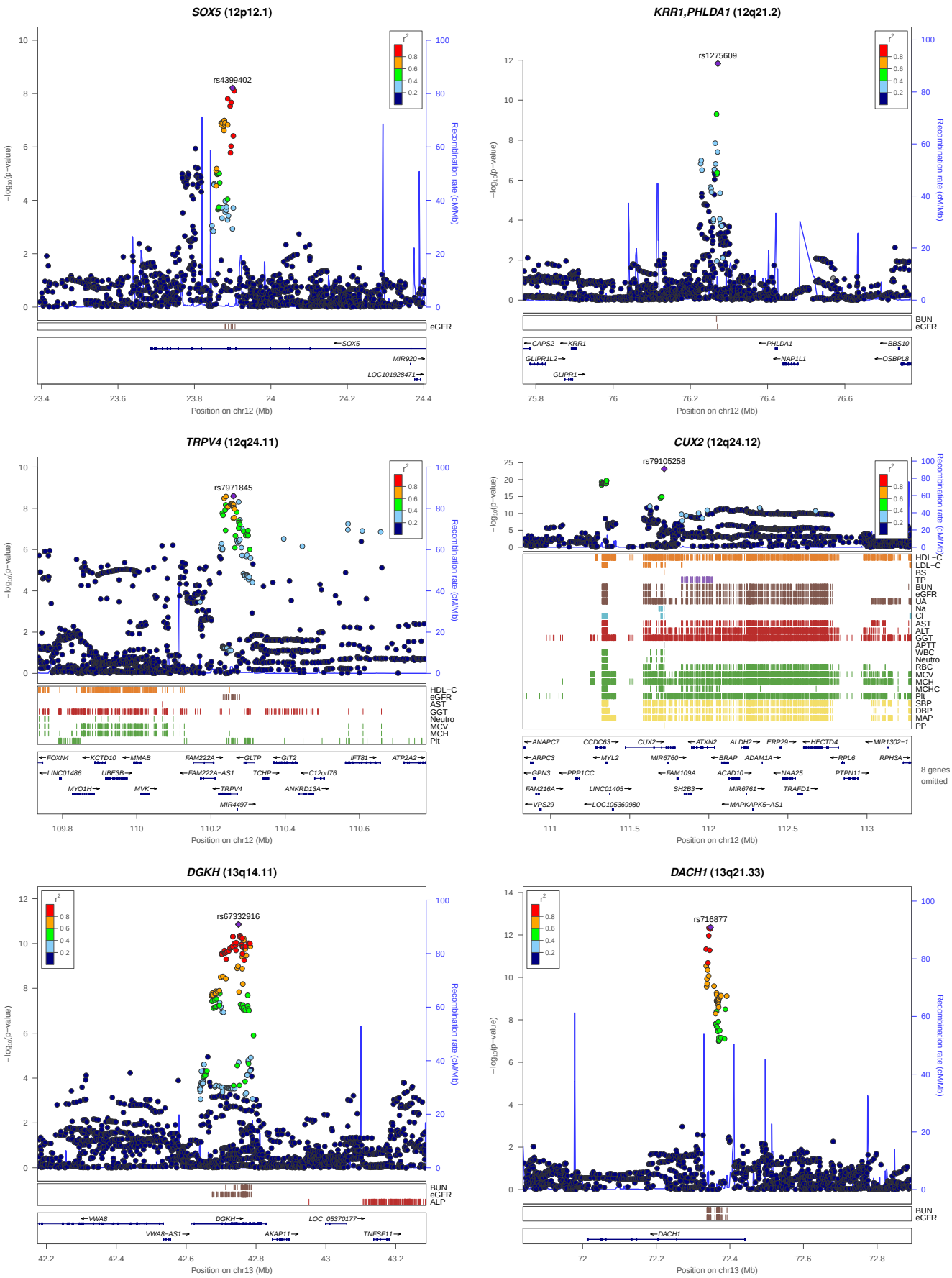
***RNASEH2C,AP5B1* (11q13.1)**

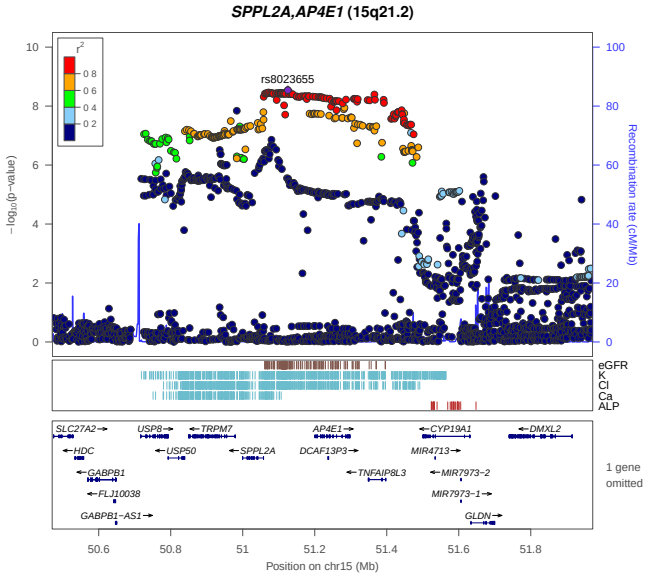


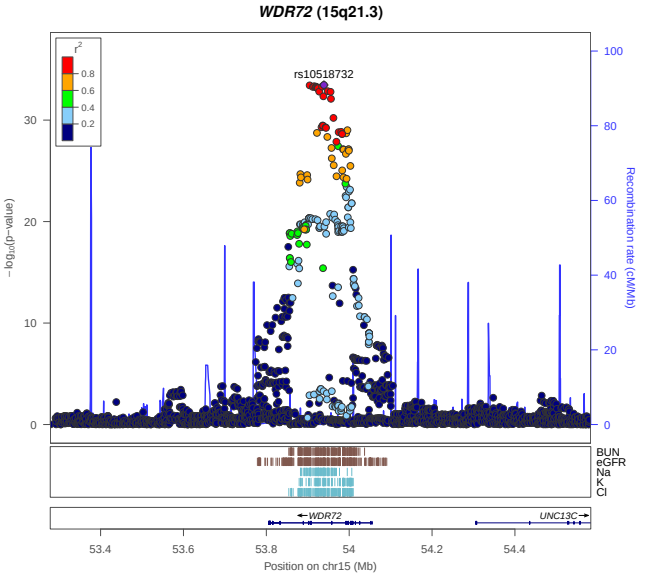
***GAB2* (11q14.1)**

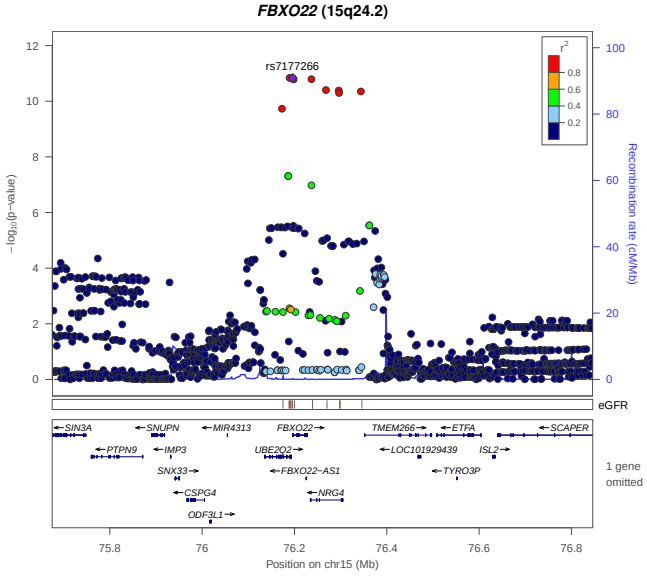


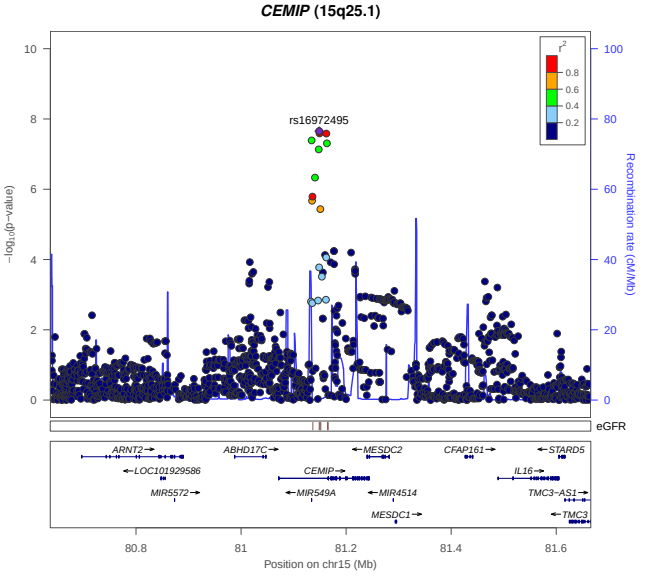
***TSPAN9* (12p13.32)**

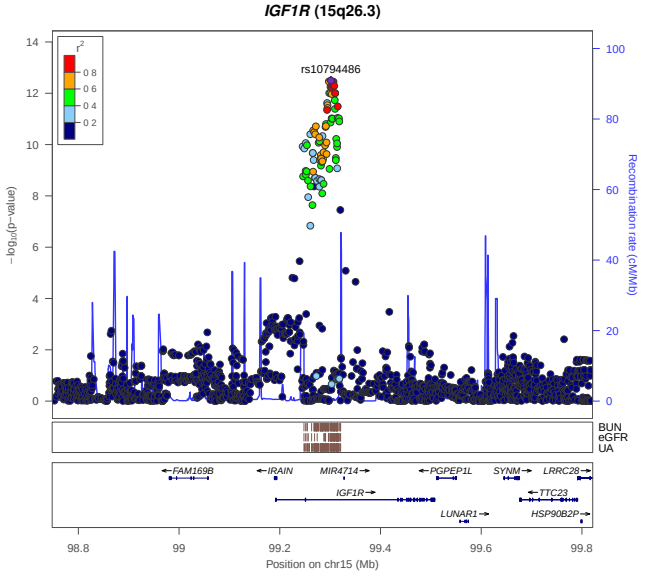

SOX5 (12p12.1)
rs4399402
eGFR
SOX5
MIR920
LOC101928471
Position on chr12 (Mb)
KRR1,PHLDA1 (12q21.2)
rs1275609
BUN
eGFR
CAPS2
KRR1
PHLDA1
BBS10
GLIPR1L2
NAP1L1
OSBPL8
GLIPR1
Position on chr12 (Mb)
TRPV4 (12q24.11)
rs7971845
HDL−C
eGFR
AST
GGT
Neutro
MCV
MCH
Plt
FOXN4
KCTD10
MMAB
FAM222A
GLTP
GIT2
IFT81
ATP2A2
LINC01486
UBE3B
FAM222A−AS1
TCHP
C12orf76
MYO1H
MVK
TRPV4
ANKRD13A
MIR4497
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
HDL−C
LDL−C
BS
TP
BUN
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
ANAPC7
CCDC63
CUX2
ATXN2
ALDH2
ERP29
HECTD4
MIR1302−1
ARPC3
MYL2
MIR6760
BRAP
ADAM1A
RPL6
RPH3A
GPN3
PPP1CC
FAM109A
ACAD10
NAA25
PTPN11
FAM216A
LINC01405
SH2B3
MIR6761
TRAFD1
VPS29
LOC105369980
MAPKAPK5−AS1
8 genes omitted
Position on chr12 (Mb)
DGKH (13q14.11)
rs67332916
BUN
eGFR
ALP
VWA8
DGKH
LOC 05370177
VWA8−AS1
AKAP11
TNFSF11
Position on chr13 (Mb)
DACH1 (13q21.33)
rs716877
BUN
eGFR
DACH1
Position on chr13 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

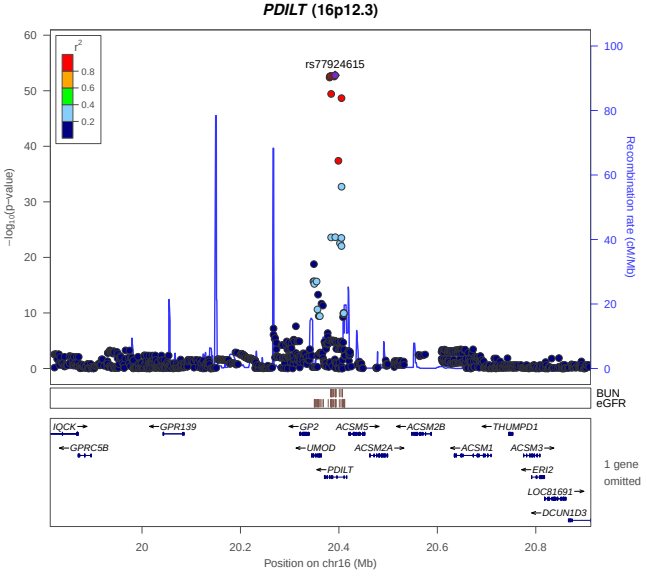

SPPL2A,AP4E1 (15q21.2)
rs8023655
eGFR
K
Cl
Ca
ALP
1 gene omitted
Position on chr15 (Mb)
Recombination rate (cM/Mb)


WDR72 (15q21.3)
rs10518732
BUN
eGFR
Na
K
Cl
Position on chr15 (Mb)
Recombination rate (cM/Mb)

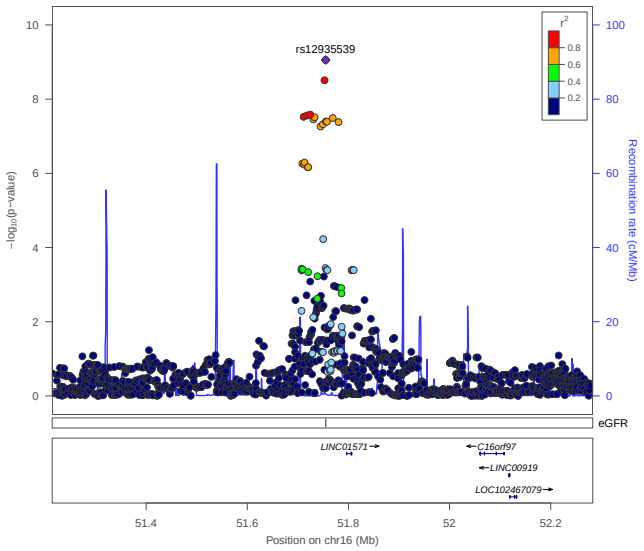

FBXO22 (15q24.2)
rs7177266
eGFR
1 gene omitted
Position on chr15 (Mb)
Recombination rate (cM/Mb)


CEMIP (15q25.1)
rs16972495
eGFR
Position on chr15 (Mb)
Recombination rate (cM/Mb)

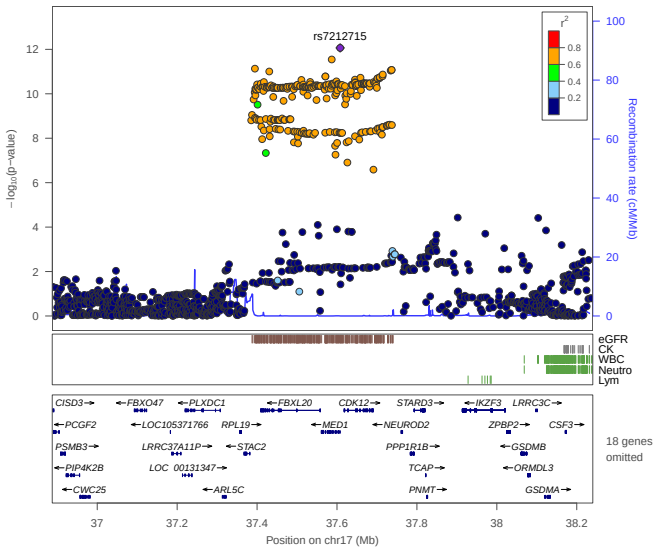

IGF1R (15q26.3)
rs10794486
BUN
eGFR
UA
Position on chr15 (Mb)
Recombination rate (cM/Mb)


PDILT (16p12.3)
rs77924615
BUN
eGFR
1 gene omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

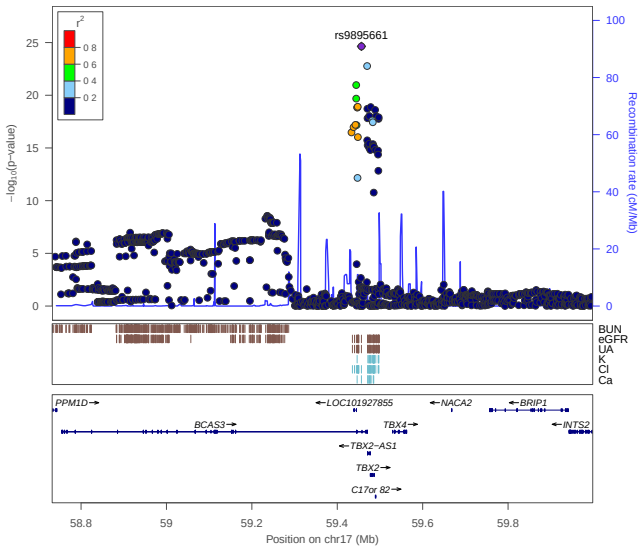
SALL1,LINC01571 **(16q12.1)**



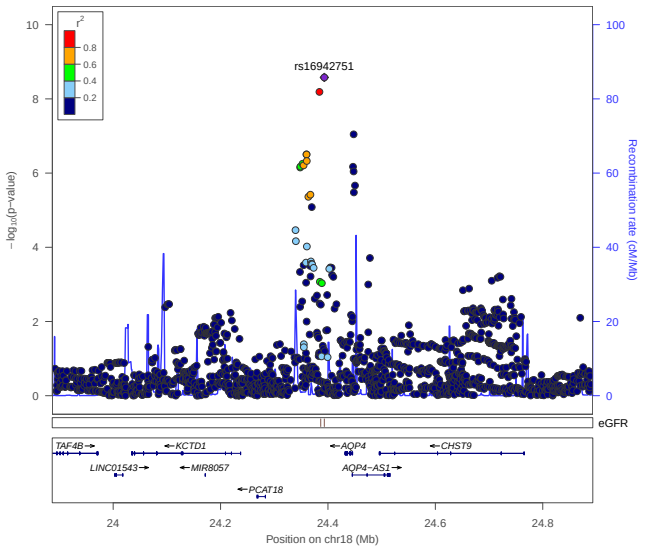
MED1 **(17q12)**



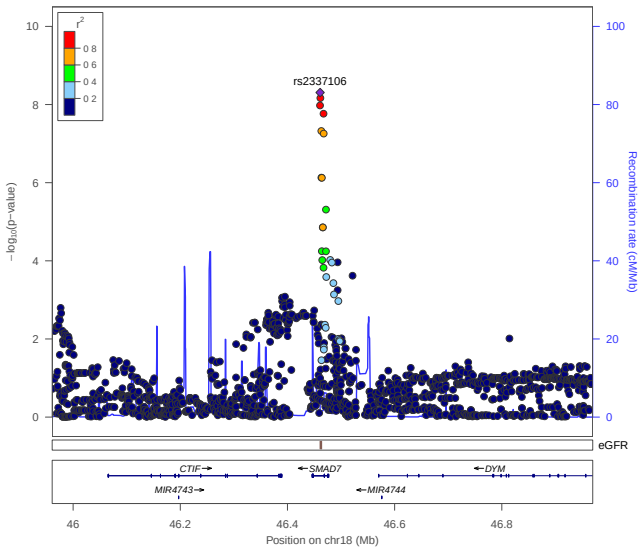
BCAS3 **(17q23.2)**



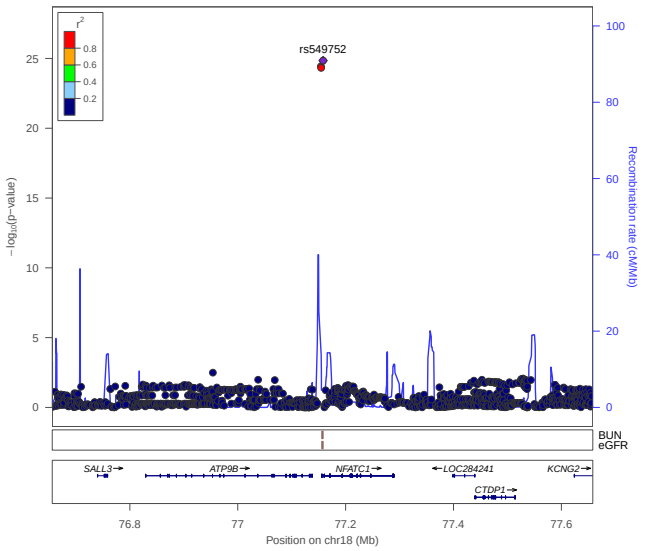
PCAT18,AQP4 **(18q11.2)**



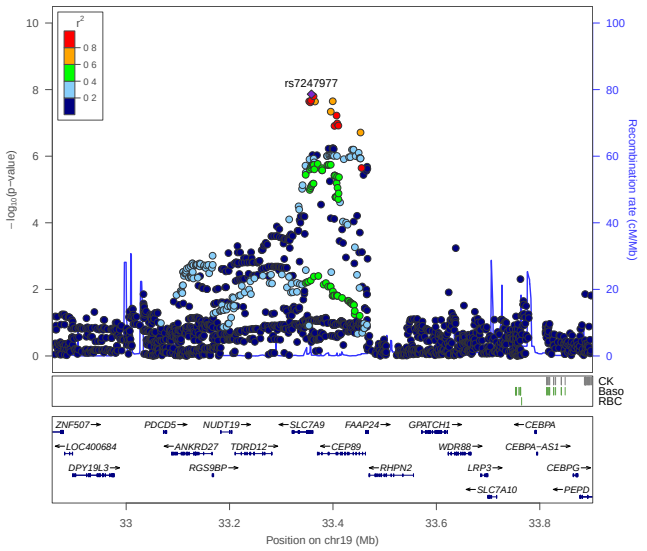
SMAD7 **(18q21.1)**



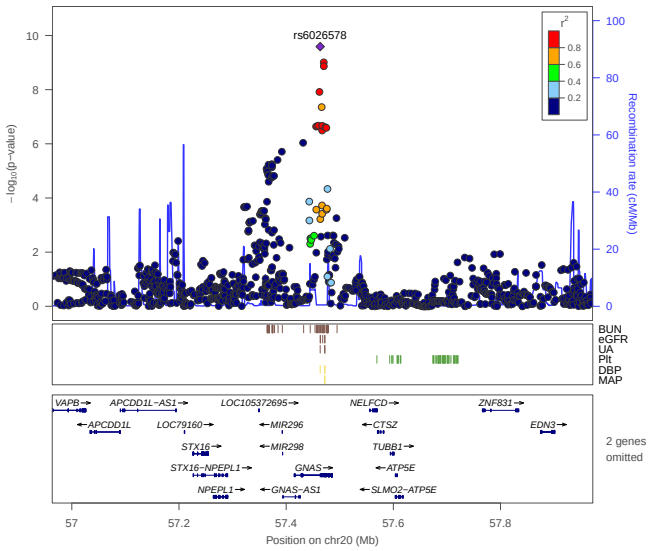
NFATC1 **(18q23)**



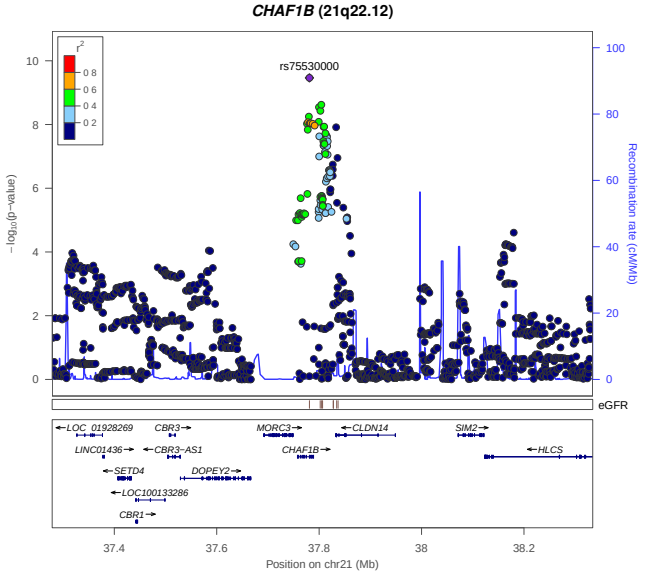
SLC7A9 **(19q13.11)**



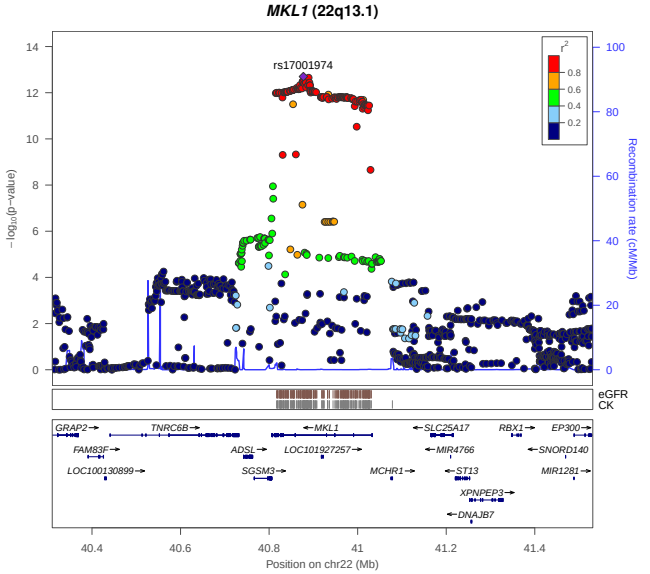
LOC101927932 **(20q13.32)**



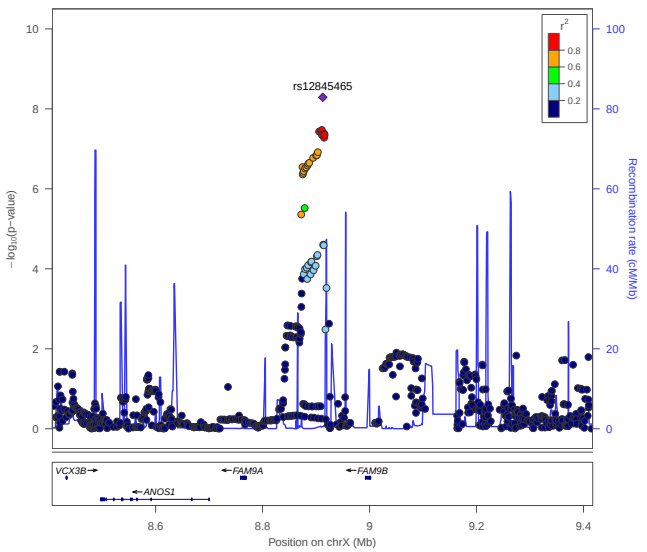
CHAF1B **(21q22.12)**



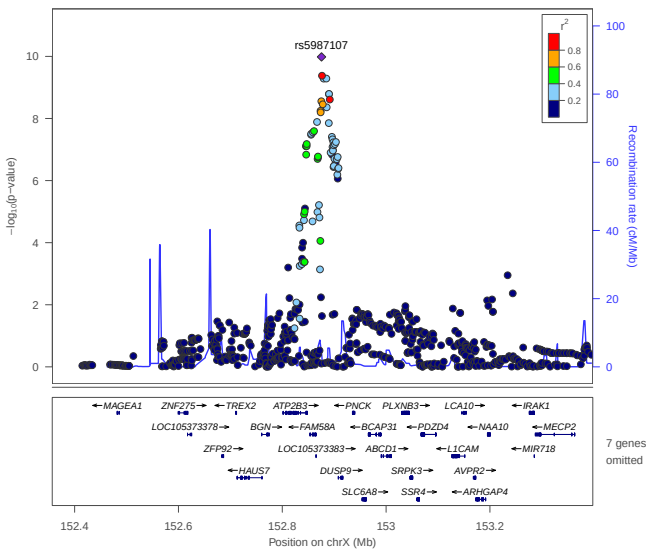
MKL1 **(22q13.1)**



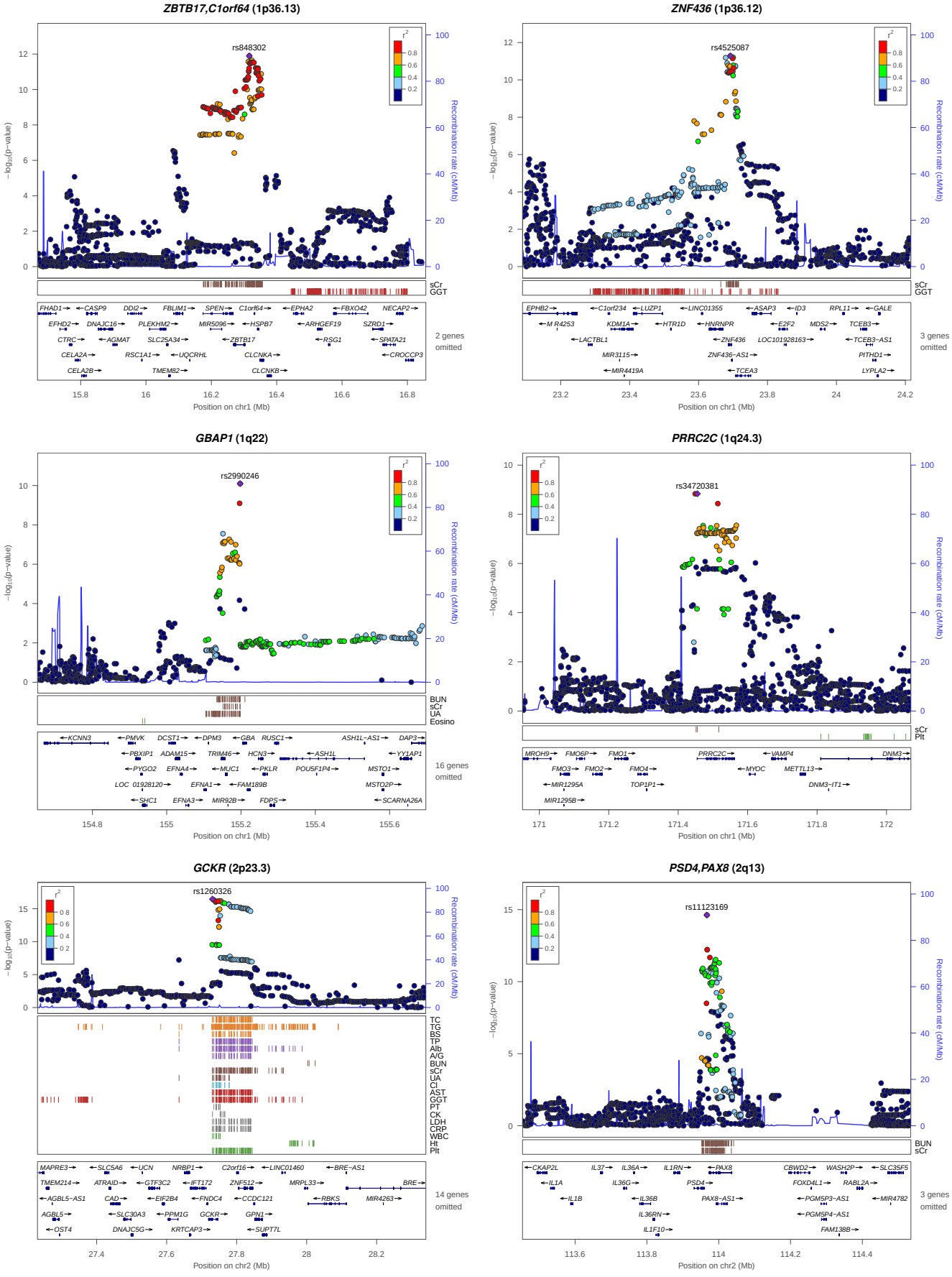
FAM9A,FAM9B **(Xp22.31)**

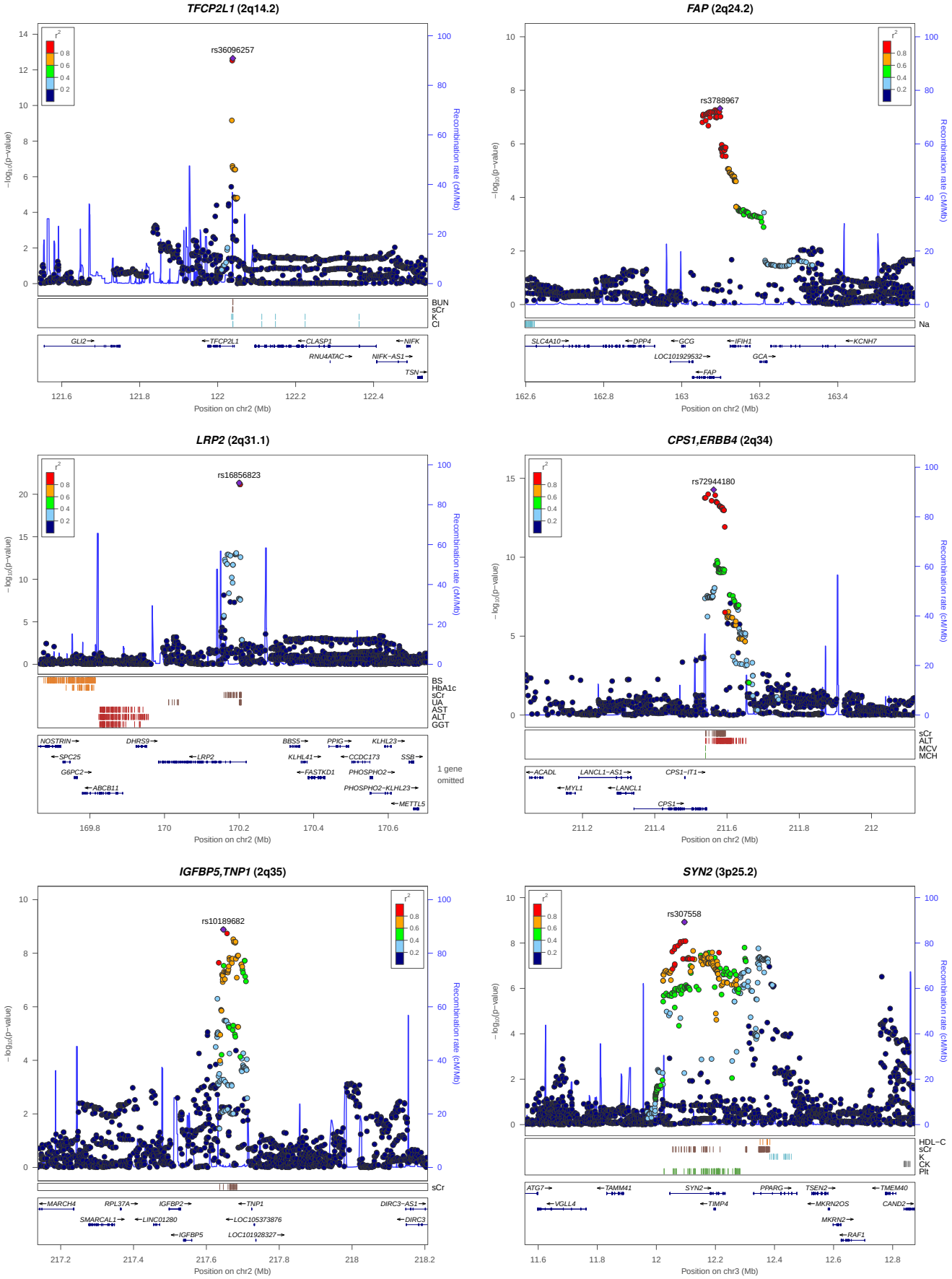


LOC105373383,DUSP9 **(Xq28)**

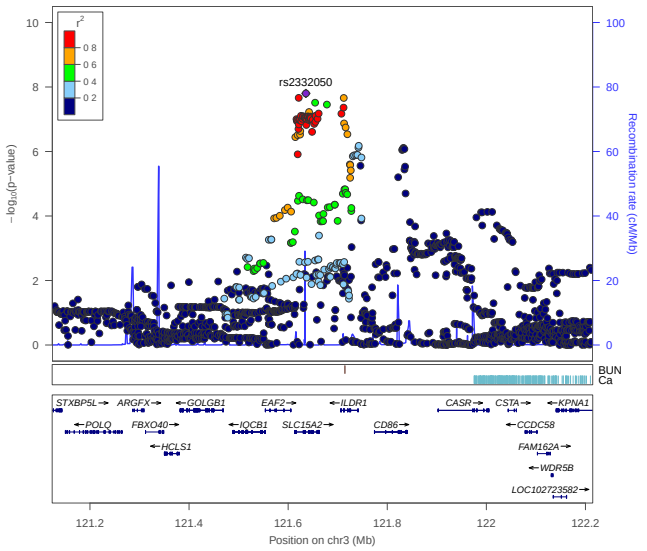


2.13 eGFR (n = 143,658)

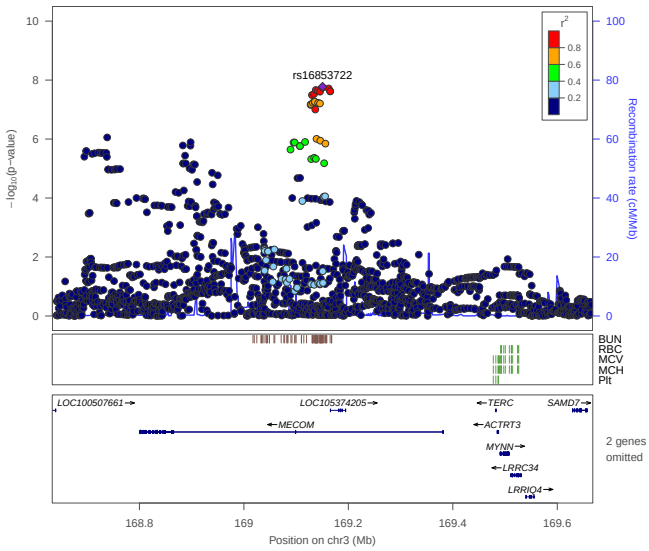



TFCP2L1 (2q14.2)
rs36096257
BUN
sCr
K
Cl
GLI2
TFCP2L1
CLASP1
NIFK
RNU4ATAC
NIFK-AS1
TSN
Position on chr2 (Mb)
FAP (2q24.2)
rs3788967
Na
SLC4A10
DPP4
GCG
IFIH1
KCNH7
LOC101929532
GCA
FAP
Position on chr2 (Mb)
LRP2 (2q31.1)
rs16856823
BS
HbA1c
sCr
UA
AST
ALT
GGT
NOSTRIN
DHRS9
BBS5
PPIG
KLHL23
SPC25
LRP2
KLHL41
CCDC173
SSB
G6PC2
FASTKD1
PHOSPHO2
ABCB11
PHOSPHO2-KLHL23
METTL5
1 gene omitted
Position on chr2 (Mb)
CPS1,ERBB4 (2q34)
rs72944180
sCr
ALT
MCV
MCH
ACADL
LANCL1-AS1
CPS1-IT1
MYL1
LANCL1
CPS1
Position on chr2 (Mb)
IGFBP5,TNP1 (2q35)
rs10189682
sCr
MARCH4
RPL37A
IGFBP2
TNP1
DIRC3-AS1
SMARCAL1
LINC01280
LOC105373876
DIRC3
IGFBP5
LOC101928327
Position on chr2 (Mb)
SYN2 (3p25.2)
rs307558
HDL-C
sCr
K
CK
Plt
ATG7
TAMM41
SYN2
PPARG
TSEN2
TMEM40
VGLL4
TIMP4
MKRN2OS
CAND2
MKRN2
RAF1
Position on chr3 (Mb)
-log10(p-value)
Recombination rate (cM/Mb)

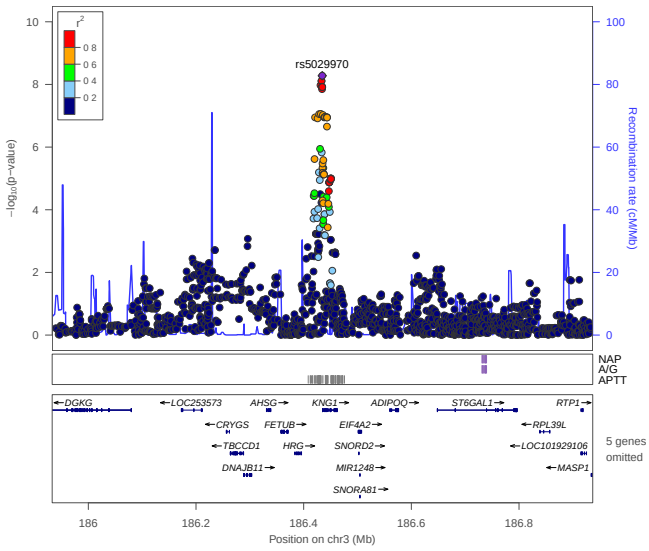
SLC15A2 **(3q13.33)**



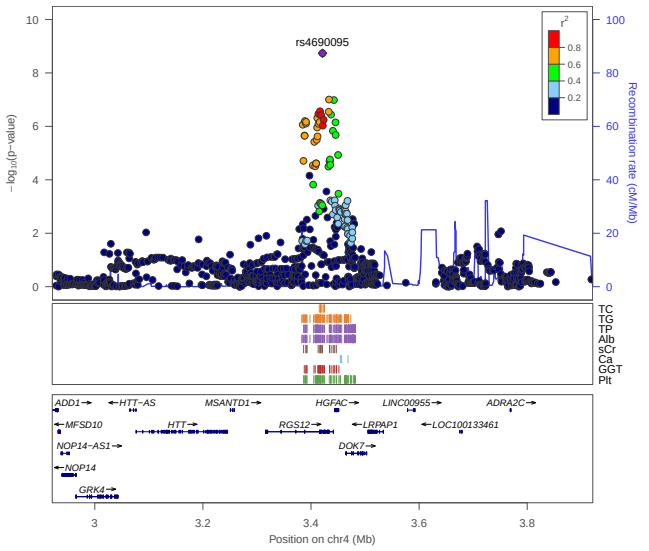
MECOM **(3q26.2)**



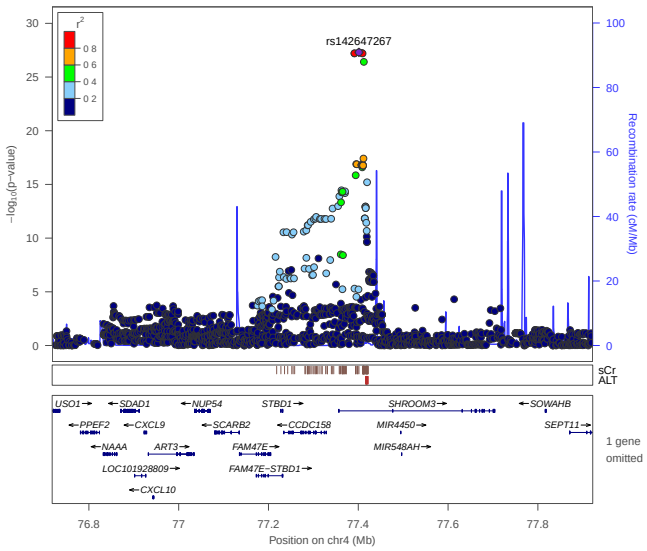
KNG1 **(3q27.3)**



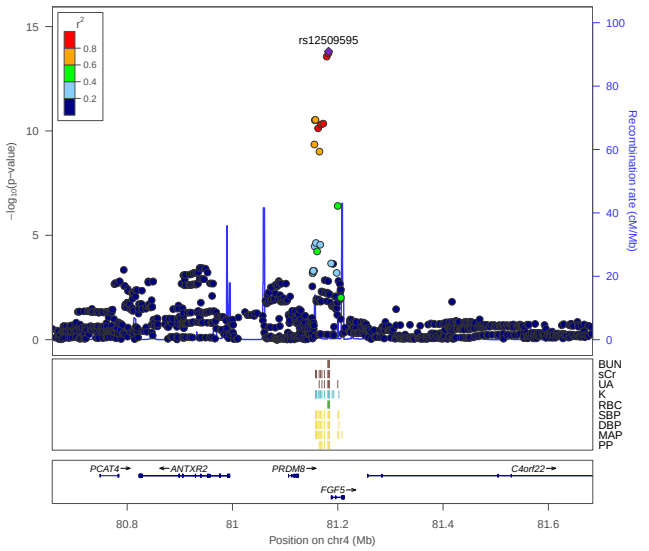
RGS12 **(4p16.3)**

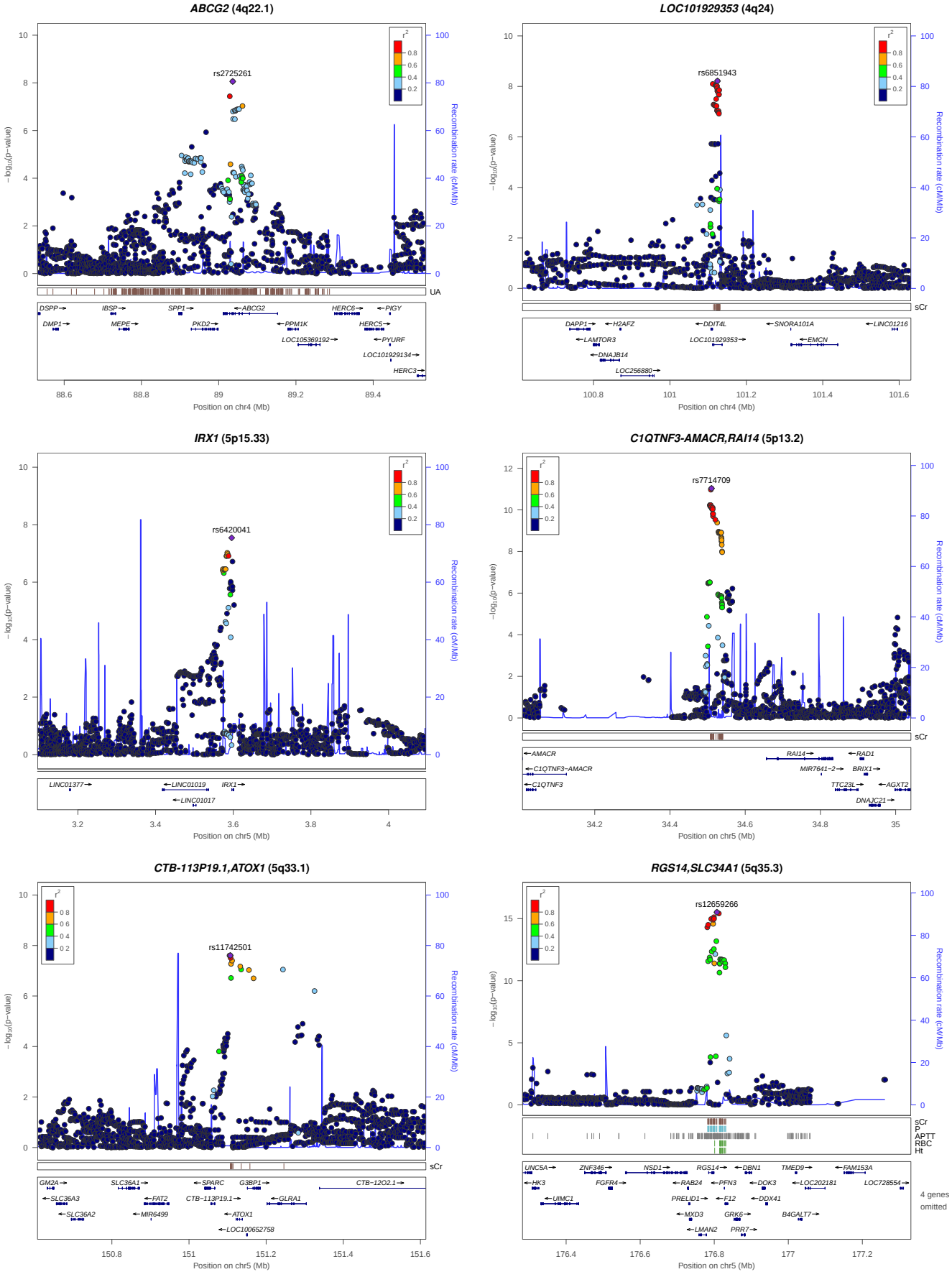


SHROOM3 **(4q21.1)**

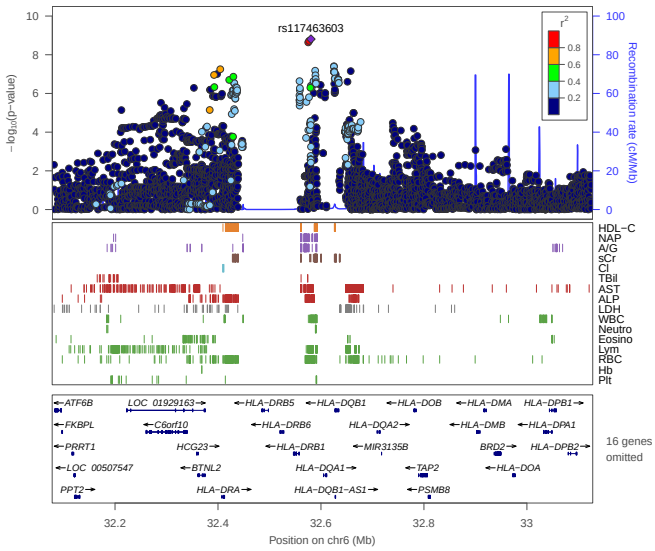


PRDM8,FGF5 **(4q21.21)**

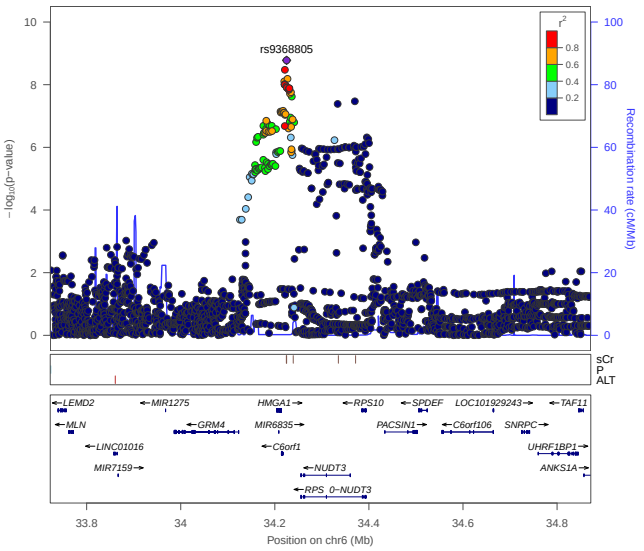



ABCG2 (4q22.1)
rs2725261
UA
DSPP
IBSP
SPP1
ABCG2
HERC6
PIGY
DMP1
MEPE
PKD2
PPM1K
HERC5
LOC105369192
PYURF
LOC101929134
HERC3
Position on chr4 (Mb)
LOC101929353 (4q24)
rs6851943
sCr
DAPP1
H2AFZ
DDIT4L
SNORA101A
LINC01216
LAMTOR3
LOC101929353
EMCN
DNAJB14
LOC256880
Position on chr4 (Mb)
IRX1 (5p15.33)
rs6420041
LINC01377
LINC01019
IRX1
LINC01017
Position on chr5 (Mb)
C1QTNF3-AMACR,RAI14 (5p13.2)
rs7714709
sCr
AMACR
RAI14
RAD1
C1QTNF3-AMACR
MIR7641-2
BRIX1
C1QTNF3
TTC23L
AGXT2
DNAJC21
Position on chr5 (Mb)
CTB-113P19.1,ATOX1 (5q33.1)
rs11742501
sCr
GM2A
SLC36A1
SPARC
G3BP1
CTB-12O2.1
SLC36A3
FAT2
CTB-113P19.1
GLRA1
SLC36A2
MIR6499
ATOX1
LOC100652758
Position on chr5 (Mb)
RGS14,SLC34A1 (5q35.3)
rs12659266
sCr
P
APTT
RBC
Ht
UNC5A
ZNF346
NSD1
RGS14
DBN1
TMED9
FAM153A
HK3
FGFR4
RAB24
PFN3
DOK3
LOC202181
LOC728554
UIMC1
PRELID1
F12
DDX41
MXD3
GRK6
B4GALT7
LMAN2
PRR7
4 genes omitted
Position on chr5 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)
r2

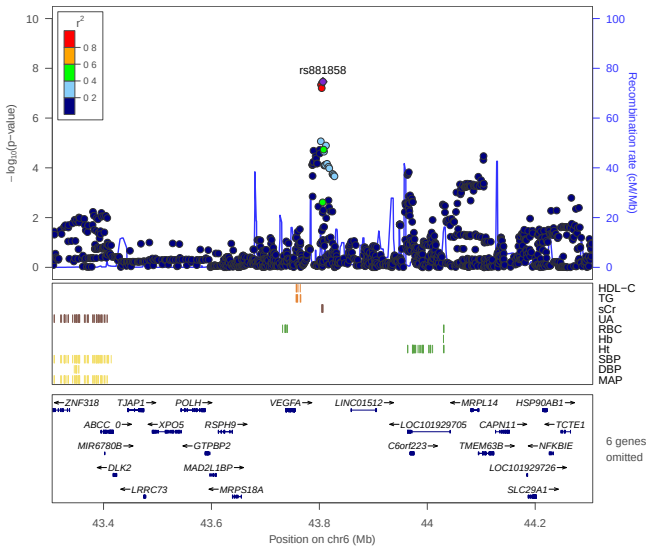
HLA-DRB1,HLA-DQA1 **(6p21.32)**



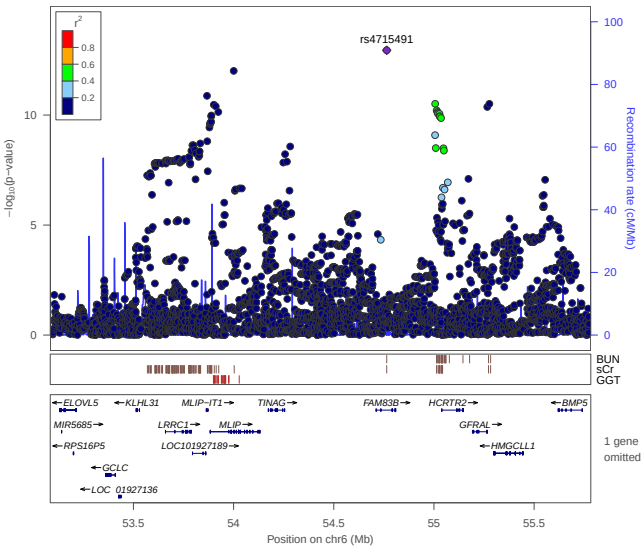
C6orf1,RPS10-NUDT3 **(6p21.31)**



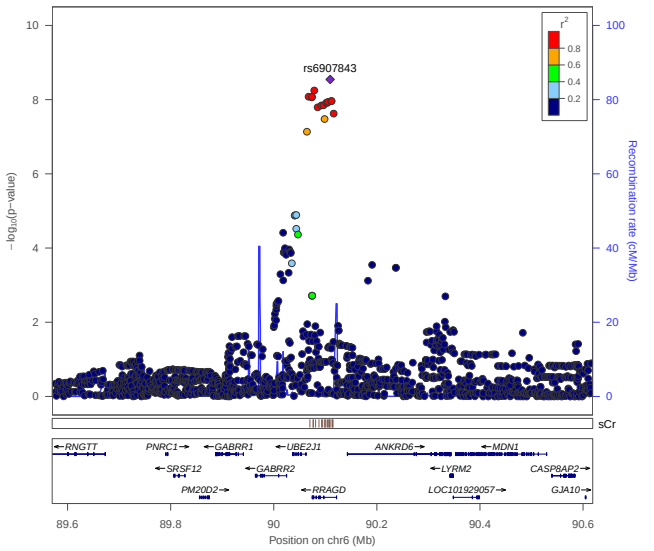
VEGFA,LINC01512 **(6p21.1)**



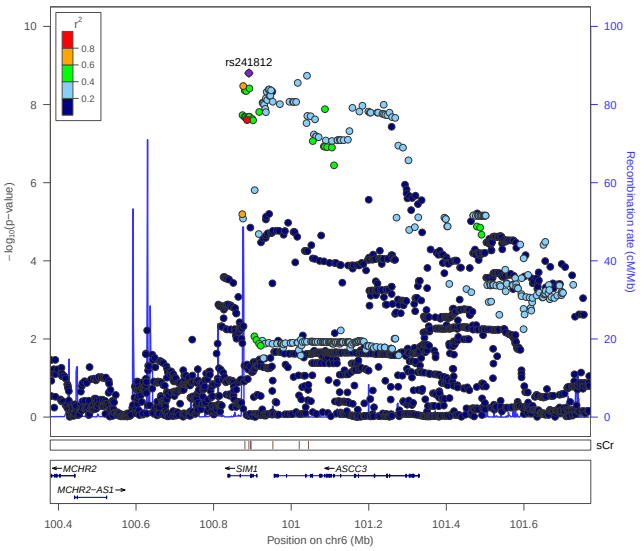
FAM83B **(6p12.1)**

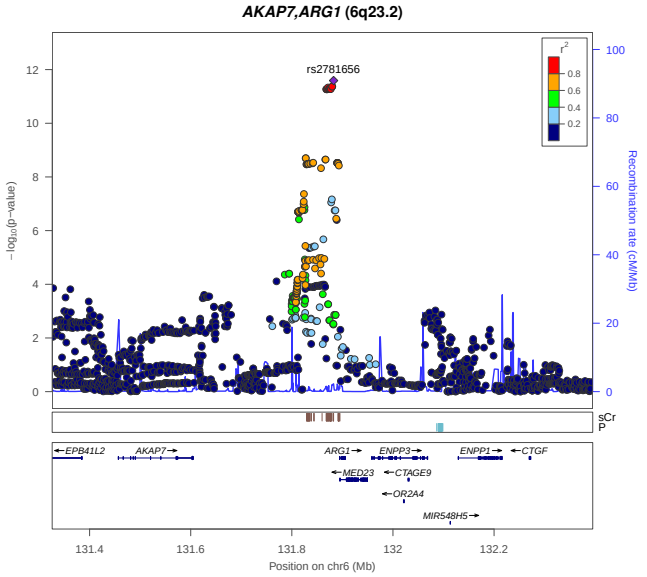


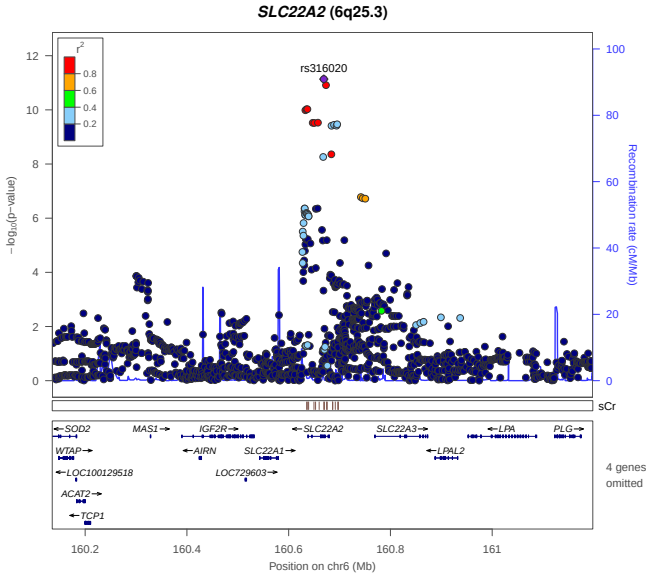
RRAGD **(6q15)**

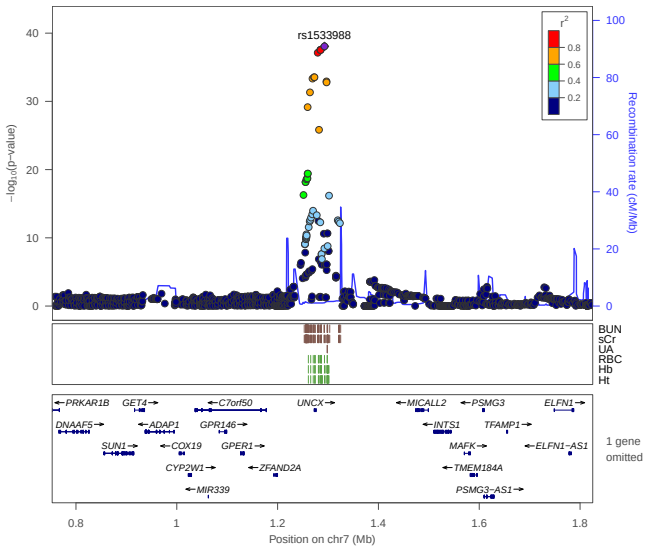


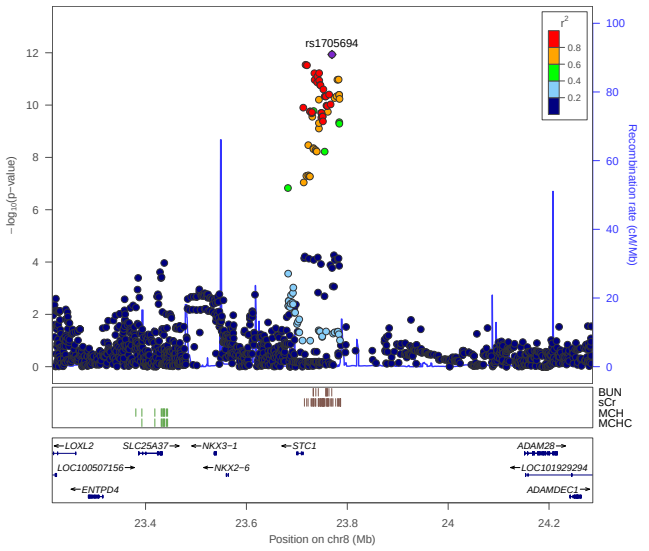
SIM1 **(6q16.3)**

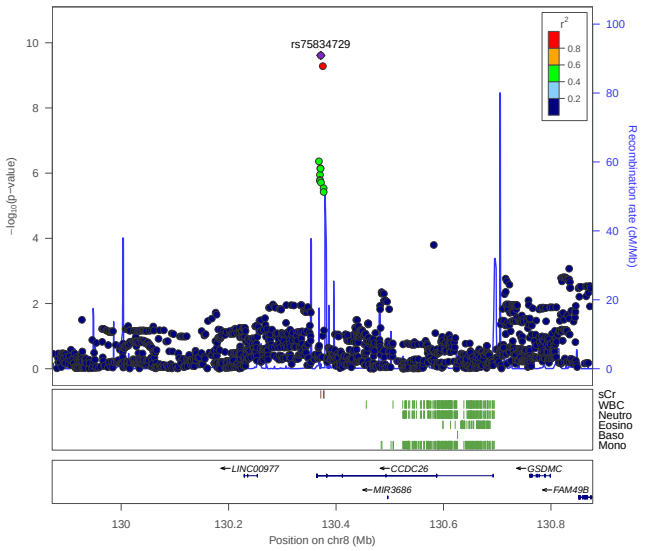


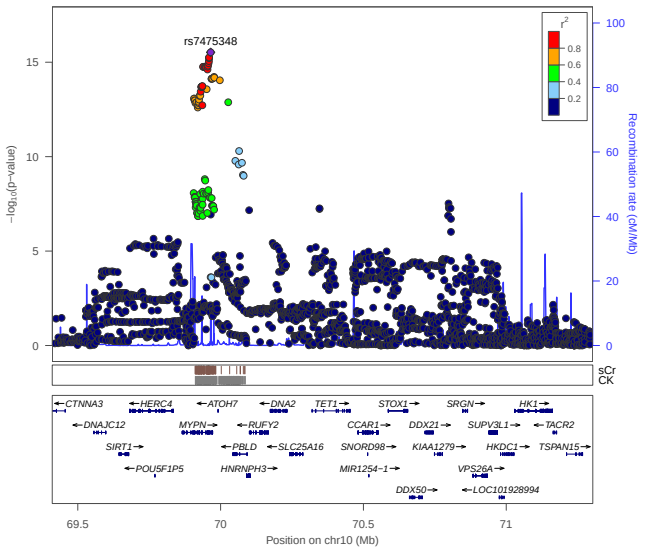

AKAP7,ARG1 (6q23.2)
rs2781656
Position on chr6 (Mb)
Recombination rate (cM/Mb)
sCr
P
4 genes omitted


SLC22A2 (6q25.3)
rs316020
Position on chr6 (Mb)
Recombination rate (cM/Mb)
sCr
4 genes omitted

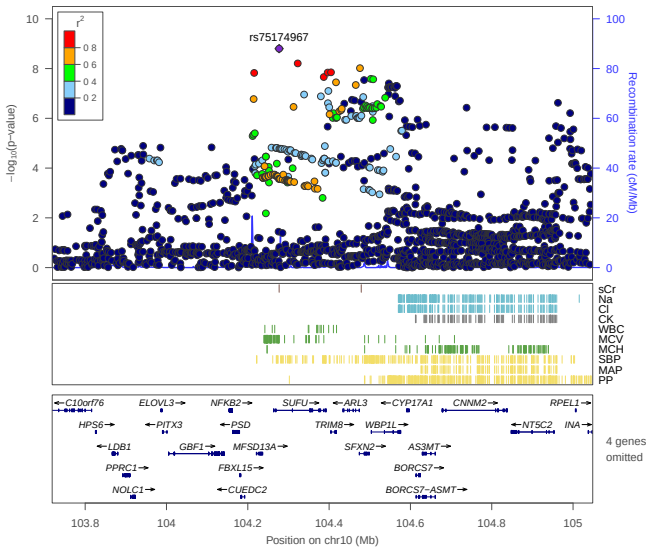

UNCX,MICALL2 (7p22.3)
rs1533988
Position on chr7 (Mb)
Recombination rate (cM/Mb)
BUN
sCr
UA
RBC
Hb
Ht
1 gene omitted


STC1,ADAM28 (8p21.2)
rs1705694
Position on chr8 (Mb)
Recombination rate (cM/Mb)
BUN
sCr
MCH
MCHC

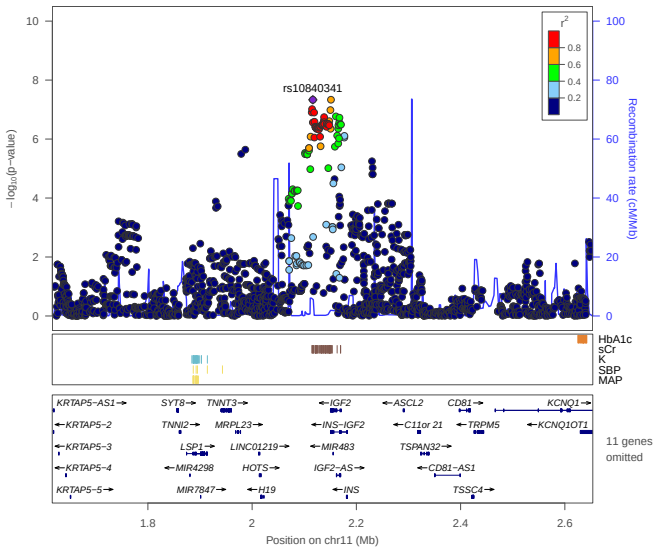

CCDC26 (8q24.21)
rs75834729
Position on chr8 (Mb)
Recombination rate (cM/Mb)
sCr
WBC
Neutro
Eosino
Baso
Mono


MYPN (10q21.3)
rs7475348
Position on chr10 (Mb)
Recombination rate (cM/Mb)
sCr
CK

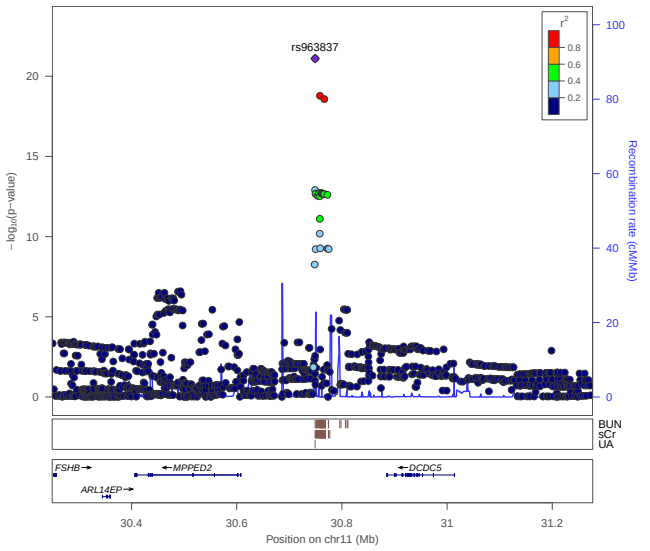
***SUFU* (10q24.32)**



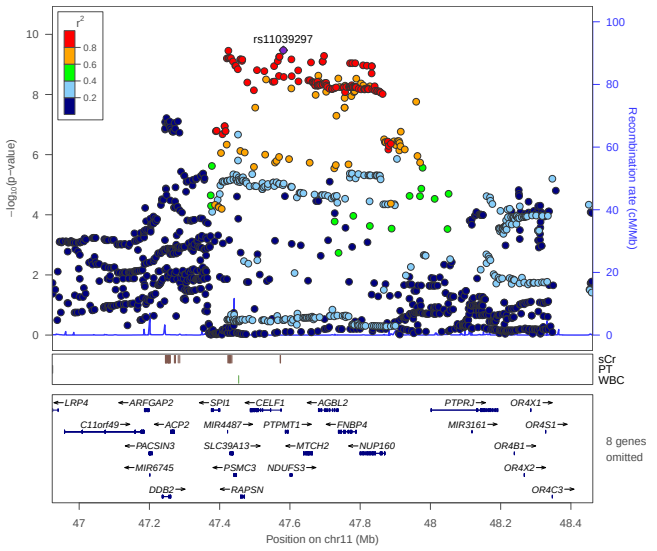
***H19,IGF2* (11p15.5)**



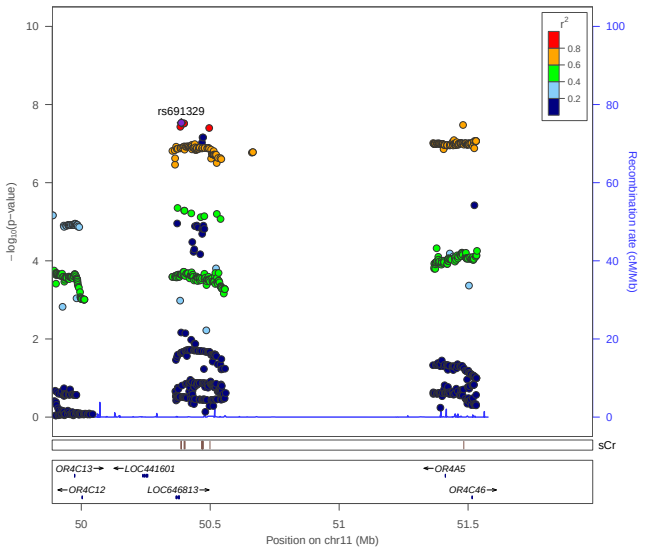
***MPPED2,DCDC5* (11p14.1)**



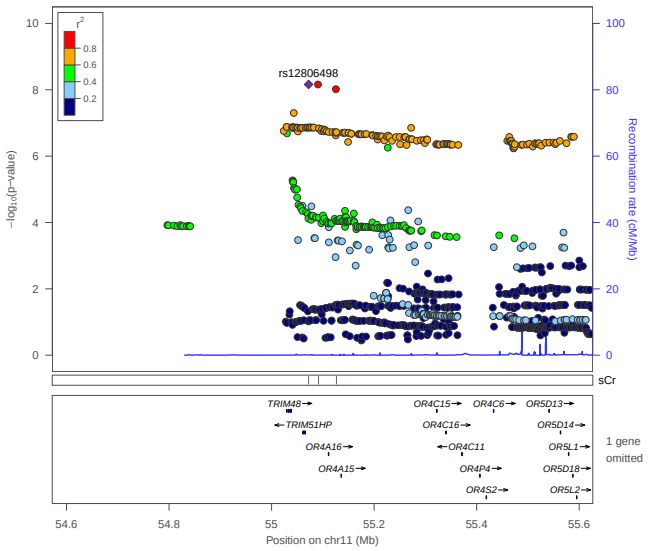
***CELF1,PTPMT1* (11p11.2)**

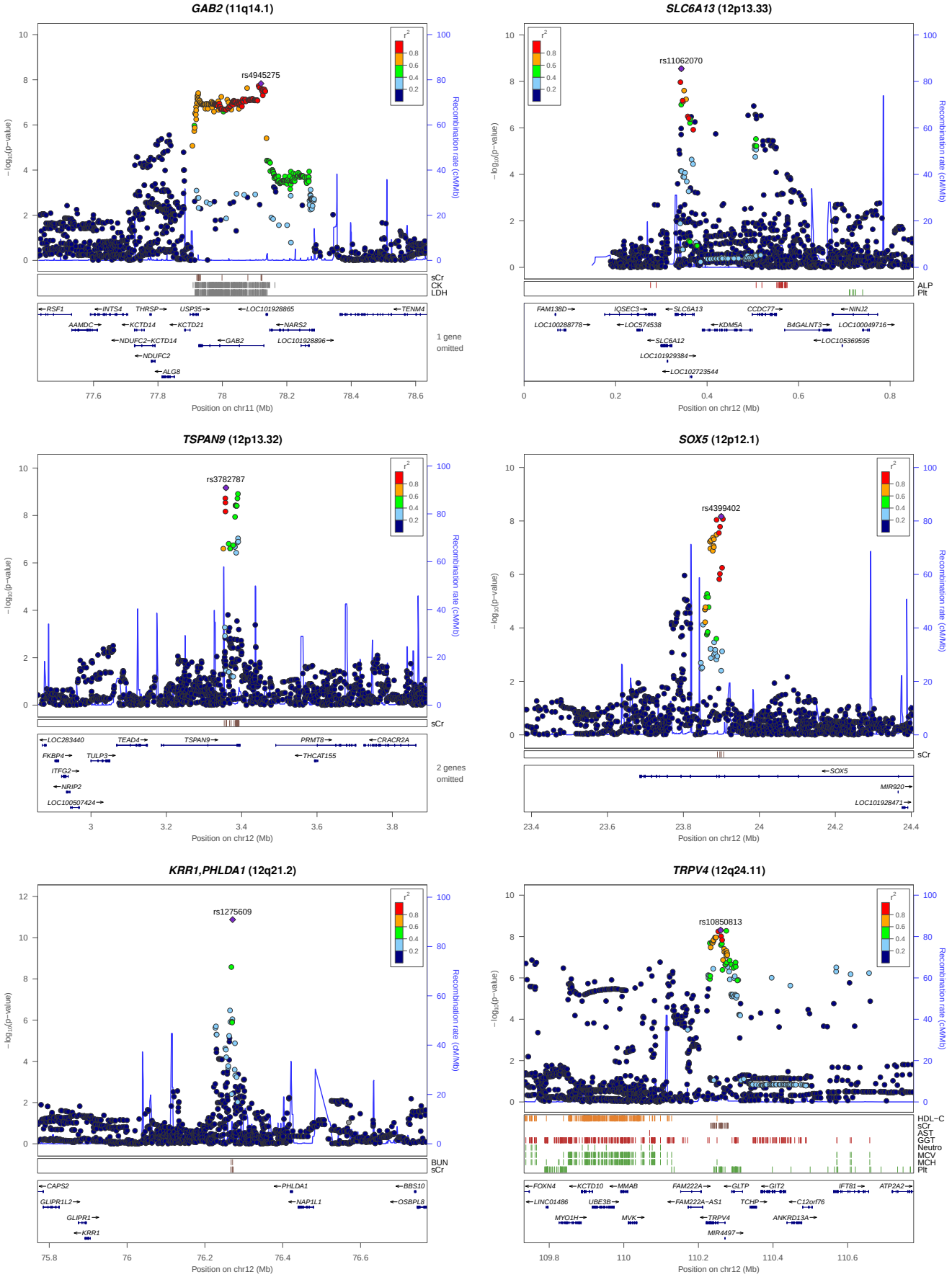


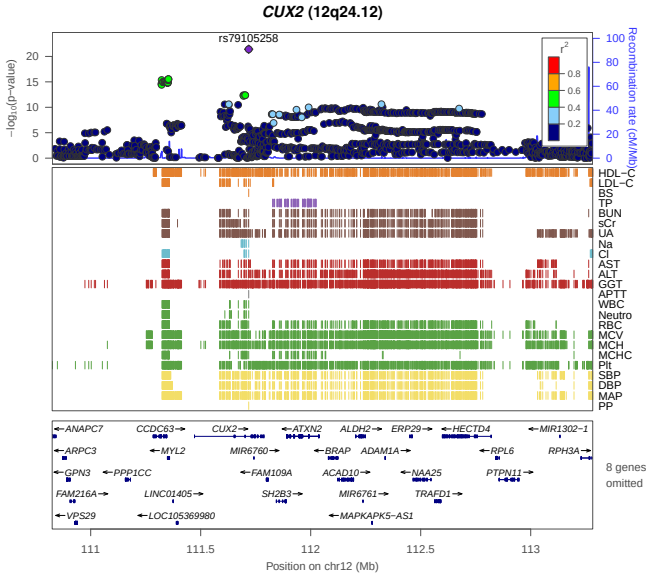
***LOC646813,OR4A5* (11p11.12)**

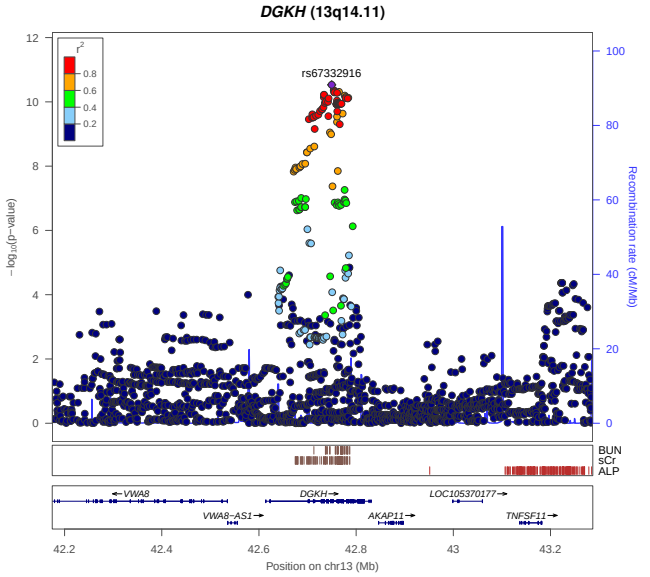


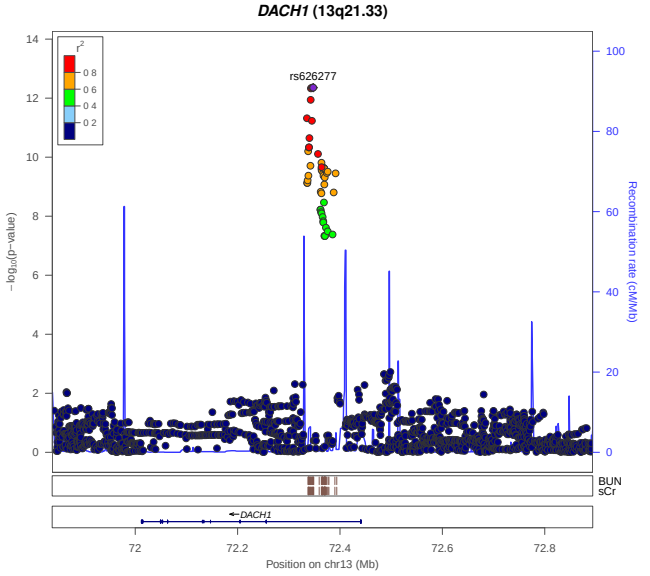
***TRIM51HP,OR4A16* (11q11)**

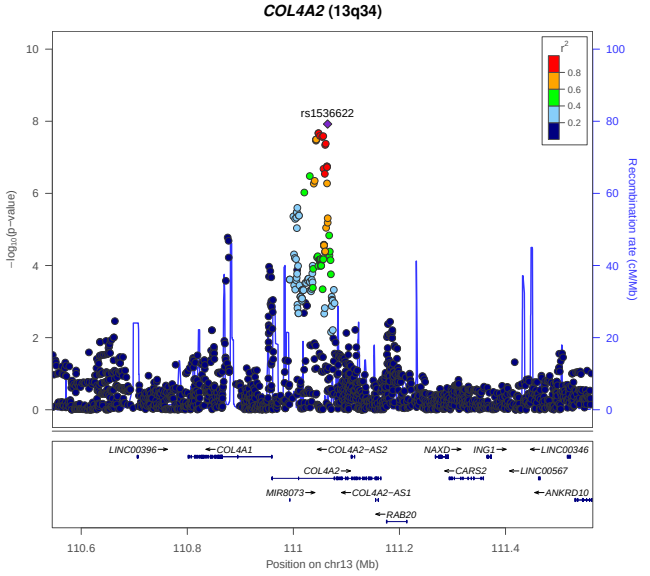


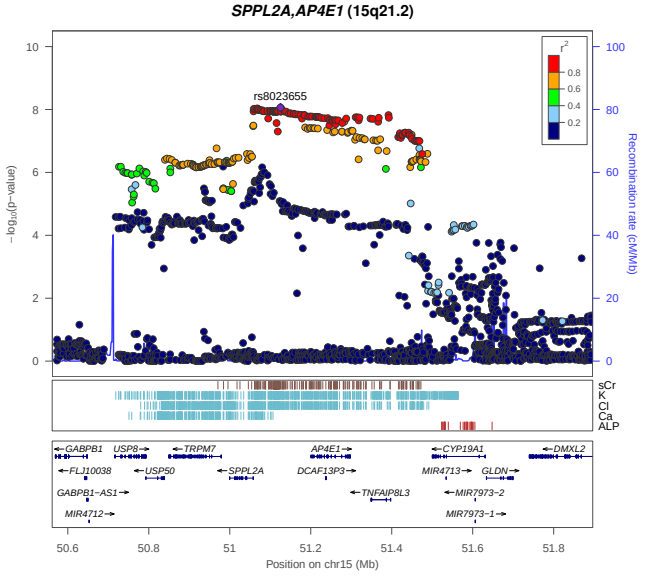

GAB2 (11q14.1)
rs4945275
sCr
CK
LDH
1 gene omitted
Position on chr11 (Mb)
SLC6A13 (12p13.33)
rs11062070
ALP
Plt
Position on chr12 (Mb)
TSPAN9 (12p13.32)
rs3782787
sCr
2 genes omitted
Position on chr12 (Mb)
SOX5 (12p12.1)
rs4399402
sCr
Position on chr12 (Mb)
KRR1,PHLDA1 (12q21.2)
rs1275609
BUN
sCr
Position on chr12 (Mb)
TRPV4 (12q24.11)
rs10850813
HDL−C
sCr
AST
GGT
Neutro
MCV
MCH
Plt
Position on chr12 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

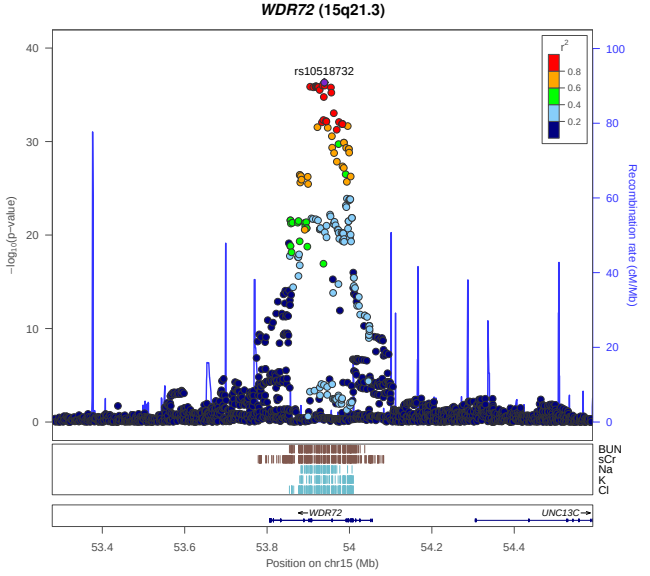

CUX2 (12q24.12)
rs79105258
HDL-C
LDL-C
BS
TP
BUN
sCr
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
8 genes omitted
Position on chr12 (Mb)

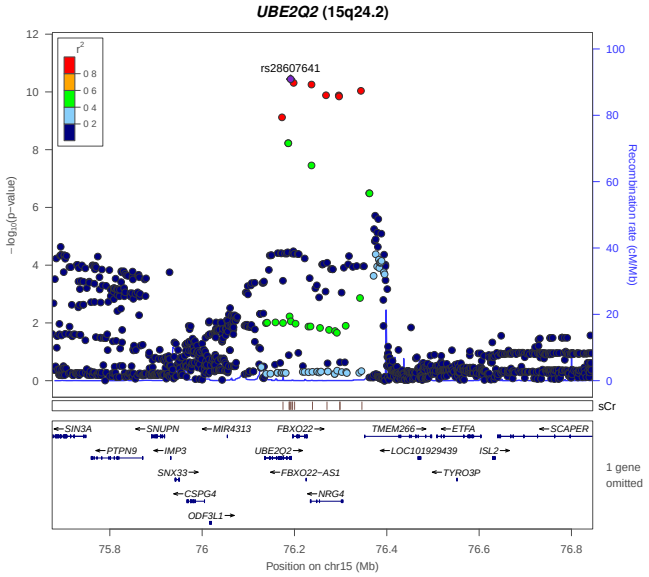

DGKH (13q14.11)
rs67332916
BUN
sCr
ALP
Position on chr13 (Mb)

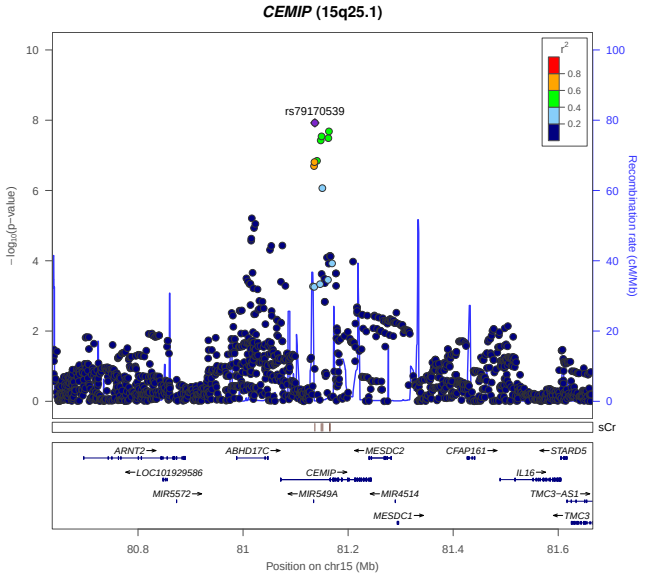

DACH1 (13q21.33)
rs626277
BUN
sCr
Position on chr13 (Mb)

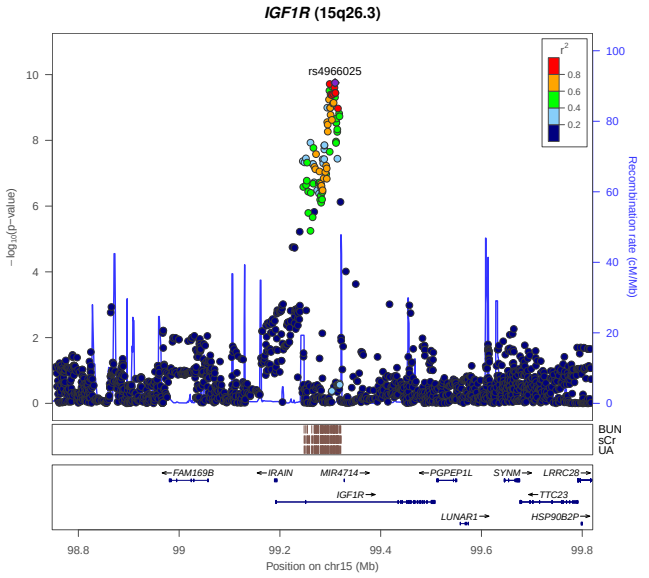

COL4A2 (13q34)
rs1536622
Position on chr13 (Mb)

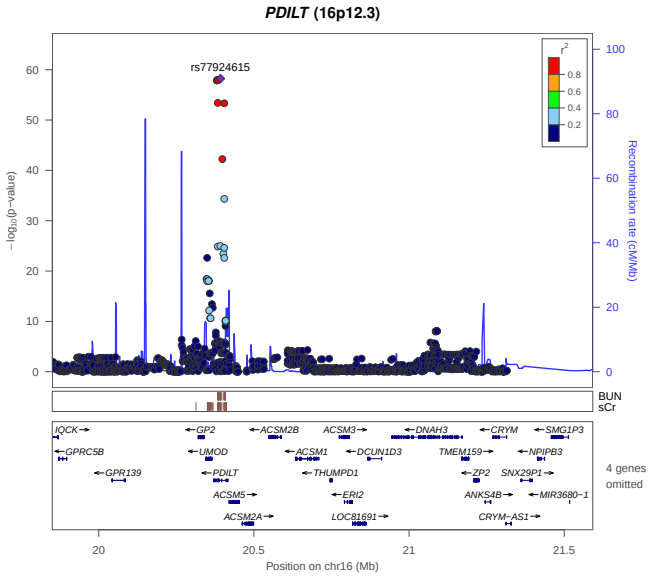

SPPL2A,AP4E1 (15q21.2)
rs8023655
sCr
K
Cl
Ca
ALP
Position on chr15 (Mb)

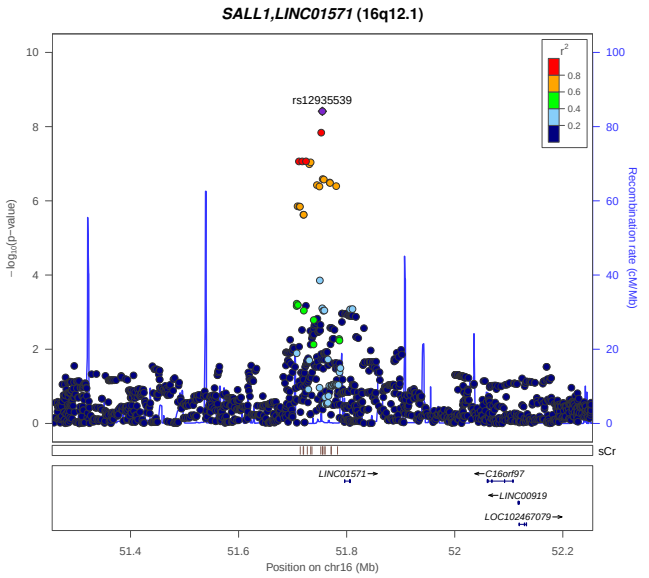

WDR72 (15q21.3)
rs10518732
BUN
sCr
Na
K
Cl
Position on chr15 (Mb)

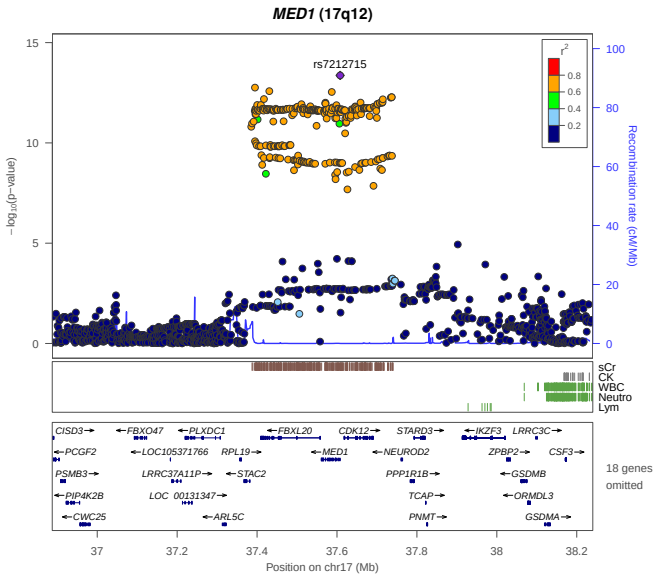

UBE2Q2 (15q24.2)
rs28607641
sCr
1 gene omitted
Position on chr15 (Mb)
Recombination rate (cM/Mb)

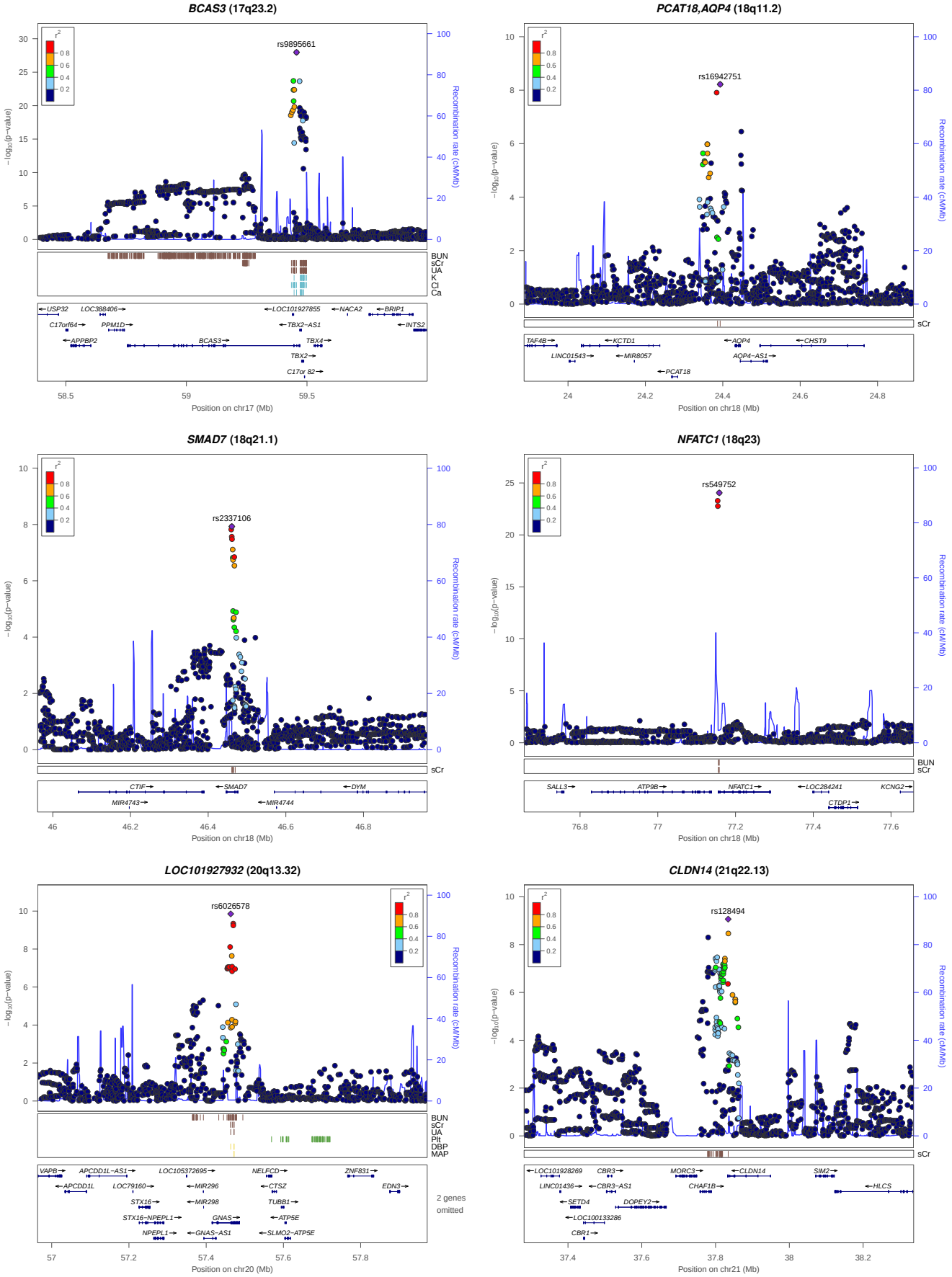

CEMIP (15q25.1)
rs79170539
sCr
Position on chr15 (Mb)
Recombination rate (cM/Mb)


IGF1R (15q26.3)
rs4966025
BUN
sCr
UA
Position on chr15 (Mb)
Recombination rate (cM/Mb)

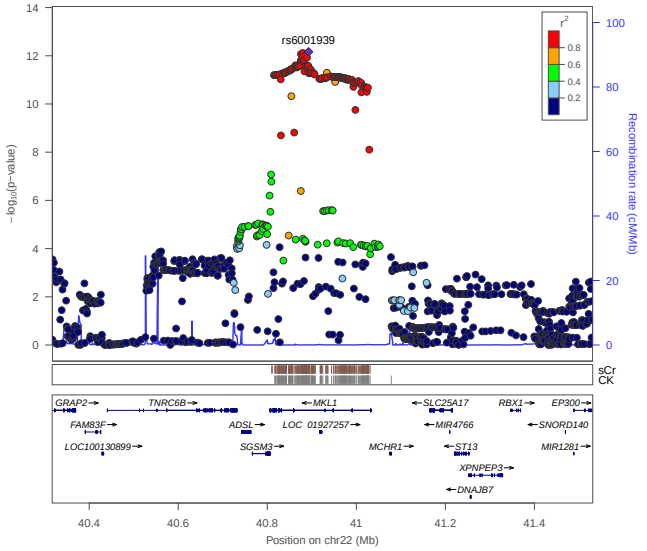

PDILT (16p12.3)
rs77924615
BUN
sCr
4 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)


SALL1,LINC01571 (16q12.1)
rs12935539
sCr
Position on chr16 (Mb)
Recombination rate (cM/Mb)

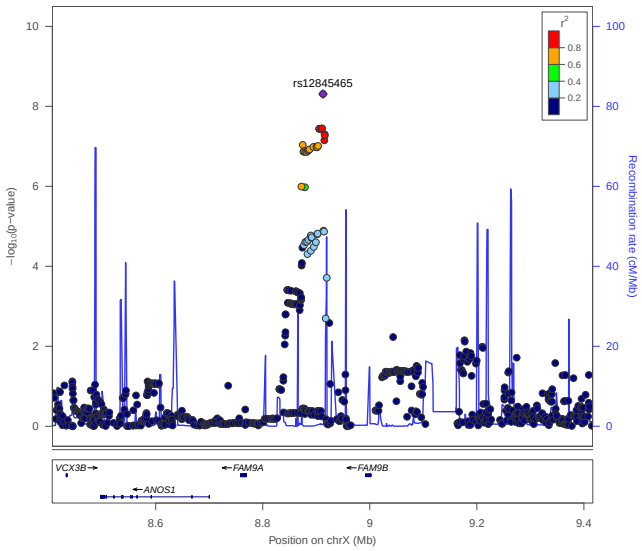

MED1 (17q12)
rs7212715
sCr
CK
WBC
Neutro
Lym
18 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)


BCAS3 (17q23.2)
rs9895661
PCAT18,AQP4 (18q11.2)
rs16942751
SMAD7 (18q21.1)
rs2337106
NFATC1 (18q23)
rs549752
LOC101927932 (20q13.32)
rs6026578
CLDN14 (21q22.13)
rs128494
Recombination rate (cM/Mb)
BUN
sCr
UA
K
Cl
Ca
Plt
DBP
MAP
2 genes omitted
Position on chr17 (Mb)
Position on chr18 (Mb)
Position on chr20 (Mb)
Position on chr21 (Mb)

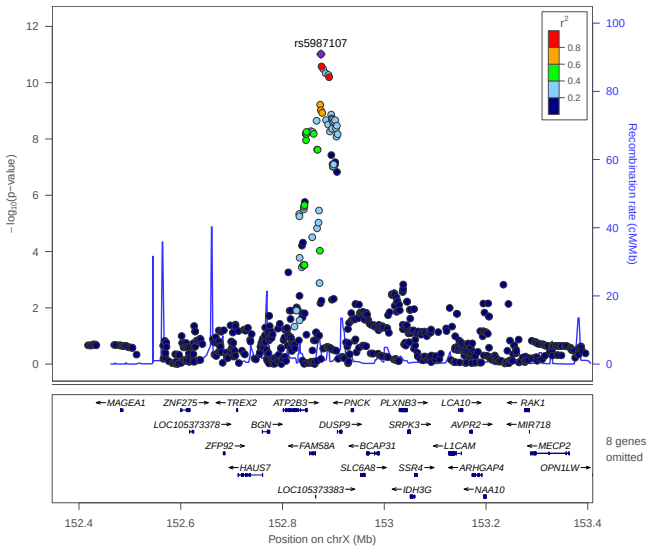
***MKL1* (22q13.1)**



***FAM9A,FAM9B* (Xp22.31)**

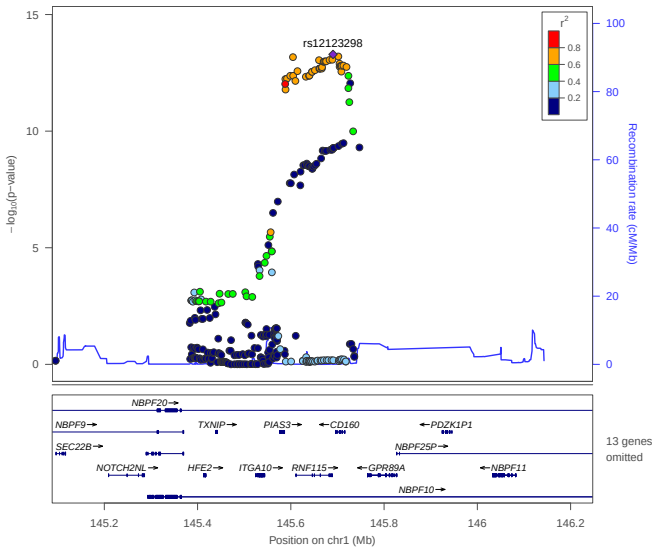


***LOC105373383,DUSP9* (Xq28)**

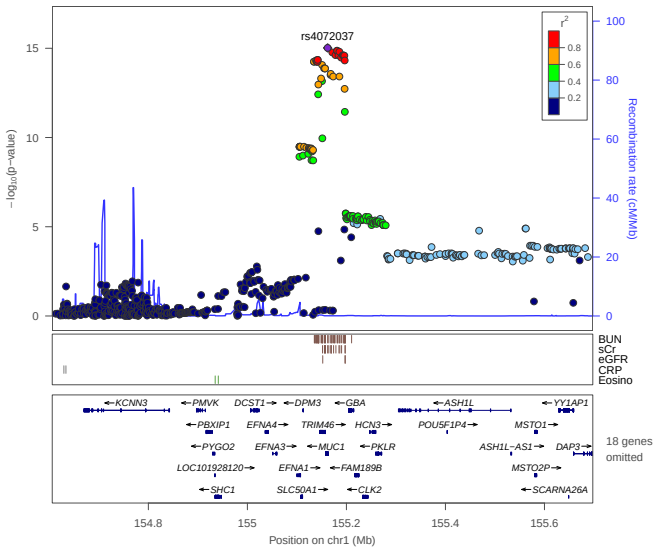


2.14 UA (n = 109,029)

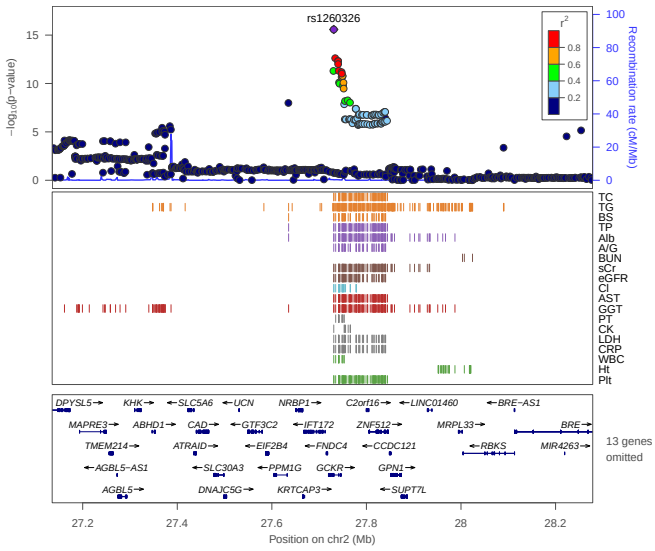
***NBPF10,NBPF20* (1q21.1)**



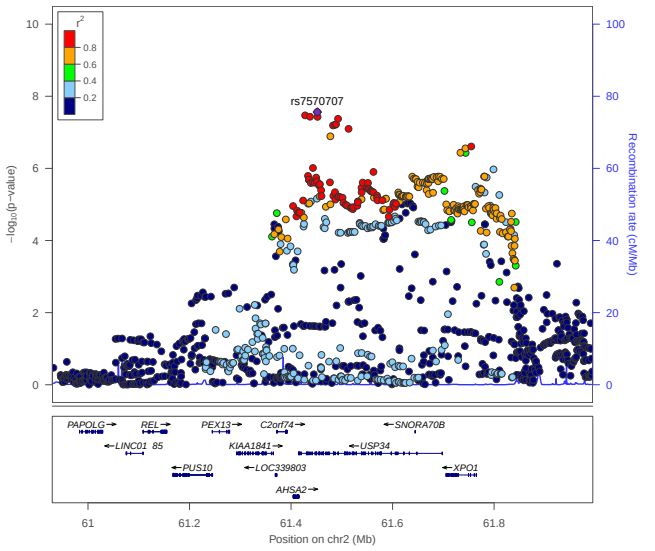
***MUC1* (1q22)**



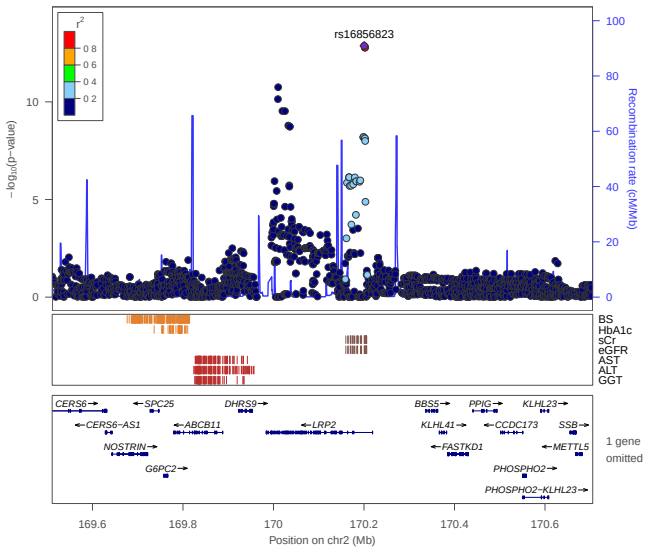
***GCKR* (2p23.3)**



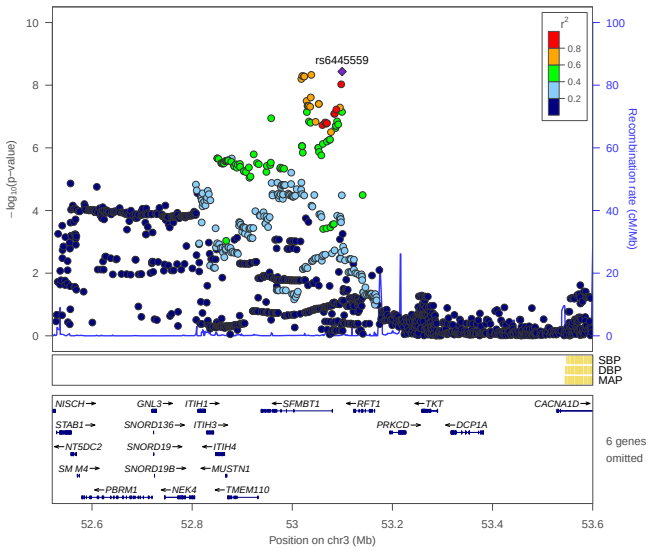
***USP34* (2p15)**

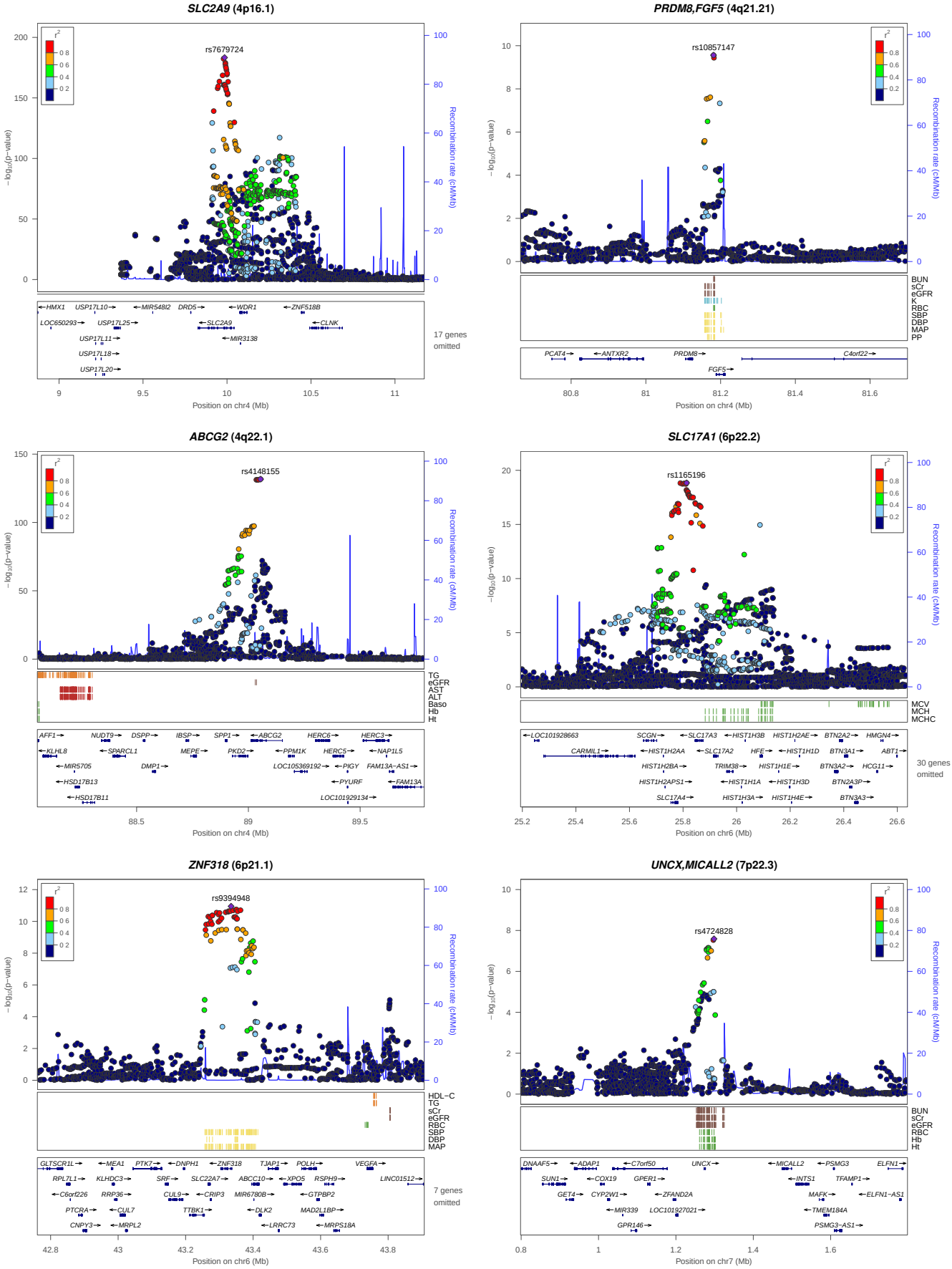


***LRP2* (2q31.1)**

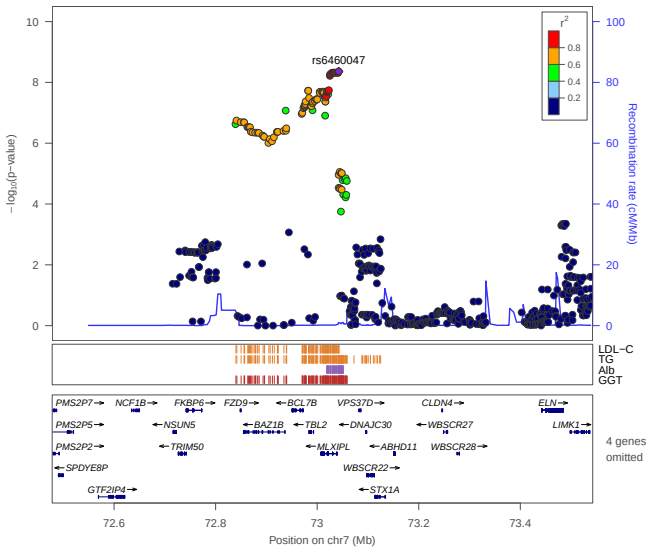


***SFMBT1,RFT1* (3p21.1)**

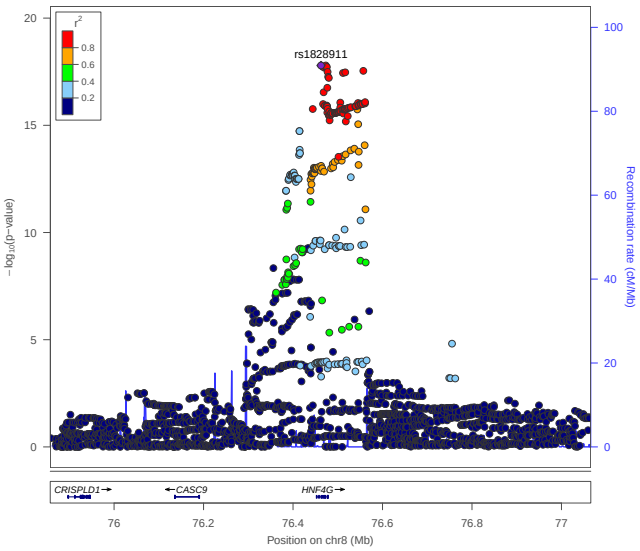



SLC2A9 (4p16.1)
rs7679724
PRDM8,FGF5 (4q21.21)
rs10857147
ABCG2 (4q22.1)
rs4148155
SLC17A1 (6p22.2)
rs1165196
ZNF318 (6p21.1)
rs9394948
UNCX,MICALL2 (7p22.3)
rs4724828
Recombination rate (cM/Mb)
Position on chr4 (Mb)
Position on chr6 (Mb)
Position on chr7 (Mb)
17 genes omitted
30 genes omitted
7 genes omitted

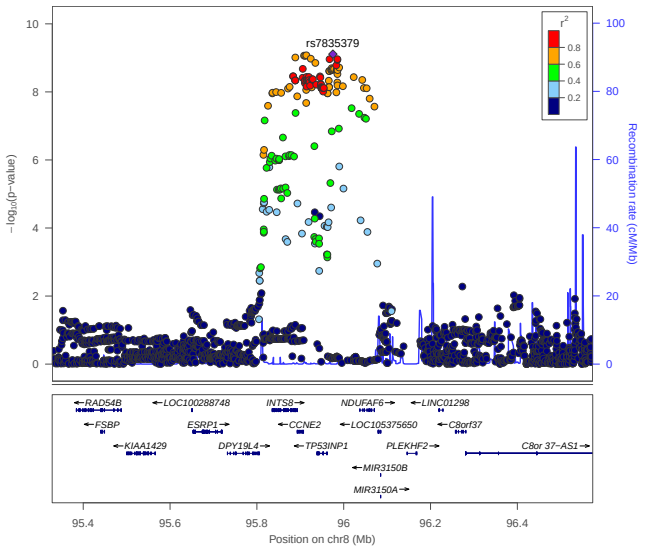
MLXIPL,VPS37D **(7q11.23)**



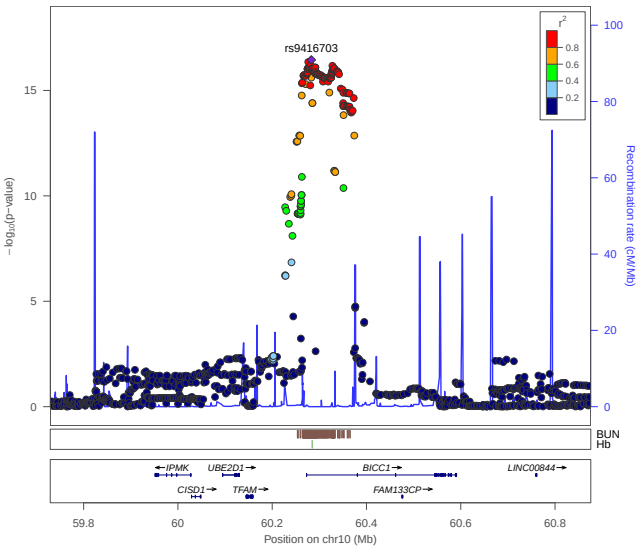
HNF4G **(8q21.11)**



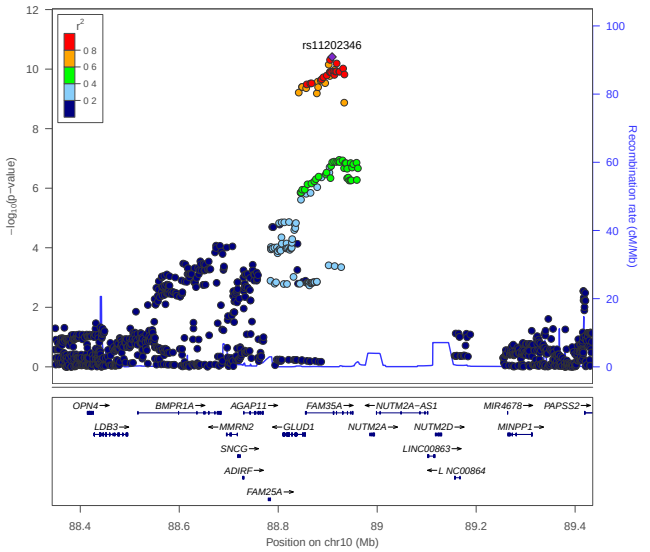
TP53INP1,NDUFAF6 **(8q22.1)**



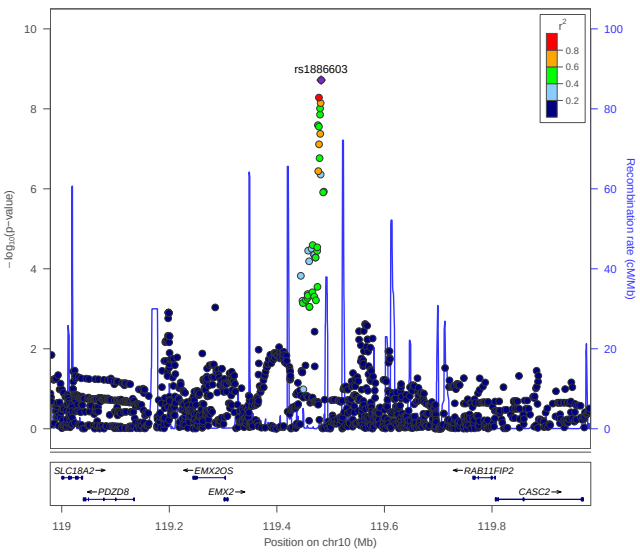
BICC1 **(10q21.1)**

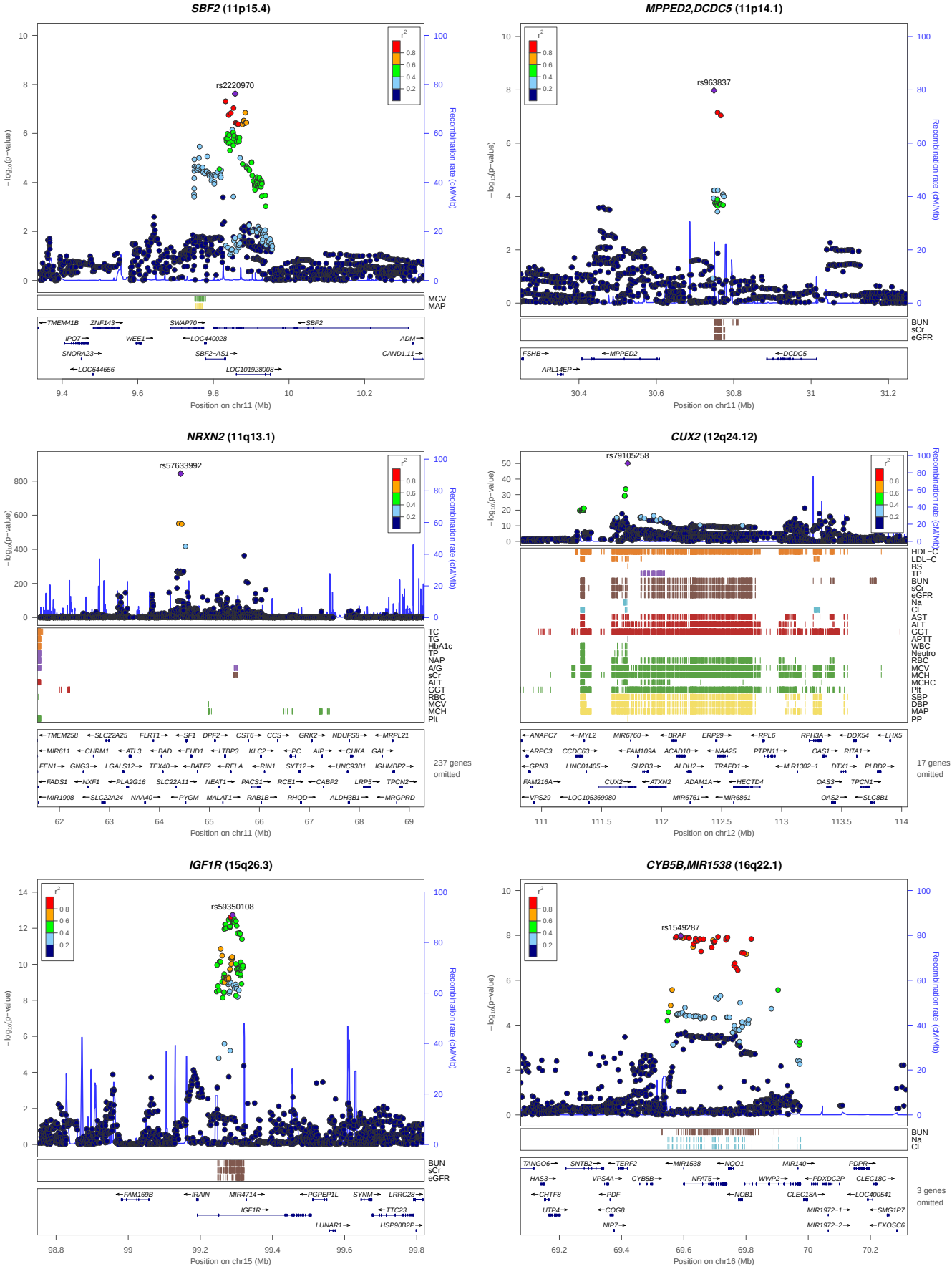


FAM35A **(10q23.2)**

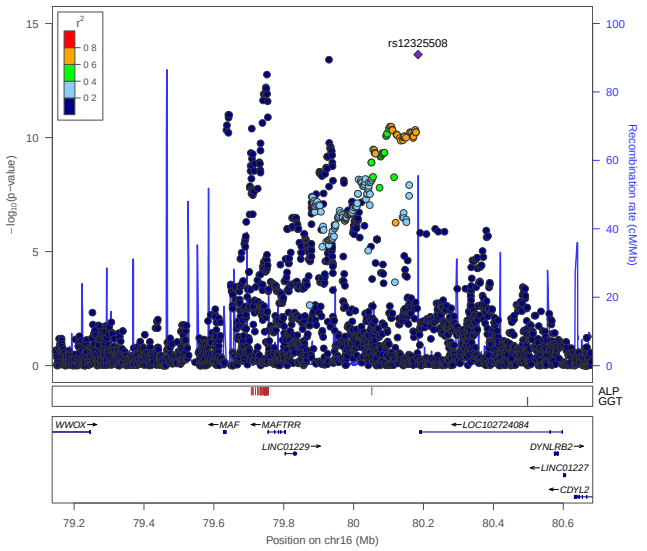


EMX2,RAB11FIP2 **(10q26.11)**

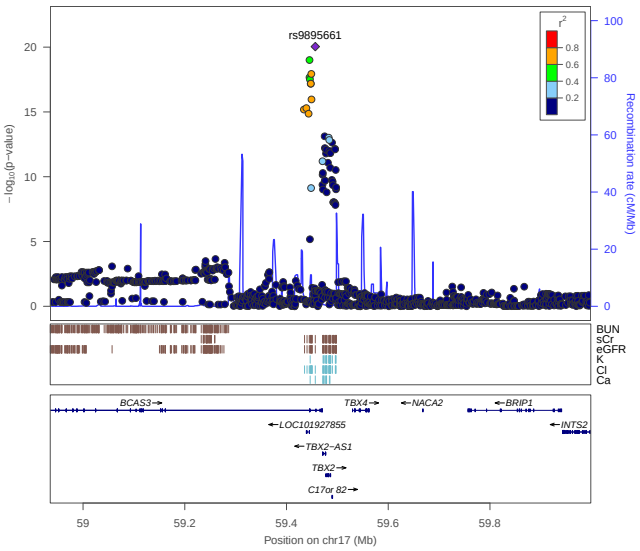



SBF2 (11p15.4)
rs2220970
MCV
MAP
Position on chr11 (Mb)
MPPED2,DCDC5 (11p14.1)
rs963837
BUN
sCr
eGFR
Position on chr11 (Mb)
NRXN2 (11q13.1)
rs57633992
TC
TG
HbA1c
TP
NAP
A/G
sCr
ALT
GGT
RBC
MCV
MCH
Plt
237 genes omitted
Position on chr11 (Mb)
CUX2 (12q24.12)
rs79105258
HDL-C
LDL-C
BS
TP
BUN
sCr
eGFR
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
17 genes omitted
Position on chr12 (Mb)
IGF1R (15q26.3)
rs59350108
BUN
sCr
eGFR
Position on chr15 (Mb)
CYB5B,MIR1538 (16q22.1)
rs1549287
BUN
Na
Cl
3 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

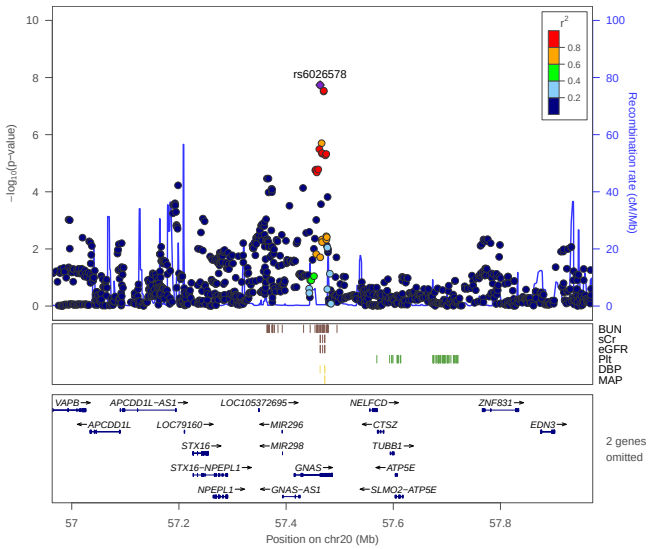
LINC01229,LOC102724084 **(16q23.2)**



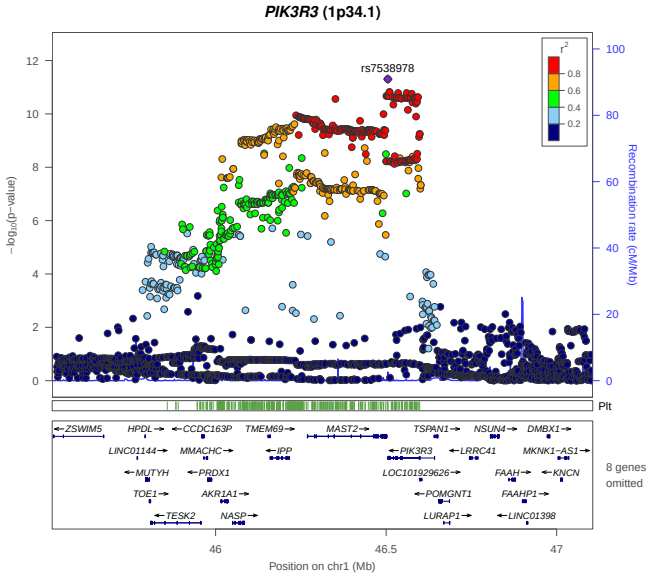
BCAS3 **(17q23.2)**

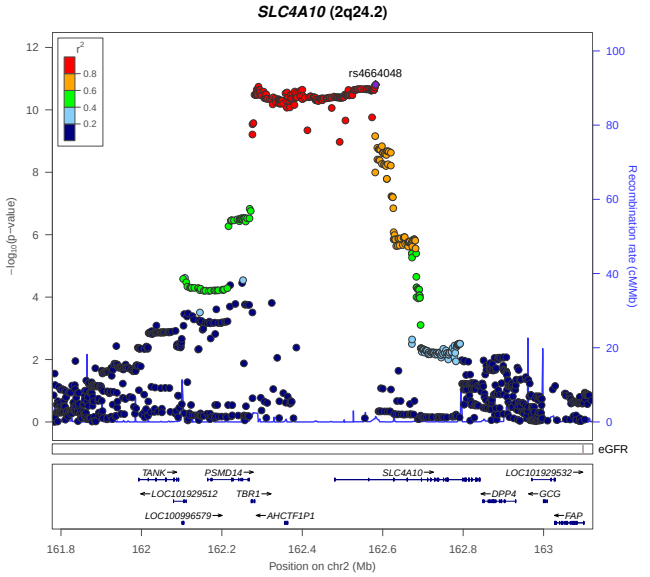


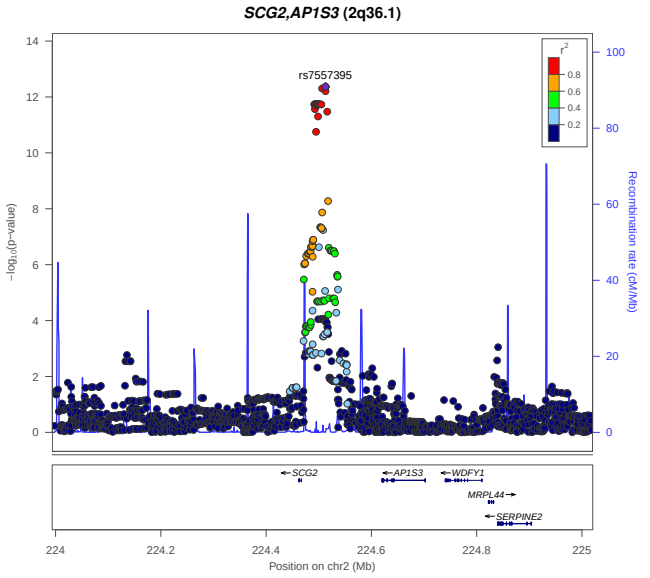
LOC101927932 **(20q13.32)**

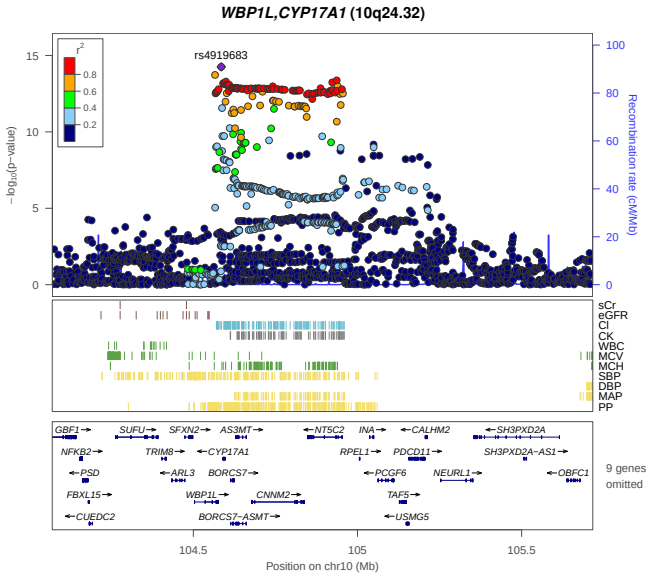


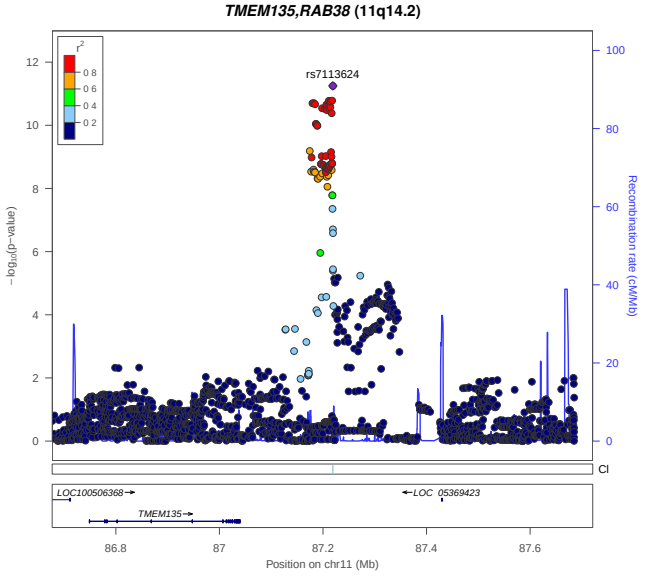
2.15 Na (n = 127,304)

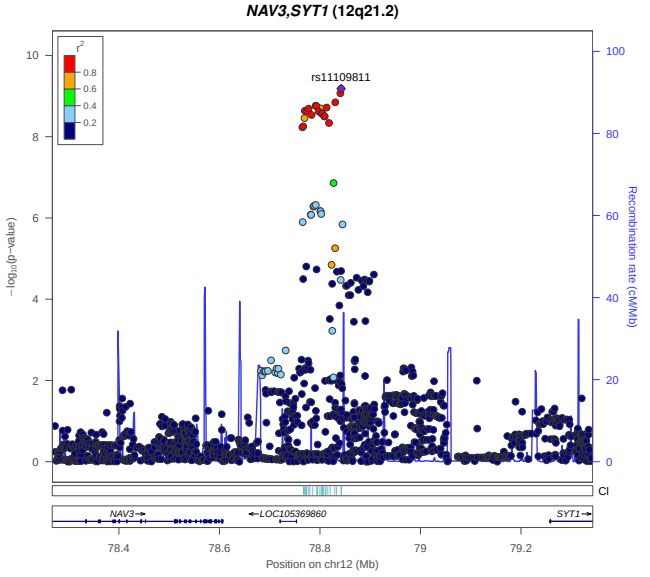


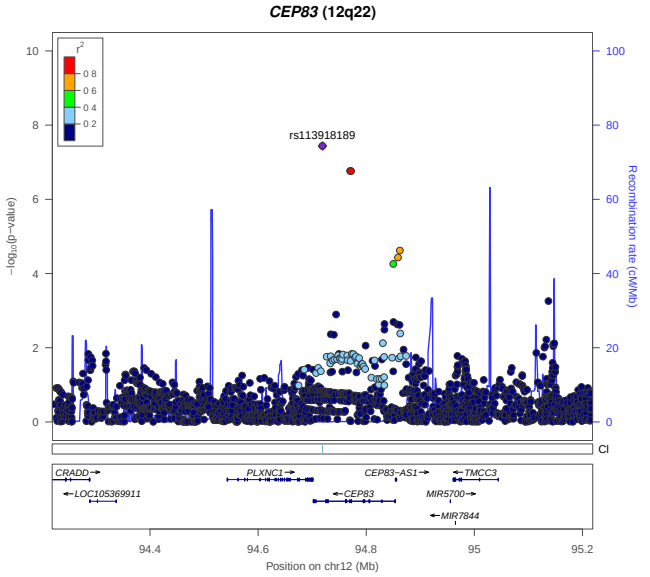


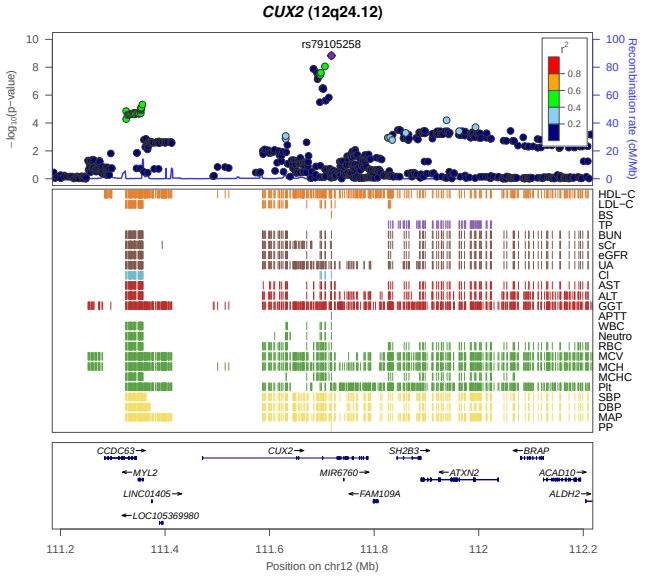


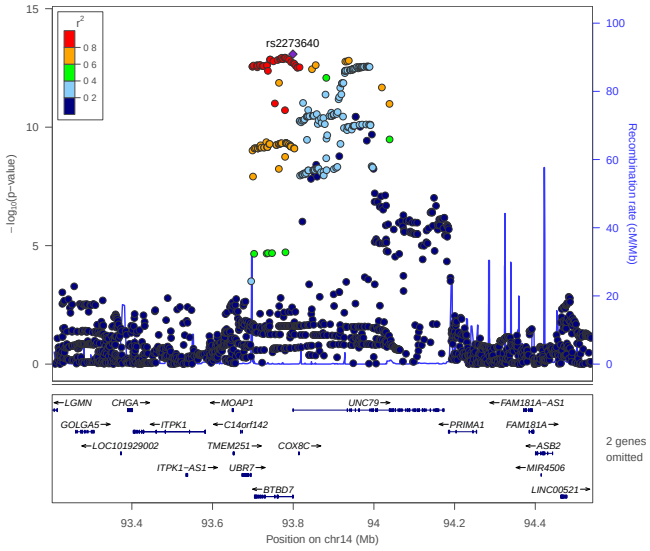


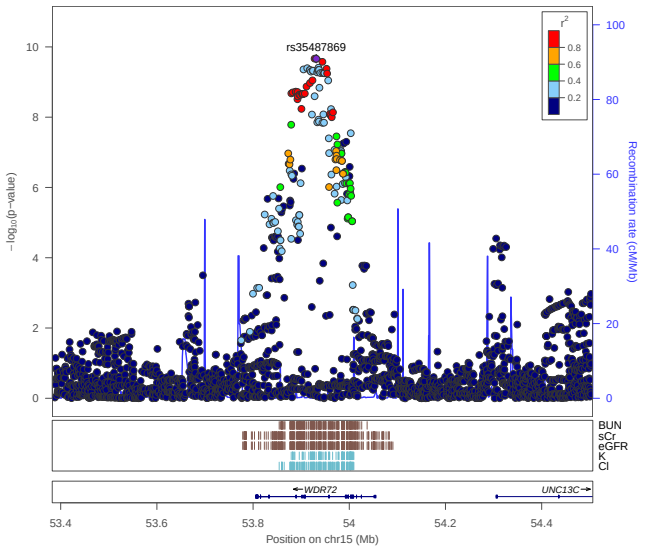


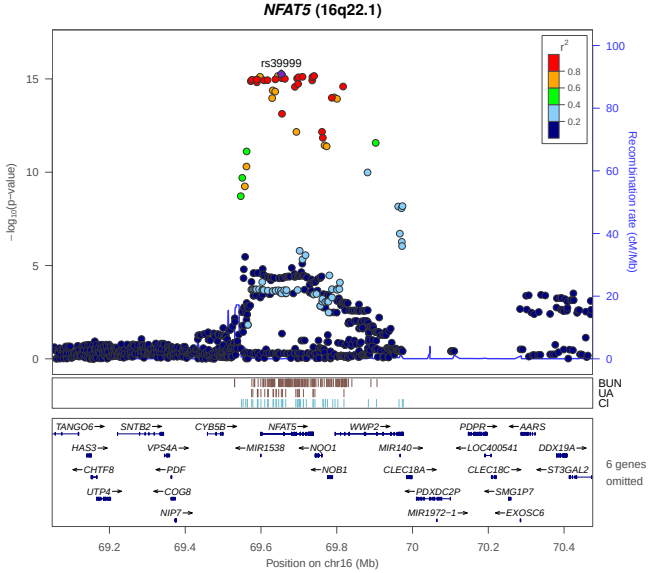


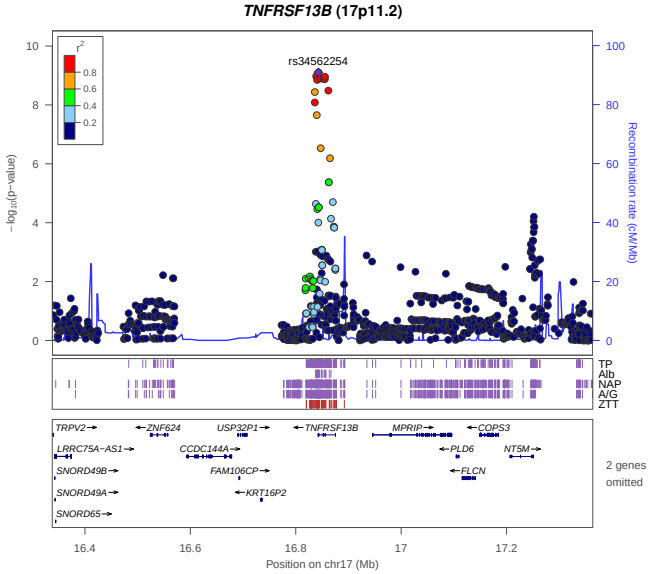

CEP83 (12q22)
rs113918189
CRADD
PLXNC1
CEP83-AS1
TMCC3
LOC105369911
CEP83
MIR5700
MIR7844
CI
Position on chr12 (Mb)
Recombination rate (cM/Mb)

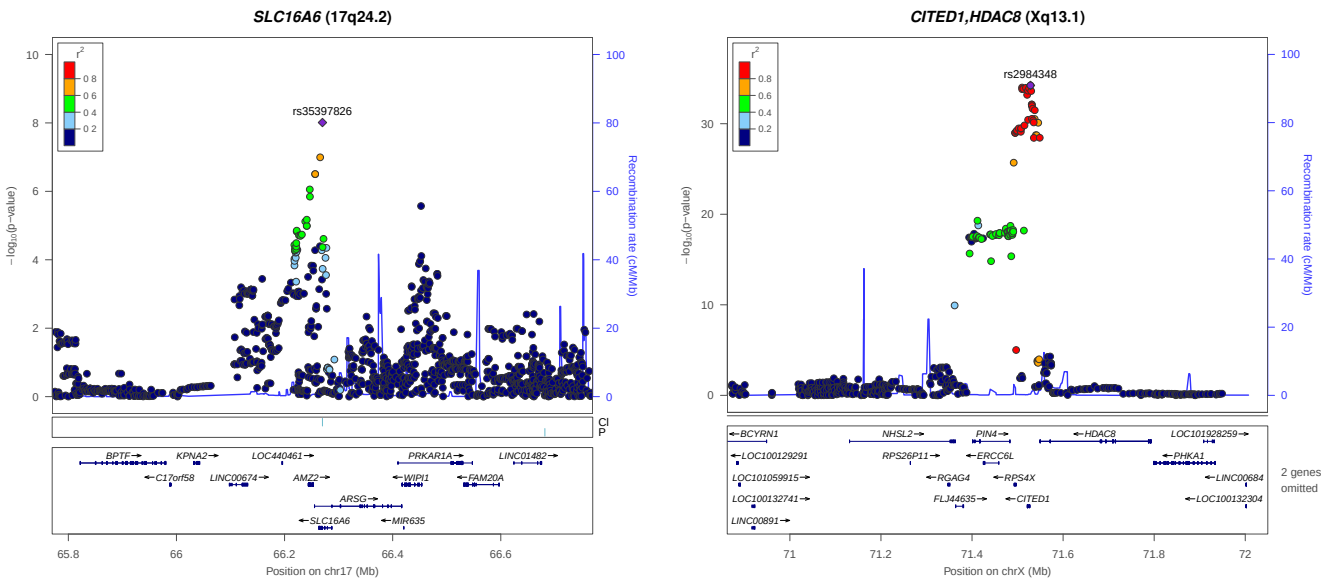

CUX2 (12q24.12)
rs79105258
HDL-C
LDL-C
BS
TP
BUN
sCr
eGFR
UA
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
CCDC63
CUX2
SH2B3
BRAP
MYL2
MIR6760
ATXN2
ACAD10
LINC01405
FAM109A
ALDH2
LOC105369980
Position on chr12 (Mb)
Recombination rate (cM/Mb)


BTBD7 (14q32.12)
rs2273640
LGMN
CHGA
MOAP1
UNC79
FAM181A-AS1
GOLGA5
ITPK1
C14orf142
PRIMA1
FAM181A
LOC101929002
TMEM251
COX8C
ASB2
ITPK1-AS1
UBR7
MIR4506
BTBD7
LINC00521
2 genes omitted
Position on chr14 (Mb)
Recombination rate (cM/Mb)

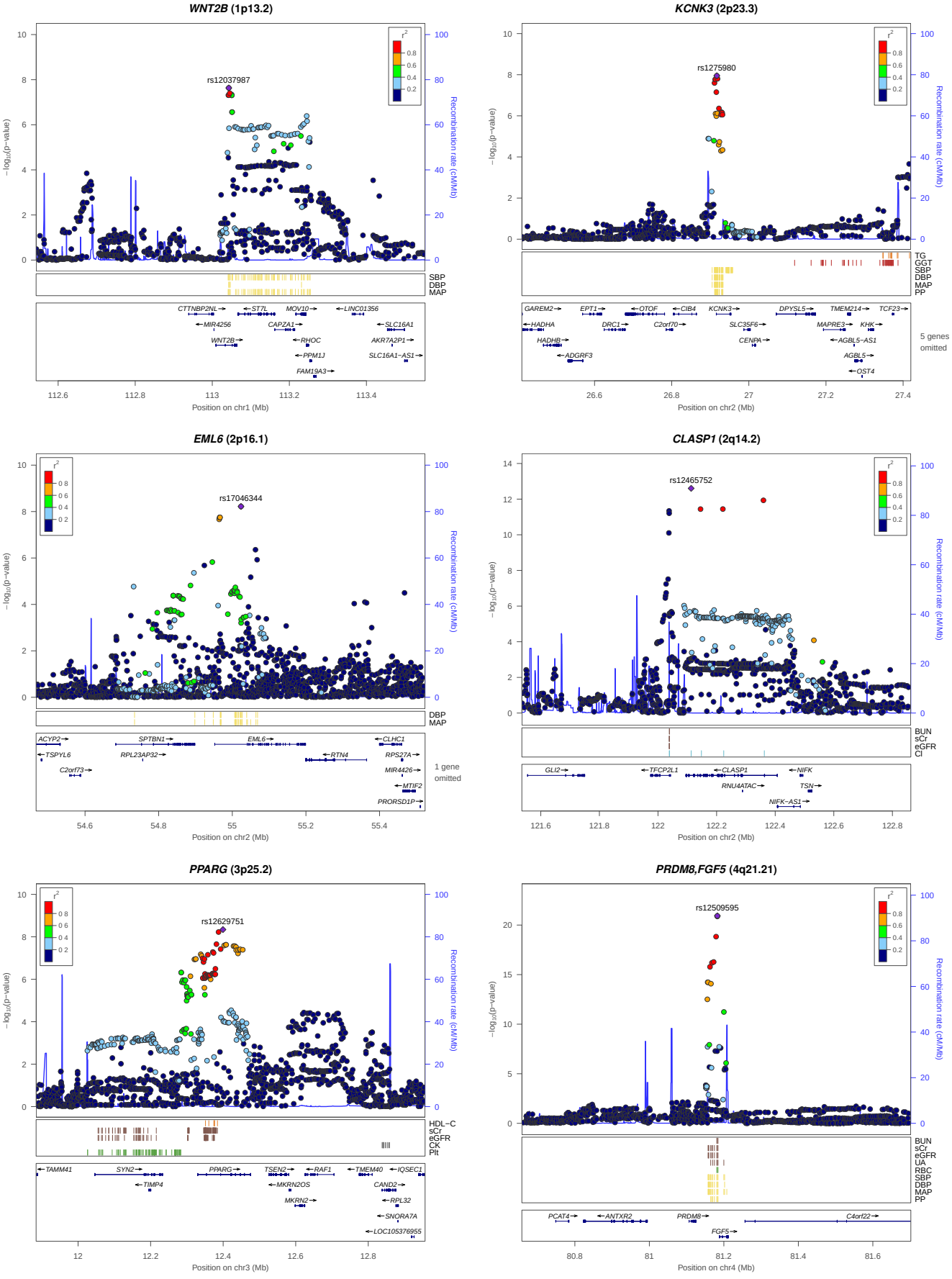

WDR72 (15q21.3)
rs35487869
BUN
sCr
eGFR
K
Cl
WDR72
UNC13C
Position on chr15 (Mb)
Recombination rate (cM/Mb)

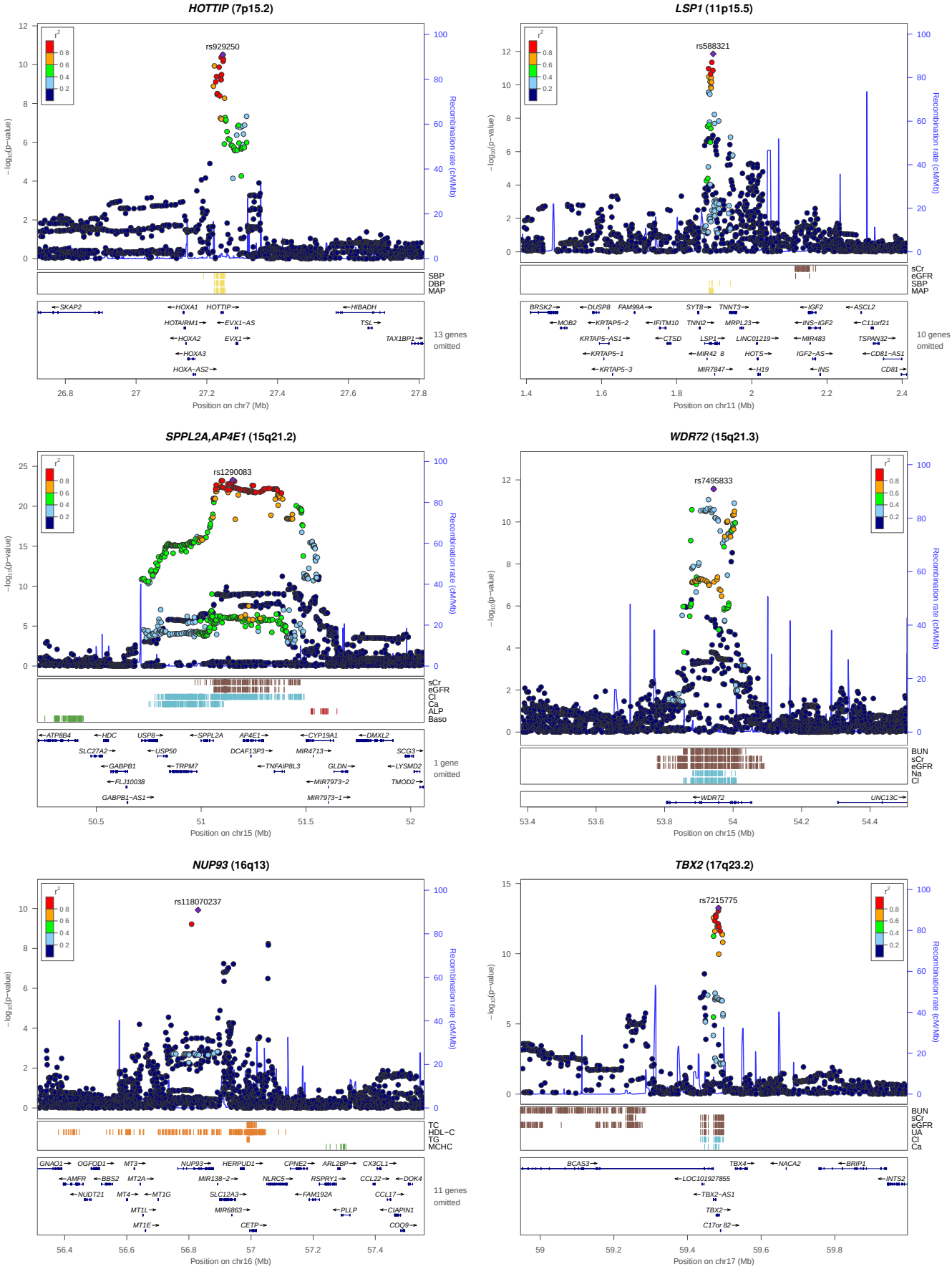

NFAT5 (16q22.1)
rs39999
BUN
UA
Cl
TANGO6
SNTB2
CYB5B
NFAT5
WWP2
PDPR
AARS
HAS3
VPS4A
MIR1538
NQO1
MIR140
LOC400541
DDX19A
CHTF8
PDF
NOB1
CLEC18A
CLEC18C
ST3GAL2
UTP4
COG8
PDXDC2P
SMG1P7
NIP7
MIR1972-1
EXOSC6
6 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)

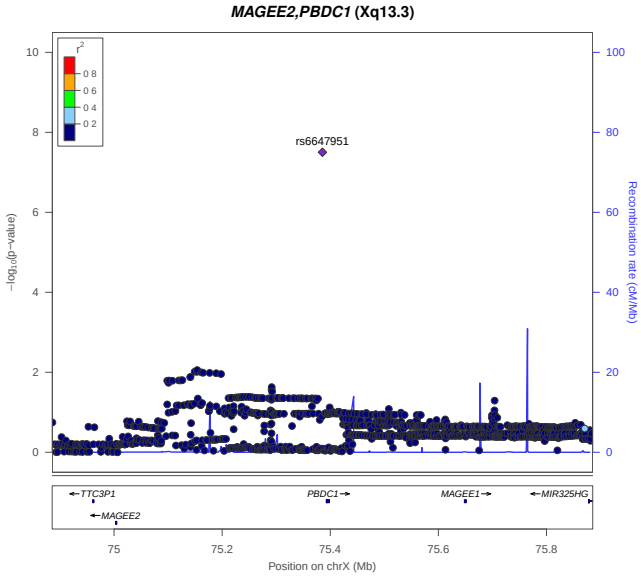

TNFRSF13B (17p11.2)
rs34562254
TP
Alb
NAP
A/G
ZTT
TRPV2
ZNF624
USP32P1
TNFRSF13B
MPRIP
COPS3
LRRC75A-AS1
CCDC144A
PLD6
NT5M
SNORD49B
FAM106CP
FLCN
SNORD49A
KRT16P2
SNORD65
2 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)

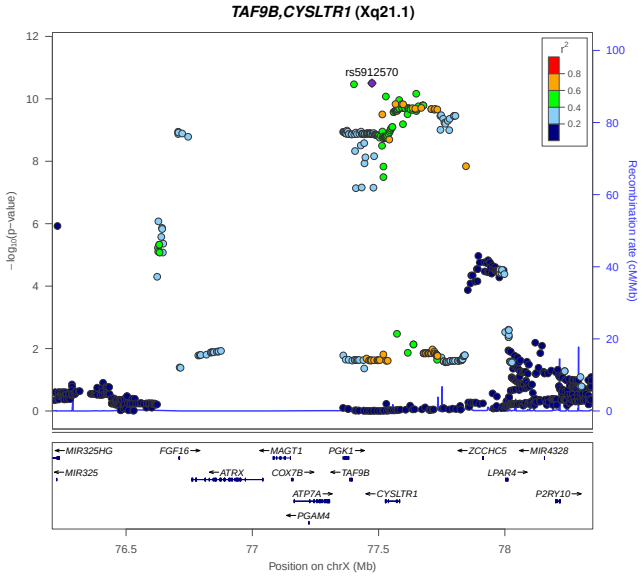

SLC16A6 (17q24.2)
rs35397826
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
BPTF
KPNA2
LOC440461
PRKAR1A
LINC01482
C17orf58
LINC00674
AMZ2
WIPI1
FAM20A
ARSG
SLC16A6
MIR635
Position on chr17 (Mb)
CHD1,HDAC8 (Xq13.1)
rs2984348
BCYRN1
NHSL2
PIN4
HDAC8
LOC101928259
LOC100129291
RPS26P11
ERCC6L
PHKA1
LOC101059915
RGAG4
RPS4X
LINC00684
LOC100132741
FLJ44635
CITED1
LOC100132304
LINC00891
2 genes omitted
Position on chrX (Mb)

2.16 K (n = 132,938)

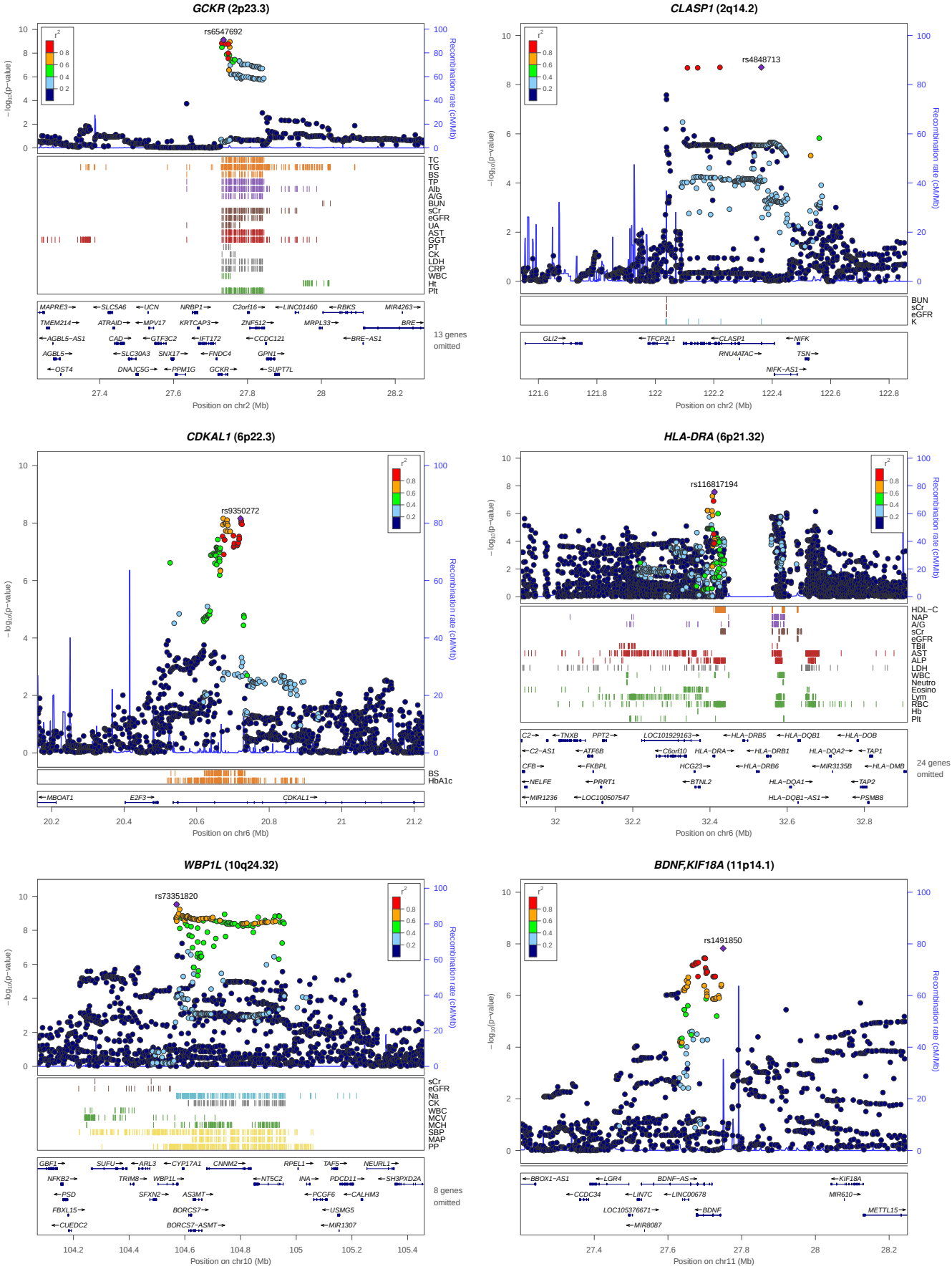


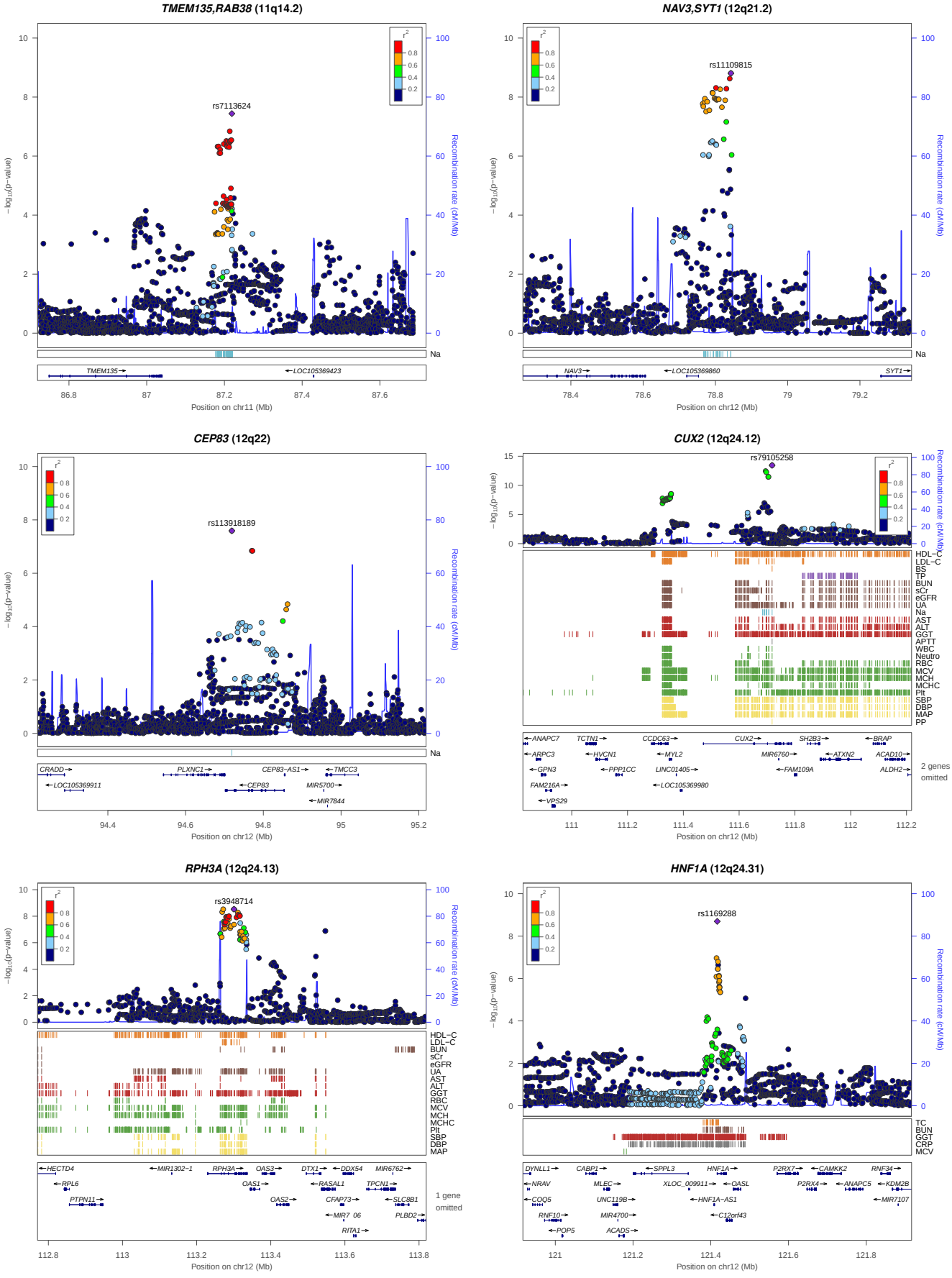

HOTTIP (7p15.2)
rs929250
SBP
DBP
MAP
13 genes omitted
Position on chr7 (Mb)
LSP1 (11p15.5)
rs588321
sCr
eGFR
SBP
MAP
10 genes omitted
Position on chr11 (Mb)
SPPL2A,AP4E1 (15q21.2)
rs1290083
sCr
eGFR
Cl
Ca
ALP
Baso
1 gene omitted
Position on chr15 (Mb)
WDR72 (15q21.3)
rs7495833
BUN
sCr
eGFR
Na
Cl
Position on chr15 (Mb)
NUP93 (16q13)
rs118070237
TC
HDL−C
TG
MCHC
11 genes omitted
Position on chr16 (Mb)
TBX2 (17q23.2)
rs7215775
BUN
sCr
eGFR
UA
Cl
Ca
Position on chr17 (Mb)
Recombination rate (cM/Mb)

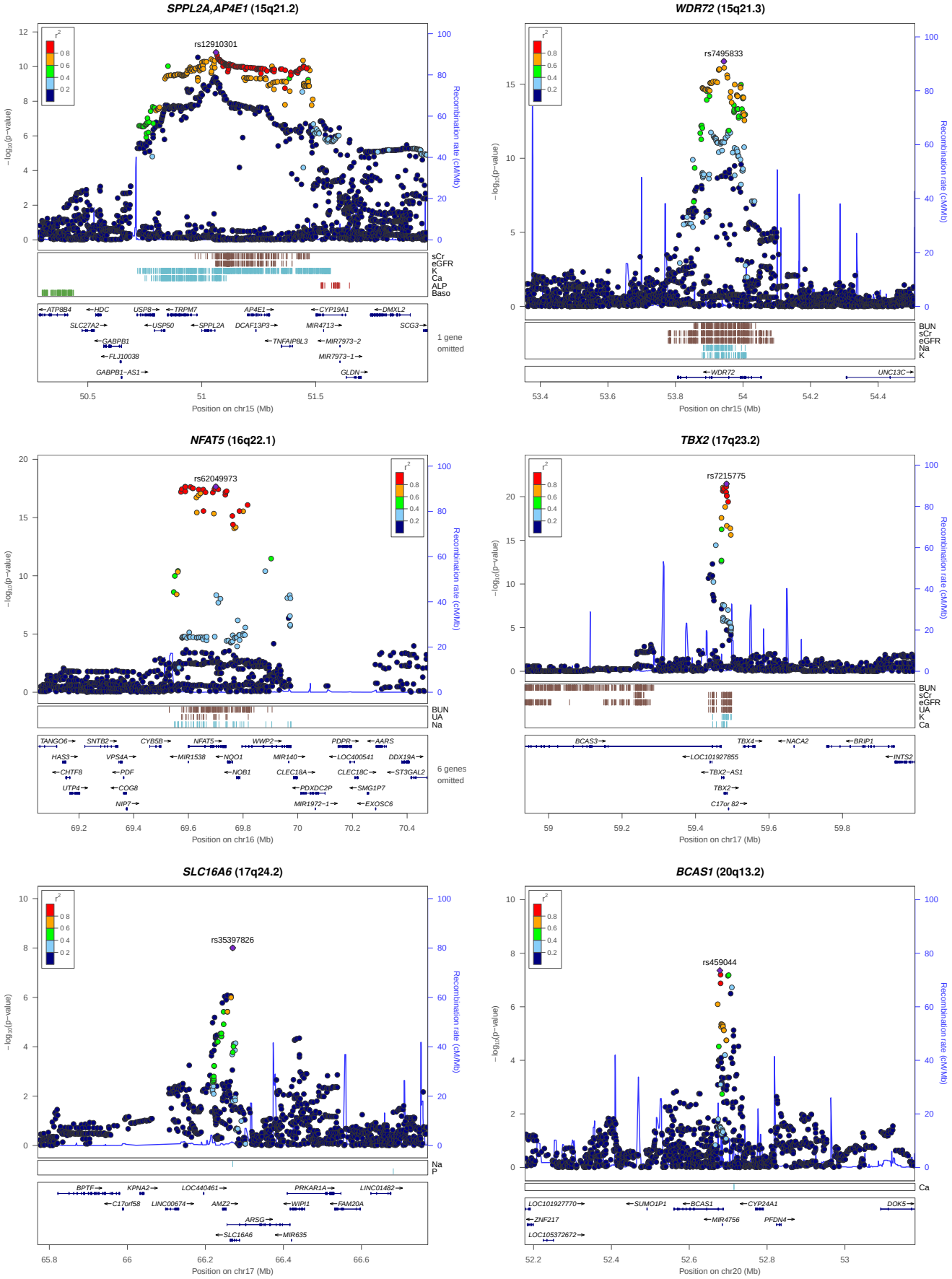

MAGEE2,PBDC1 (Xq13.3)
rs6647951
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
TTC3P1
MAGEE2
PBDC1
MAGEE1
MIR325HG
Position on chrX (Mb)

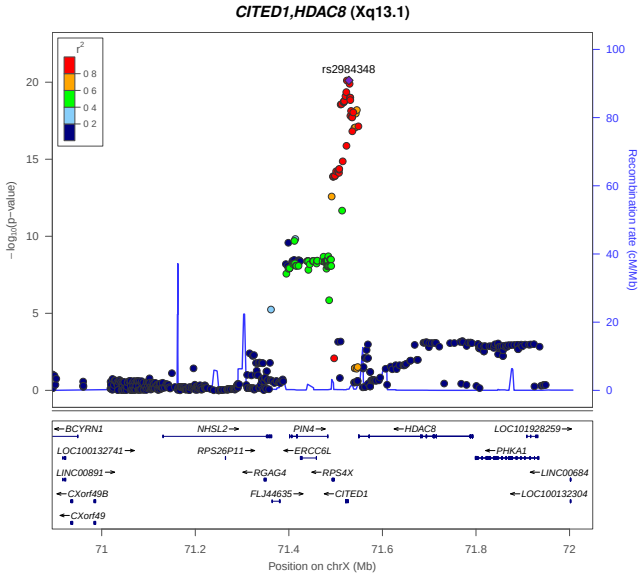

TAF9B,CYSLTR1 (Xq21.1)
rs5912570
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
MIR325HG
FGF16
MAGT1
PGK1
ZCCHC5
MIR4328
MIR325
ATRX
COX7B
TAF9B
LPAR4
ATP7A
CYSLTR1
P2RY10
PGAM4
Position on chrX (Mb)

2.17 CI (n = 126,402)



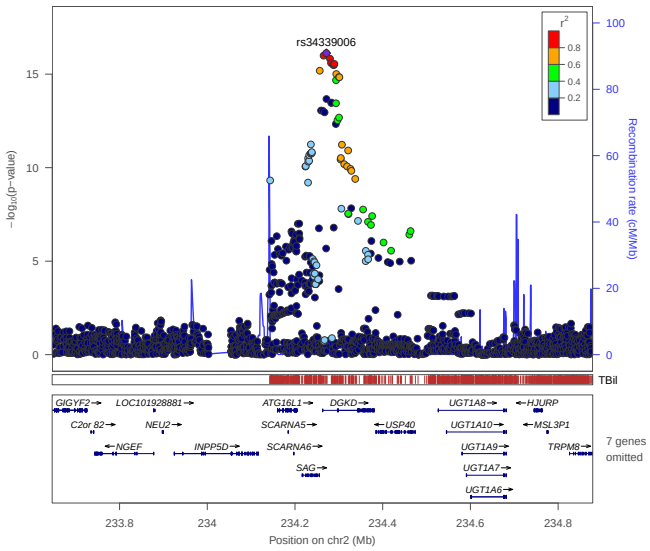

TMEM135,RAB38 (11q14.2)
rs7113624
NAV3,SYT1 (12q21.2)
rs11109815
CEP83 (12q22)
rs113918189
CUX2 (12q24.12)
rs79105258
RPH3A (12q24.13)
rs3948714
HNF1A (12q24.31)
rs1169288
Recombination rate (cM/Mb)
Position on chr11 (Mb)
Position on chr12 (Mb)
2 genes omitted
1 gene omitted


SPPL2A,AP4E1 (15q21.2)
rs12910301
WDR72 (15q21.3)
rs7495833
NFAT5 (16q22.1)
rs62049973
TBX2 (17q23.2)
rs7215775
SLC16A6 (17q24.2)
rs35397826
BCAS1 (20q13.2)
rs459044
Recombination rate (cM/Mb)
Position on chr15 (Mb)
Position on chr16 (Mb)
Position on chr17 (Mb)
Position on chr20 (Mb)
1 gene omitted
6 genes omitted

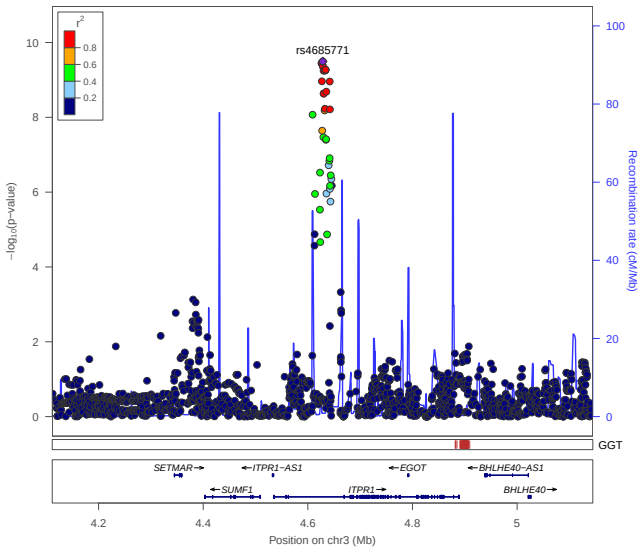

CITED1,HDAC8 (Xq13.1)
rs2984348
r2
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
BCYRN1
NHSL2
PIN4
HDAC8
LOC101928259
LOC100132741
RPS26P11
ERCC6L
PHKA1
LINC00891
RGAG4
RPS4X
LINC00684
CXorf49B
FLJ44635
CITED1
LOC100132304
CXorf49
Position on chrX (Mb)

2.18 Ca (n = 71,701)

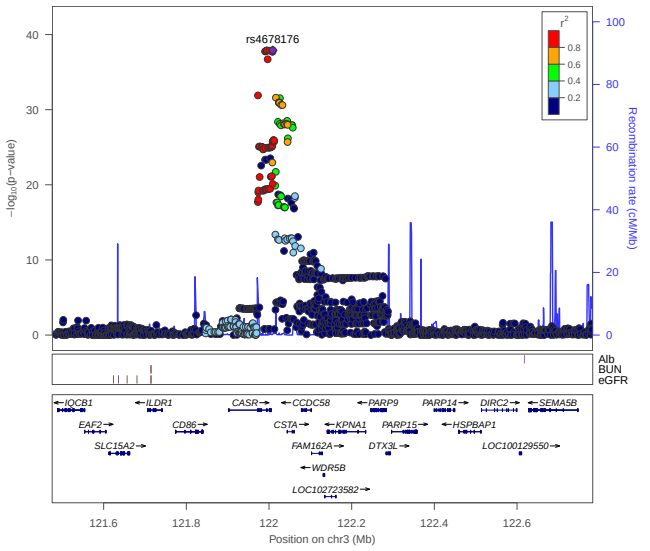
***DGKD* (2q37.1)**



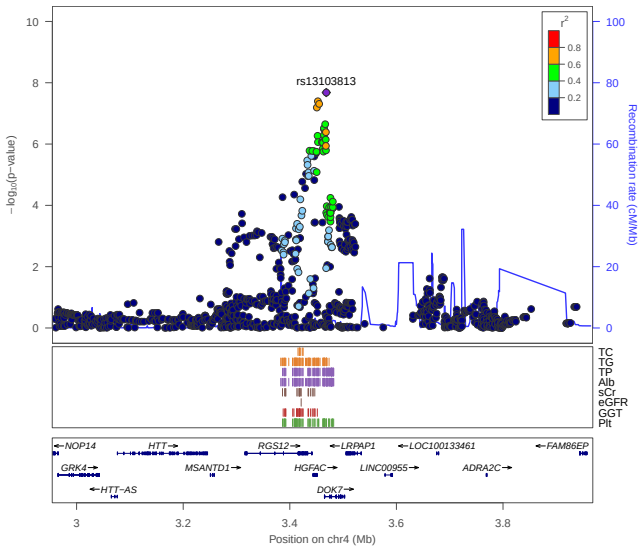
***ITPR1* (3p26.1)**



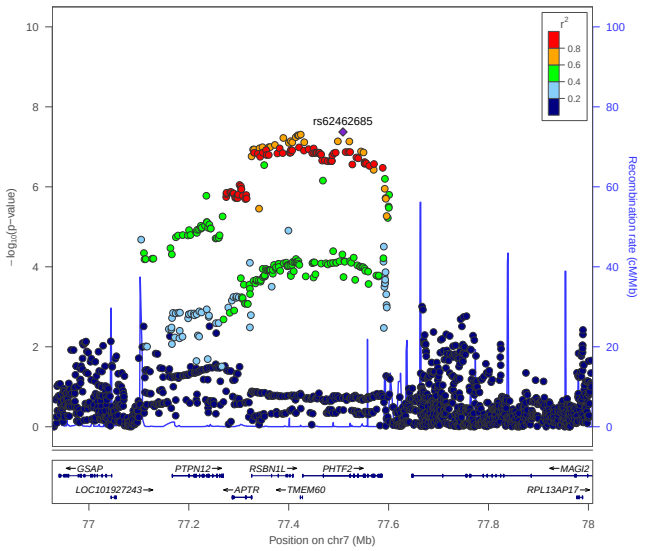
***CASR,CSTA* (3q21.1)**



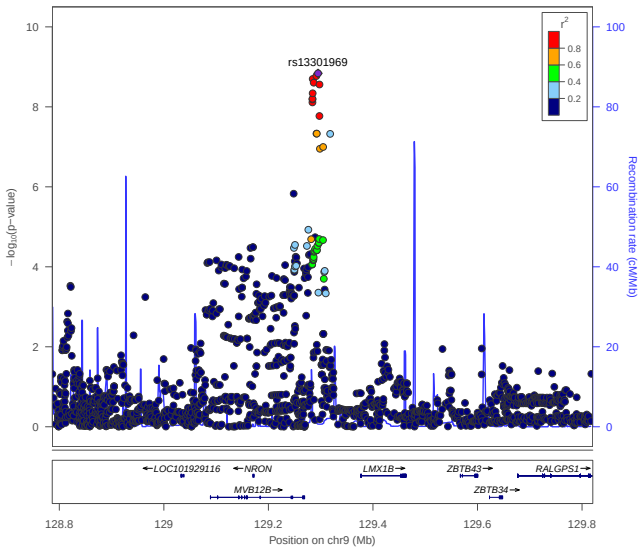
***DOK7* (4p16.3)**



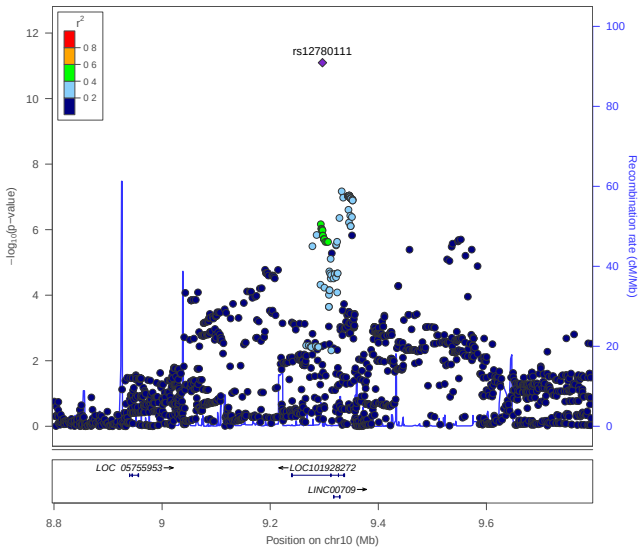
***PHTF2* (7q21.11)**



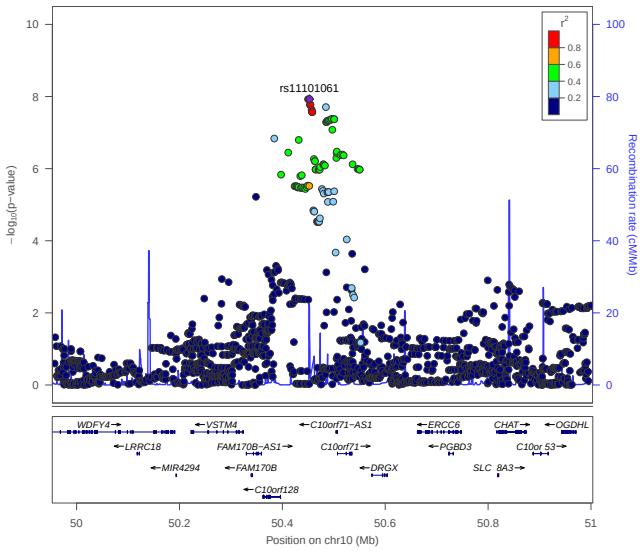
***MVB12B,LMX1B* (9q33.3)**



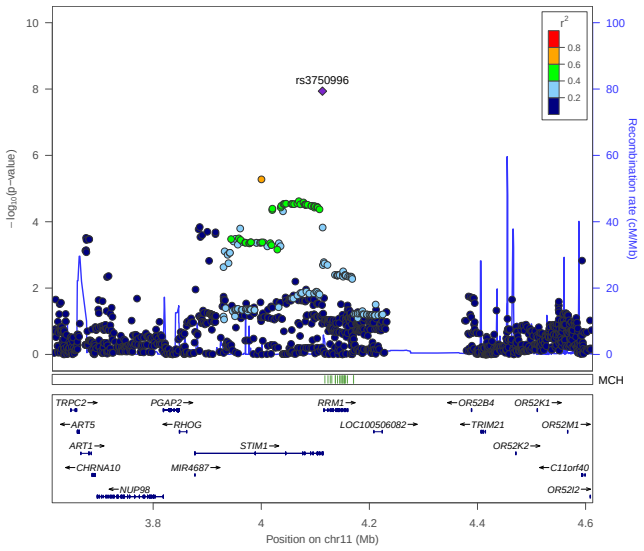
LOC101928272 **(10p14)**



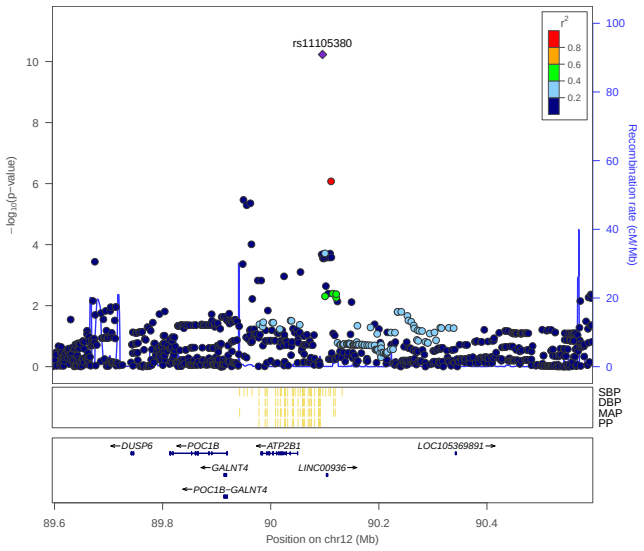
C10orf128,C10orf71-AS1 **(10q11.23)**



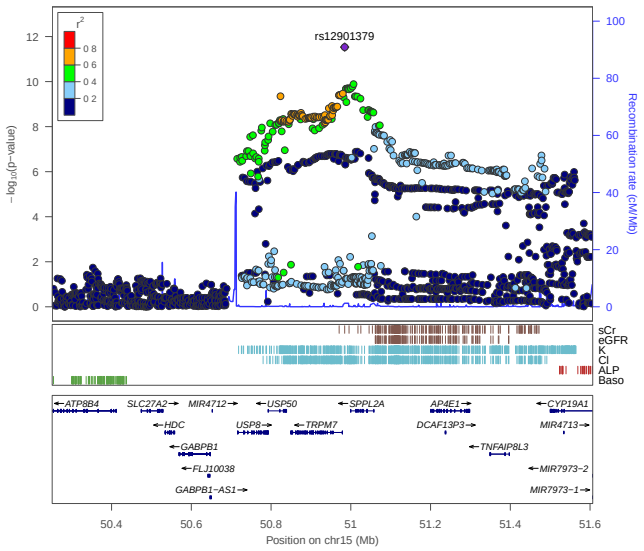
STIM1 **(11p15.4)**



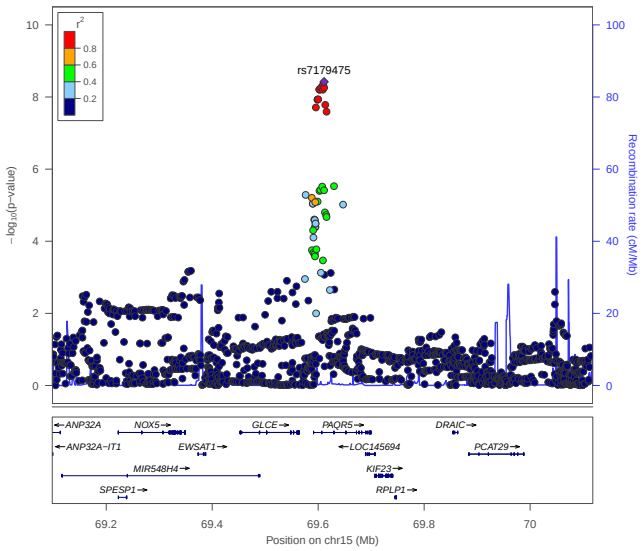
ATP2B1,LINC00936 **(12q21.33)**

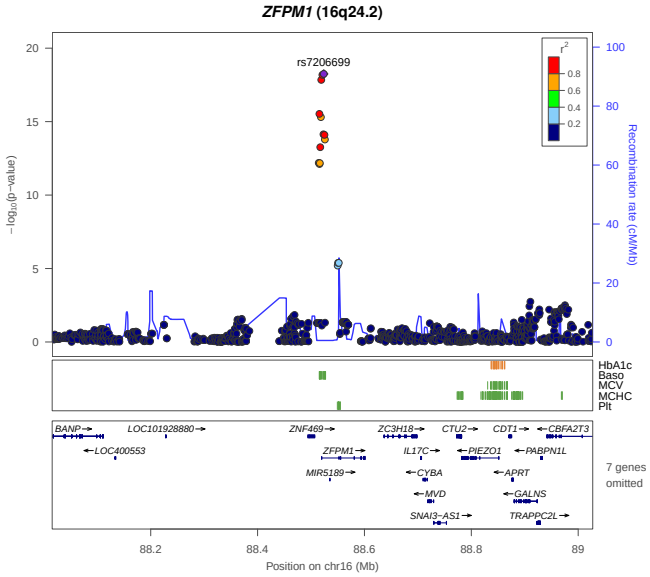


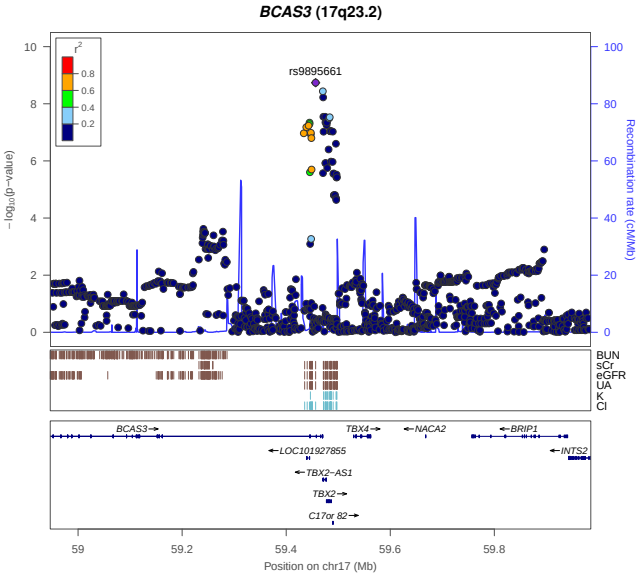
TRPM7,SPPL2A **(15q21.2)**

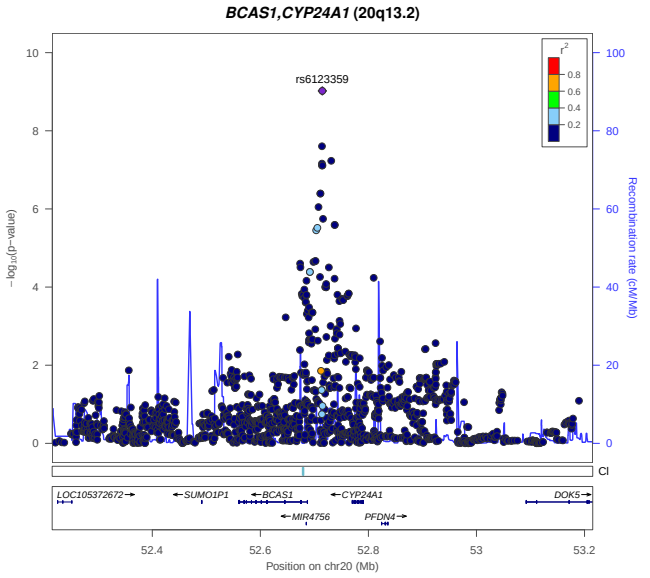


PAQR5 **(15q23)**

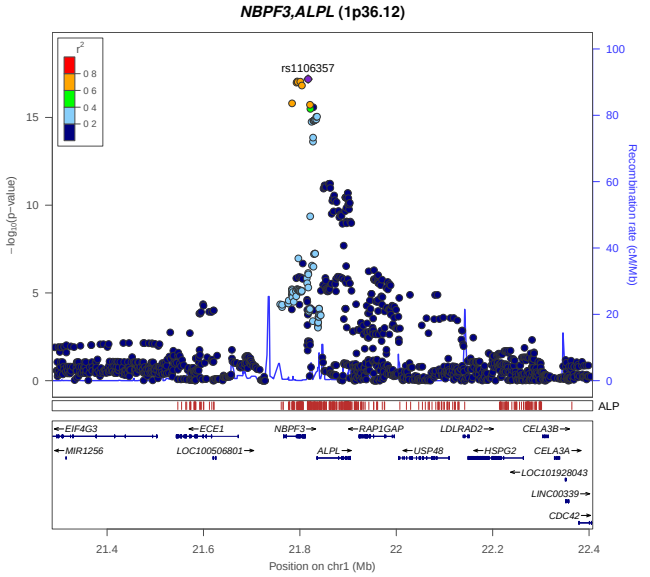


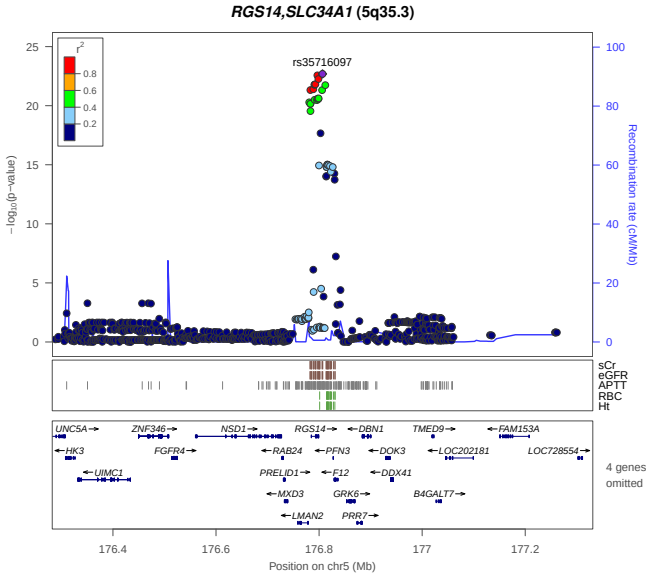

ZFPM1 (16q24.2)
rs7206699
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
HbA1c
Baso
MCV
MCHC
Plt
BANP
LOC101928880
ZNF469
ZC3H18
CTU2
CDT1
CBFA2T3
LOC400553
ZFPM1
IL17C
PIEZO1
PABPN1L
MIR5189
CYBA
APRT
MVD
GALNS
SNAI3-AS1
TRAPPC2L
7 genes omitted
Position on chr16 (Mb)

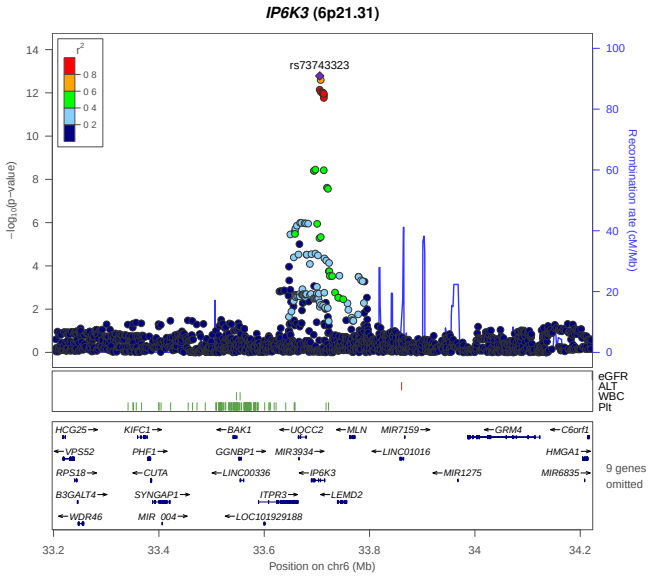

BCAS3 (17q23.2)
rs9895661
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
BUN
sCr
eGFR
UA
K
Cl
BCAS3
TBX4
NACA2
BRIP1
LOC101927855
INTS2
TBX2-AS1
TBX2
C17or 82
Position on chr17 (Mb)

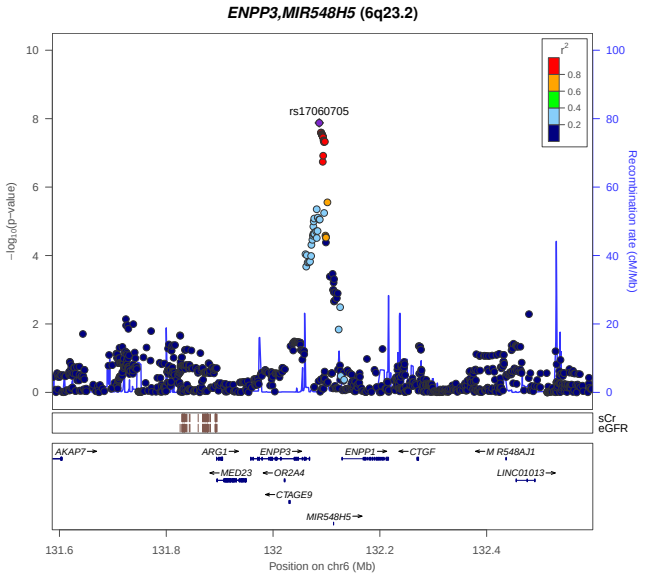

BCAS1,CYP24A1 (20q13.2)
rs6123359
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
Cl
LOC105372672
SUMO1P1
BCAS1
CYP24A1
DOK5
MIR4756
PFDN4
Position on chr20 (Mb)

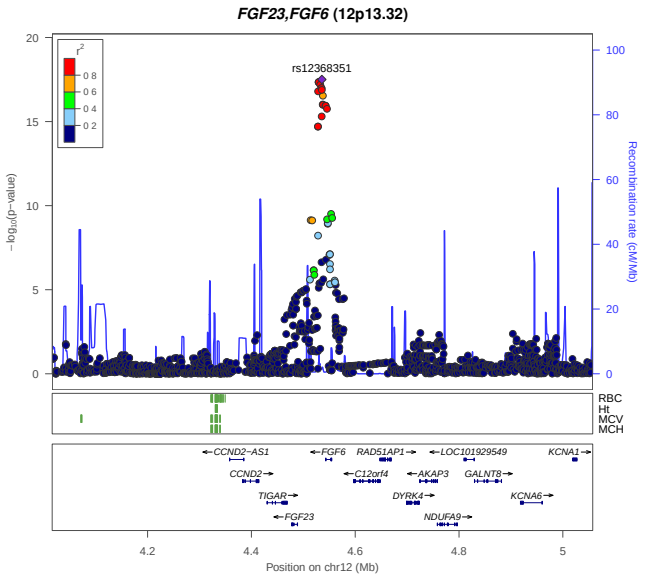
2.19 P (n = 42,793)

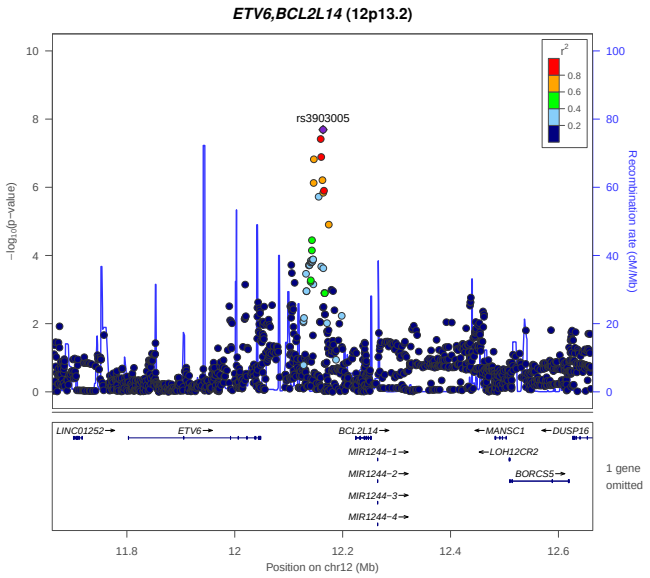

NBPF3,ALPL (1p36.12)
rs1106357
ALP
Position on chr1 (Mb)
Recombination rate (cM/Mb)

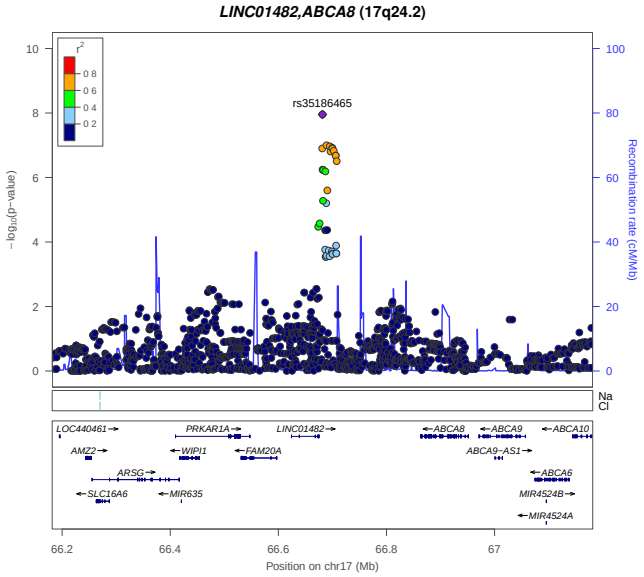

RGS14,SLC34A1 (5q35.3)
rs35716097
sCr
eGFR
APTT
RBC
Ht
4 genes omitted
Position on chr5 (Mb)
Recombination rate (cM/Mb)

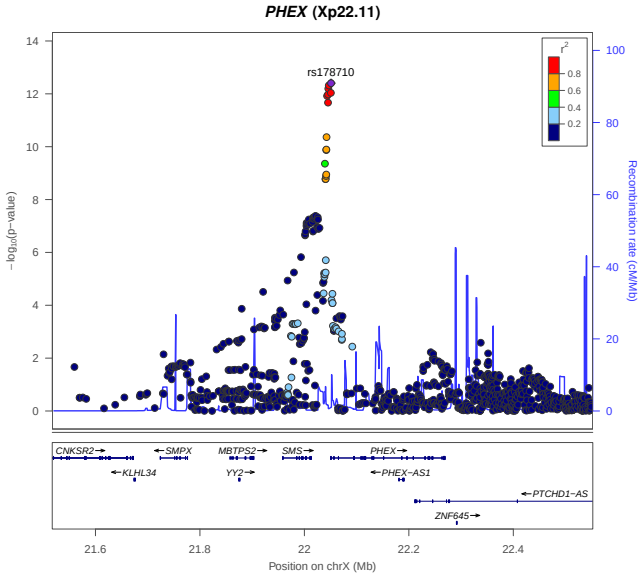

IP6K3 (6p21.31)
rs73743323
eGFR
ALT
WBC
Plt
9 genes omitted
Position on chr6 (Mb)
Recombination rate (cM/Mb)


ENPP3,MIR548H5 (6q23.2)
rs17060705
sCr
eGFR
Position on chr6 (Mb)
Recombination rate (cM/Mb)

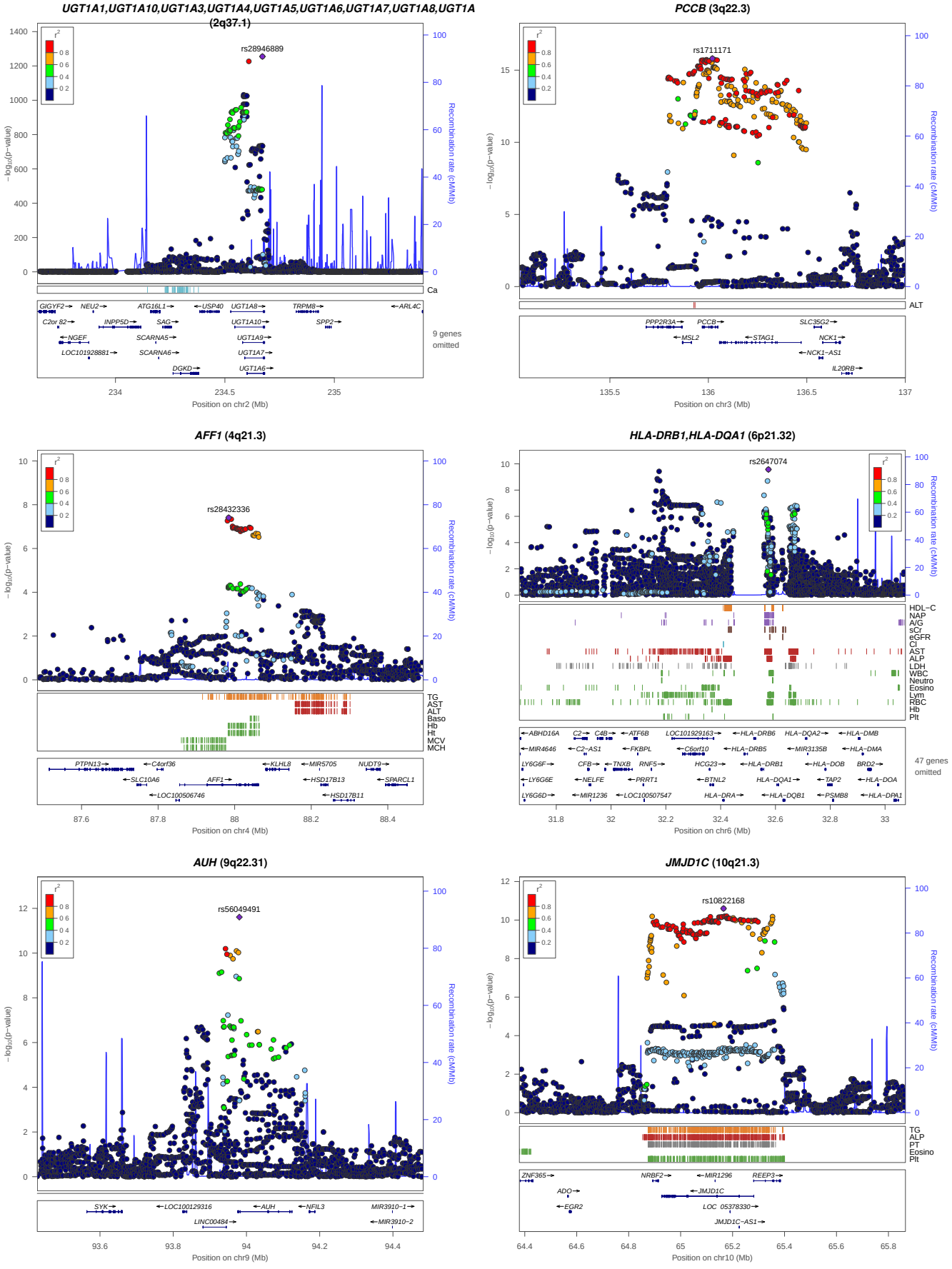

FGF23,FGF6 (12p13.32)
rs12368351
RBC
Ht
MCV
MCH
Position on chr12 (Mb)
Recombination rate (cM/Mb)

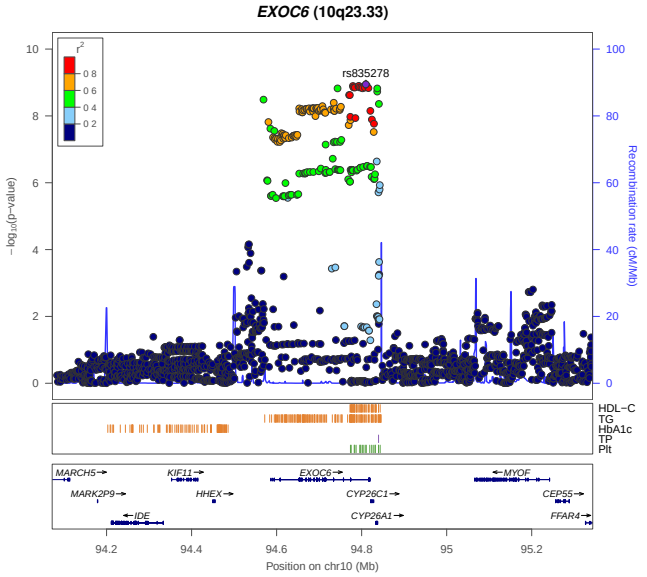

ETV6,BCL2L14 (12p13.2)
rs3903005
1 gene omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

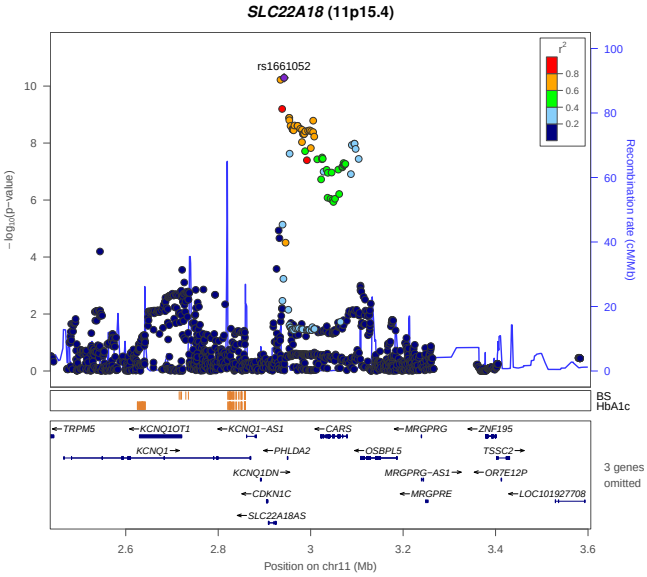

LINC01482,ABCA8 (17q24.2)
rs35186465
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
LOC440461
PRKAR1A
LINC01482
ABCA8
ABCA9
ABCA10
AMZ2
WIPI1
FAM20A
ABCA9−AS1
ARSG
ABCA6
SLC16A6
MIR635
MIR4524B
MIR4524A
Position on chr17 (Mb)

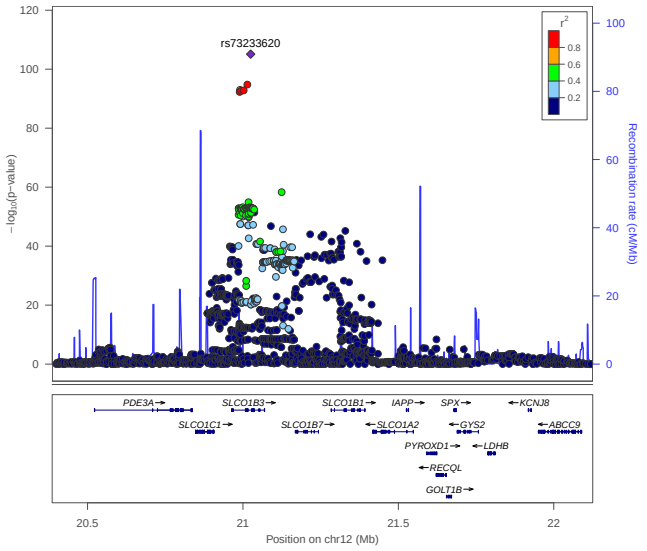

PHEX (Xp22.11)
rs178710
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
CNKSR2
SMPX
MBTPS2
SMS
PHEX
KLHL34
YY2
PHEX−AS1
PTCHD1−AS
ZNF645
Position on chrX (Mb)

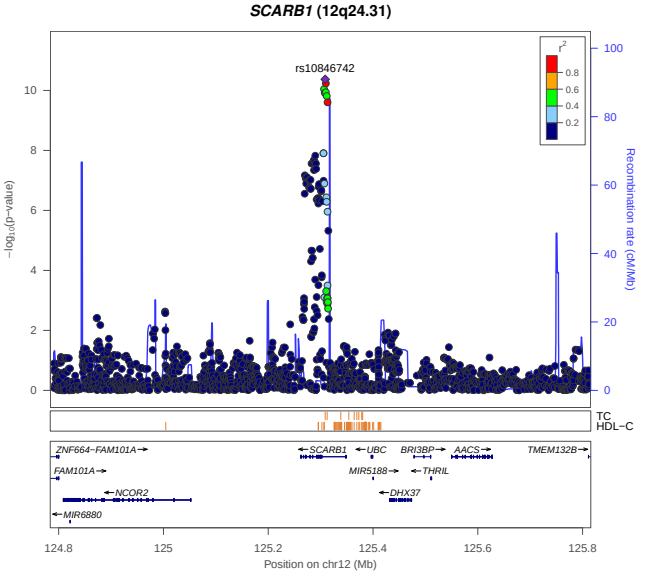
2.20 TBil ($n = 0$)

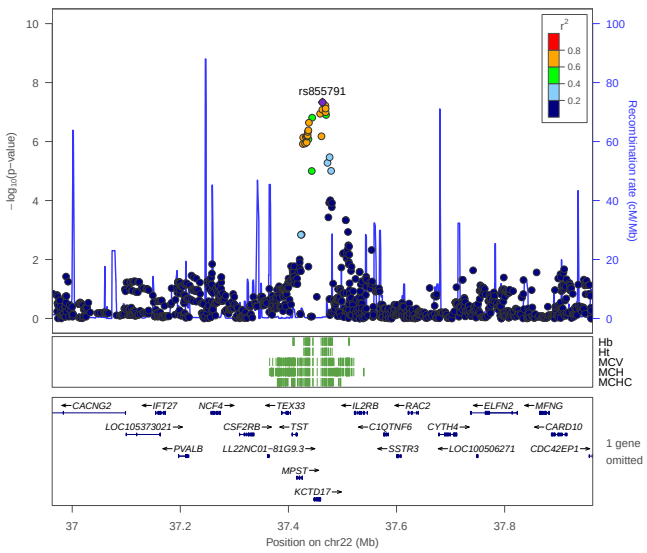

UGT1A1,UGT1A10,UGT1A3,UGT1A4,UGT1A5,UGT1A6,UGT1A7,UGT1A8,UGT1A (2q37.1)
rs28946889
PCCB (3q22.3)
rs1711171
AFF1 (4q21.3)
rs28432336
HLA-DRB1,HLA-DQA1 (6p21.32)
rs2647074
AUH (9q22.31)
rs56049491
JMJD1C (10q21.3)
rs10822168
Recombination rate (cM/Mb)
Position on chr2 (Mb)
Position on chr3 (Mb)
Position on chr4 (Mb)
Position on chr6 (Mb)
Position on chr9 (Mb)
Position on chr10 (Mb)
9 genes omitted
47 genes omitted


EXOC6 (10q23.33)
rs835278
HDL−C
TG
HbA1c
TP
Plt
MARCH5
KIF11
EXOC6
MYOF
MARK2P9
HHEX
CYP26C1
CEP55
IDE
CYP26A1
FFAR4
Position on chr10 (Mb)
Recombination rate (cM/Mb)

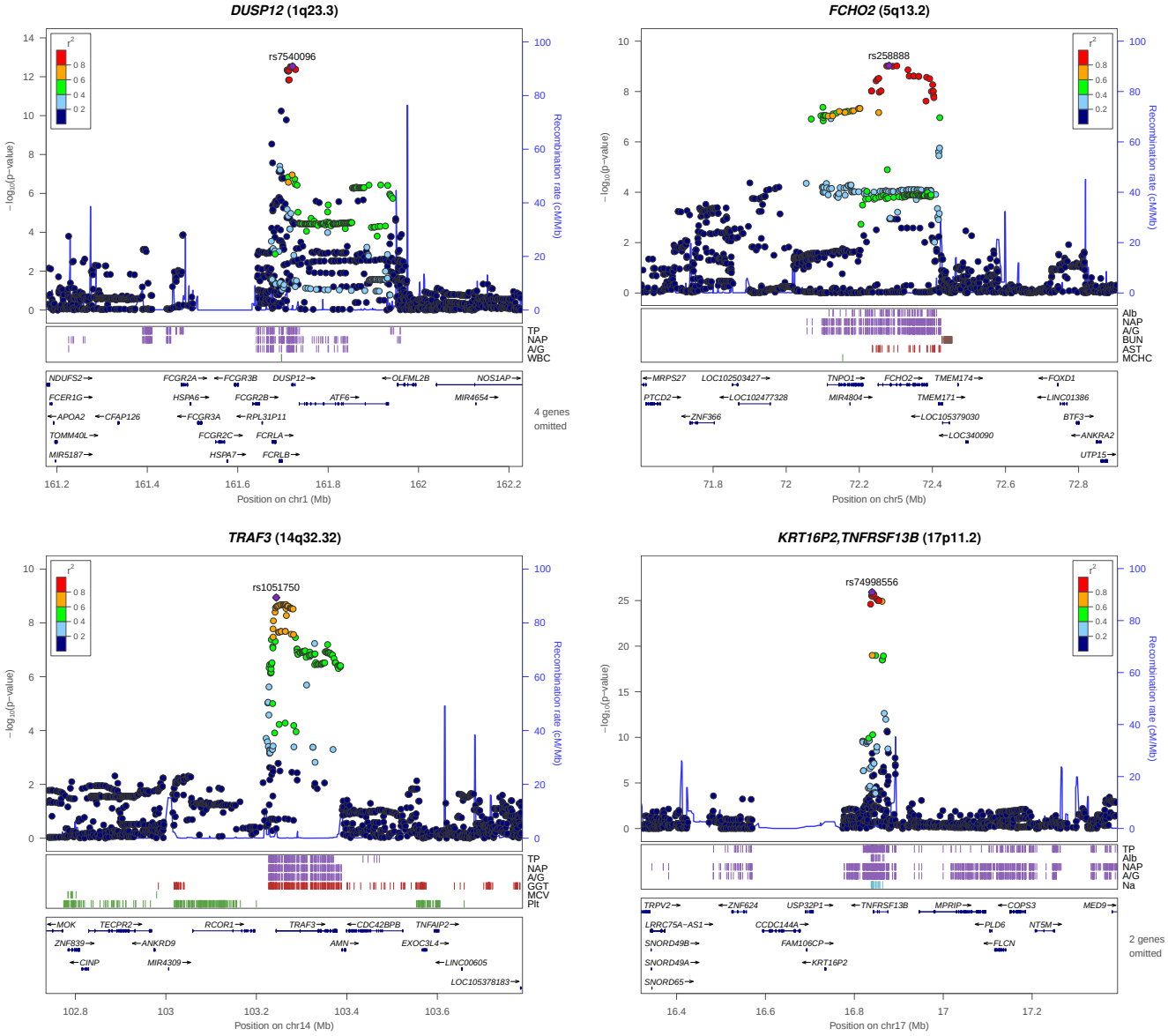

SLC22A18 (11p15.4)
rs1661052
BS
HbA1c
TRPM5
KCNQ1OT1
KCNQ1−AS1
CARS
MRGPRG
ZNF195
KCNQ1
PHLDA2
OSBPL5
TSSC2
KCNQ1DN
MRGPRG−AS1
OR7E12P
CDKN1C
MRGPRE
LOC101927708
SLC22A18AS
3 genes
omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)


SLCO1B3 (12p12.2)
rs73233620
PDE3A
SLCO1B3
SLCO1B1
IAPP
SPX
KCNJ8
SLCO1C1
SLCO1B7
SLCO1A2
GYS2
ABCC9
PYROXD1
LDHB
RECQL
GOLT1B
Position on chr12 (Mb)
Recombination rate (cM/Mb)

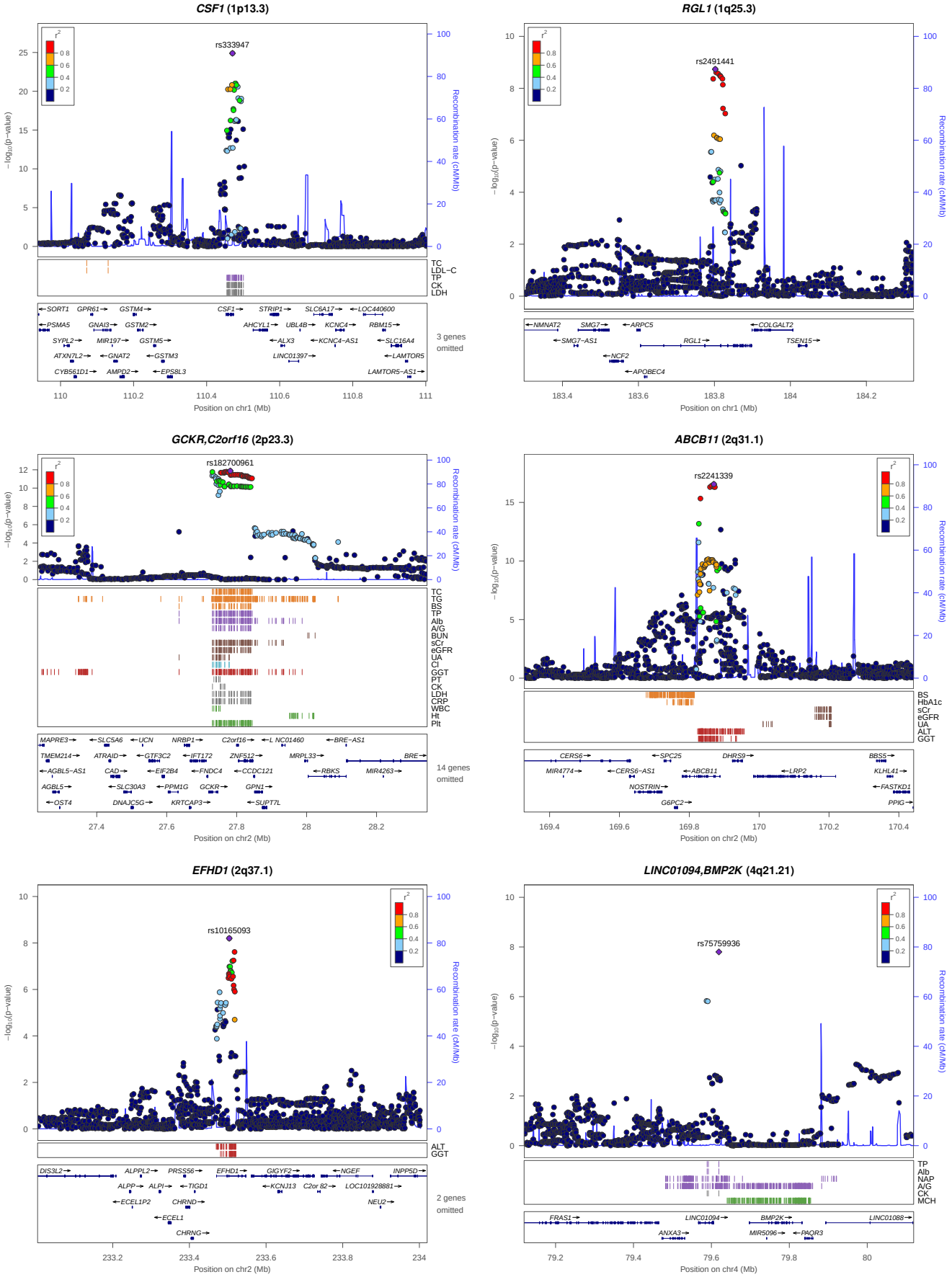

SCARB1 (12q24.31)
rs10846742
TC
HDL−C
ZNF664−FAM101A
SCARB1
UBC
BRI3BP
AACS
TMEM132B
FAM101A
MIR5188
THRIL
NCOR2
DHX37
MIR6880
Position on chr12 (Mb)
Recombination rate (cM/Mb)


TMPRSS6 (22q12.3)
rs855791
Hb
Ht
MCV
MCH
MCHC
CACNG2
IFT27
NCF4
TEX33
IL2RB
RAC2
ELFN2
MFNG
LOC105373021
CSF2RB
TST
C1QTNF6
CYTH4
CARD10
PVALB
LL22NC01−81G9.3
SSTR3
LOC100506271
CDC42EP1
MPST
KCTD17
1 gene
omitted
Position on chr22 (Mb)
Recombination rate (cM/Mb)

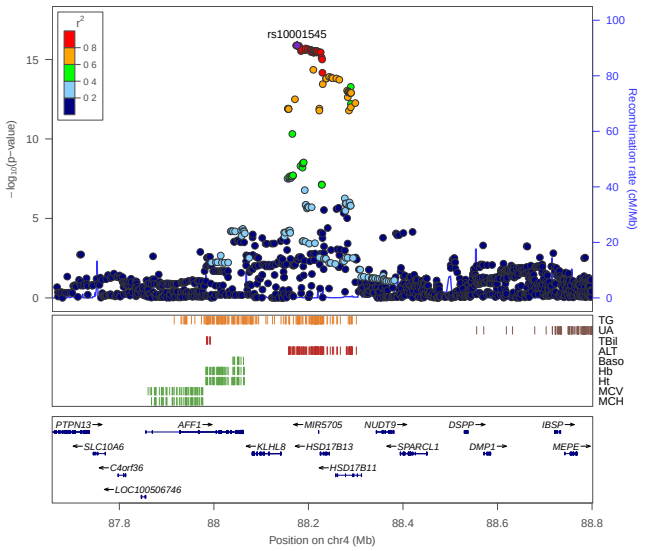
2.21 ZTT (n = 12,303)



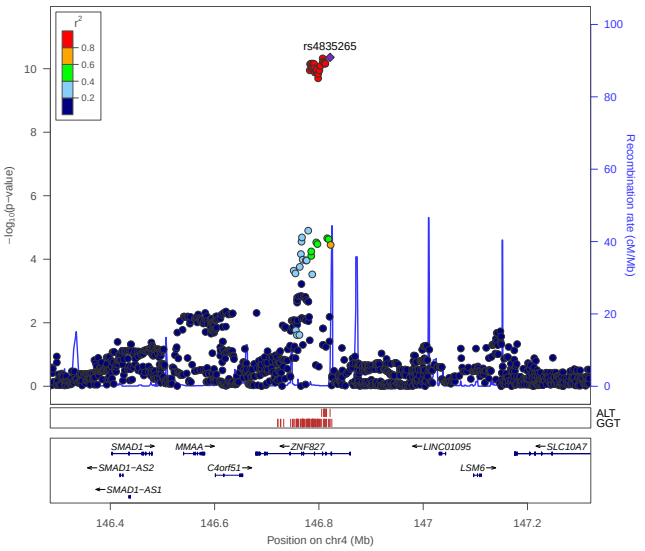
2.22 AST (n = 134,154)



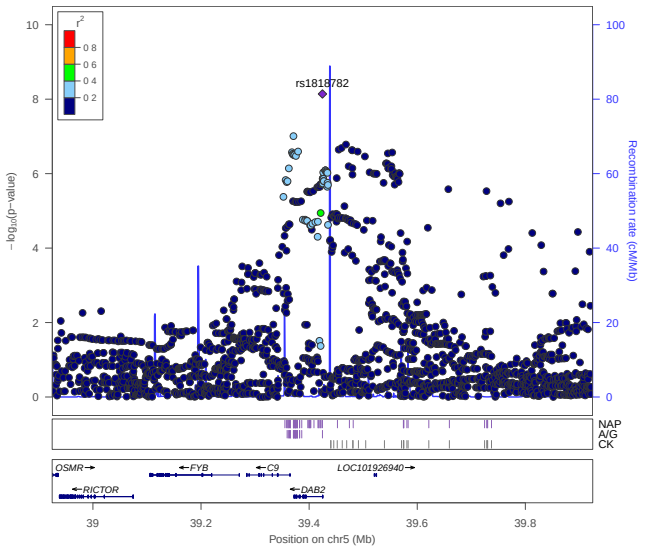
***KLHL8,MIR5705* (4q22.1)**



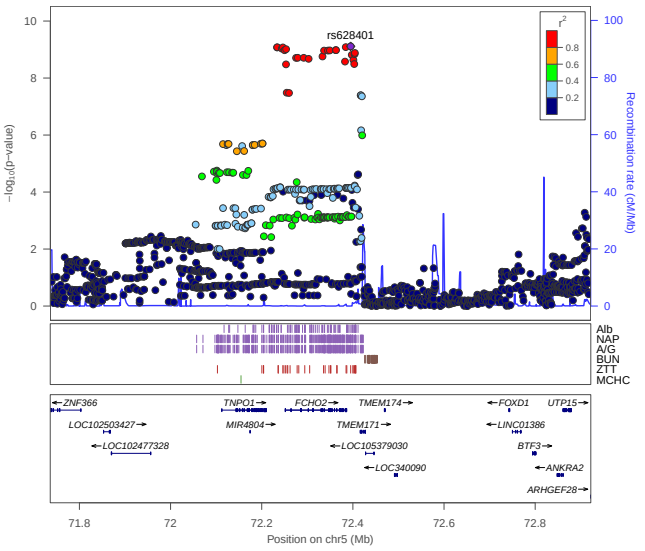
***ZNF827* (4q31.22)**



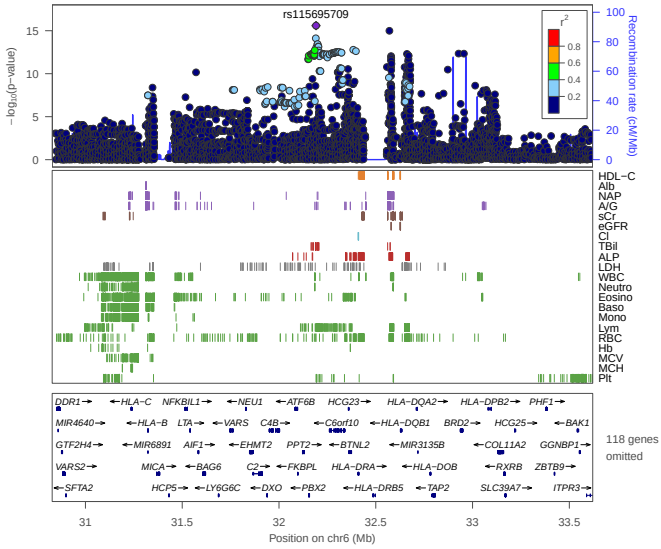
***DAB2* (5p13.1)**



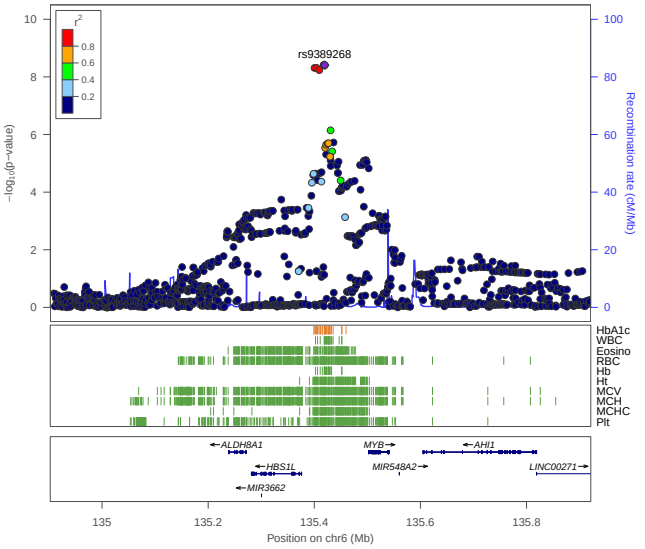
***FCHO2,TMEM171* (5q13.2)**

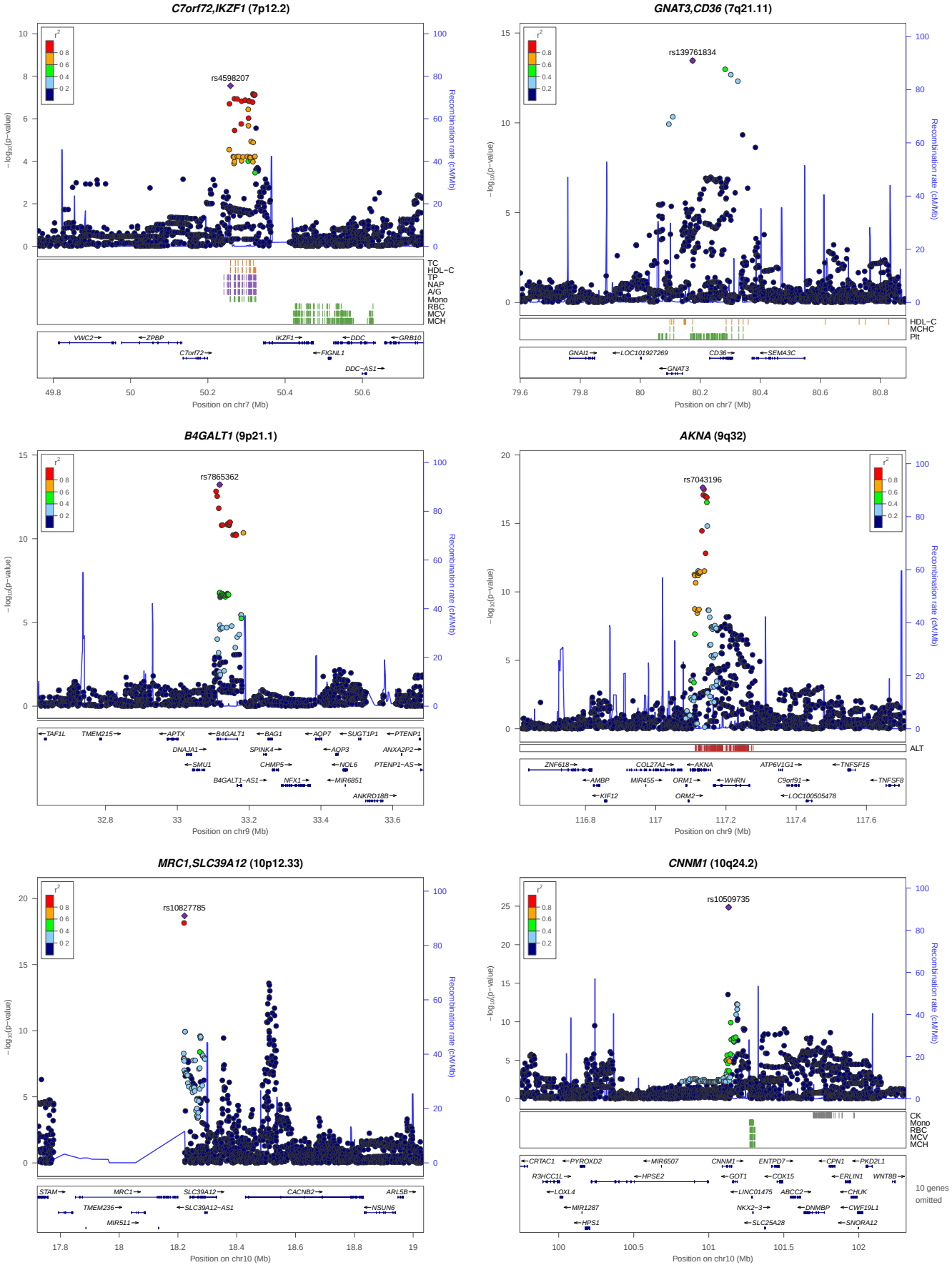


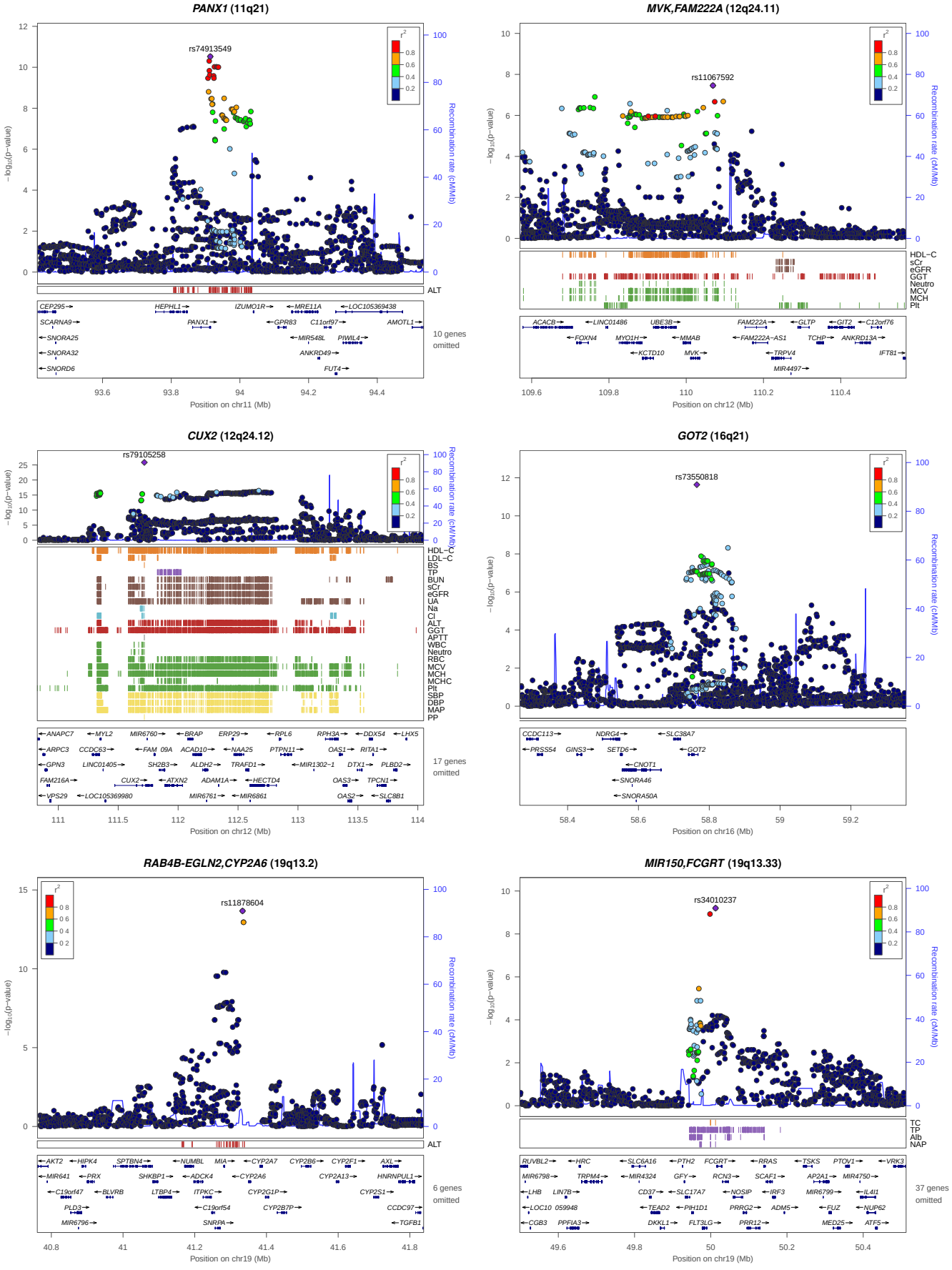
***NOTCH4* (6p21.32)**

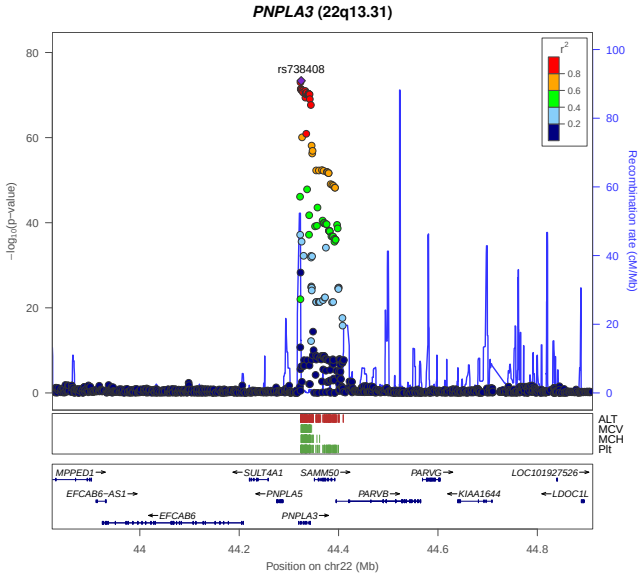


***HBS1L,MYB* (6q23.3)**

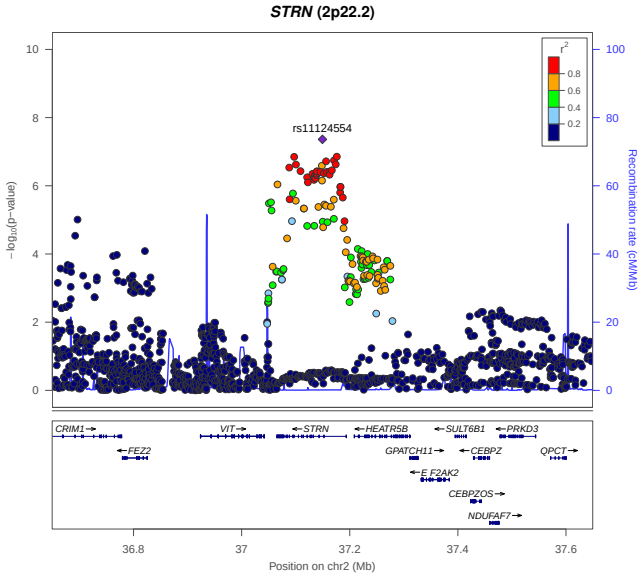


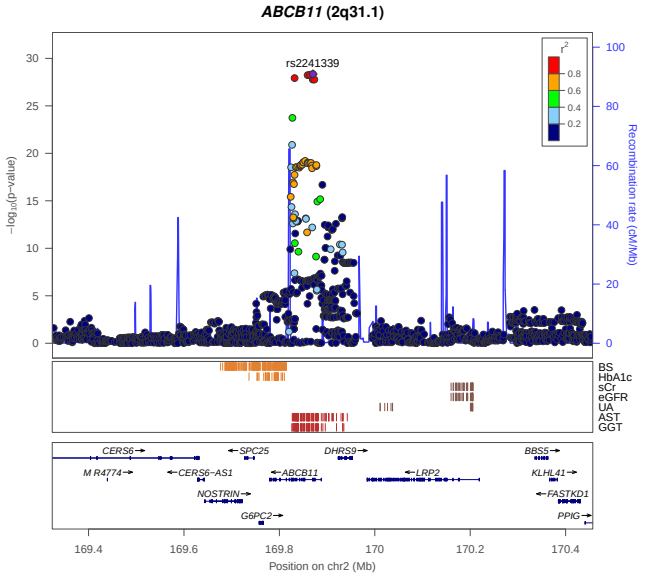

C7orf72,IKZF1 (7p12.2)
rs4598207
TC
HDL−C
TP
NAP
A/G
Mono
RBC
MCV
MCH
VWC2
ZPBP
C7orf72
IKZF1
FIGNL1
DDC
GRB10
DDC−AS1
Position on chr7 (Mb)
GNAT3,CD36 (7q21.11)
rs139761834
HDL−C
MCHC
Plt
GNAI1
LOC101927269
CD36
SEMA3C
GNAT3
Position on chr7 (Mb)
B4GALT1 (9p21.1)
rs7865362
TAF1L
TMEM215
APTX
B4GALT1
BAG1
AQP7
SUGT1P1
PTENP1
DNAJA1
SPINK4
AQP3
ANXA2P2
SMU1
CHMP5
NOL6
PTENP1−AS
B4GALT1−AS1
NFX1
MIR6851
ANKRD18B
Position on chr9 (Mb)
AKNA (9q32)
rs7043196
ALT
ZNF618
COL27A1
AKNA
ATP6V1G1
TNFSF15
AMBP
MIR455
ORM1
WHRN
C9orf91
TNFSF8
KIF12
ORM2
LOC100505478
Position on chr9 (Mb)
MRC1,SLC39A12 (10p12.33)
rs10827785
STAM
MRC1
SLC39A12
CACNB2
ARL5B
TMEM236
SLC39A12−AS1
NSUN6
MIR511
Position on chr10 (Mb)
CNNM1 (10q24.2)
rs10509735
CK
Mono
RBC
MCV
MCH
CRTAC1
PYROXD2
MIR6507
CNNM1
ENTPD7
CPN1
PKD2L1
R3HCC1L
HPSE2
GOT1
COX15
ERLIN1
WNT8B
LOXL4
LINC01475
ABCC2
CHUK
MIR1287
NKX2−3
DNMBP
CWF19L1
HPS1
SLC25A28
SNORA12
10 genes omitted
Position on chr10 (Mb)
Recombination rate (cM/Mb)
− log10(p−value)

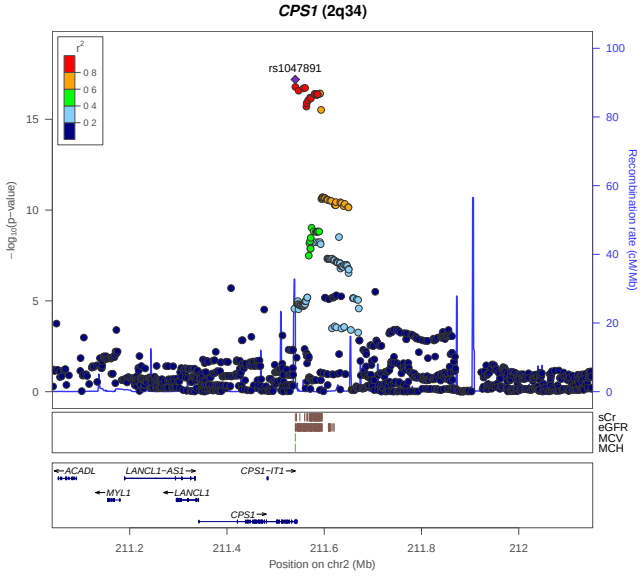

PANX1 (11q21)
rs74913549
ALT
10 genes omitted
Position on chr11 (Mb)
MVK,FAM222A (12q24.11)
rs11067592
HDL−C
sCr
eGFR
GGT
Neutro
MCV
MCH
Plt
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
HDL−C
LDL−C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
17 genes omitted
Position on chr12 (Mb)
GOT2 (16q21)
rs73550818
Position on chr16 (Mb)
RAB4B-EGLN2,CYP2A6 (19q13.2)
rs11878604
ALT
6 genes omitted
Position on chr19 (Mb)
MIR150,FCGRT (19q13.33)
rs34010237
TC
TP
Alb
NAP
37 genes omitted
Position on chr19 (Mb)
Recombination rate (cM/Mb)

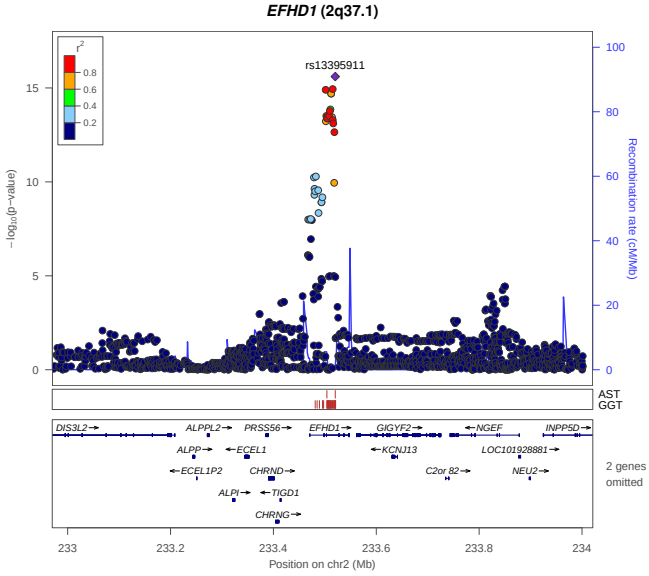

PNPLA3 (22q13.31)
rs738408
r2
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
ALT
MCV
MCH
Plt
MPPED1
SULT4A1
SAMM50
PARVG
LOC101927526
EFCAB6-AS1
PNPLA5
PARVB
KIAA1644
LDOC1L
EFCAB6
PNPLA3
Position on chr22 (Mb)

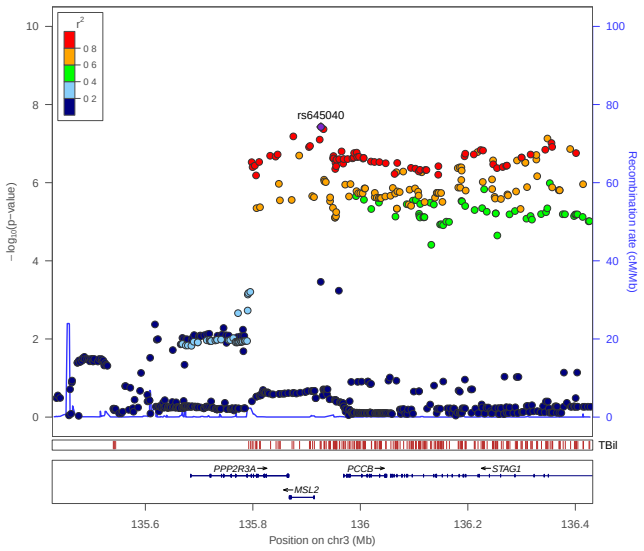
2.23 ALT (n = 134,182)

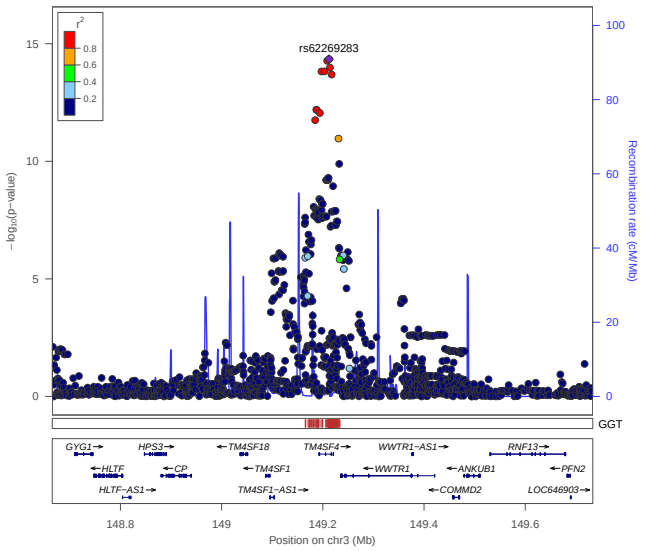


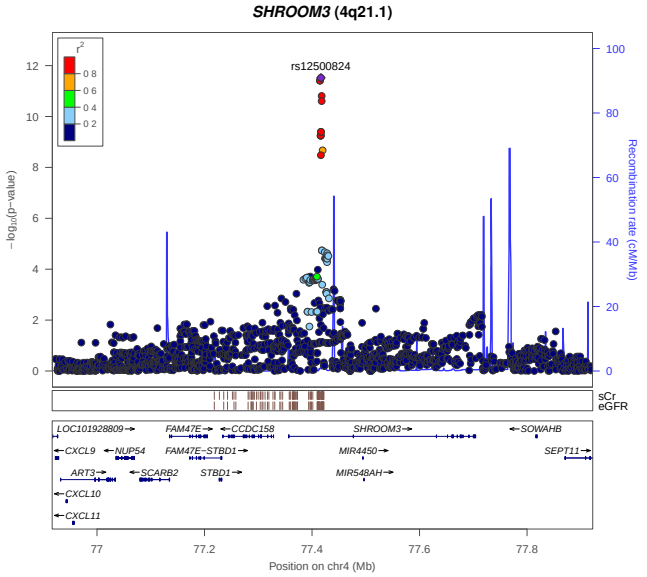


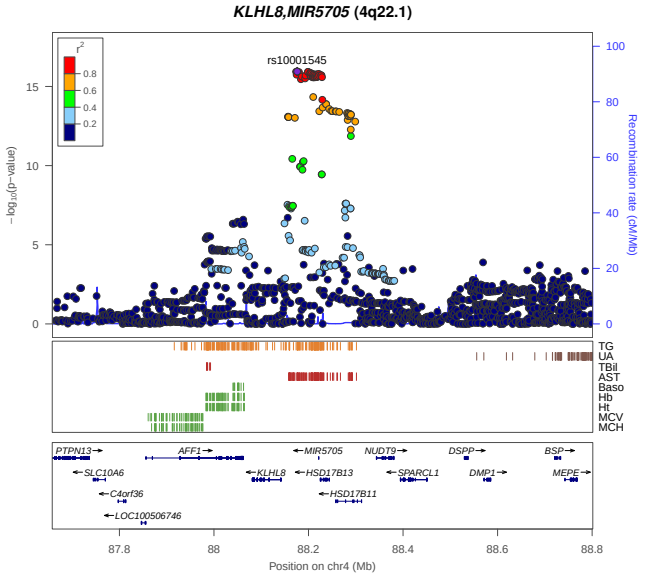


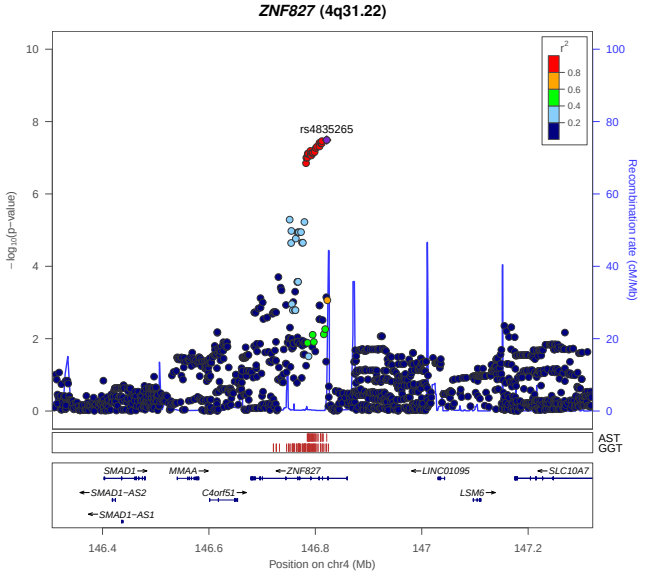


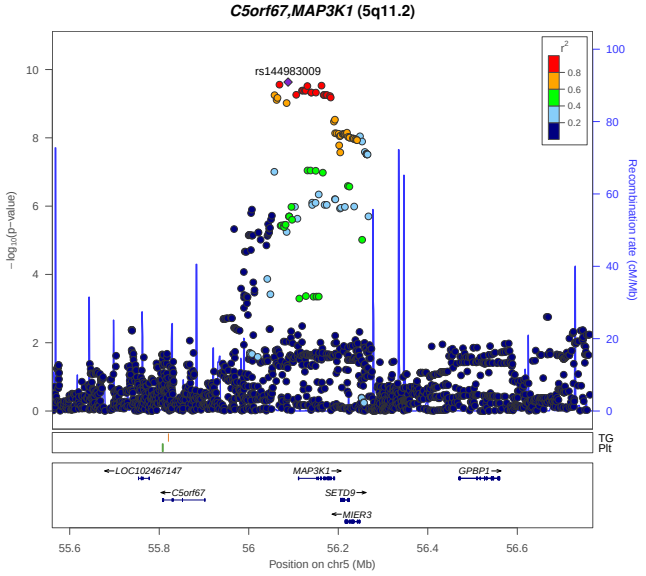


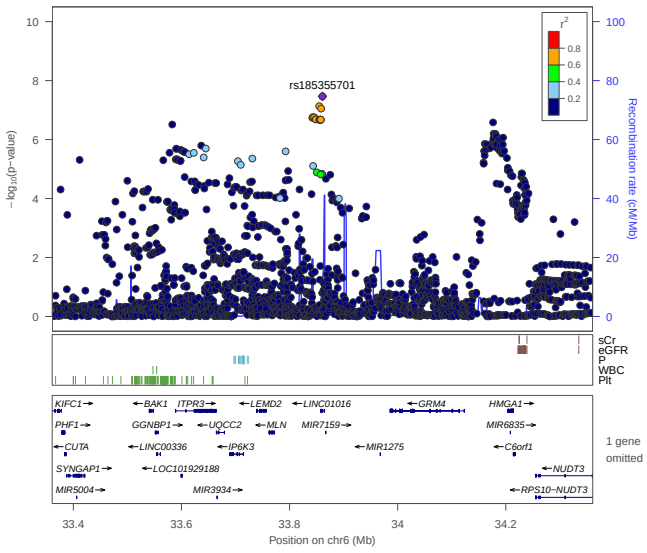


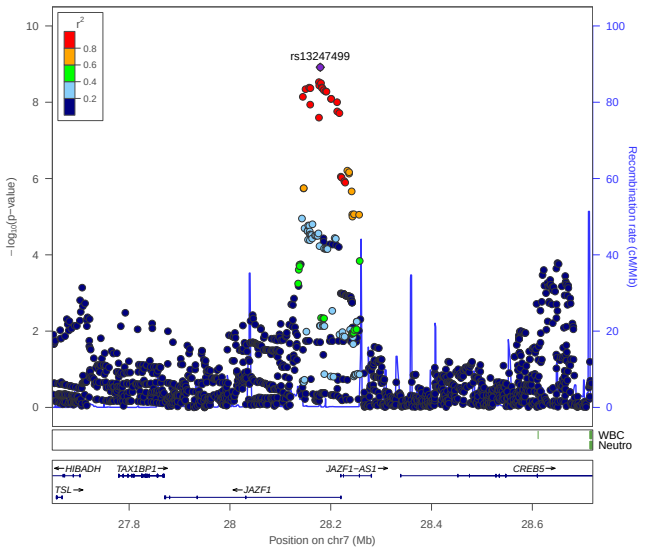

SHROOM3 (4q21.1)
rs12500824
Recombination rate (cM/Mb)
sCr
eGFR
Position on chr4 (Mb)

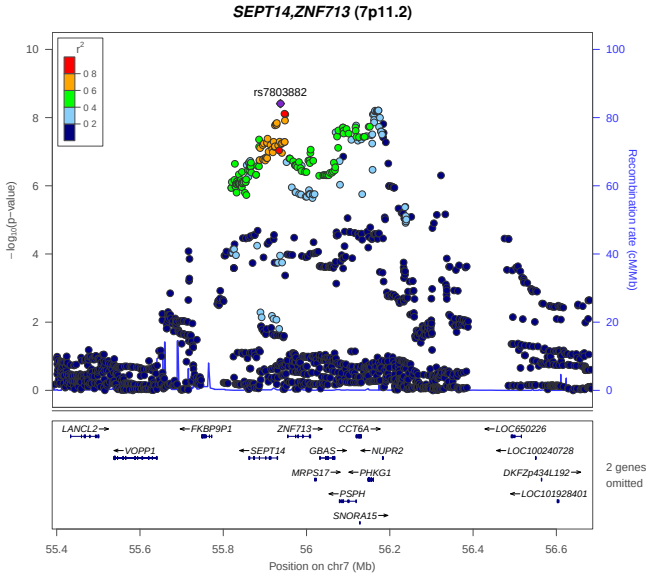

KLHL8,MIR5705 (4q22.1)
rs10001545
Recombination rate (cM/Mb)
TG
UA
TBil
AST
Baso
Hb
Ht
MCV
MCH
Position on chr4 (Mb)

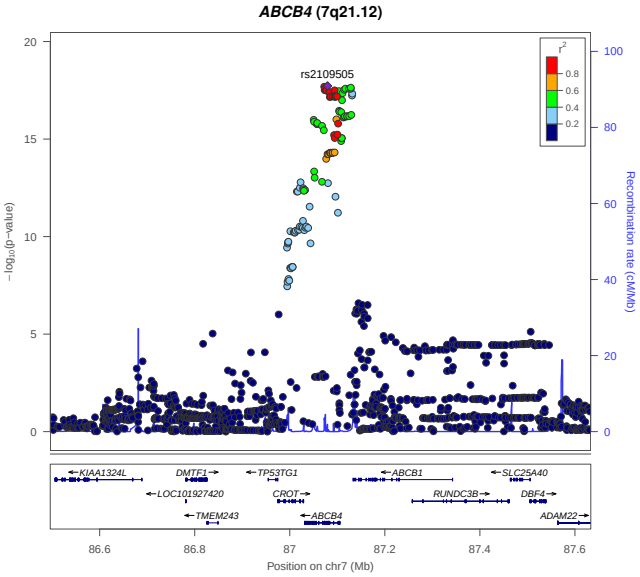

ZNF827 (4q31.22)
rs4835265
Recombination rate (cM/Mb)
AST
GGT
Position on chr4 (Mb)

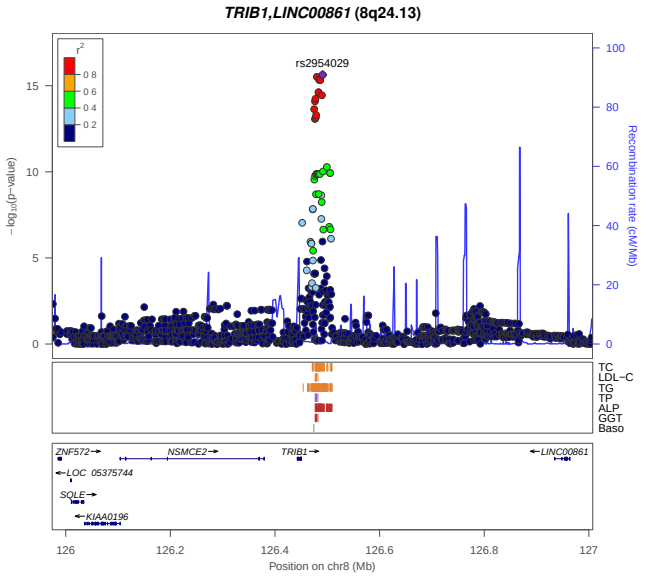

C5orf67,MAP3K1 (5q11.2)
rs144983009
Recombination rate (cM/Mb)
TG
Plt
Position on chr5 (Mb)

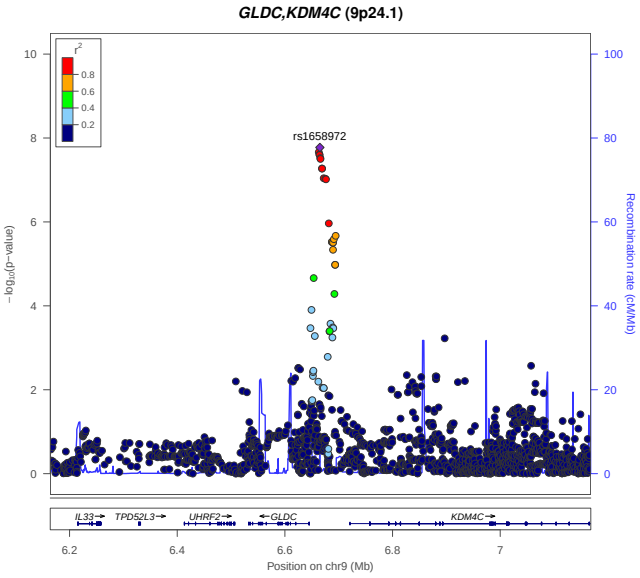

LINC01016 (6p21.31)
rs185355701
Recombination rate (cM/Mb)
sCr
eGFR
P
WBC
Plt
1 gene omitted
Position on chr6 (Mb)

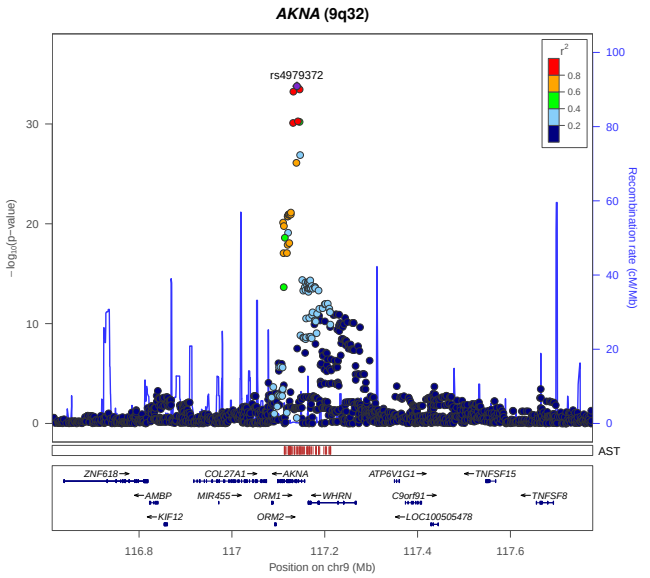

JAZF1 (7p15.1)
rs13247499
Recombination rate (cM/Mb)
WBC
Neutro
Position on chr7 (Mb)

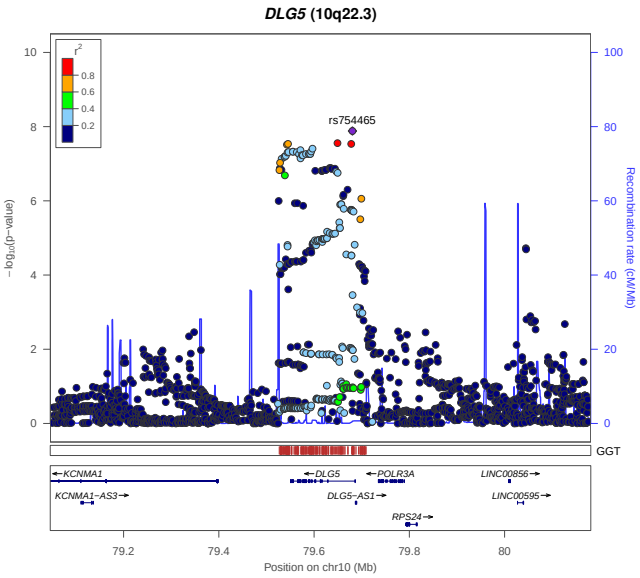

SEPT14,ZNF713 (7p11.2)
rs7803882
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
LANCL2
FKBP9P1
ZNF713
CCT6A
LOC650226
VOPP1
SEPT14
GBAS
NUPR2
LOC100240728
MRPS17
PHKG1
DKFZp434L192
PSPH
LOC101928401
SNORA15
2 genes omitted
Position on chr7 (Mb)

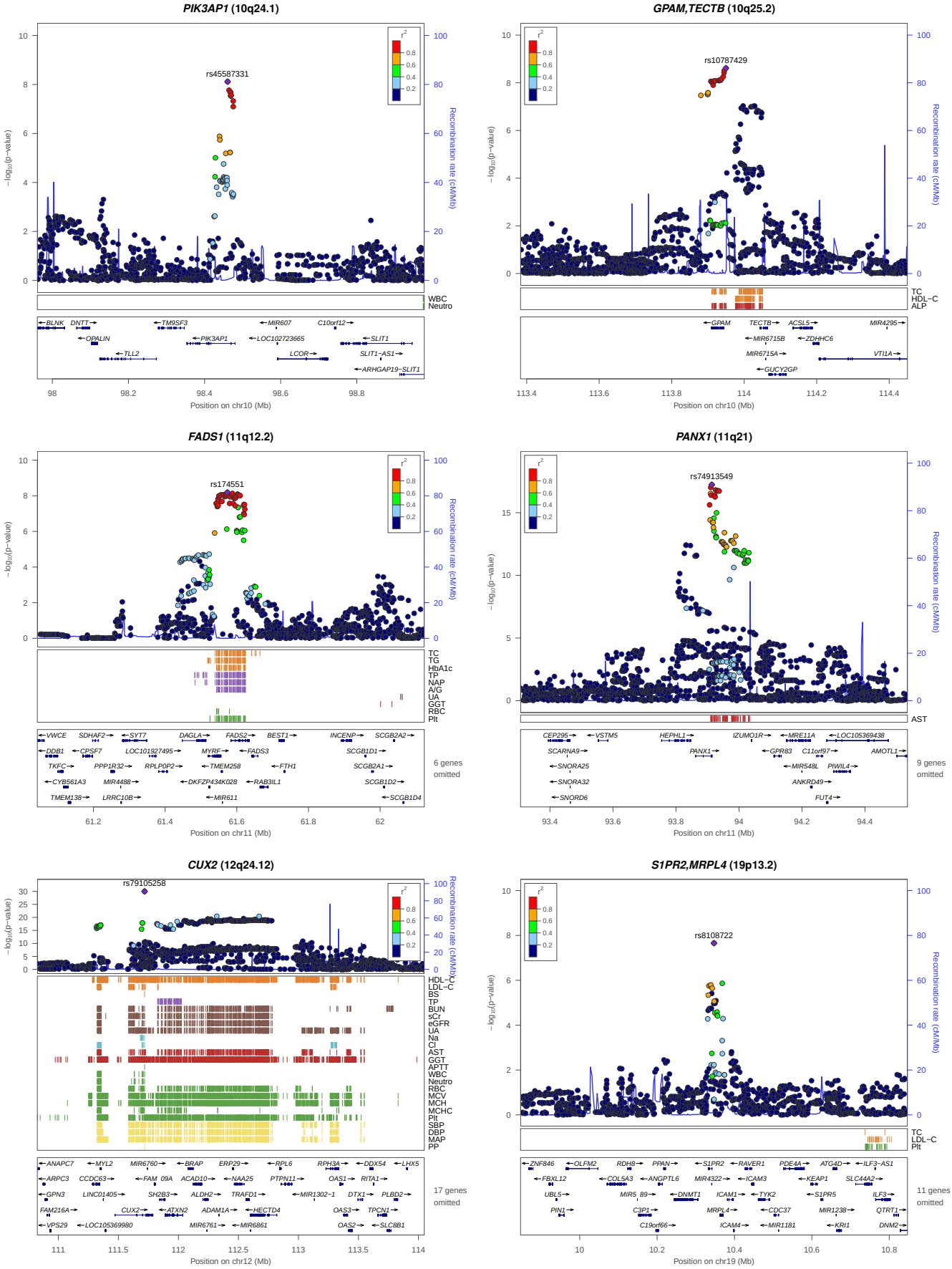

ABCB4 (7q21.12)
rs2109505
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
KIAA1324L
DMTF1
TP53TG1
ABCB1
SLC25A40
LOC101927420
CROT
RUNDC3B
DBF4
TMEM243
ABCB4
ADAM22
Position on chr7 (Mb)


TRIB1,LINC00861 (8q24.13)
rs2954029
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
TC
LDL−C
TG
TP
ALP
GGT
Baso
ZNF572
NSMCE2
TRIB1
LINC00861
LOC 05375744
SQLE
KIAA0196
Position on chr8 (Mb)

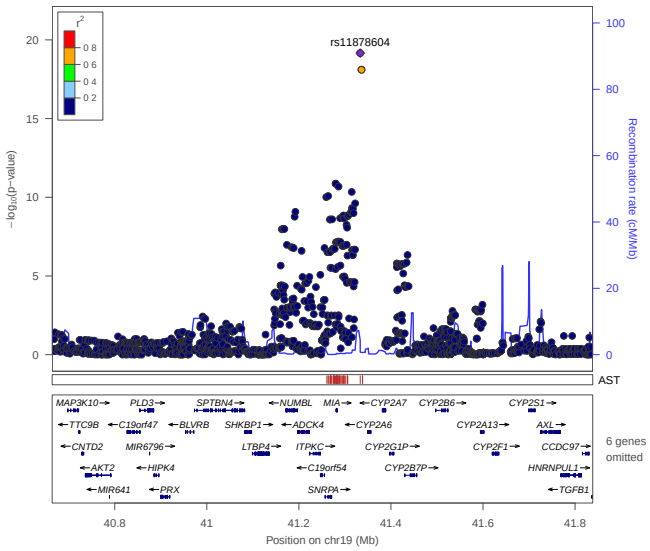

GLDC,KDM4C (9p24.1)
rs1658972
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
IL33
TPD52L3
UHRF2
GLDC
KDM4C
Position on chr9 (Mb)


AKNA (9q32)
rs4979372
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
AST
ZNF618
COL27A1
AKNA
ATP6V1G1
TNFSF15
AMBP
MIR455
ORM1
WHRN
C9orf91
TNFSF8
KIF12
ORM2
LOC100505478
Position on chr9 (Mb)

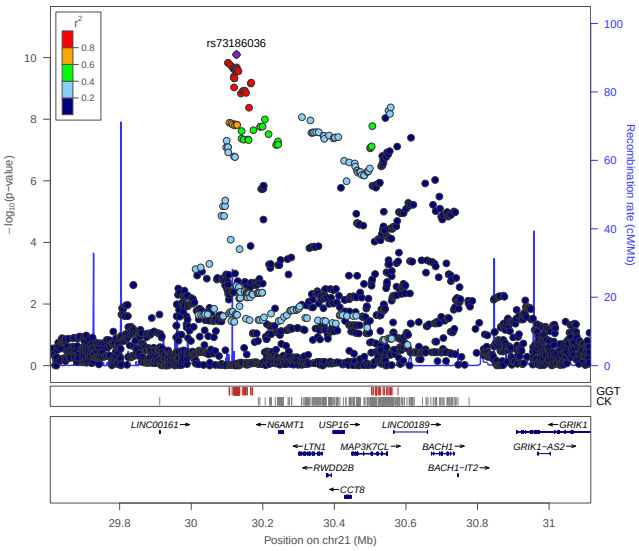

DLG5 (10q22.3)
rs754465
r²
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
GGT
KCNMA1
DLG5
POLR3A
LINC00856
KCNMA1−AS3
DLG5−AS1
LINC00595
RPS24
Position on chr10 (Mb)


PIK3AP1 (10q24.1)
rs45587331
WBC
Neutro
Position on chr10 (Mb)
GPAM,TECTB (10q25.2)
rs10787429
TC
HDL−C
ALP
Position on chr10 (Mb)
FADS1 (11q12.2)
rs174551
TC
TG
HbA1c
TP
NAP
A/G
UA
GGT
RBC
Plt
6 genes omitted
Position on chr11 (Mb)
PANX1 (11q21)
rs74913549
AST
9 genes omitted
Position on chr11 (Mb)
CUX2 (12q24.12)
rs79105258
HDL−C
LDL−C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
17 genes omitted
Position on chr12 (Mb)
S1PR2,MRPL4 (19p13.2)
rs8108722
TC
LDL−C
Plt
11 genes omitted
Position on chr19 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

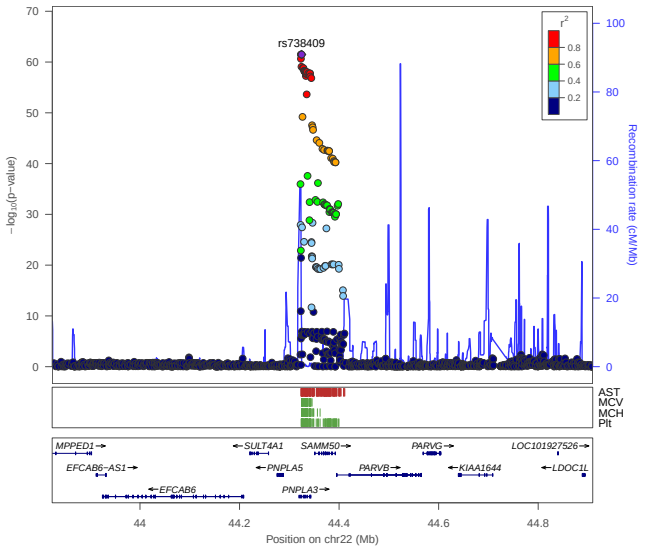
RAB4B-EGLN2,CYP2A6 **(19q13.2)**



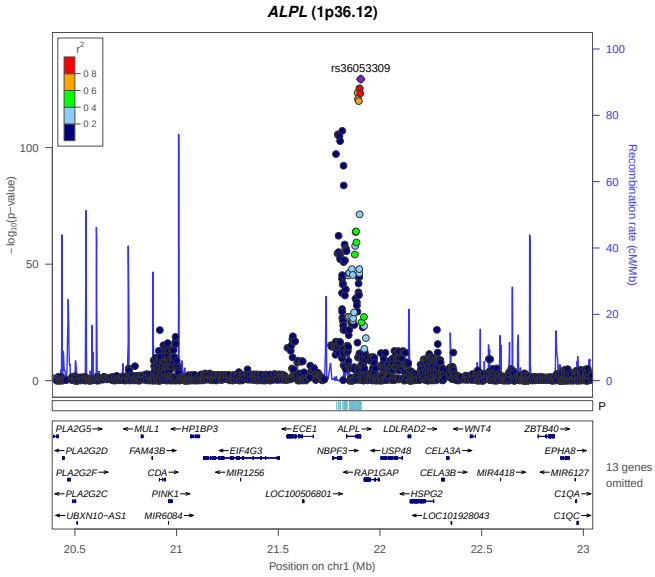
LINC00161,N6AMT1 **(21q21.3)**

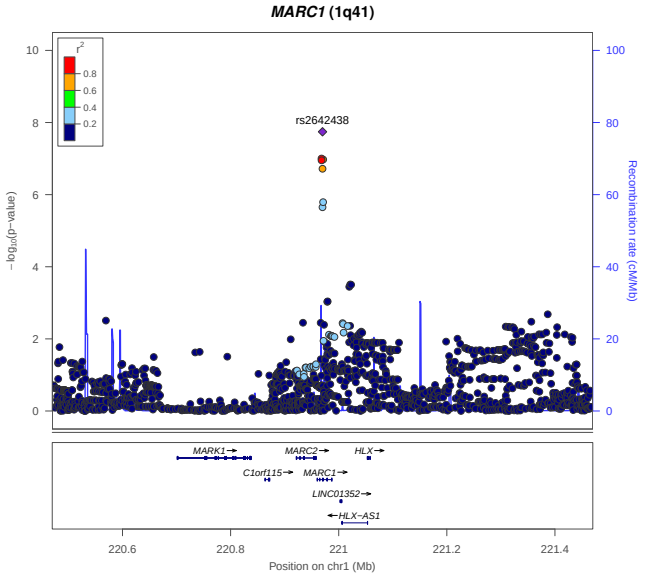


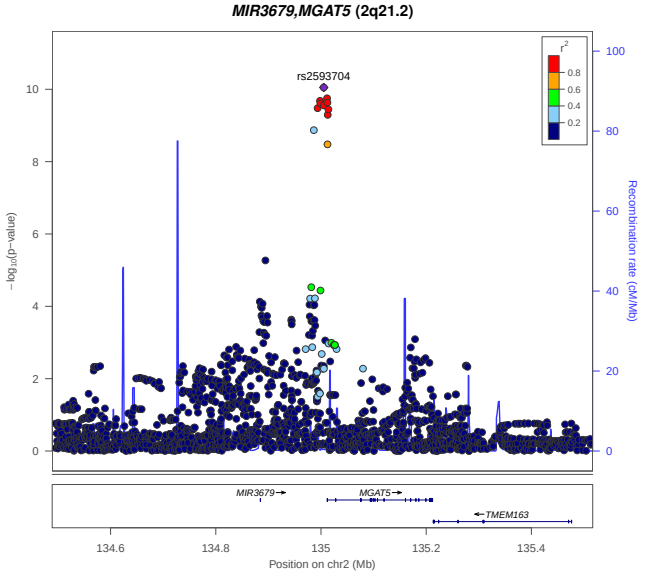
PNPLA3 **(22q13.31)**

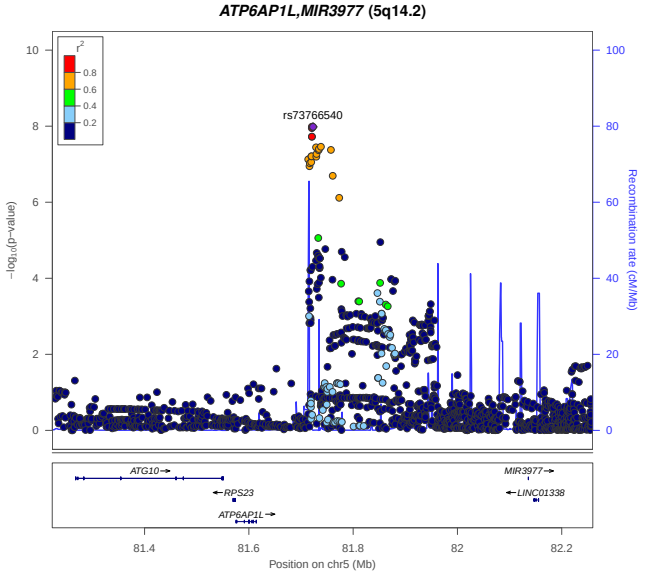


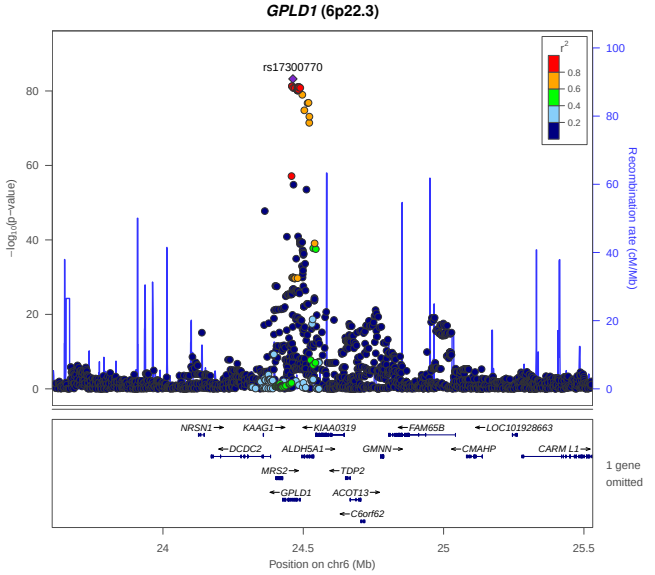
2.24 ALP (n = 105,030)

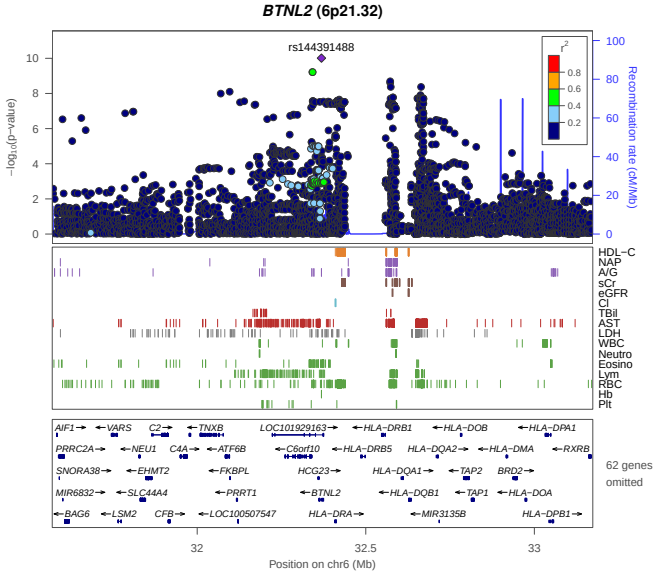


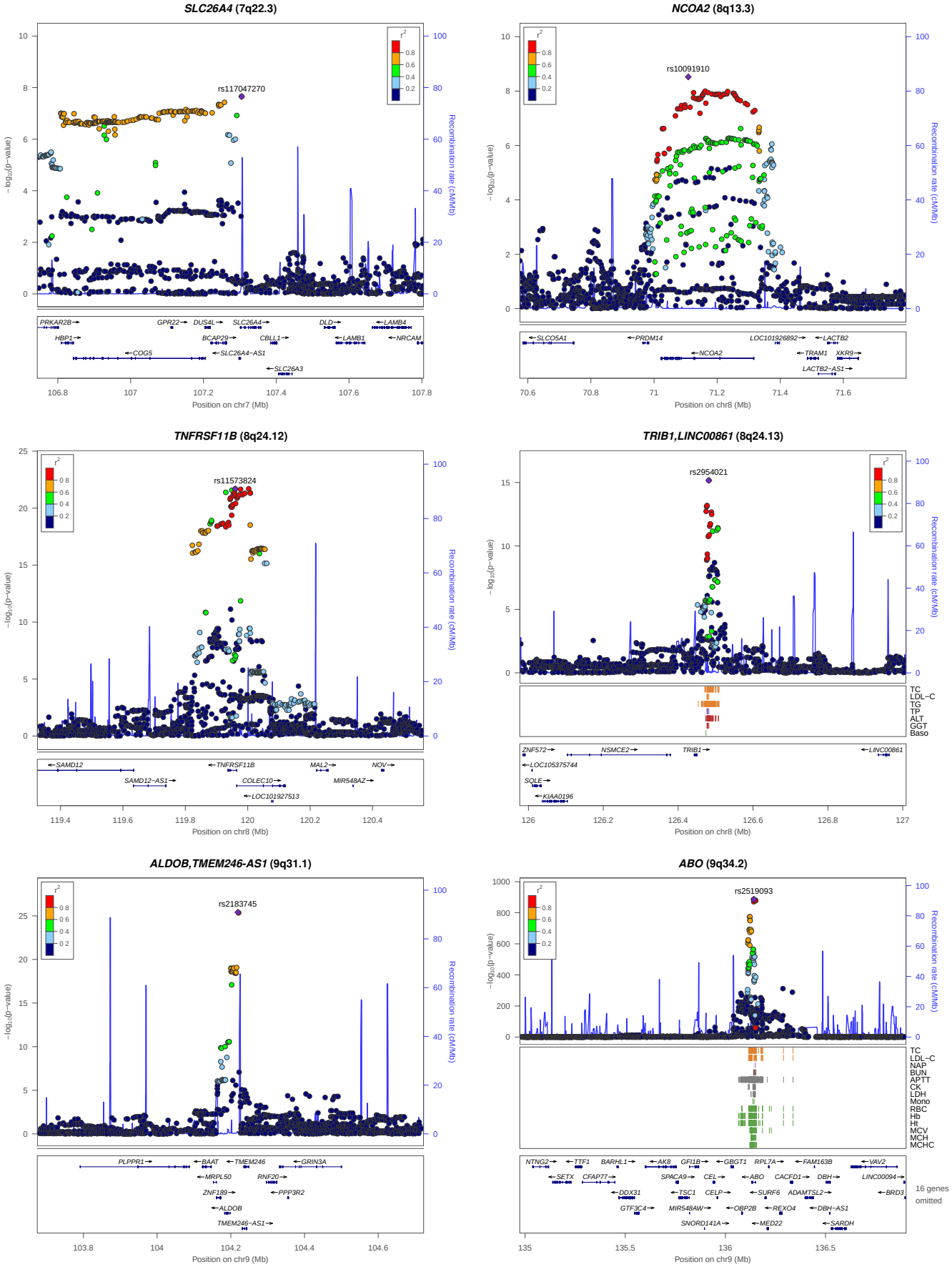


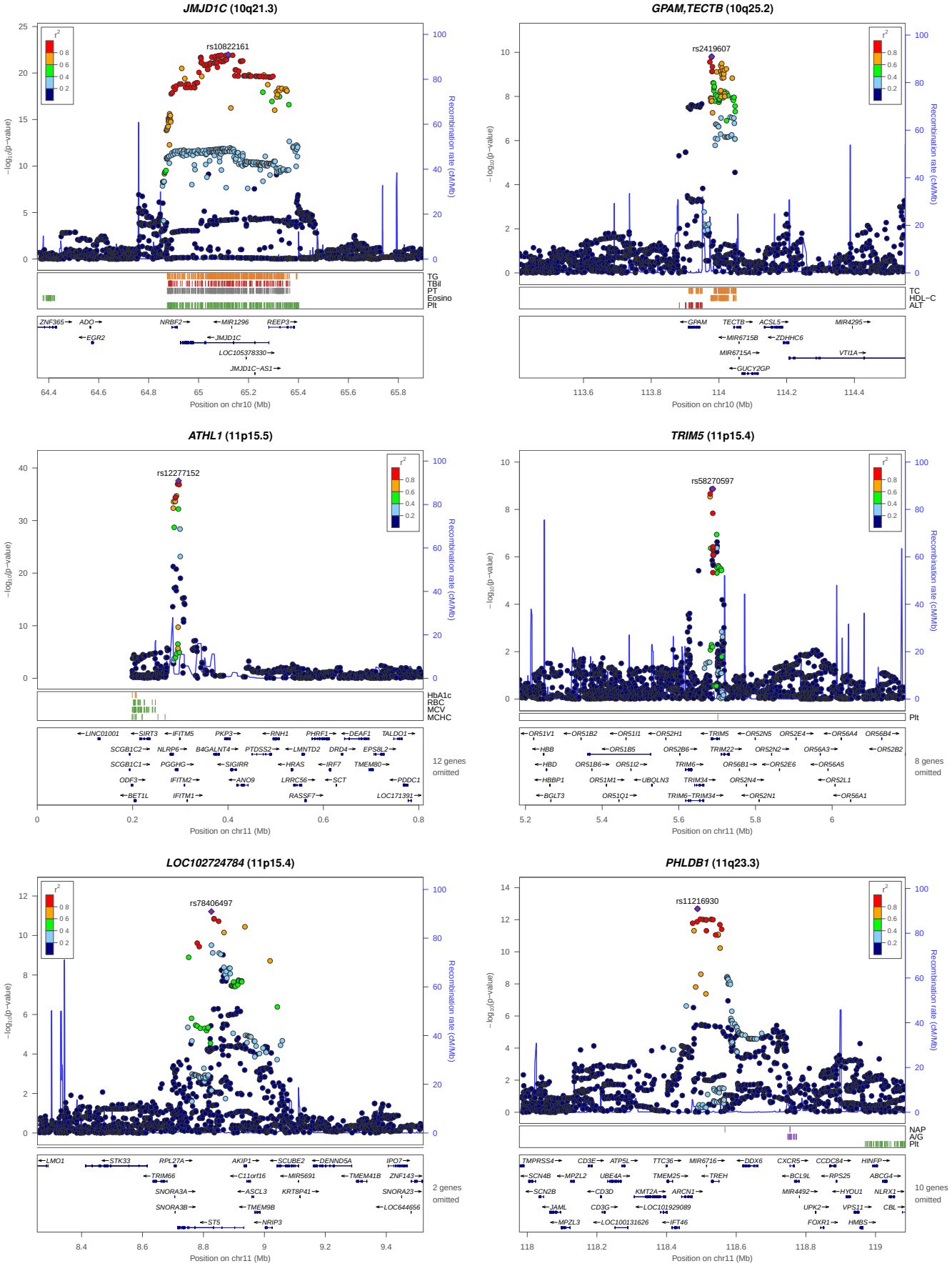




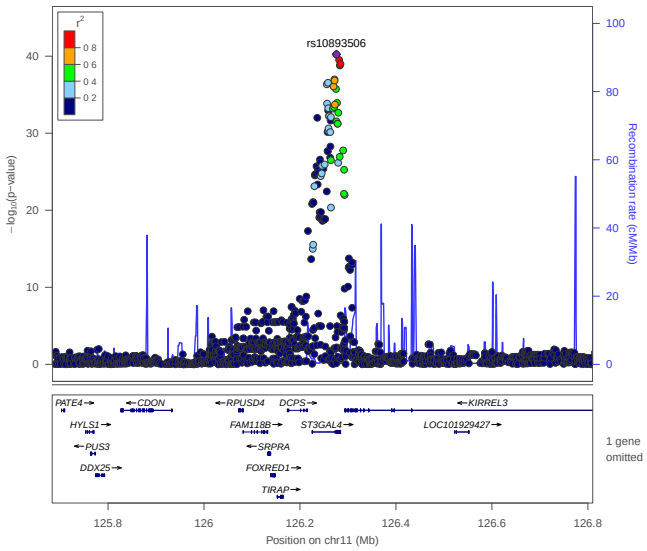




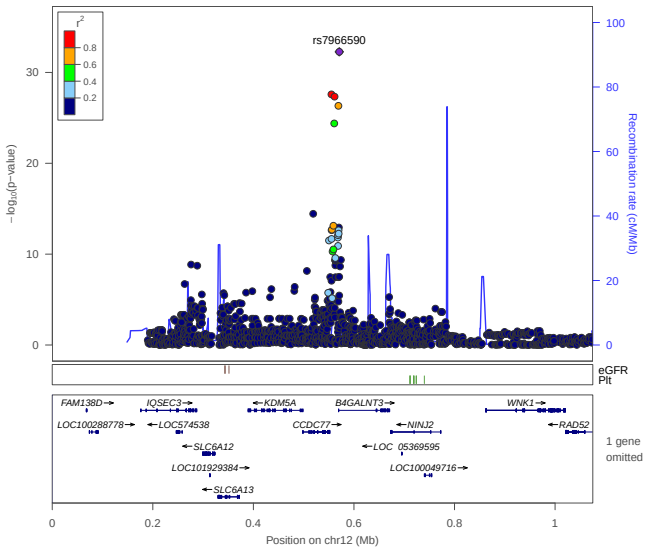

SLC26A4 (7q22.3)
rs117047270
PRKAR2B
GPR22
DUS4L
SLC26A4
DLD
LAMB4
HBP1
BCAP29
CBLL1
LAMB1
NRCAM
COG5
SLC26A4-AS1
SLC26A3
Position on chr7 (Mb)
NCOA2 (8q13.3)
rs10091910
SLCO5A1
PRDM14
LOC101926892
LACTB2
NCOA2
TRAM1
XKR9
LACTB2-AS1
Position on chr8 (Mb)
TNFRSF11B (8q24.12)
rs11573824
SAMD12
TNFRSF11B
MAL2
NOV
SAMD12-AS1
COLEC10
MIR548AZ
LOC101927513
Position on chr8 (Mb)
TRIB1,LINC00861 (8q24.13)
rs2954021
TC
LDL-C
TG
TP
ALT
GGT
Baso
ZNF572
NSMCE2
TRIB1
LINC00861
LOC105375744
SOLE
KIAA0196
Position on chr8 (Mb)
ALDOB,TMEM246-AS1 (9q31.1)
rs2183745
PLPPR1
BAAT
TMEM246
GRIN3A
MRPL50
RNF20
ZNF189
PPP3R2
ALDOB
TMEM246-AS1
Position on chr9 (Mb)
ABO (9q34.2)
rs2519093
TC
LDL-C
NAP
BUN
APTT
CK
LDH
Mono
RBC
Hb
Ht
MCV
MCH
MCHC
NTNG2
TTF1
BARHL1
AK8
GFI1B
GBGT1
RPL7A
FAM163B
VAV2
SETX
CFAP77
SPACA9
CEL
ABO
CACFD1
DBH
LINC00094
DDX31
TSC1
CELP
SURF6
ADAMTSL2
BRD3
GTF3C4
MIR548AW
OBP2B
REXO4
DBH-AS1
SNORD141A
MED22
SARDH
16 genes omitted
Position on chr9 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)
r2


JMJD1C (10q21.3)
rs10822161
TG
TBil
PT
Eosino
Plt
ZNF365
ADO
EGR2
NRBF2
MIR1296
REEP3
JMJD1C
LOC105378330
JMJD1C-AS1
Position on chr10 (Mb)
GPAM,TECTB (10q25.2)
rs2419607
TC
HDL-C
ALT
GPAM
TECTB
ACSL5
MIR4295
MIR6715B
ZDHHC6
MIR6715A
VTI1A
GUCY2GP
Position on chr10 (Mb)
ATHL1 (11p15.5)
rs12277152
HbA1c
RBC
MCV
MCHC
12 genes omitted
Position on chr11 (Mb)
TRIM5 (11p15.4)
rs58270597
Plt
8 genes omitted
Position on chr11 (Mb)
LOC102724784 (11p15.4)
rs78406497
2 genes omitted
Position on chr11 (Mb)
PHLDB1 (11q23.3)
rs11216930
NAP
A/G
Plt
10 genes omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)

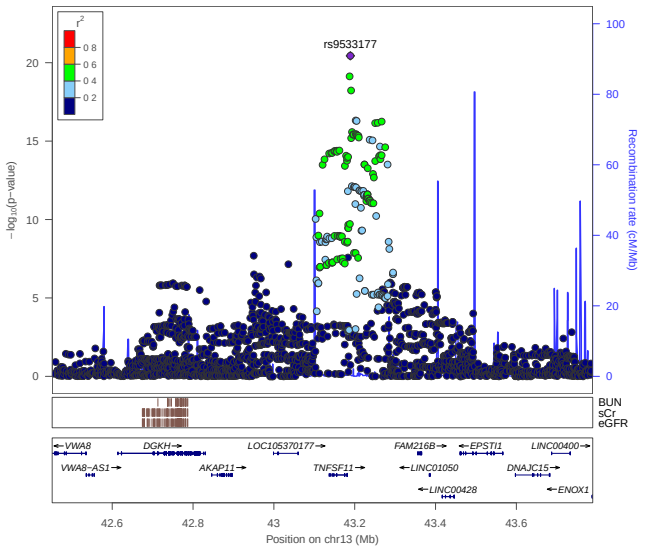
***ST3GAL4* (11q24.2)**



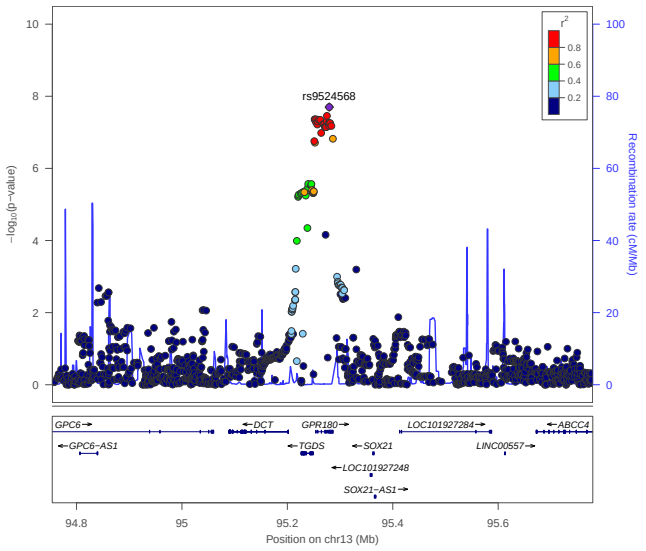
***B4GALNT3* (12p13.33)**



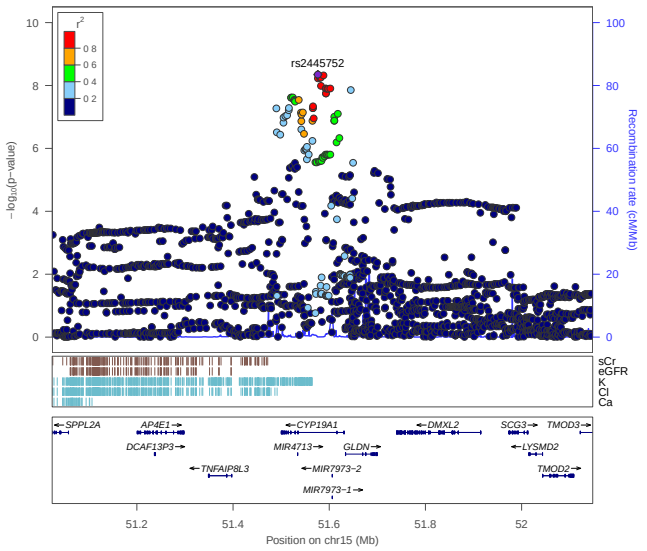
***TNFSF11,FAM216B* (13q14.11)**



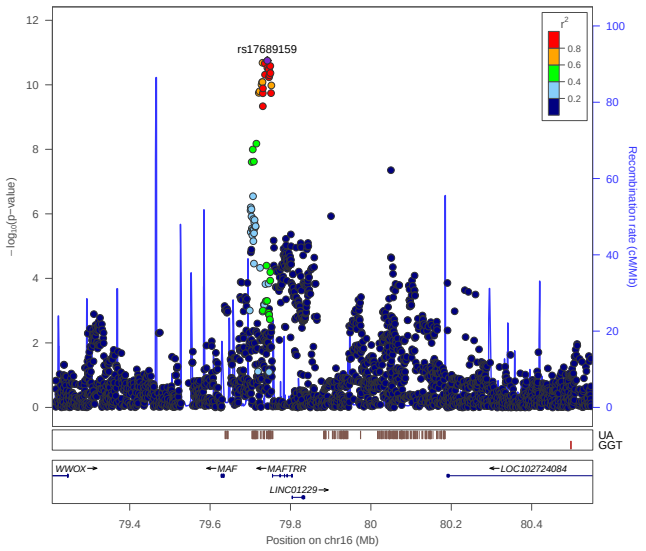
***GPR180* (13q32.1)**

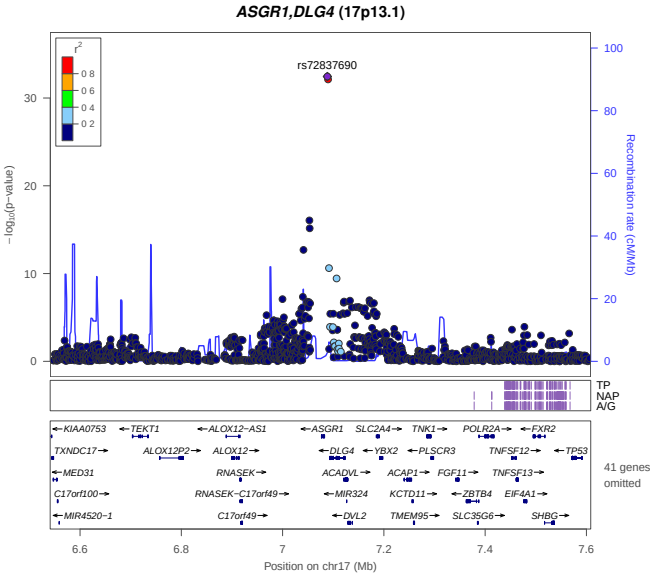


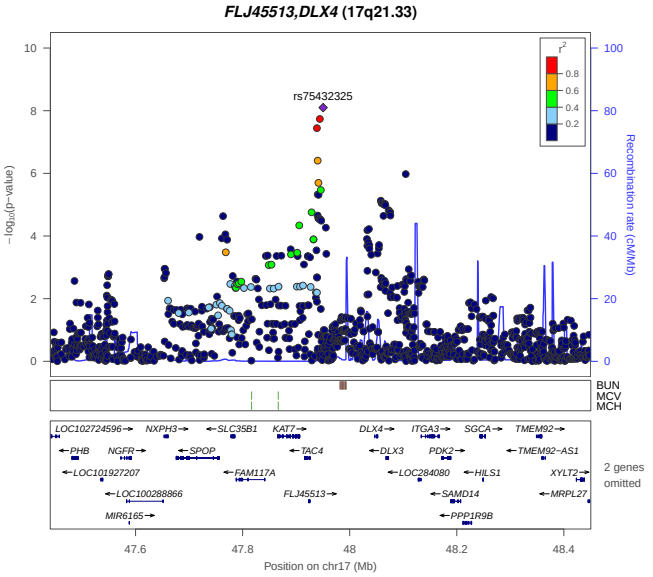
***CYP19A1* (15q21.2)**

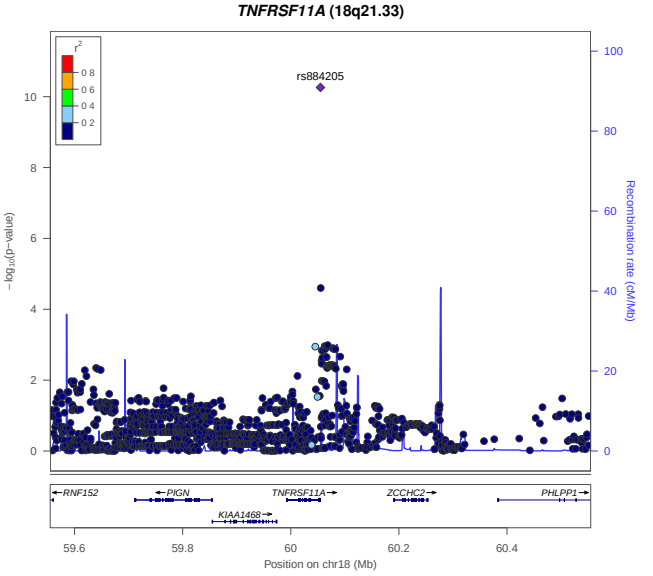


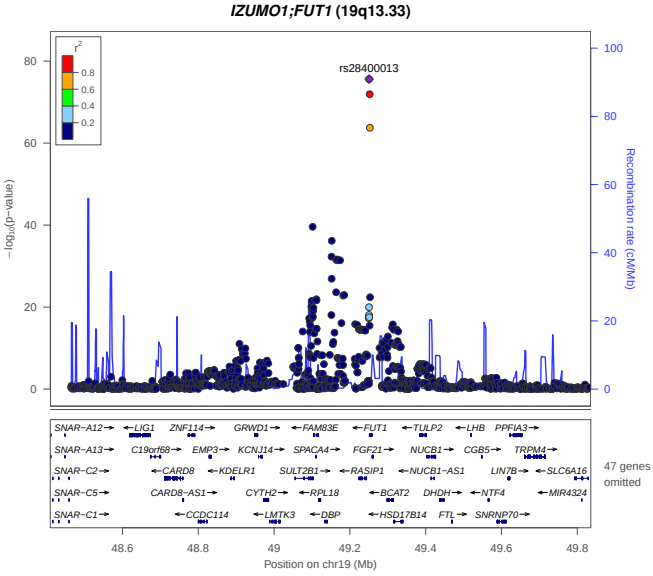
***MAF,MAFTRR* (16q23.2)**



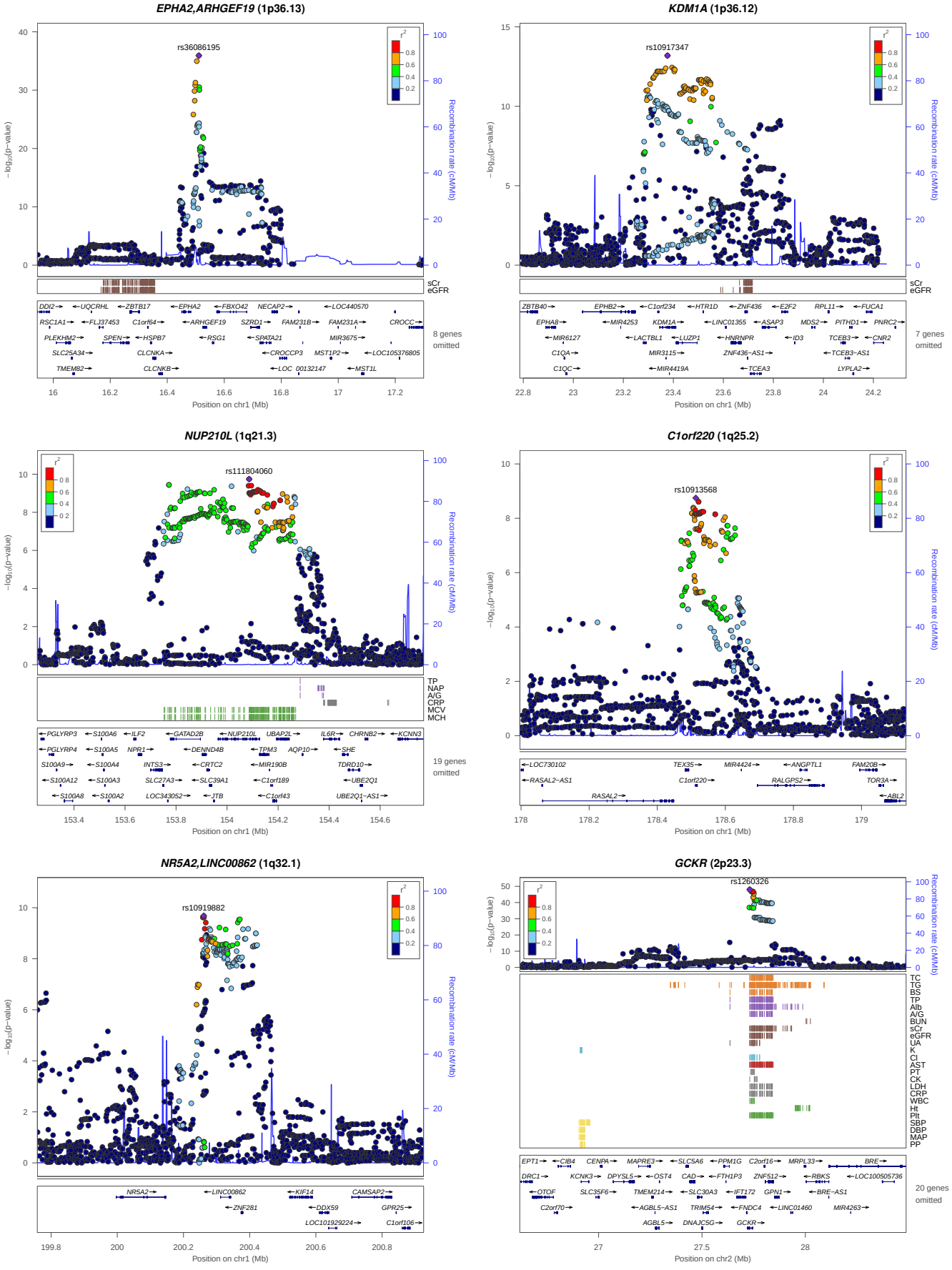

ASGR1,DLG4 (17p13.1)
rs72837690
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
TP
NAP
A/G
41 genes omitted
Position on chr17 (Mb)

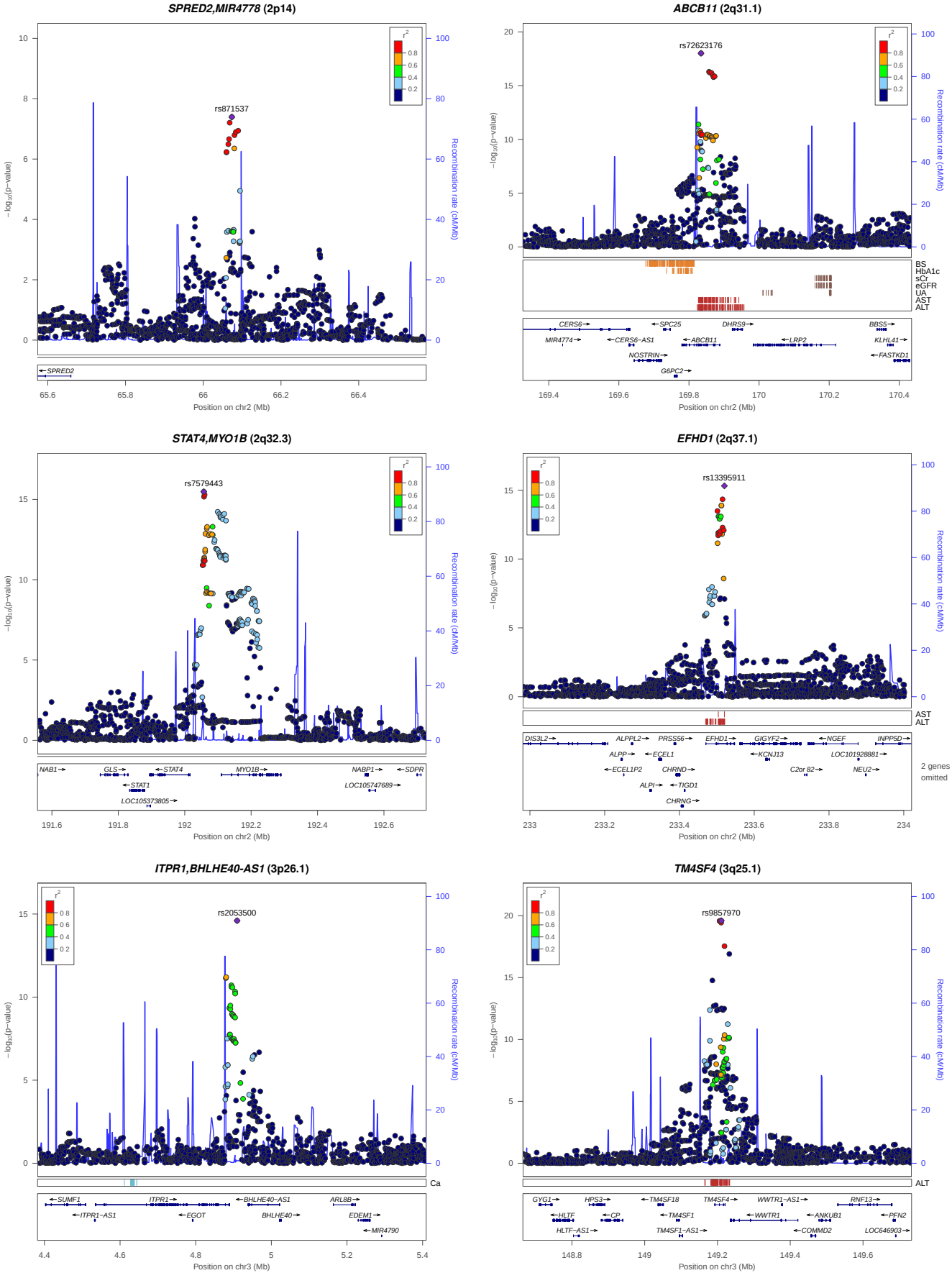

FLJ45513,DLX4 (17q21.33)
rs75432325
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
BUN
MCV
MCH
2 genes omitted
Position on chr17 (Mb)


TNFRSF11A (18q21.33)
rs884205
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
Position on chr18 (Mb)

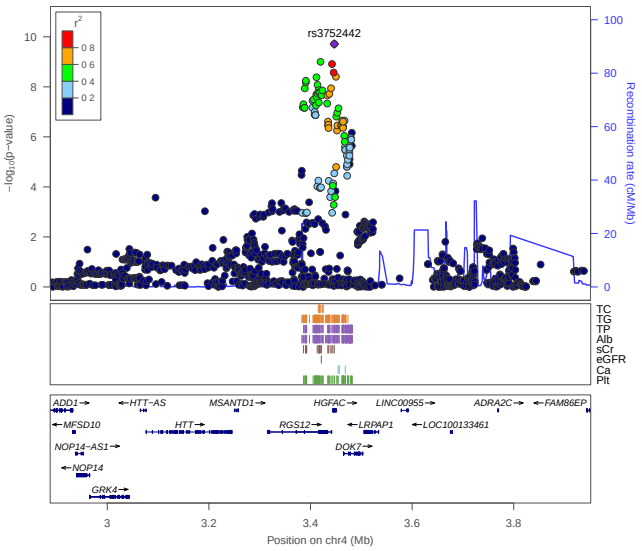

IZUMO1;FUT1 (19q13.33)
rs28400013
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
47 genes omitted
Position on chr19 (Mb)

2.25 GGT (n = 118,309)

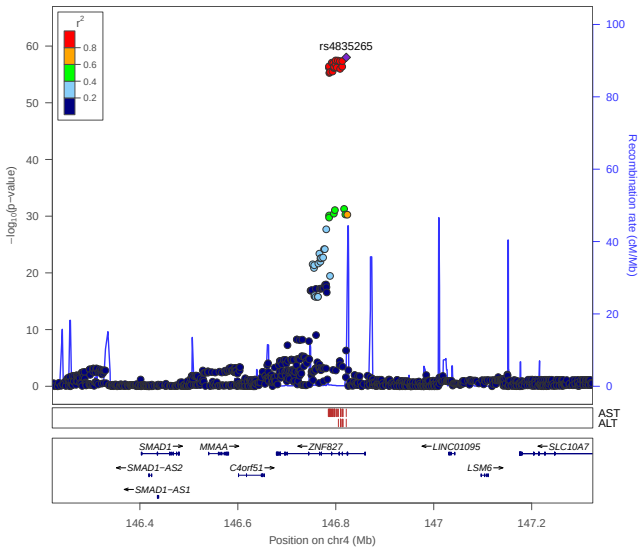



SPRED2,MIR4778 (2p14)
rs871537
SPRED2
Position on chr2 (Mb)
ABCB11 (2q31.1)
rs72623176
BS
HbA1c
sCr
eGFR
UA
AST
ALT
CERS6
SPC25
DHRS9
BBS5
MIR4774
CERS6-AS1
ABCB11
LRP2
KLHL41
NOSTRIN
FASTKD1
G6PC2
Position on chr2 (Mb)
STAT4,MYO1B (2q32.3)
rs7579443
NAB1
GLS
STAT4
MYO1B
NABP1
SDPR
STAT1
LOC105747689
LOC105373805
Position on chr2 (Mb)
EFHD1 (2q37.1)
rs13395911
AST
ALT
DIS3L2
ALPPL2
PRSS56
EFHD1
GIGYF2
NGEF
INPP5D
ALPP
ECEL1
KCNJ13
LOC101928881
ECEL1P2
CHRND
C2or82
NEU2
ALPI
TIGD1
CHRNG
2 genes omitted
Position on chr2 (Mb)
ITPR1,BHLHE40-AS1 (3p26.1)
rs2053500
Ca
SUMF1
ITPR1
BHLHE40-AS1
ARL8B
ITPR1-AS1
EGOT
BHLHE40
EDEM1
MIR4790
Position on chr3 (Mb)
TM4SF4 (3q25.1)
rs9857970
ALT
GYG1
HPS3
TM4SF18
TM4SF4
WWTR1-AS1
RNF13
HLTF
CP
TM4SF1
WWTR1
ANKUB1
PFN2
HLTF-AS1
TM4SF1-AS1
COMMD2
LOC646903
Position on chr3 (Mb)
-log10(p-value)
Recombination rate (cM/Mb)

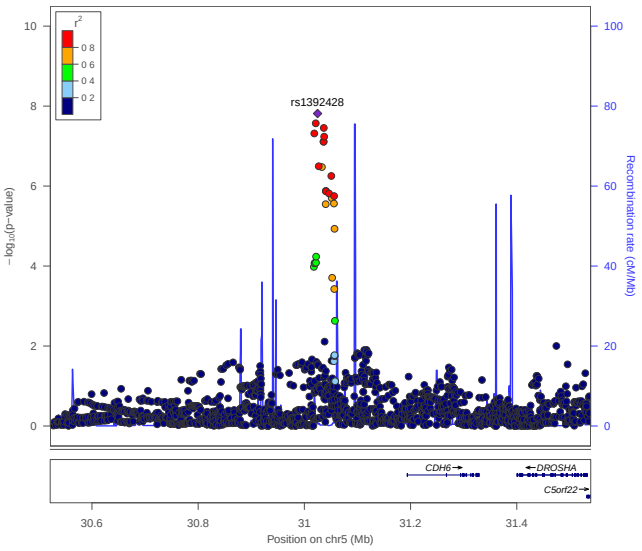
HGFAC **(4p16.3)**



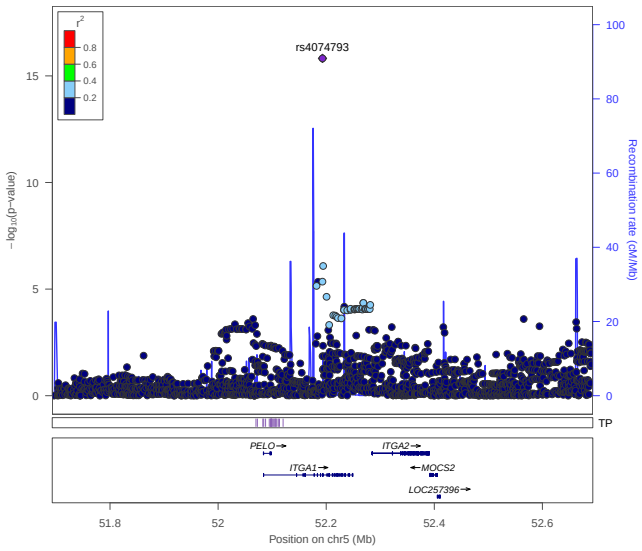
ZNF827 **(4q31.22)**



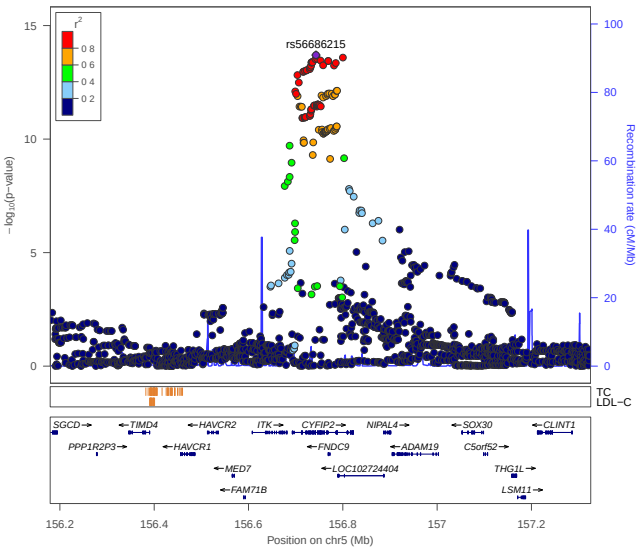
LOC101929681,CDH6 **(5p13.3)**



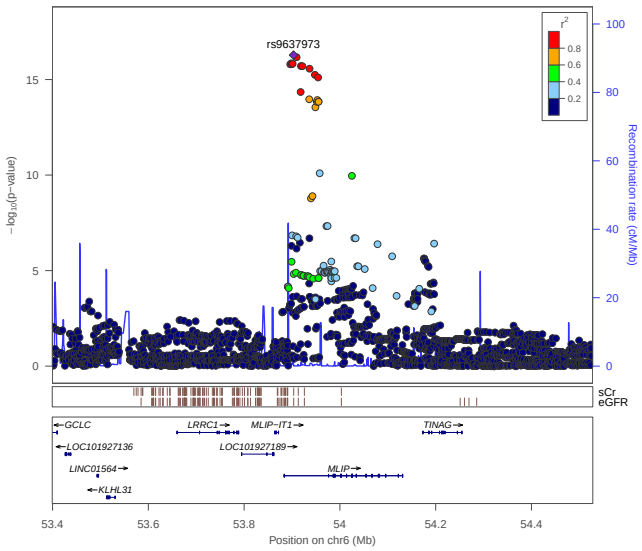
ITGA1 **(5q11.2)**

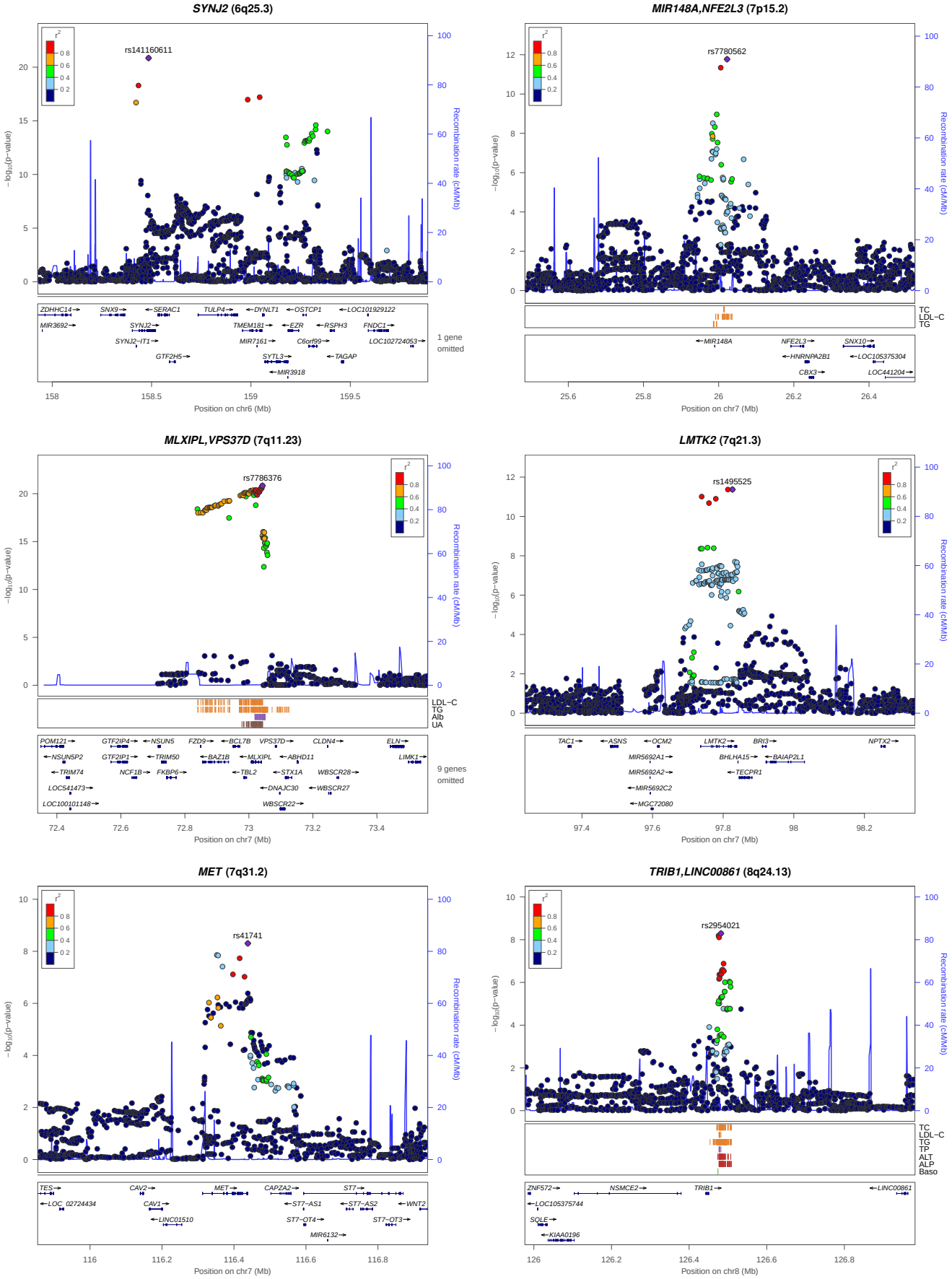


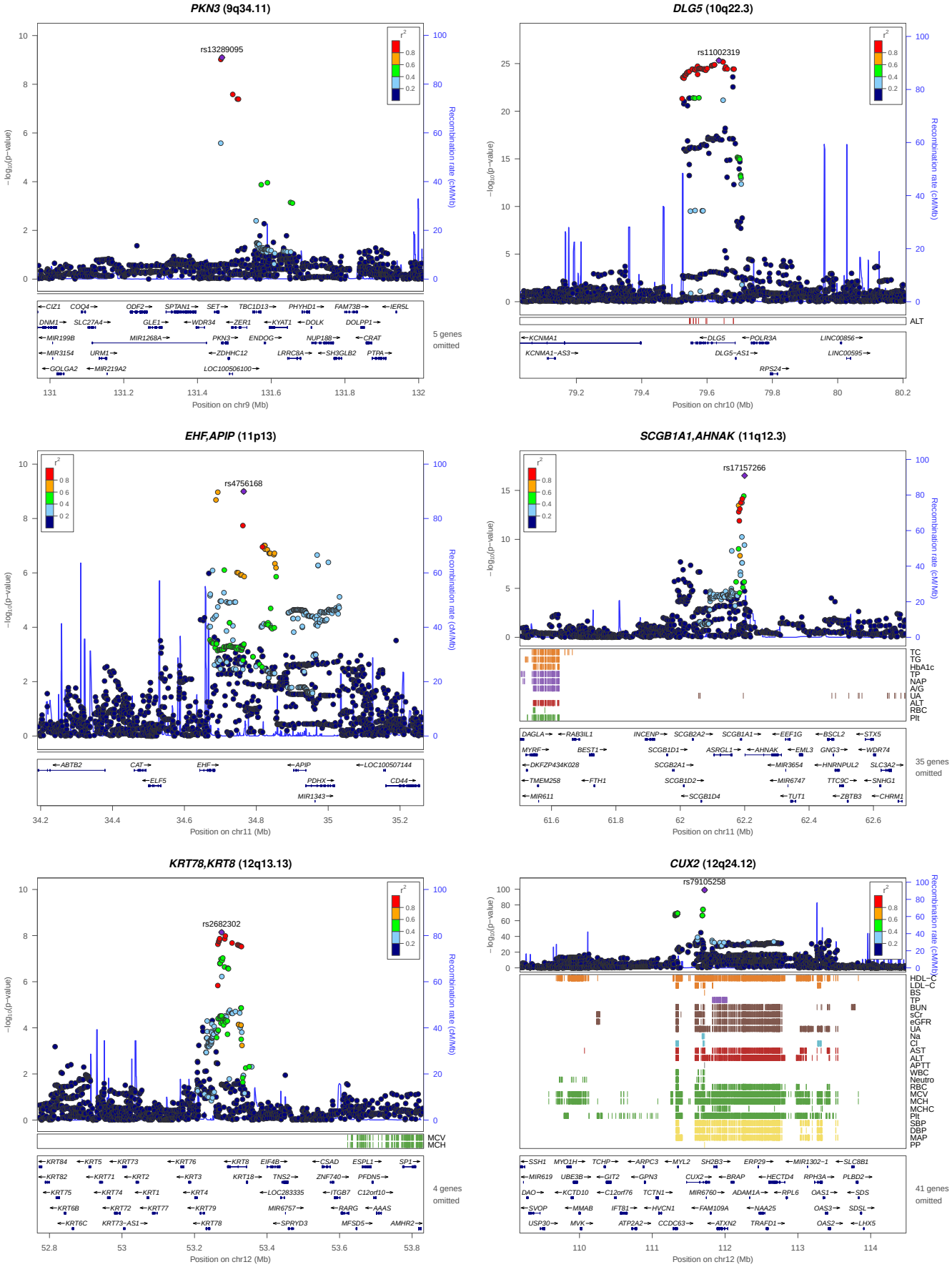
CYFIP2 **(5q33.3)**

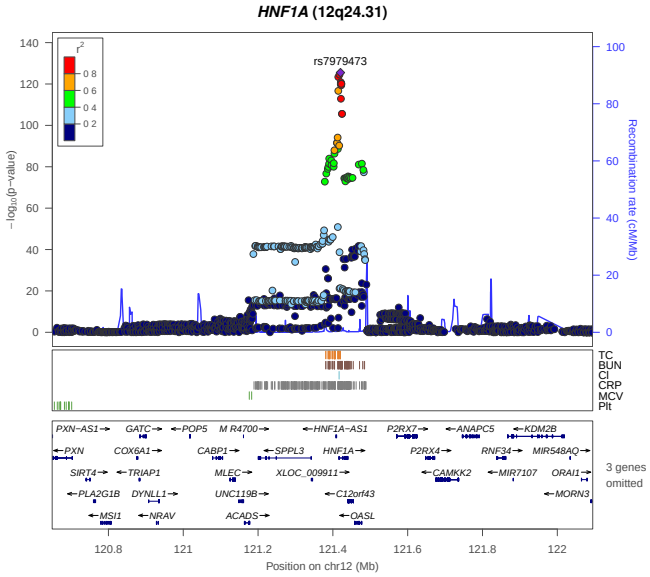


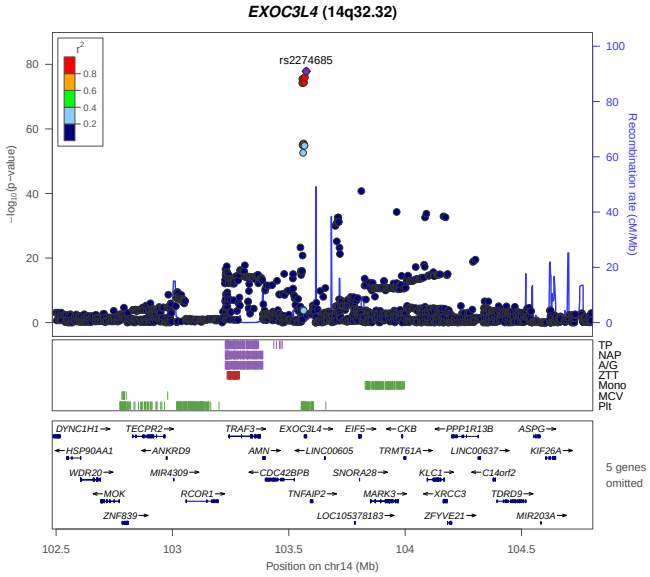
MLIP **(6p12.1)**

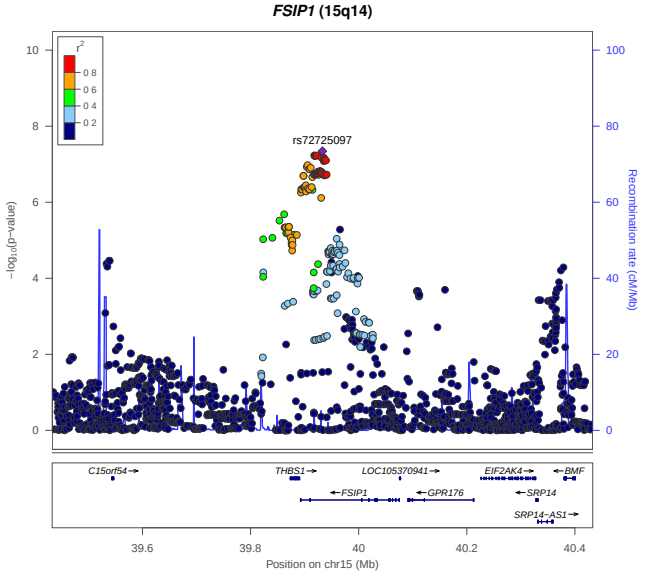


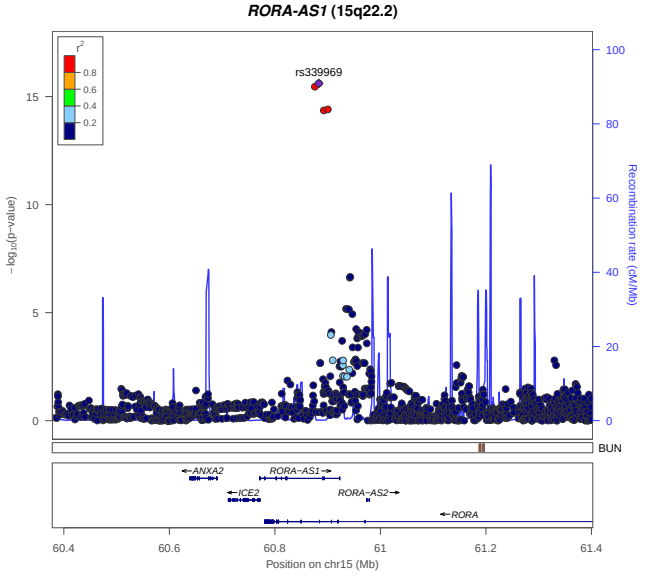

SYNJ2 (6q25.3)
rs141160611
1 gene omitted
Position on chr6 (Mb)
MIR148A,NFE2L3 (7p15.2)
rs7780562
TC
LDL−C
TG
Position on chr7 (Mb)
MLXIPL,VPS37D (7q11.23)
rs7786376
LDL−C
TG
Alb
UA
9 genes omitted
Position on chr7 (Mb)
LMTK2 (7q21.3)
rs1495525
Position on chr7 (Mb)
MET (7q31.2)
rs41741
Position on chr7 (Mb)
TRIB1,LINC00861 (8q24.13)
rs2954021
TC
LDL−C
TG
TP
ALT
ALP
Baso
Position on chr8 (Mb)
Recombination rate (cM/Mb)

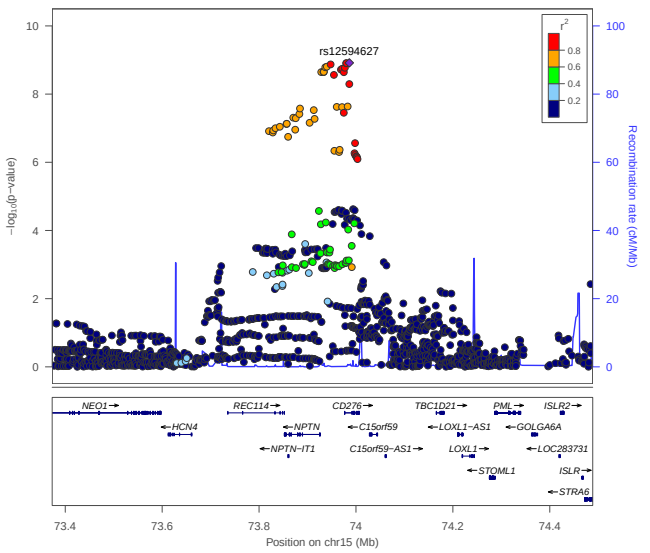

PKN3 (9q34.11)
rs13289095
Position on chr9 (Mb)
5 genes omitted
DLG5 (10q22.3)
rs11002319
ALT
Position on chr10 (Mb)
EHF,APIP (11p13)
rs4756168
Position on chr11 (Mb)
SCGB1A1,AHNAK (11q12.3)
rs17157266
TC
TG
HbA1c
TP
NAP
A/G
UA
ALT
RBC
Plt
35 genes omitted
Position on chr11 (Mb)
KRT78,KRT8 (12q13.13)
rs2682302
MCV
MCH
4 genes omitted
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
HDL-C
LDL-C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
APTT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
41 genes omitted
Position on chr12 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

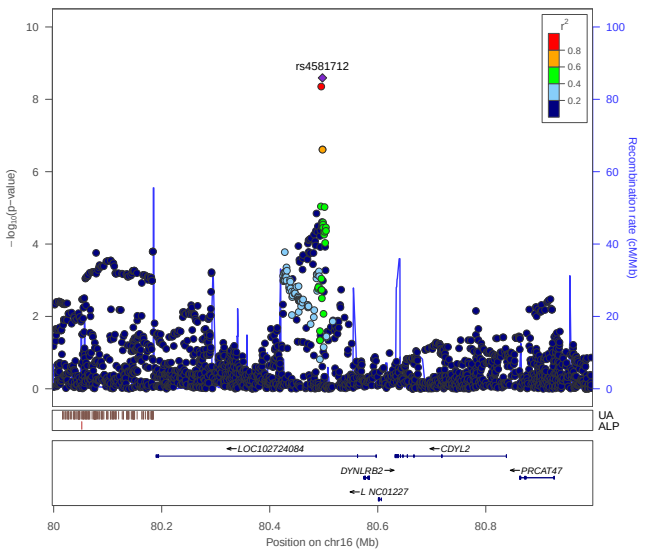

HNF1A (12q24.31)
rs7979473
TC
BUN
Cl
CRP
MCV
Plt
3 genes omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

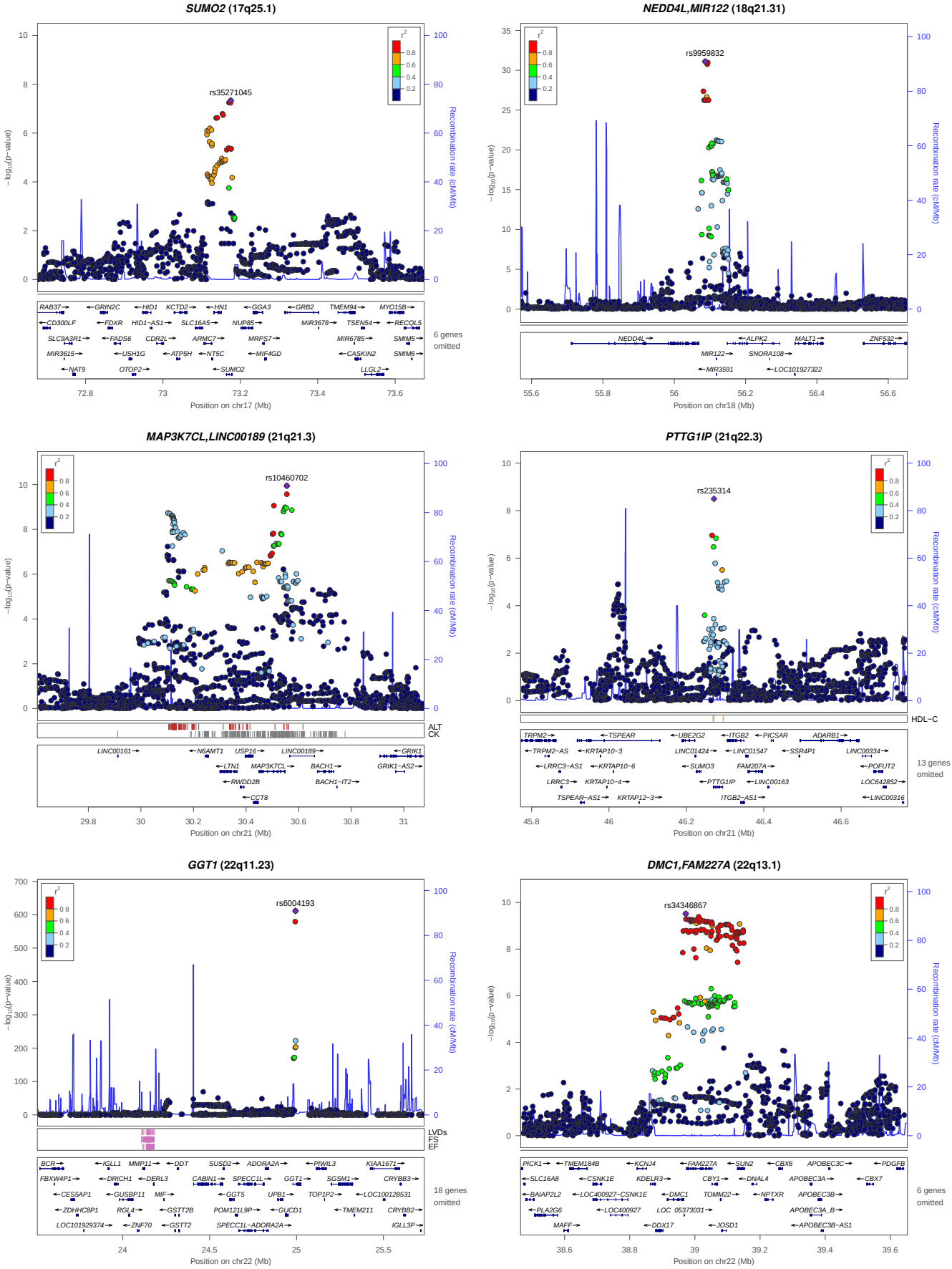

EXOC3L4 (14q32.32)
rs2274685
TP
NAP
A/G
ZTT
Mono
MCV
Plt
5 genes omitted
Position on chr14 (Mb)
Recombination rate (cM/Mb)


FSIP1 (15q14)
rs72725097
Position on chr15 (Mb)
Recombination rate (cM/Mb)

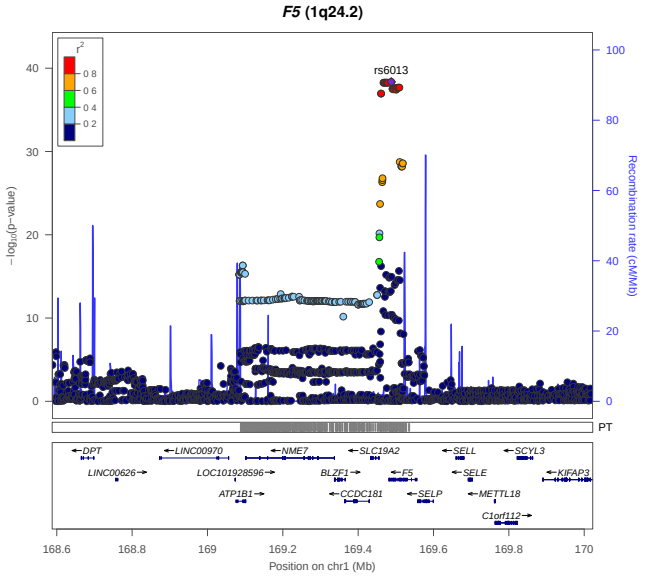

RORA-AS1 (15q22.2)
rs339969
BUN
Position on chr15 (Mb)
Recombination rate (cM/Mb)

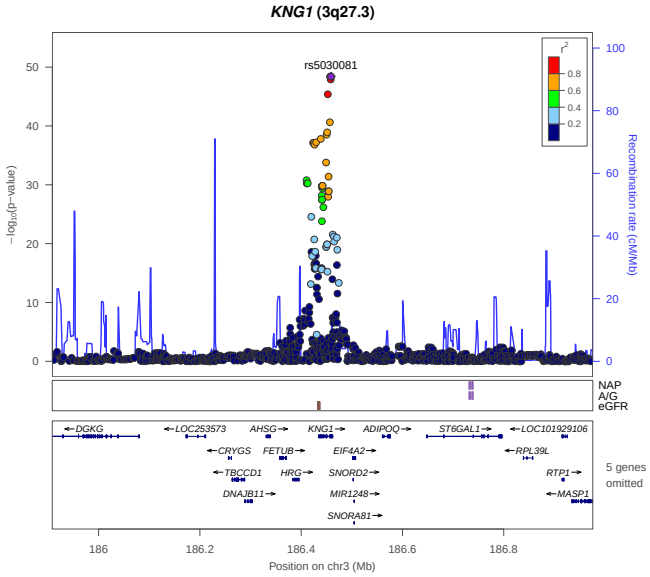

CD276 (15q24.1)
rs12594627
Position on chr15 (Mb)
Recombination rate (cM/Mb)

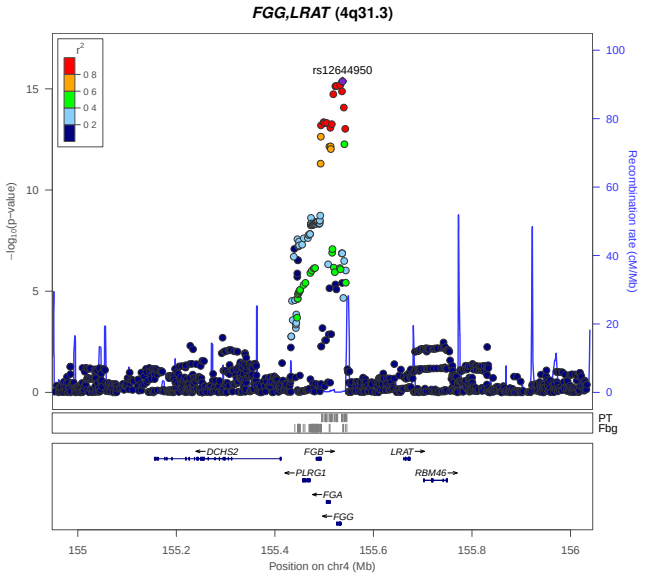

LOC102724084 (16q23.2)
rs4581712
UA
ALP
Position on chr16 (Mb)
Recombination rate (cM/Mb)

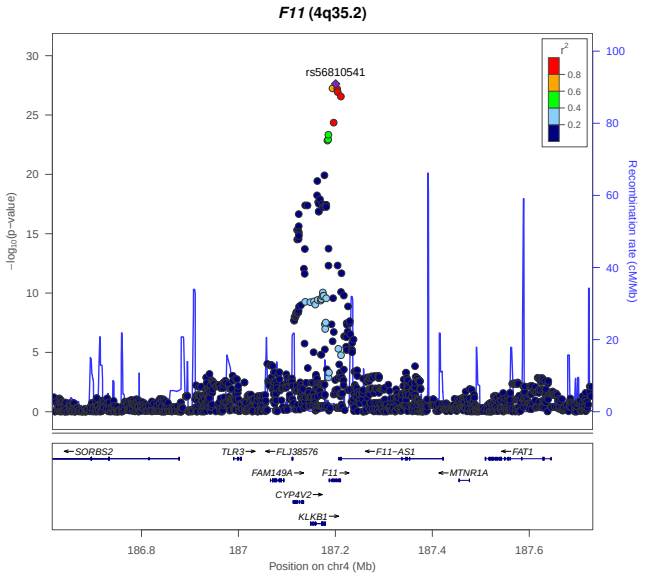

SUMO2 (17q25.1)
rs35271045
6 genes omitted
Position on chr17 (Mb)
NEDD4L,MIR122 (18q21.31)
rs9959832
Position on chr18 (Mb)
MAP3K7CL,LINC00189 (21q21.3)
rs10460702
ALT
CK
Position on chr21 (Mb)
PTTG1IP (21q22.3)
rs235314
HDL−C
13 genes omitted
Position on chr21 (Mb)
GGT1 (22q11.23)
rs6004193
LVDs
FS
EF
18 genes omitted
Position on chr22 (Mb)
DMC1,FAM227A (22q13.1)
rs34346867
6 genes omitted
Position on chr22 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

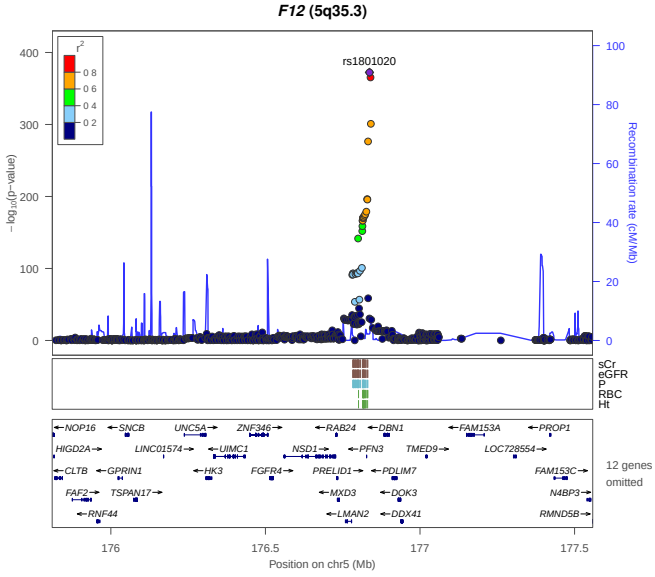
2.26 APTT (n = 37,767)

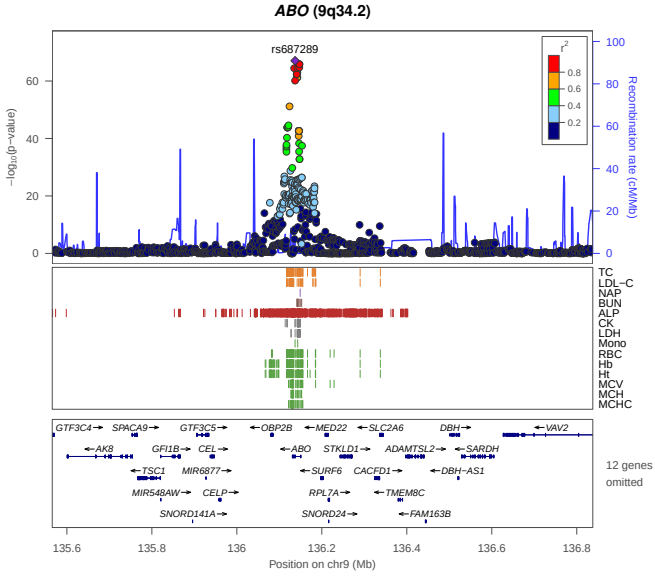


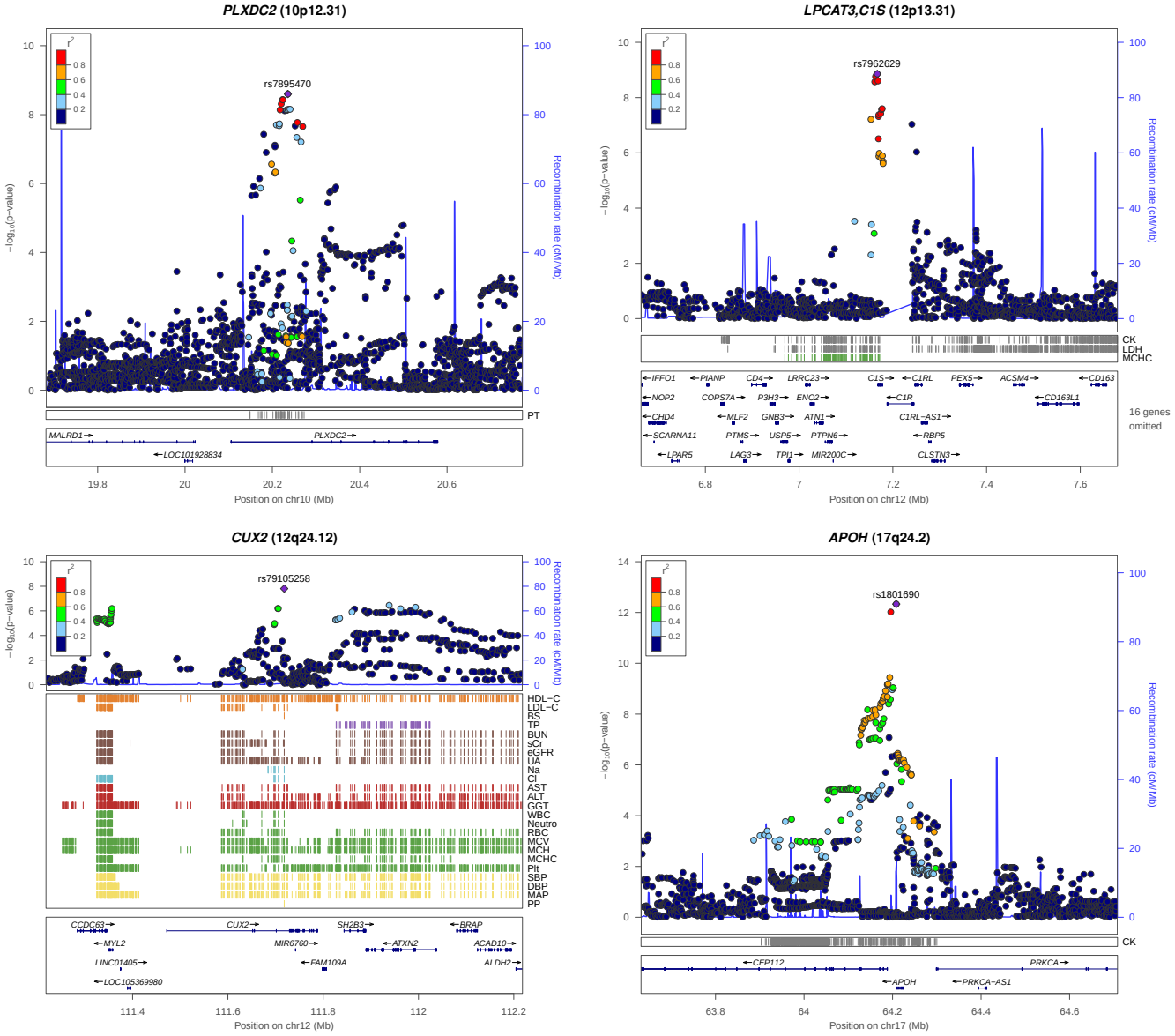




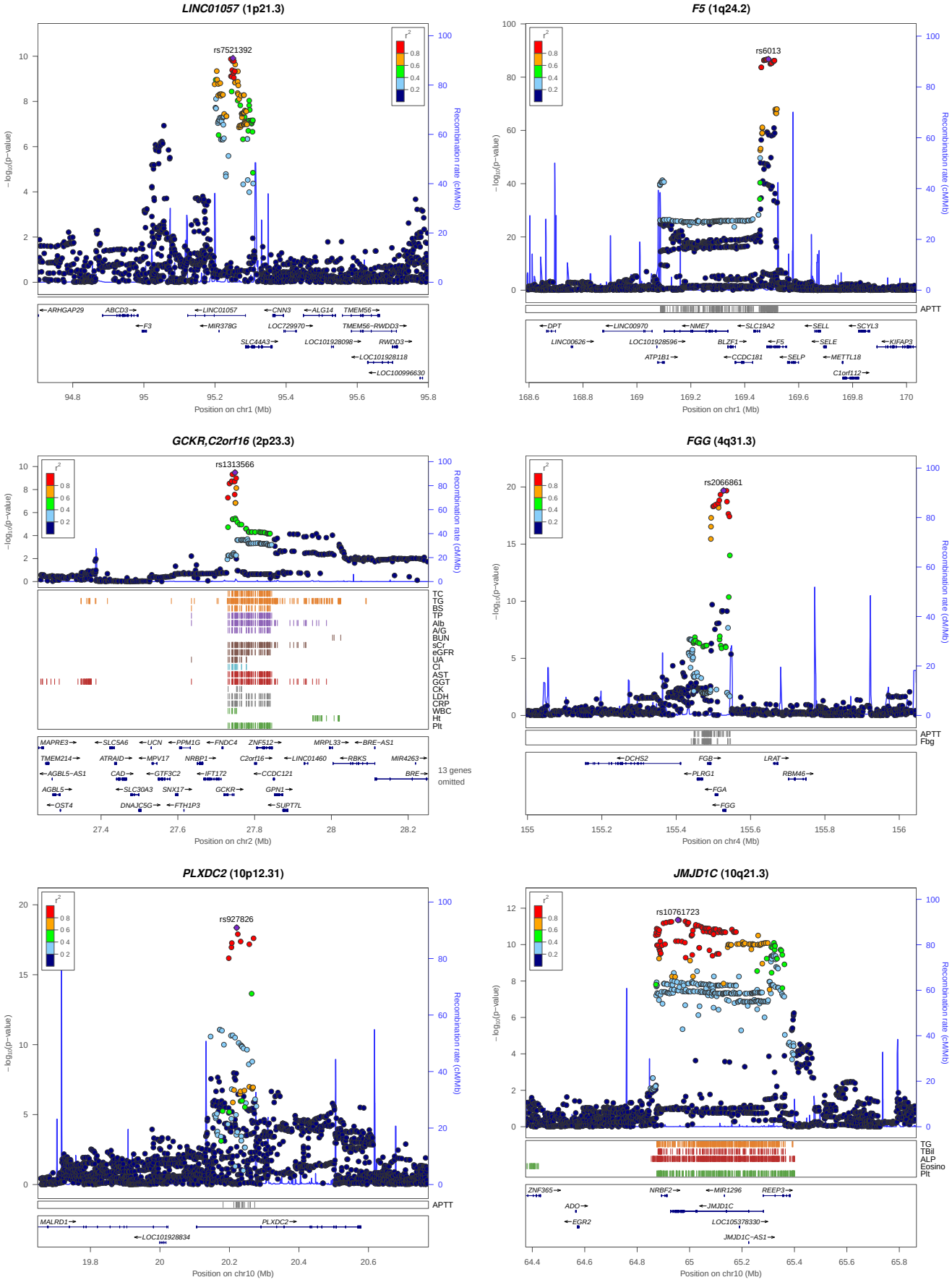


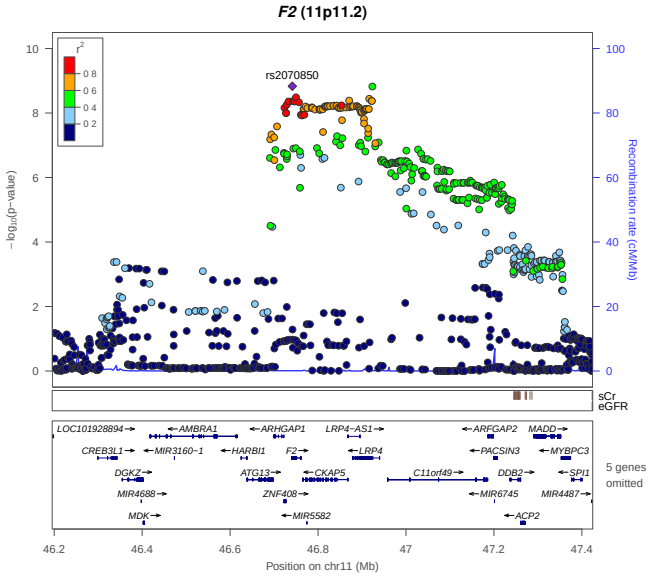


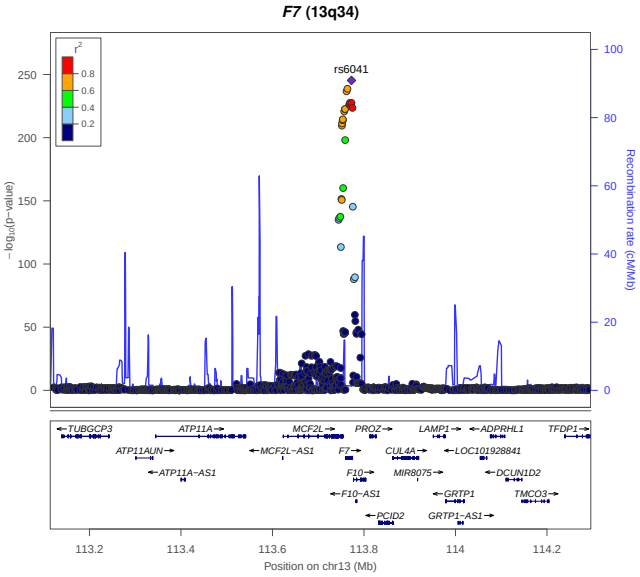


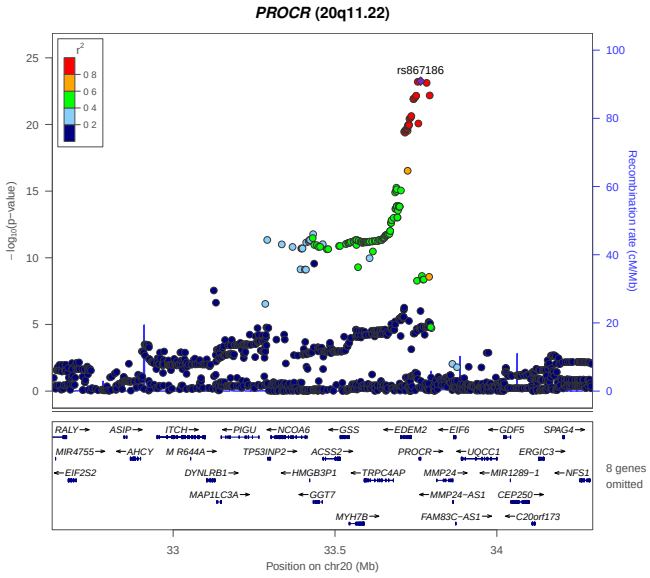

PLXDC2 (10p12.31)
rs7895470
PT
MALRD1
PLXDC2
LOC101928834
Position on chr10 (Mb)
LPCAT3,C1S (12p13.31)
rs7962629
CK
LDH
MCHC
16 genes omitted
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
HDL_C
LDL_C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
WBC
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
CCDC63
CUX2
SH2B3
BRAP
MYL2
MIR6760
ATXN2
ACAD10
LINC01405
FAM109A
ALDH2
LOC105369980
Position on chr12 (Mb)
APOH (17q24.2)
rs1801690
CK
CEP112
PRKCA
APOH
PRKCA-AS1
Position on chr17 (Mb)
Recombination rate (cM/Mb)

2.27 PT (n = 58,110)

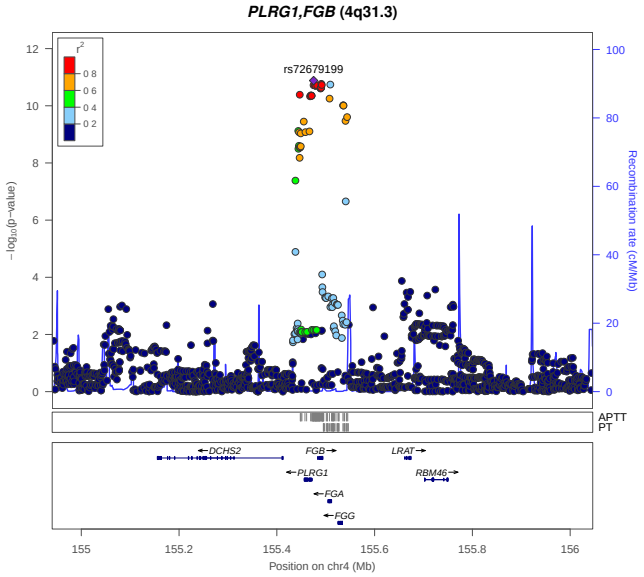



F2 (11p11.2)
rs2070850
r2
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
sCr
eGFR
LOC101928894
AMBRA1
ARHGAP1
LRP4−AS1
ARFGAP2
MADD
CREB3L1
MIR3160−1
HARBI1
F2
LRP4
PACSIN3
MYBPC3
DGKZ
ATG13
CKAP5
C11orf49
DDB2
SPI1
MIR4688
ZNF408
MIR6745
MIR4487
MDK
MIR5582
ACP2
5 genes
omitted
Position on chr11 (Mb)

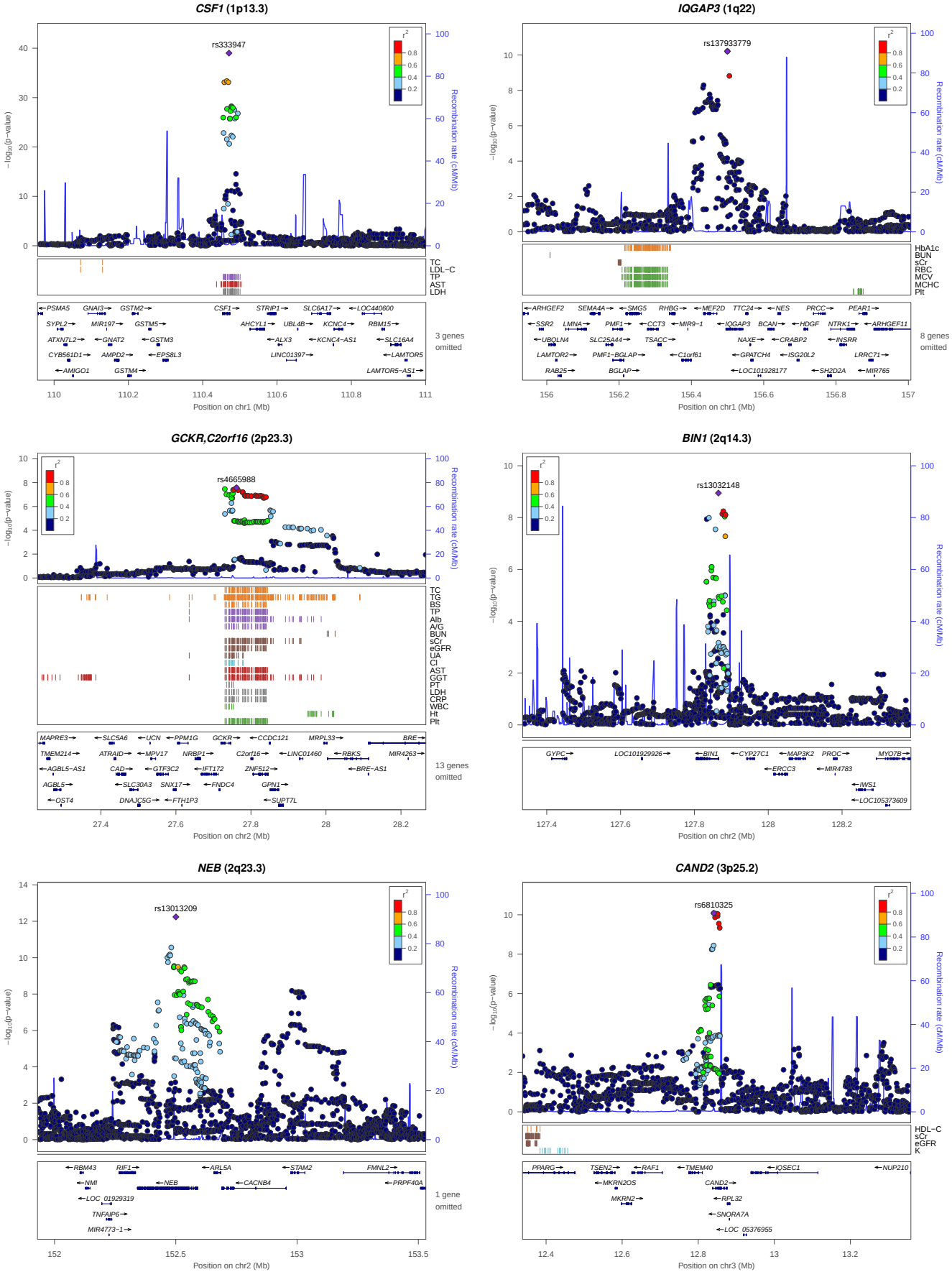

F7 (13q34)
rs6041
r2
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
TUBGCP3
ATP11A
MCF2L
PROZ
LAMP1
ADPRHL1
TFDP1
ATP11AUN
MCF2L−AS1
F7
CUL4A
LOC101928841
ATP11A−AS1
F10
MIR8075
DCUN1D2
F10−AS1
GRTP1
TMCO3
PCID2
GRTP1−AS1
Position on chr13 (Mb)


PROCR (20q11.22)
rs867186
r2
0.8
0.6
0.4
0.2
−log10(p−value)
Recombination rate (cM/Mb)
RALY
ASIP
ITCH
PIGU
NCOA6
GSS
EDEM2
EIF6
GDF5
SPAG4
MIR4755
AHCY
M R644A
TP53INP2
ACSS2
PROCR
UQCC1
ERGIC3
EIF2S2
DYNLRB1
HMGB3P1
TRPC4AP
MMP24
MIR1289−1
NFS1
MAP1LC3A
GGT7
MMP24−AS1
CEP250
MYH7B
FAM83C−AS1
C20orf173
8 genes
omitted
Position on chr20 (Mb)

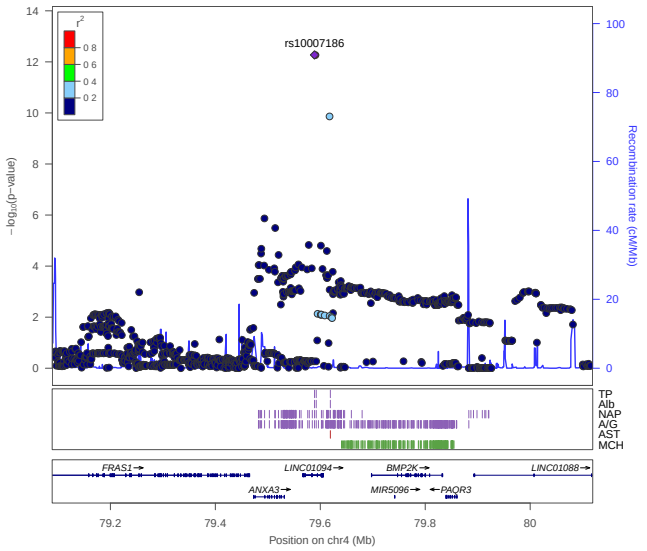
2.28 Fbg (n = 18,348)



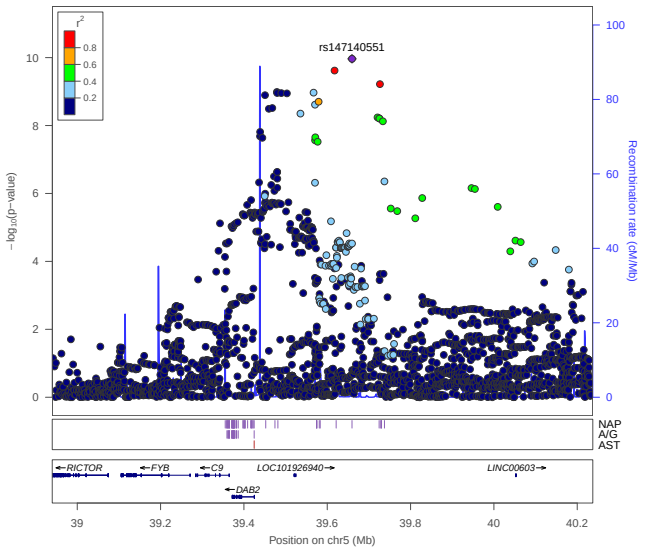
2.29 CK (n = 106,080)



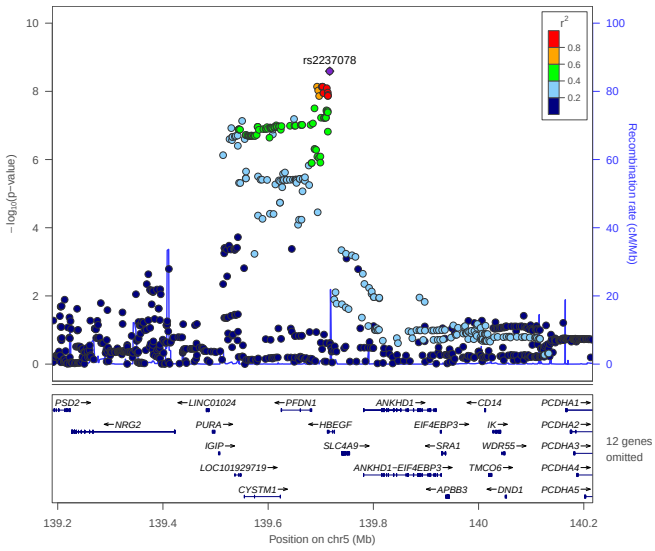
***LINC01094* (4q21.21)**



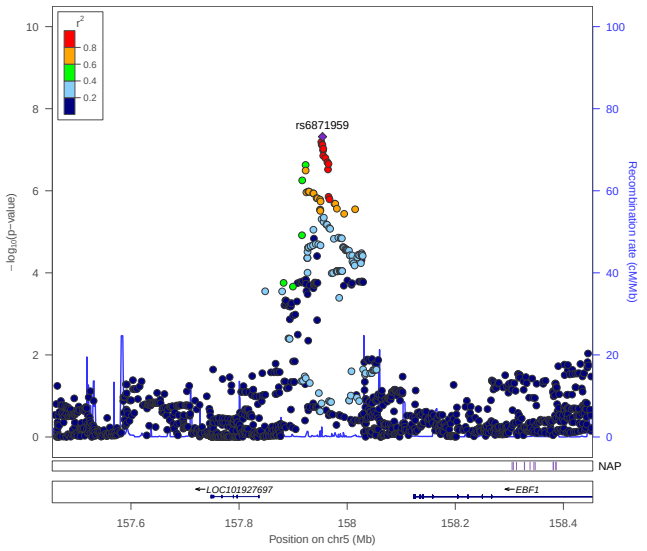
***LOC101926940,LINC00603* (5p13.1)**



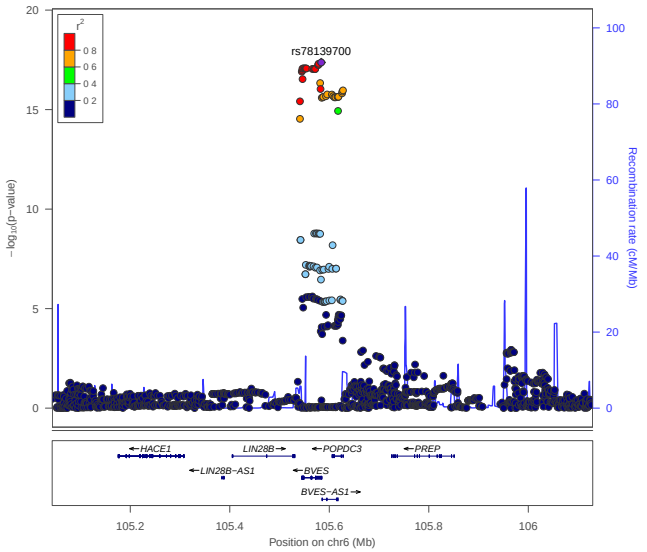
***HBEGF* (5q31.3)**



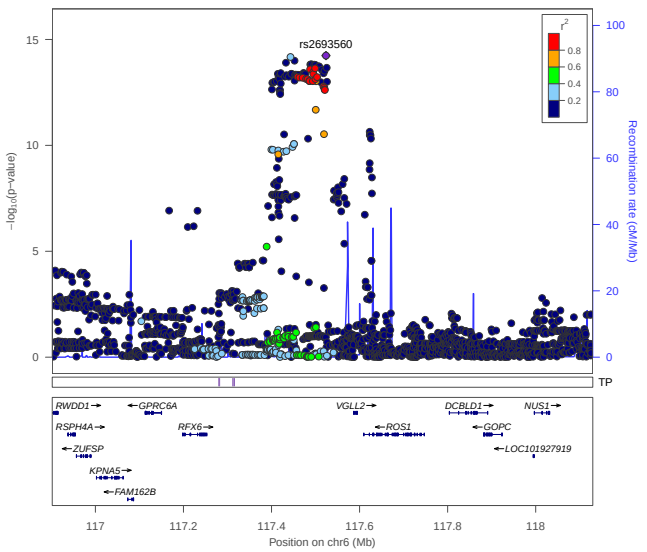
***LOC101927697,EBF1* (5q33.3)**

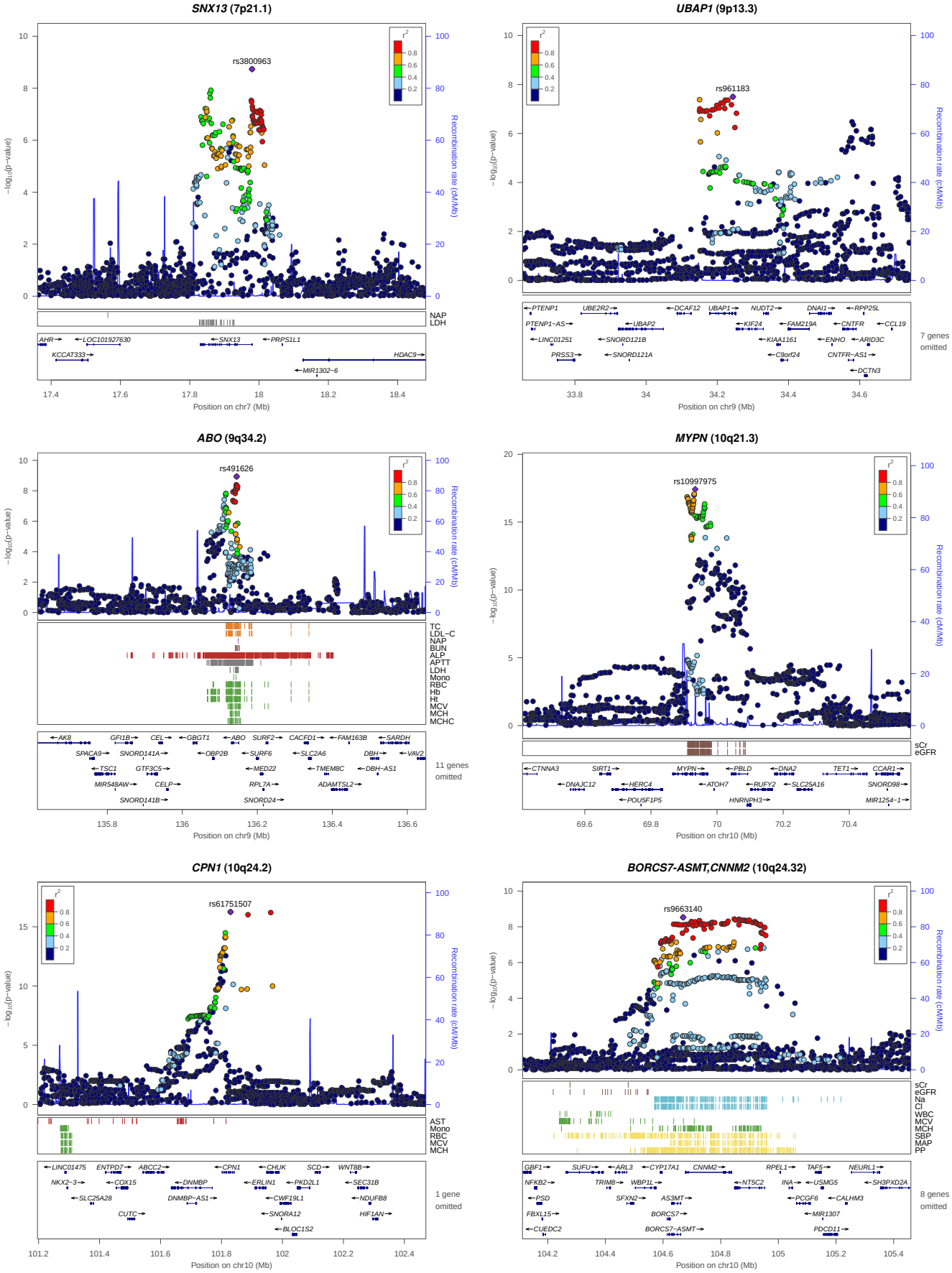


***BVES* (6q21)**

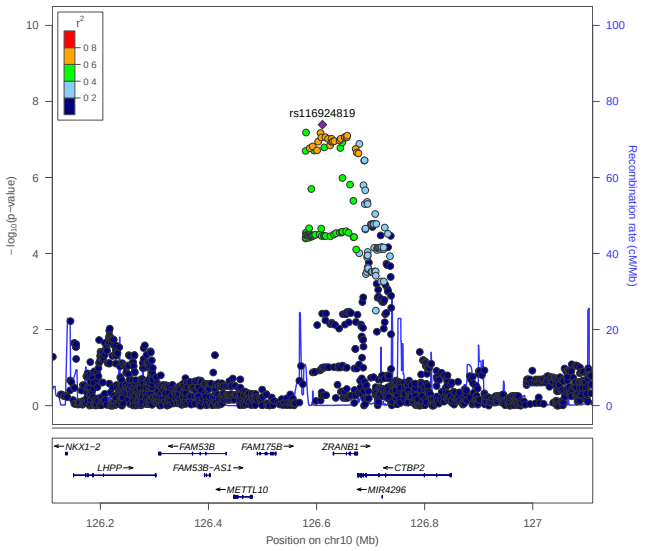


***RFX6,VGLL2* (6q22.1)**

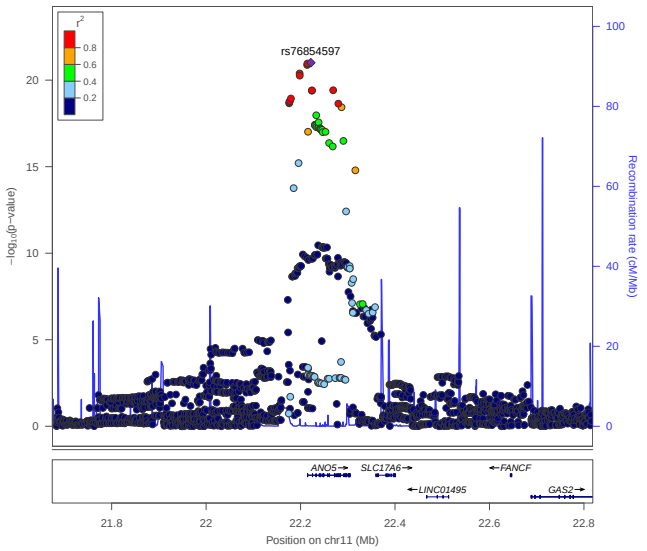



SNX13 (7p21.1)
rs3800963
NAP
LDH
AHR
LOC101927630
SNX13
PRPS1L1
KCCAT333
HDAC9
MIR1302−6
Position on chr7 (Mb)
UBAP1 (9p13.3)
rs961183
PTENP1
UBE2R2
DCAF12
UBAP1
NUDT2
DNAJ1
RPP25L
PTENP1−AS
UBAP2
KIF24
FAM219A
CNTFR
CCL19
LINC01251
SNORD121B
KIAA1161
ENHO
ARID3C
PRSS3
SNORD121A
C9orf24
CNTFR−AS1
DCTN3
7 genes omitted
Position on chr9 (Mb)
ABO (9q34.2)
rs491626
TC
LDL−C
NAP
BUN
ALP
APTT
LDH
Mono
RBC
Hb
Ht
MCV
MCH
MCHC
AK8
GFI1B
CEL
GBGT1
ABO
SURF2
CACFD1
FAM163B
SARDH
SPACA9
SNORD141A
OBP2B
SURF6
SLC2A6
DBH
VAV2
TSC1
GTF3C5
MED22
TMEM8C
DBH−AS1
MIR548AW
CELP
RPL7A
ADAMTSL2
SNORD141B
SNORD24
11 genes omitted
Position on chr9 (Mb)
MYPN (10q21.3)
rs10997975
sCr
eGFR
CTNNA3
SIRT1
MYPN
PBLD
DNA2
TET1
CCAR1
DNAJC12
HERC4
ATOH7
RUFY2
SLC25A16
SNORD98
POU5F1P5
HNRNPH3
MIR1254−1
Position on chr10 (Mb)
CPN1 (10q24.2)
rs61751507
AST
Mono
RBC
MCV
MCH
LINC01475
ENTPD7
ABCC2
CPN1
CHUK
SCD
WNT8B
NKX2−3
COX15
DNMBP
ERLIN1
PKD2L1
SEC31B
SLC25A28
DNMBP−AS1
CWF19L1
NDUFB8
CUTC
SNORA12
HIF1AN
BLOC1S2
1 gene omitted
Position on chr10 (Mb)
BORCS7−ASMT,CNNM2 (10q24.32)
rs9663140
sCr
eGFR
Na
Cl
WBC
MCV
MCH
SBP
MAP
PP
GBF1
SUFU
ARL3
CYP17A1
CNNM2
RPEL1
TAF5
NEURL1
NFKB2
TRIM8
WBP1L
NT5C2
INA
USMG5
SH3PXD2A
PSD
SFXN2
AS3MT
PCGF6
CALHM3
FBXL15
BORCS7
MIR1307
CUEDC2
BORCS7−ASMT
PDCD11
8 genes omitted
Position on chr10 (Mb)

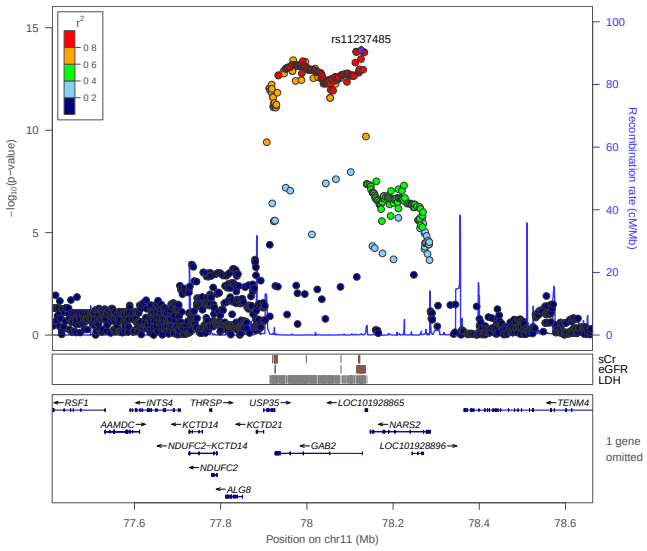
FAM175B,ZRANB1 **(10q26.13)**



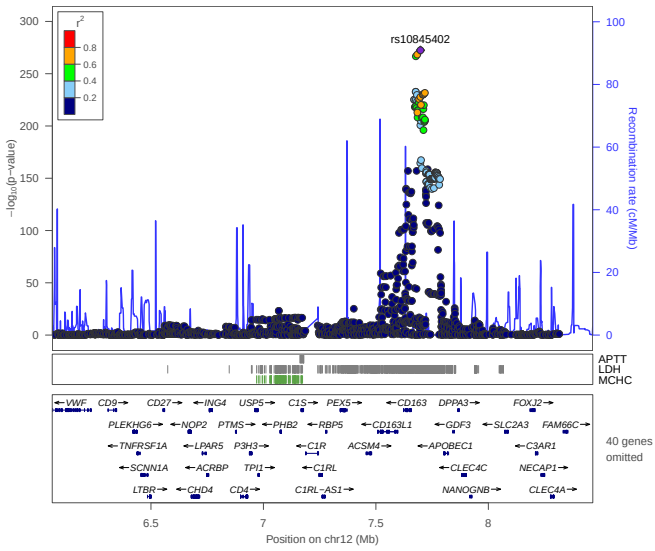
ANO5 **(11p14.3)**



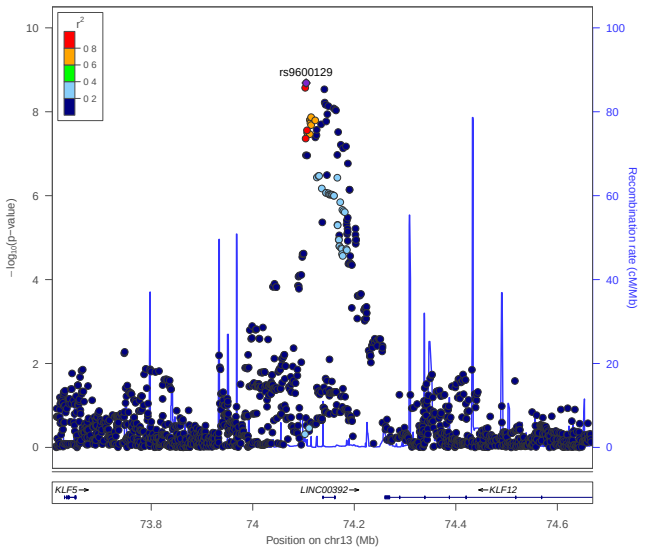
GAB2 **(11q14.1)**



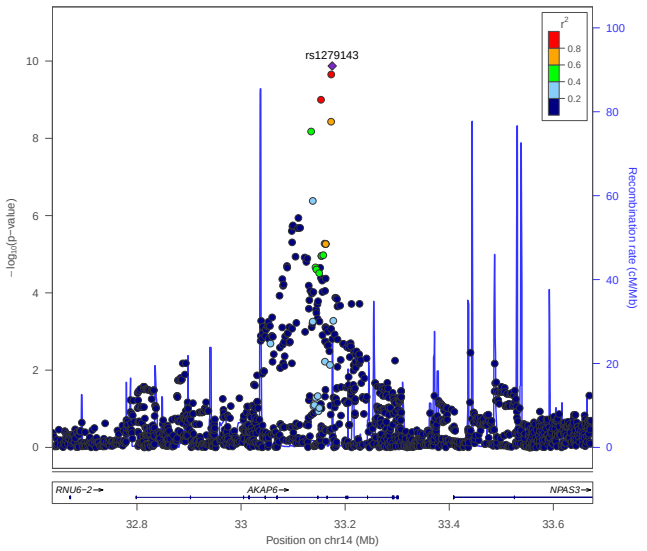
CD163,APOBEC1 **(12p13.31)**

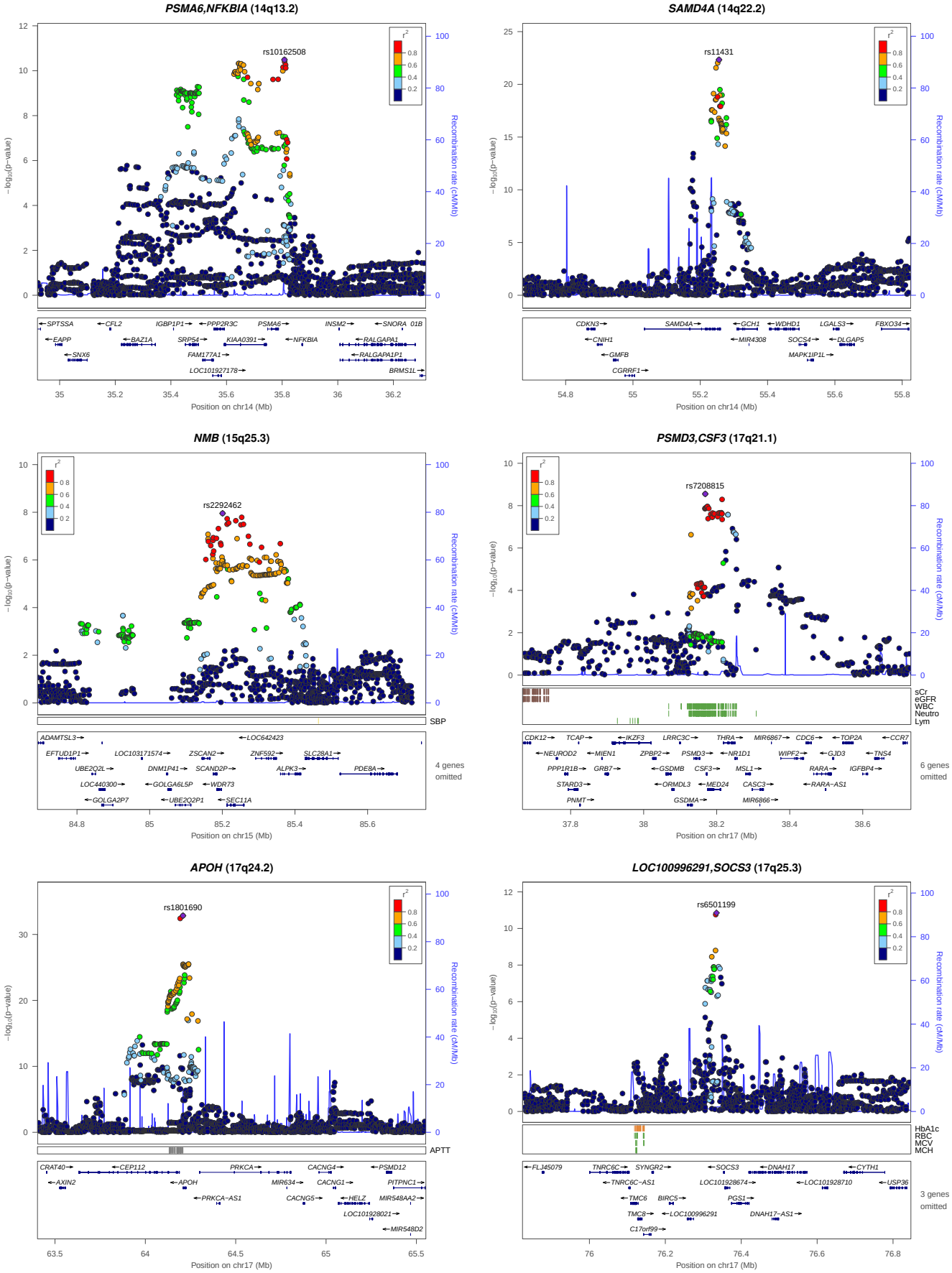


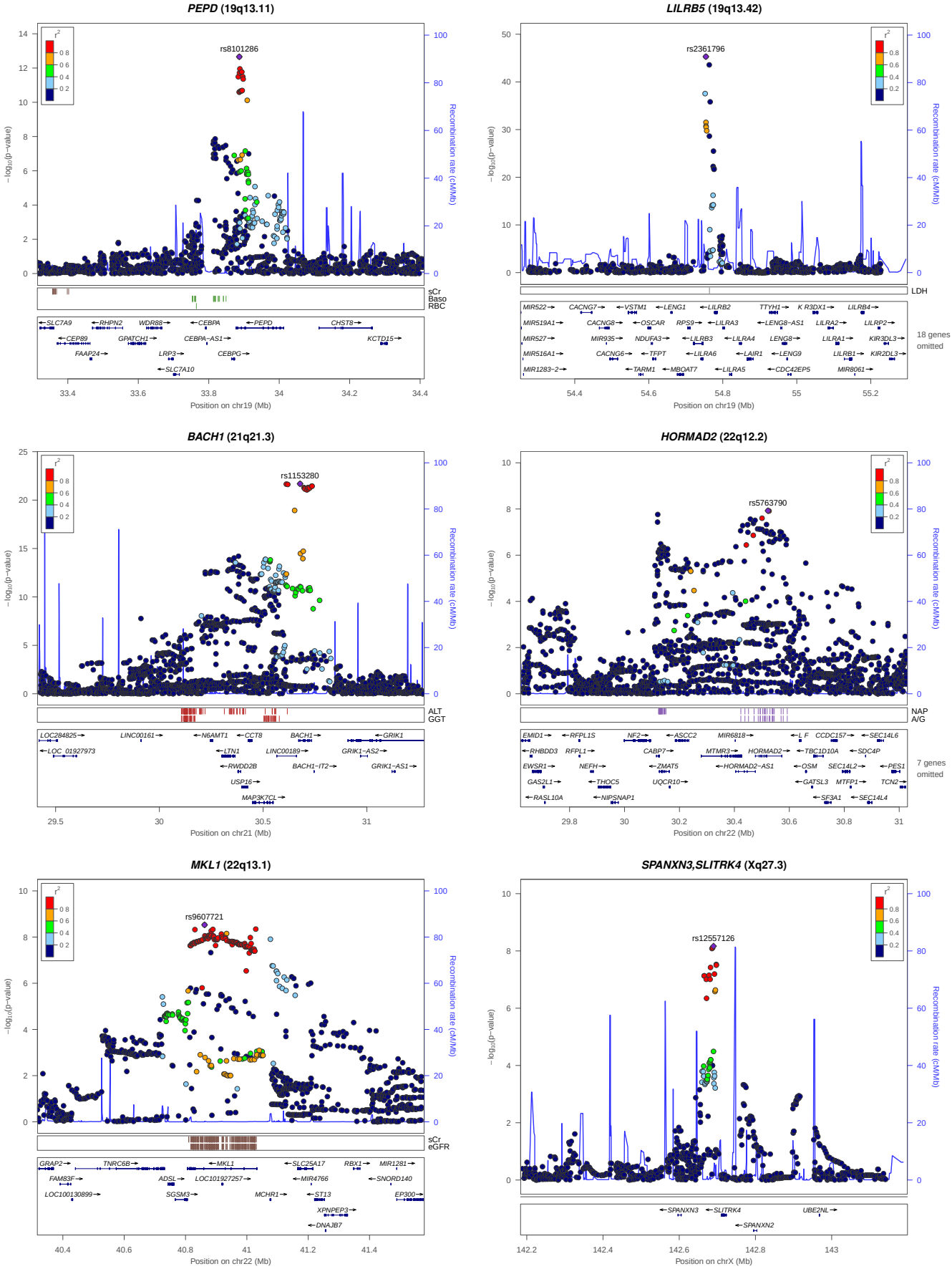
KLF5,LINC00392 **(13q22.1)**



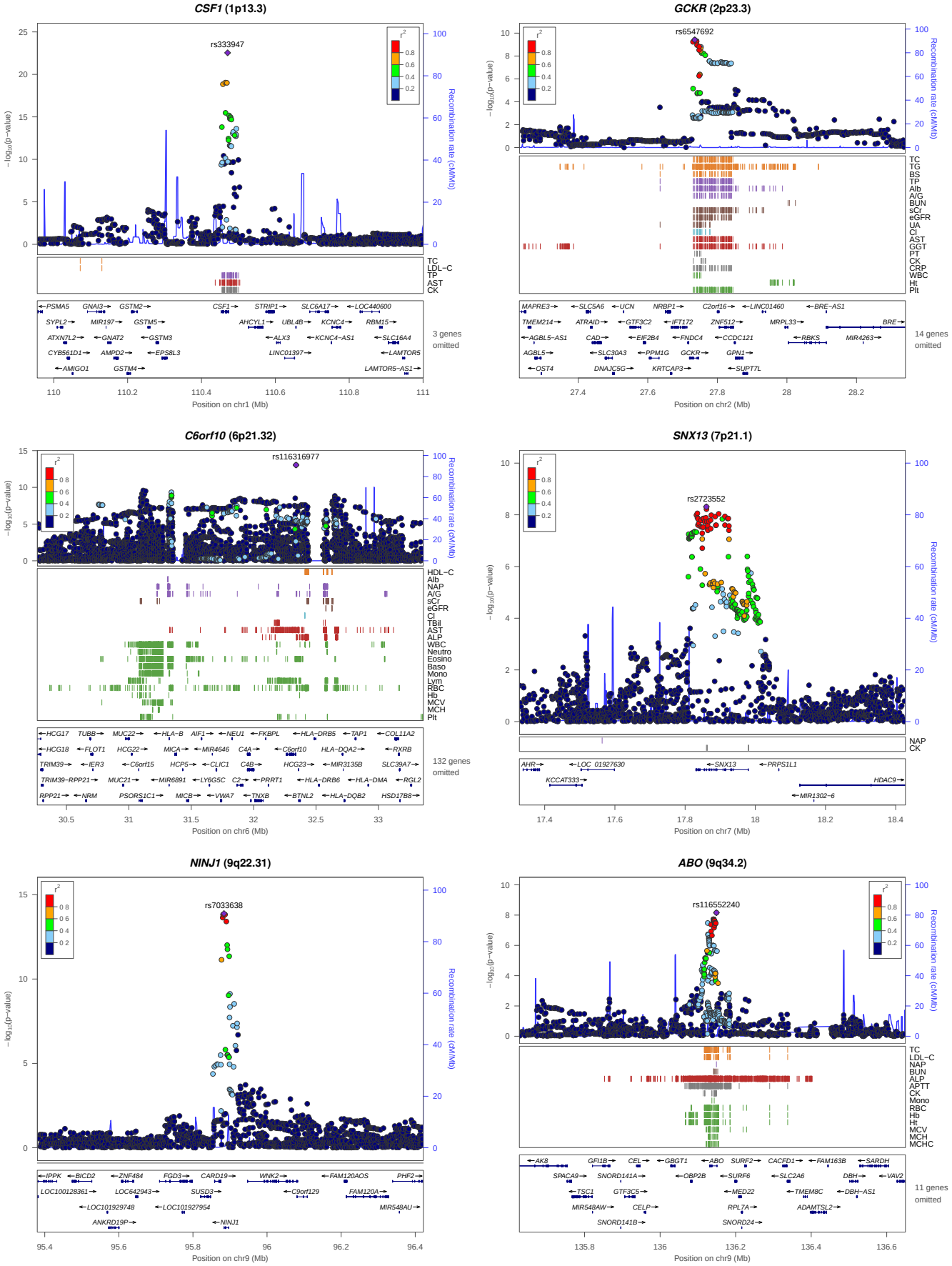
AKAP6 **(14q12)**

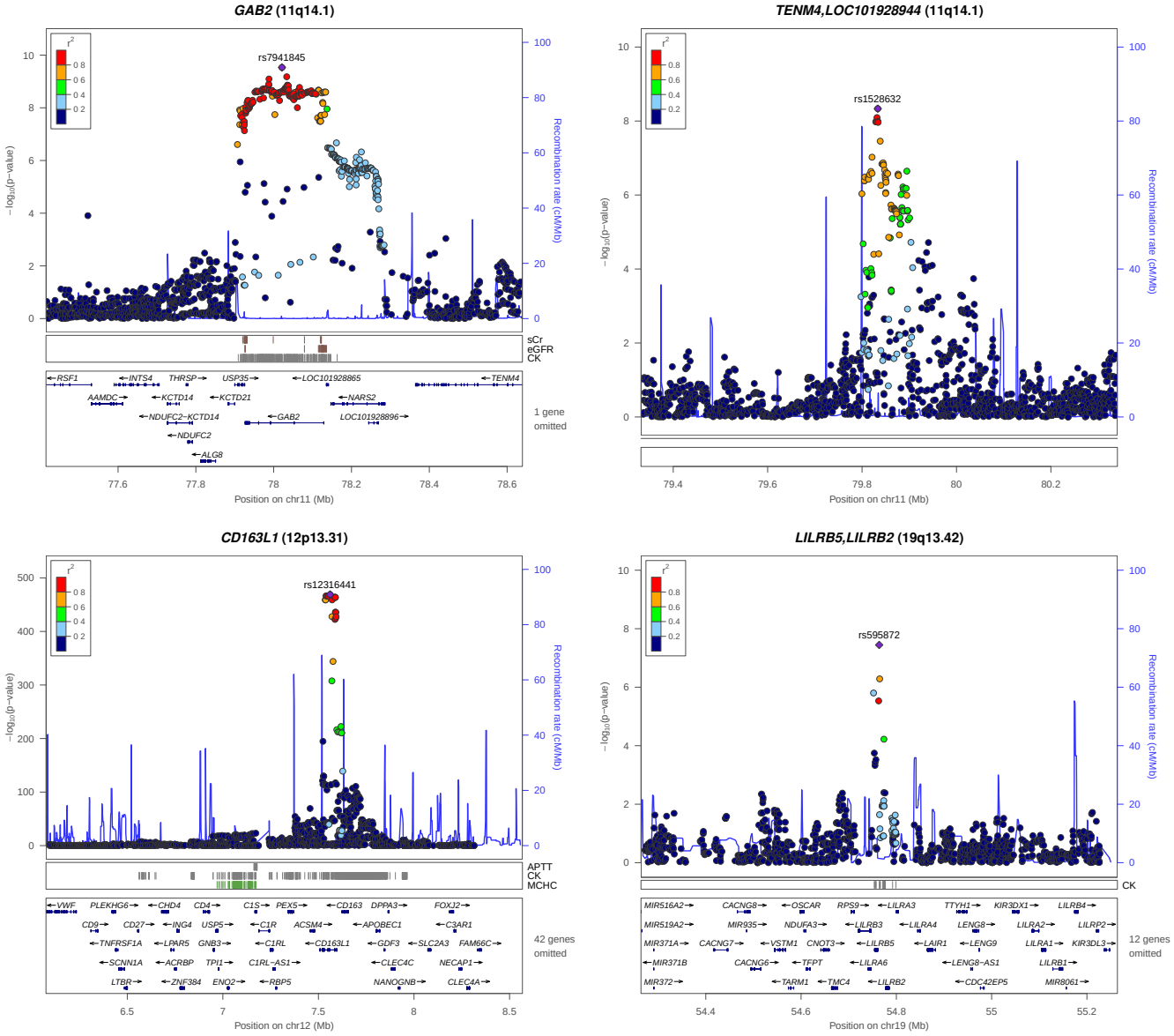



PSMA6,NFKBIA (14q13.2)
rs10162508
SAMD4A (14q22.2)
rs11431
NMB (15q25.3)
rs2292462
SBP
4 genes omitted
PSMD3,CSF3 (17q21.1)
rs7208815
sCr
eGFR
WBC
Neutro
Lym
6 genes omitted
APOH (17q24.2)
rs1801690
APTT
LOC100996291,SOCS3 (17q25.3)
rs6501199
HbA1c
RBC
MCV
MCH
3 genes omitted
Position on chr14 (Mb)
Position on chr15 (Mb)
Position on chr17 (Mb)
Recombination rate (cM/Mb)

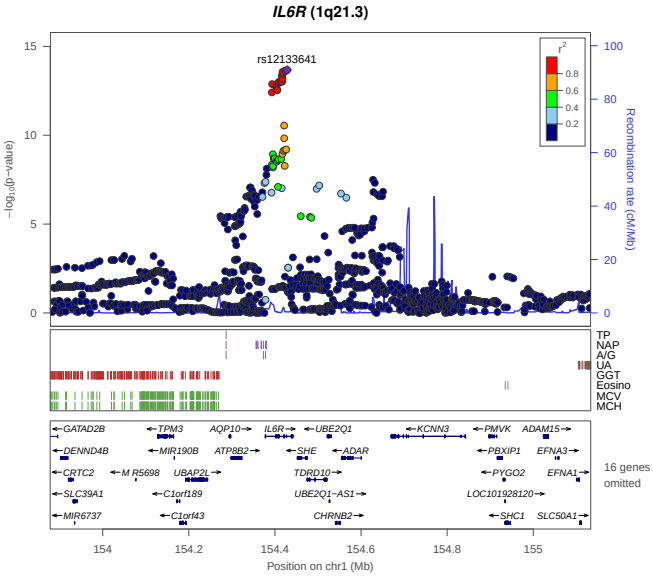

PEPD (19q13.11)
rs8101286
sCr
Baso
RBC
Position on chr19 (Mb)
LILRB5 (19q13.42)
rs2361796
LDH
18 genes
omitted
Position on chr19 (Mb)
BACH1 (21q21.3)
rs1153280
ALT
GGT
Position on chr21 (Mb)
HORMAD2 (22q12.2)
rs5763790
NAP
A/G
7 genes
omitted
Position on chr22 (Mb)
MKL1 (22q13.1)
rs9607721
sCr
eGFR
Position on chr22 (Mb)
SPANXN3,SLITRK4 (Xq27.3)
rs12557126
Position on chrX (Mb)
Recombination rate (cM/Mb)

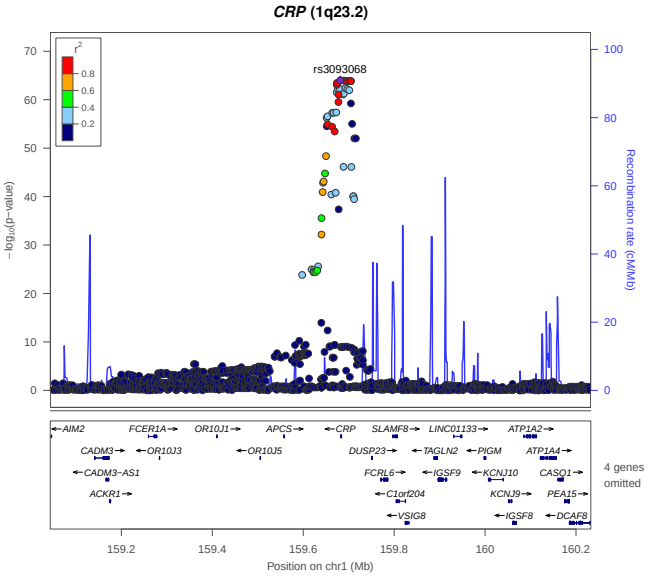
2.30 LDH (n = 126,319)

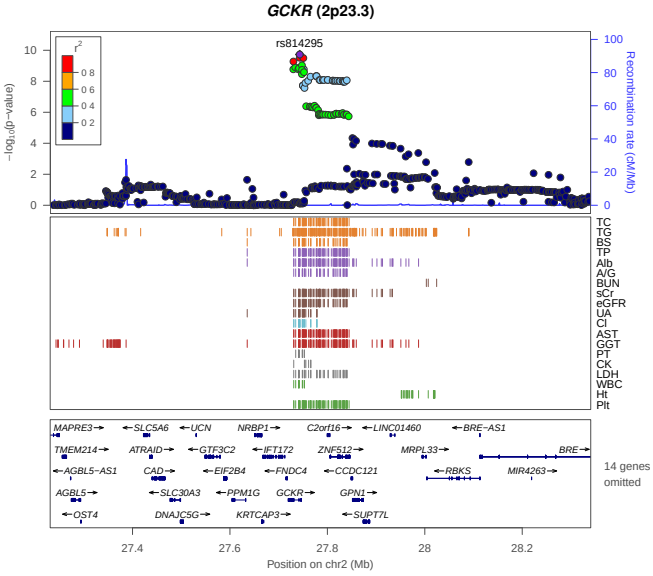


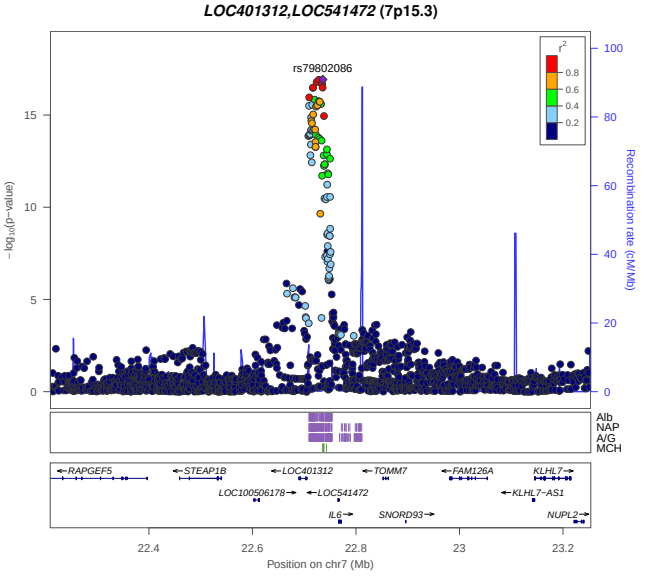

GAB2 (11q14.1)
rs7941845
sCr
eGFR
CK
1 gene
omitted
Position on chr11 (Mb)
TENM4,LOC101928944 (11q14.1)
rs1528632
Position on chr11 (Mb)
CD163L1 (12p13.31)
rs12316441
APTT
CK
MCHC
42 genes
omitted
Position on chr12 (Mb)
LILRB5,LILRB2 (19q13.42)
rs595872
CK
12 genes
omitted
Position on chr19 (Mb)
Recombination rate (cM/Mb)

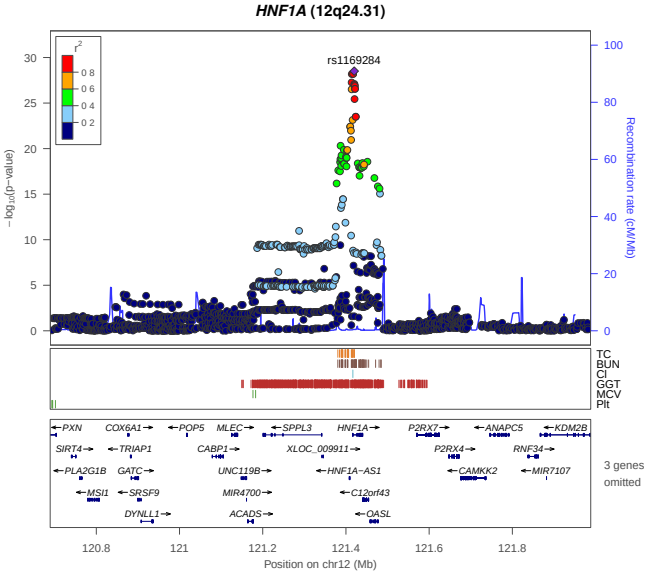
2.31 CRP (n = 75,391)

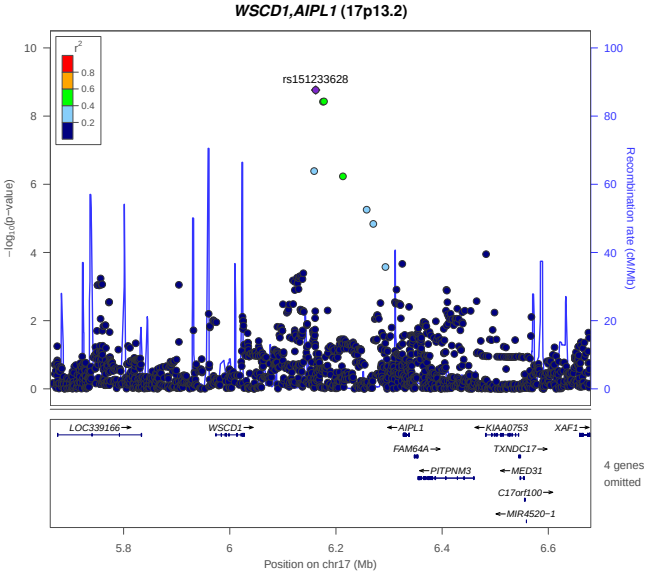


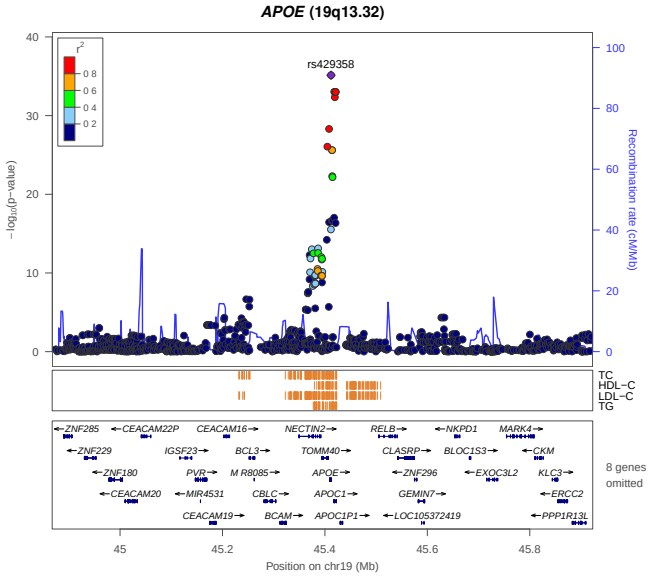




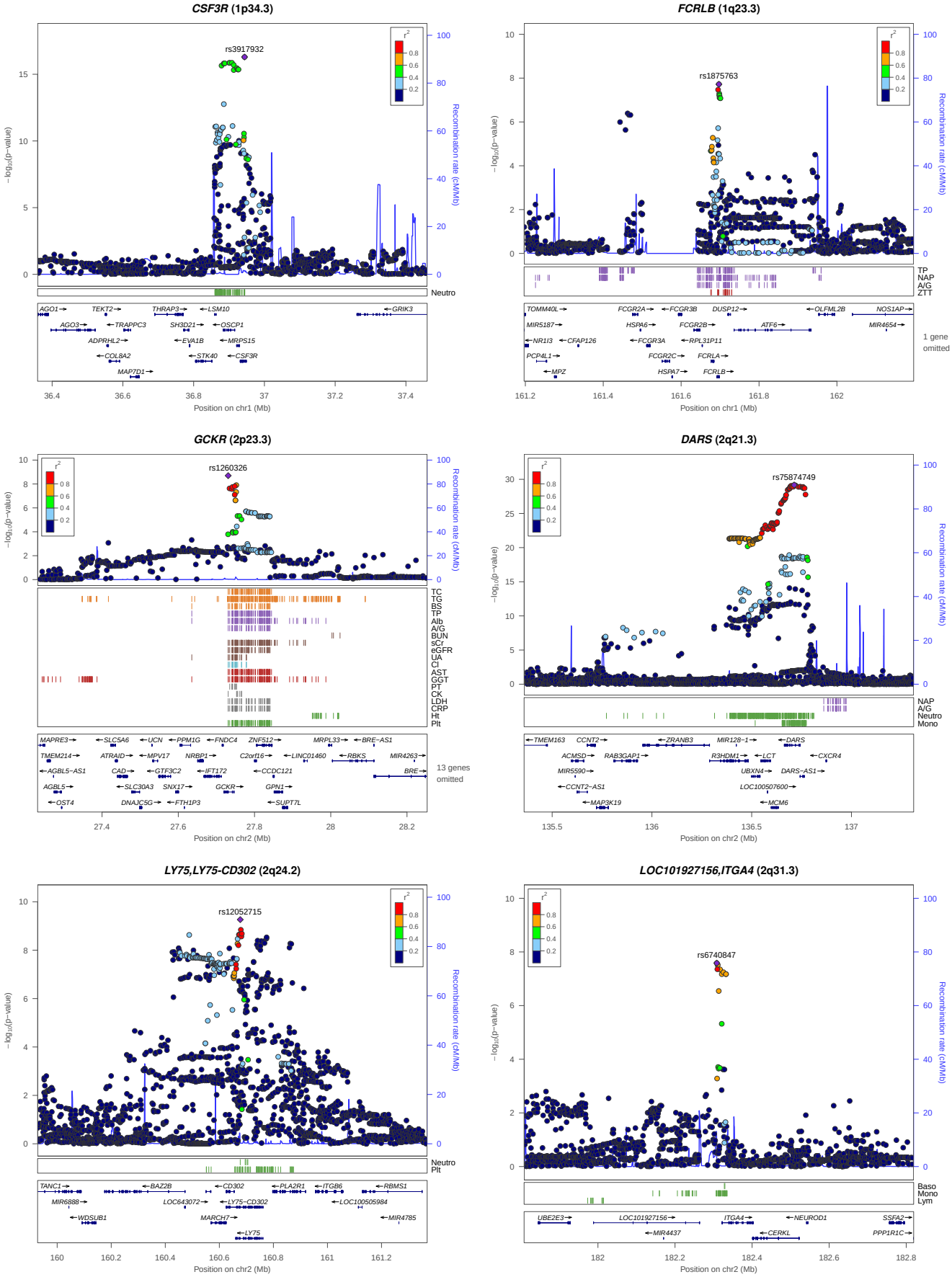


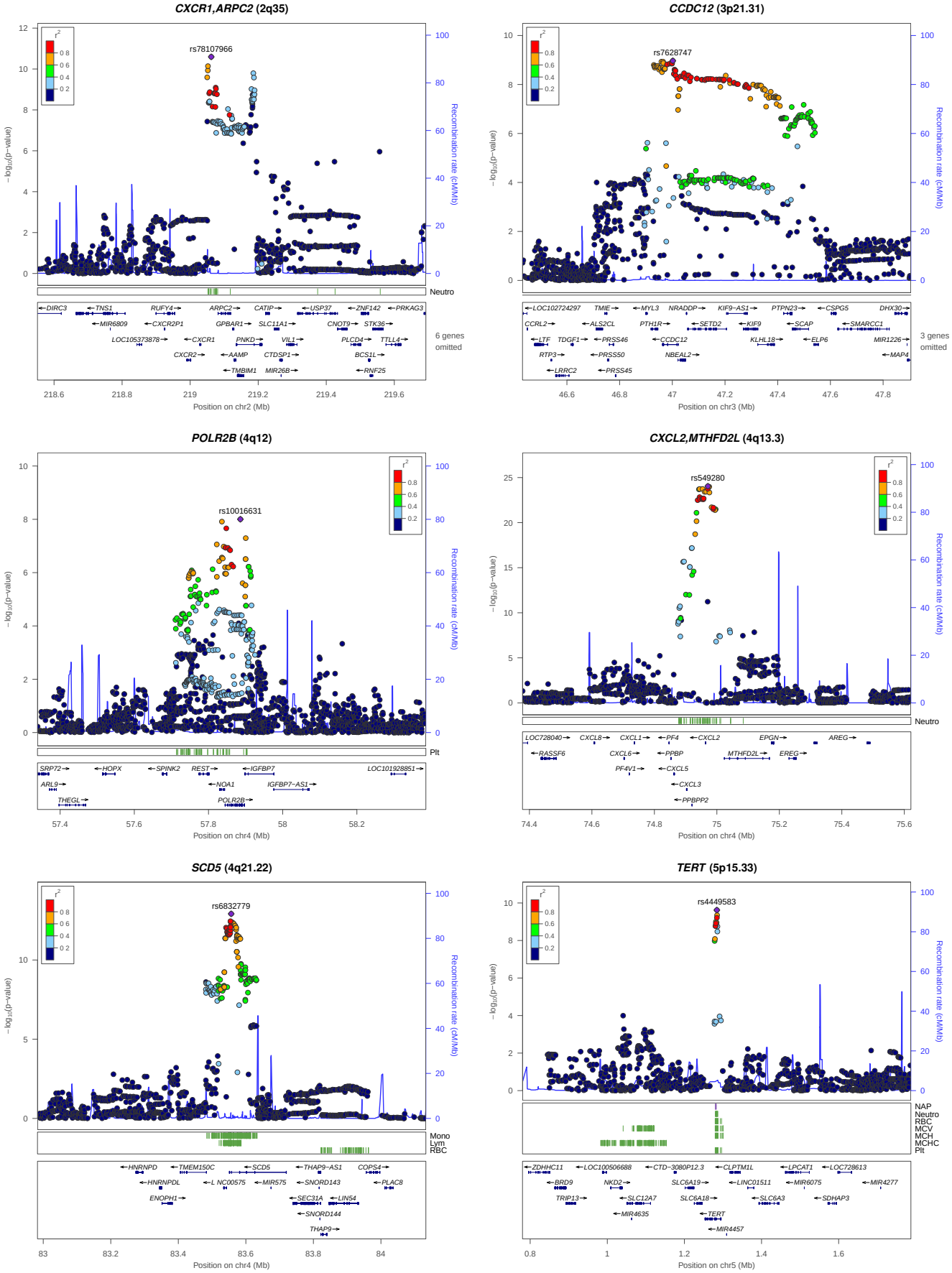


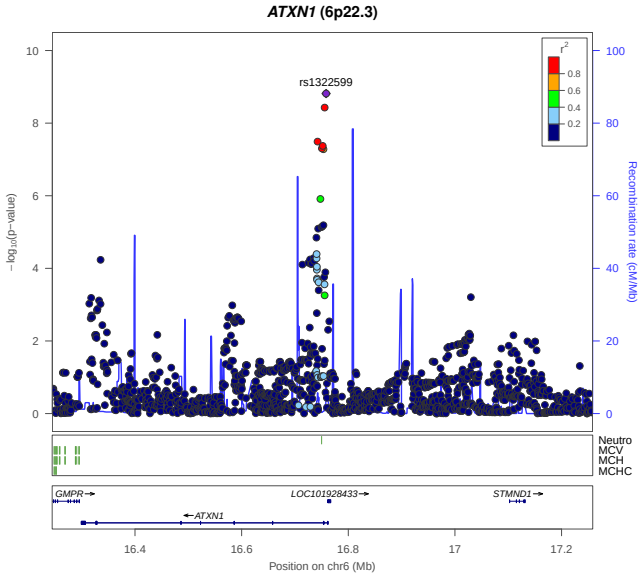


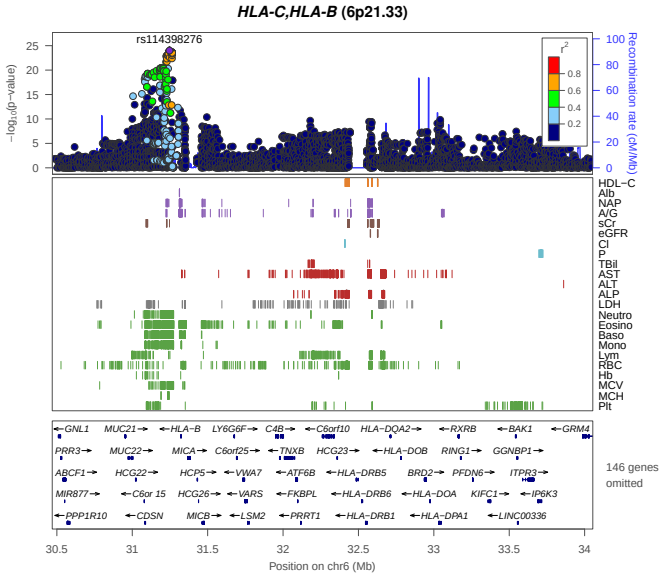

APOE (19q13.32)
rs429358
r2
0.8
0.6
0.4
0.2
−(log10)(p-value)
Recombination rate (cM/Mb)
TC
HDL−C
LDL−C
TG
8 genes omitted
ZNF285
CEACAM22P
CEACAM16
NECTIN2
RELB
NKPD1
MARK4
ZNF229
IGSF23
BCL3
TOMM40
CLASRP
BLOC1S3
CKM
ZNF180
PVR
M R8085
APOE
ZNF296
EXOC3L2
KLC3
CEACAM20
MIR4531
CBLC
APOC1
GEMIN7
ERCC2
CEACAM19
BCAM
APOC1P1
LOC105372419
PPP1R13L
Position on chr19 (Mb)

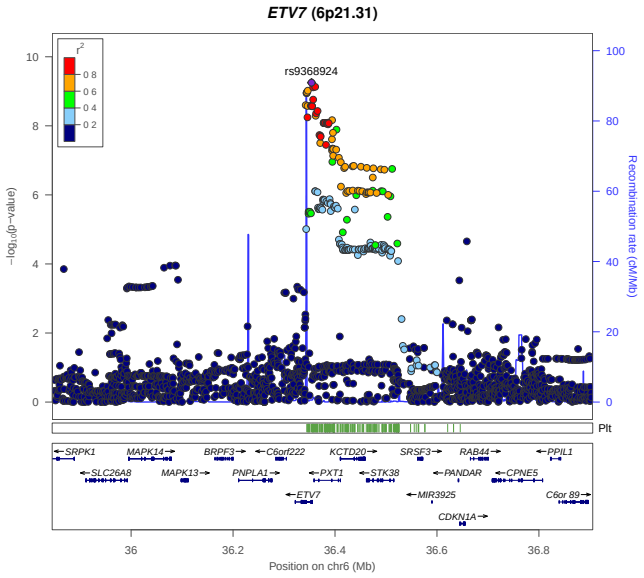
2.32 WBC (n = 107,964)

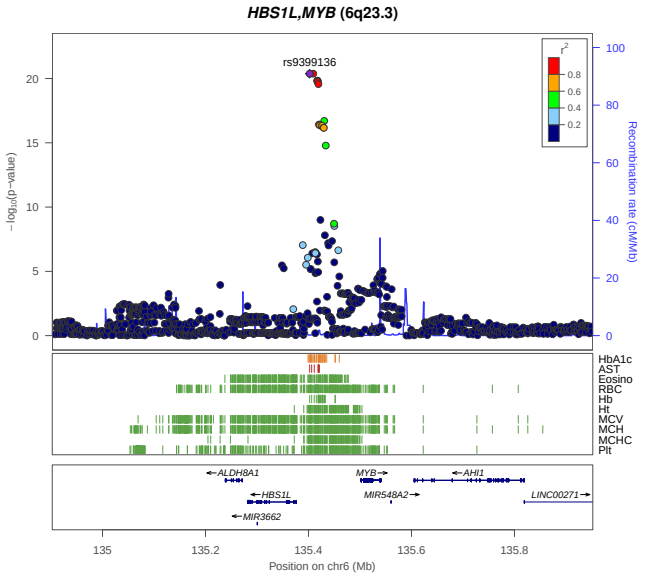


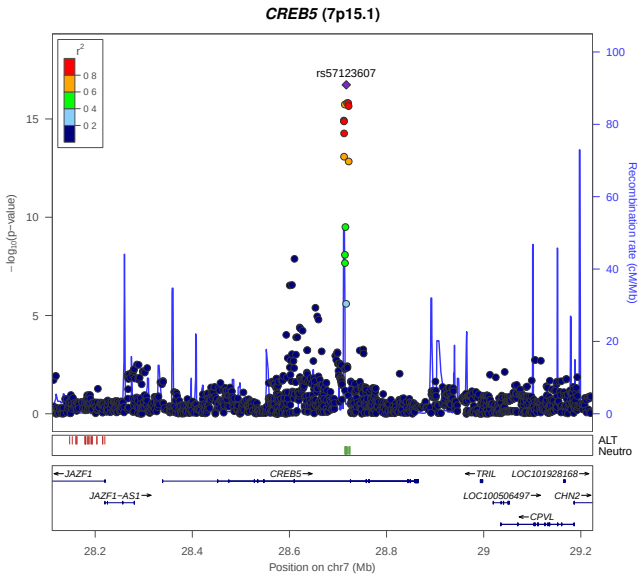

CXCR1,ARPC2 (2q35)
rs78107966
Neutro
6 genes omitted
Position on chr2 (Mb)
CCDC12 (3p21.31)
rs7628747
3 genes omitted
Position on chr3 (Mb)
POLR2B (4q12)
rs10016631
Plt
Position on chr4 (Mb)
CXCL2,MTHFD2L (4q13.3)
rs549280
Neutro
Position on chr4 (Mb)
SCD5 (4q21.22)
rs6832779
Mono
Lym
RBC
Position on chr4 (Mb)
TERT (5p15.33)
rs4449583
NAP
Neutro
RBC
MCV
MCH
MCHC
Plt
Position on chr5 (Mb)
Recombination rate (cM/Mb)

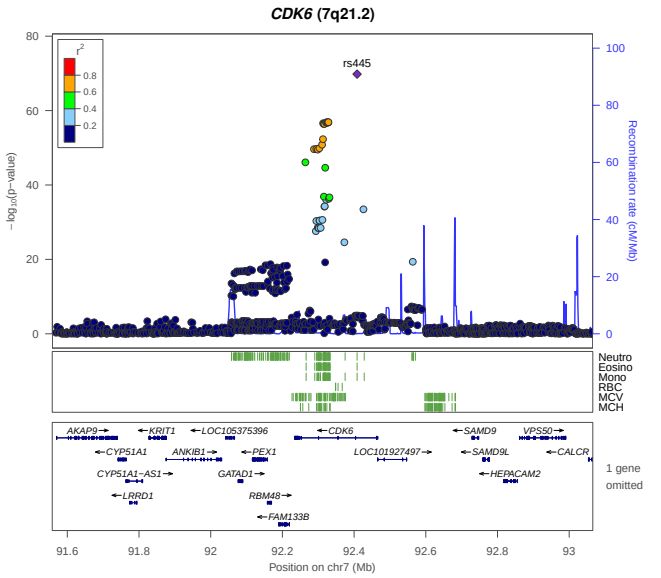

ATXN1 (6p22.3)
rs1322599
Neutro
MCV
MCH
MCHC
GMPR
LOC101928433
STMND1
ATXN1
Position on chr6 (Mb)
Recombination rate (cM/Mb)

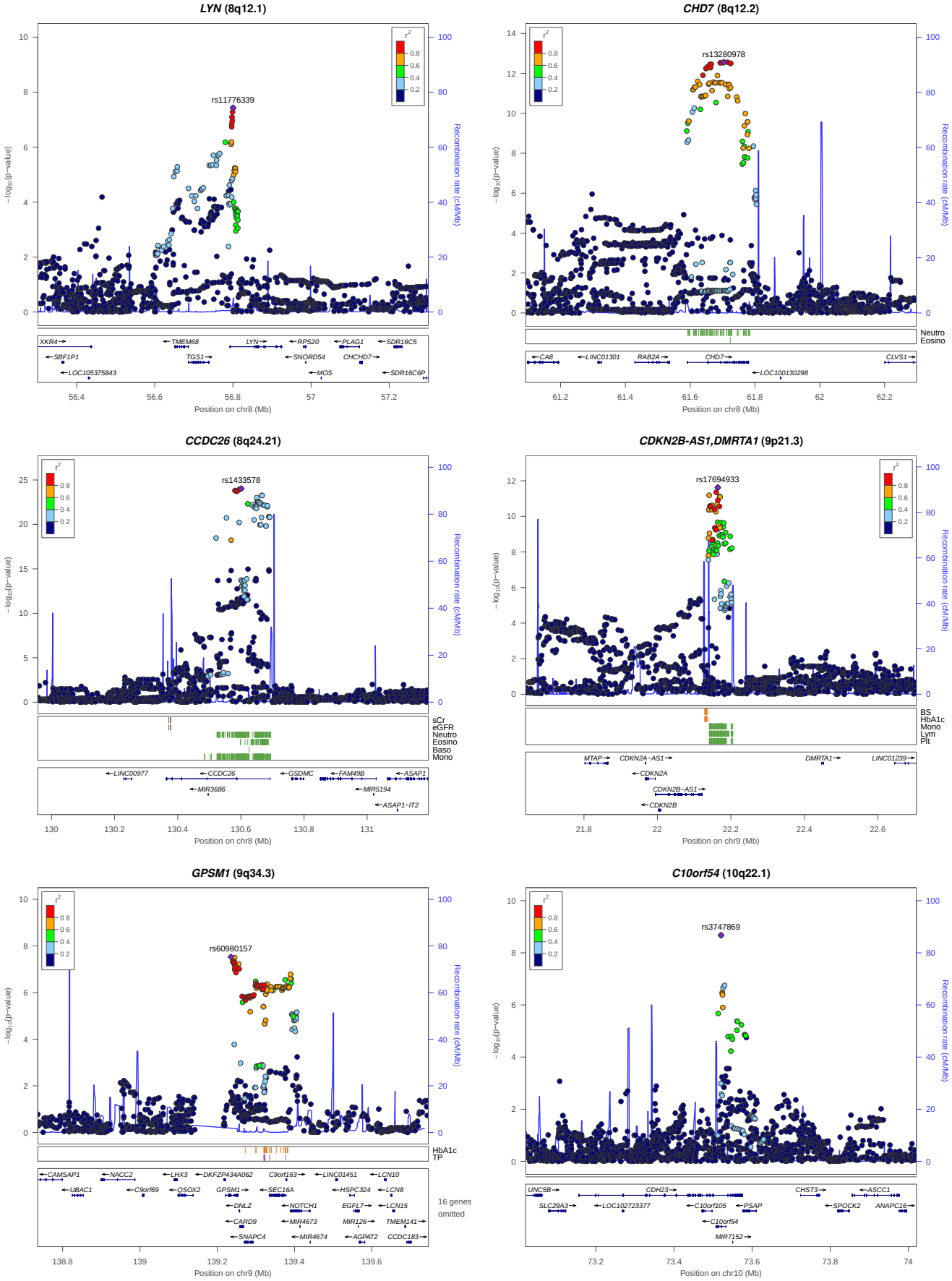

HLA-C,HLA-B (6p21.33)
rs114398276
HDL_C
Alb
NAP
AG
sCr
eGFR
Cl
P
TBil
AST
ALT
ALP
LDH
Neutro
Eosino
Baso
Mono
Lym
RBC
Hb
MCV
MCH
Plt
146 genes omitted
Position on chr6 (Mb)
Recombination rate (cM/Mb)

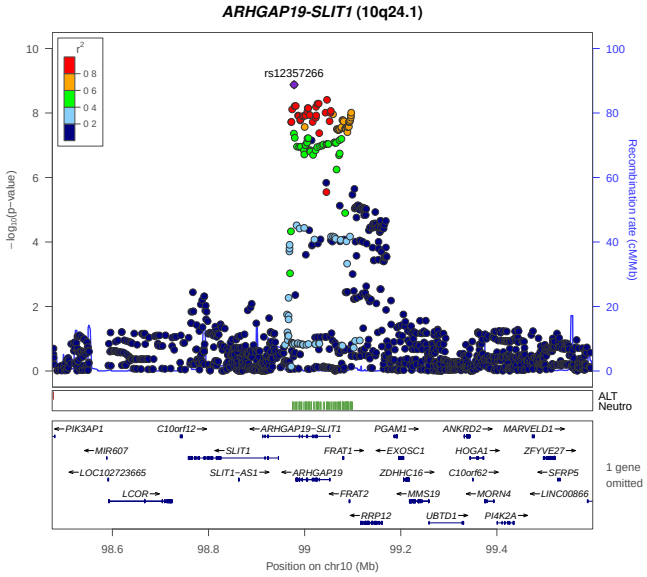

ETV7 (6p21.31)
rs9368924
Plt
Position on chr6 (Mb)
Recombination rate (cM/Mb)

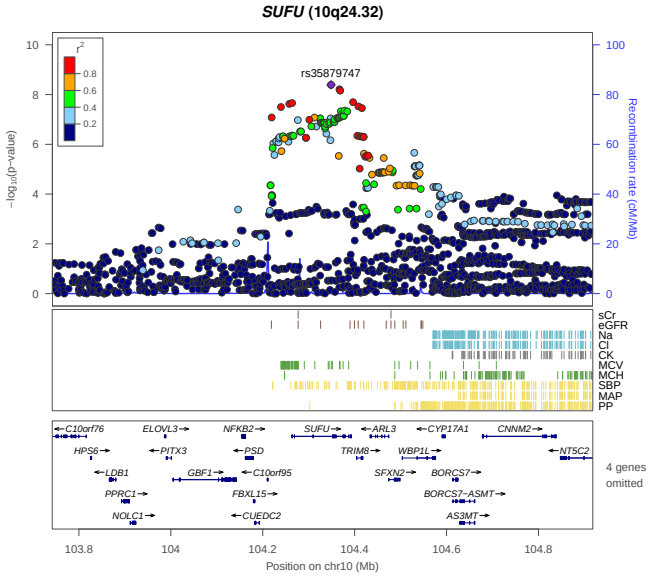

HBS1L,MYB (6q23.3)
rs9399136
HbA1c
AST
Eosino
RBC
Hb
Ht
MCV
MCH
MCHC
Plt
Position on chr6 (Mb)
Recombination rate (cM/Mb)

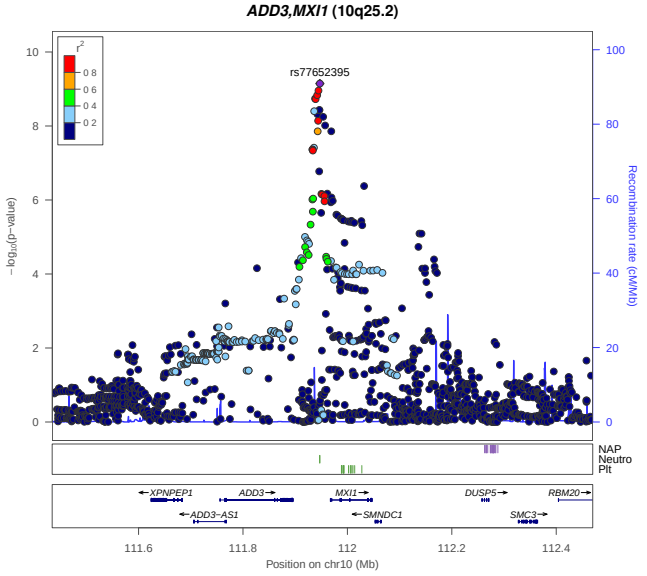

CREB5 (7p15.1)
rs57123607
ALT
Neutro
Position on chr7 (Mb)
Recombination rate (cM/Mb)

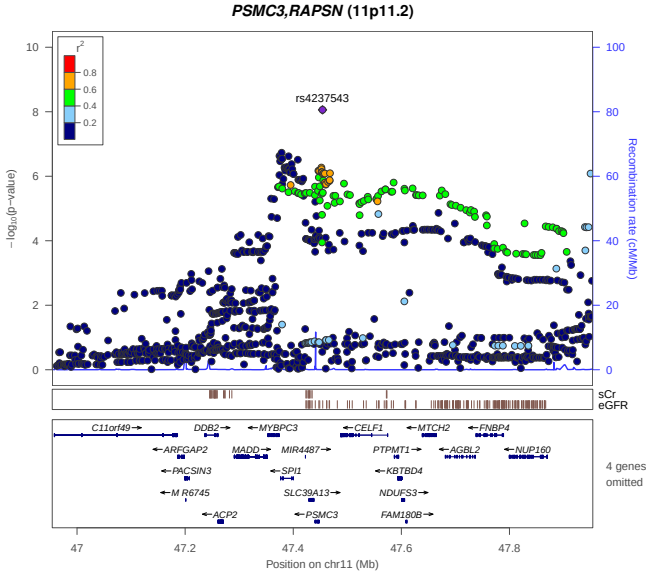

CDK6 (7q21.2)
rs445
Neutro
Eosino
Mono
RBC
MCV
MCH
1 gene omitted
Position on chr7 (Mb)
Recombination rate (cM/Mb)

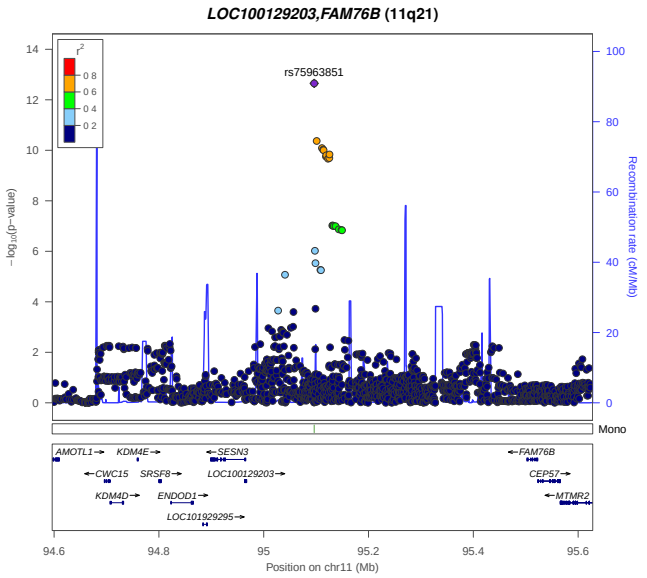

LYN (8q12.1)
rs11776339
CHD7 (8q12.2)
rs13280978
CCDC26 (8q24.21)
rs1433578
CDKN2B-AS1,DMRTA1 (9p21.3)
rs17694933
GPSM1 (9q34.3)
rs60980157
C10orf54 (10q22.1)
rs3747869
Position on chr8 (Mb)
Position on chr9 (Mb)
Position on chr10 (Mb)
Recombination rate (cM/Mb)
16 genes omitted

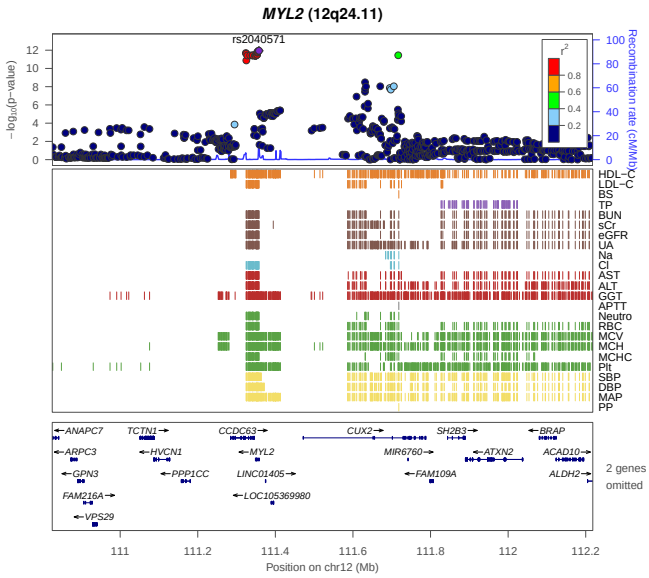

ARHGAP19-SLIT1 (10q24.1)
rs12357266
ALT
Neutro
1 gene
omitted
Position on chr10 (Mb)
Recombination rate (cM/Mb)

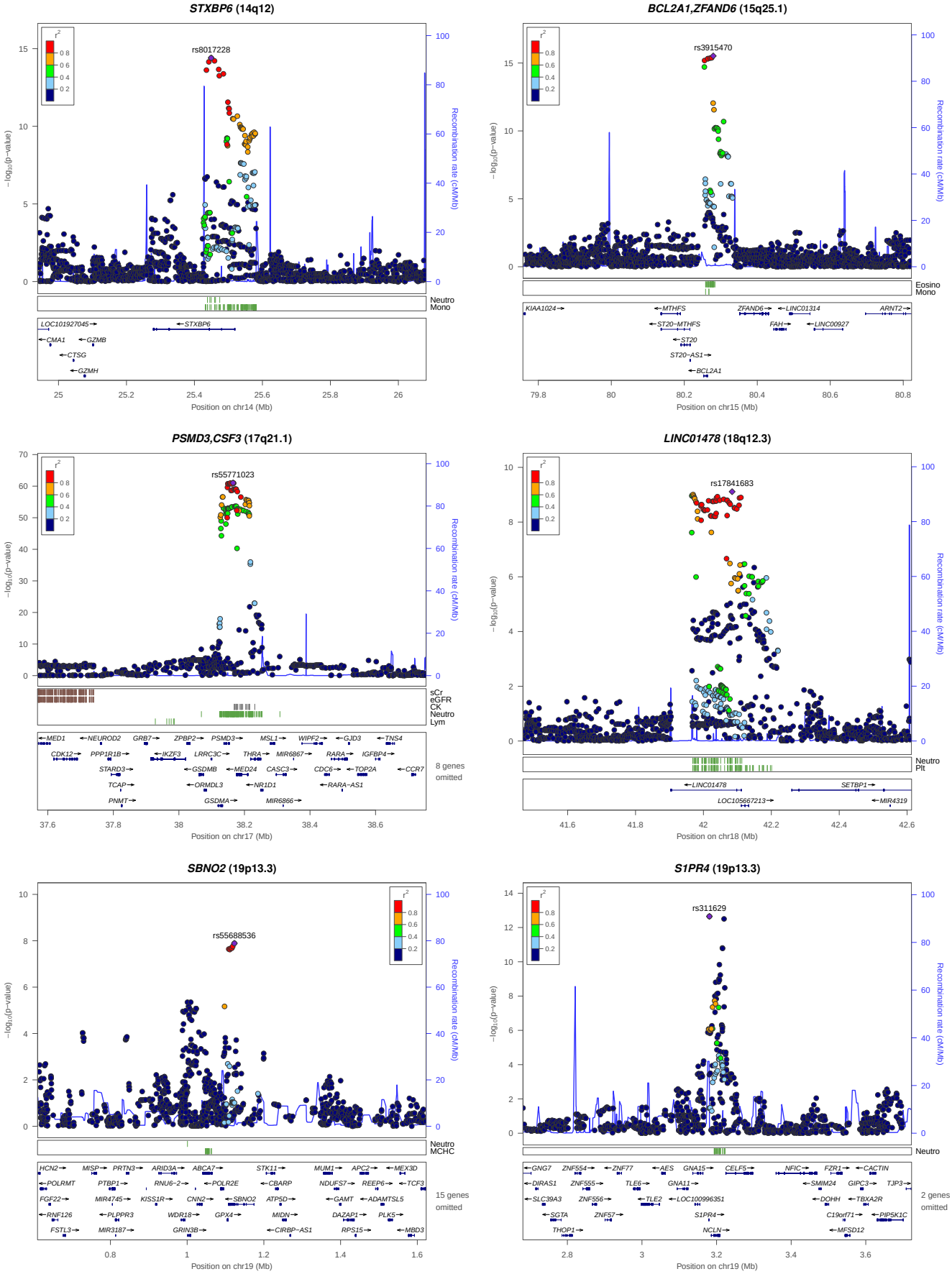

SUFU (10q24.32)
rs35879747
sCr
eGFR
Na
Cl
CK
MCV
MCH
SBP
MAP
PP
4 genes
omitted
Position on chr10 (Mb)
Recombination rate (cM/Mb)


ADD3,MXI1 (10q25.2)
rs77652395
NAP
Neutro
Plt
Position on chr10 (Mb)
Recombination rate (cM/Mb)

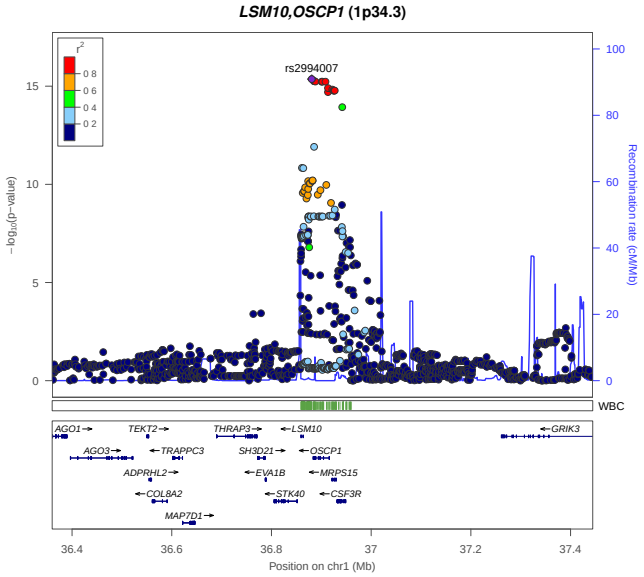

PSMC3,RAPSN (11p11.2)
rs4237543
sCr
eGFR
4 genes
omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)

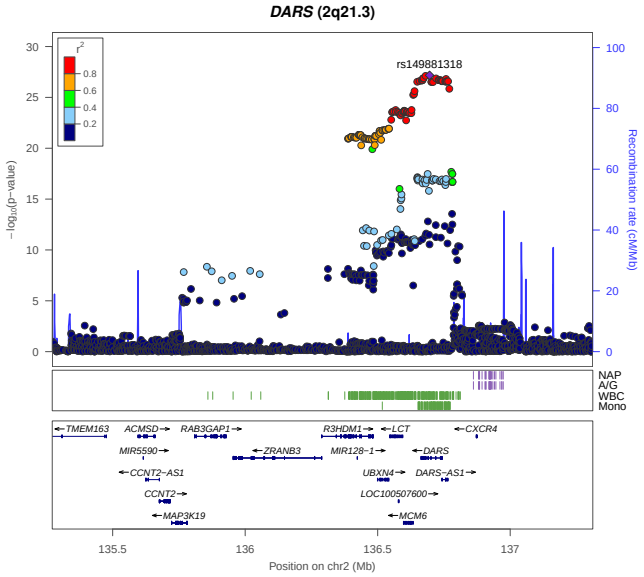

LOC100129203,FAM76B (11q21)
rs75963851
Mono
Position on chr11 (Mb)
Recombination rate (cM/Mb)

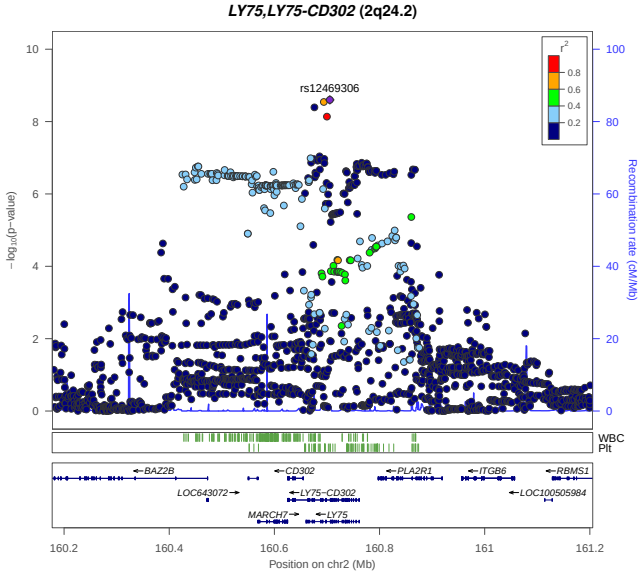

MYL2 (12q24.11)
rs2040571
HDL-C
LDL-C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
Neutro
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
2 genes
omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

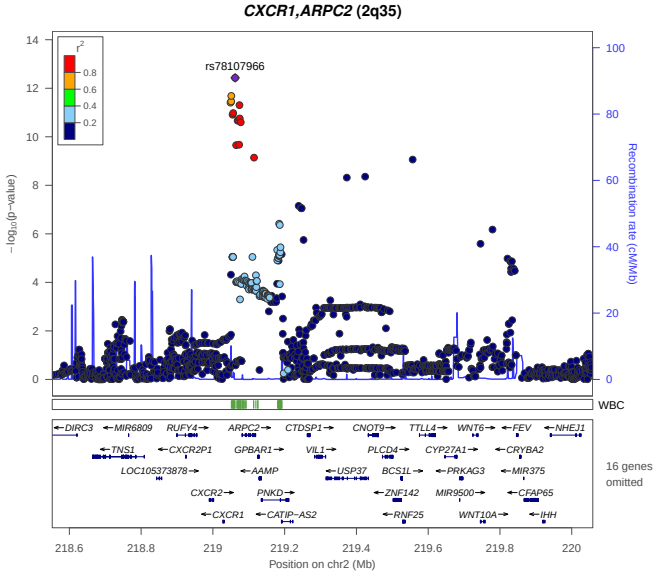

STXBP6 (14q12)
rs8017228
Neutro
Mono
LOC101927045
STXBP6
CMA1
GZMB
CTSG
GZMH
Position on chr14 (Mb)
BCL2A1,ZFAND6 (15q25.1)
rs3915470
Eosino
Mono
KIAA1024
MTHFS
ZFAND6
LINC01314
ARNT2
ST20−MTHFS
FAH
LINC00927
ST20
ST20−AS1
BCL2A1
Position on chr15 (Mb)
PSMD3,CSF3 (17q21.1)
rs55771023
sCr
eGFR
CK
Neutro
Lym
8 genes
omitted
Position on chr17 (Mb)
LINC01478 (18q12.3)
rs17841683
Neutro
Plt
LINC01478
SETBP1
LOC105967213
MIR4319
Position on chr18 (Mb)
SBNO2 (19p13.3)
rs55688536
Neutro
MCHC
15 genes
omitted
Position on chr19 (Mb)
S1PR4 (19p13.3)
rs311629
Neutro
2 genes
omitted
Position on chr19 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

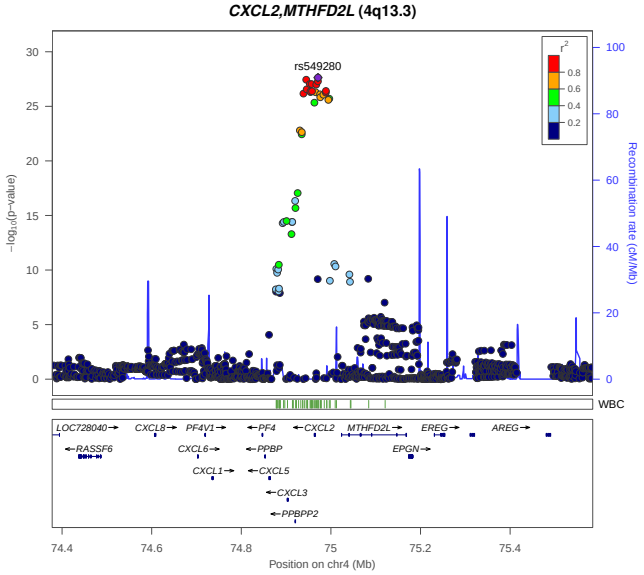
2.33 Neutro (n = 62,076)

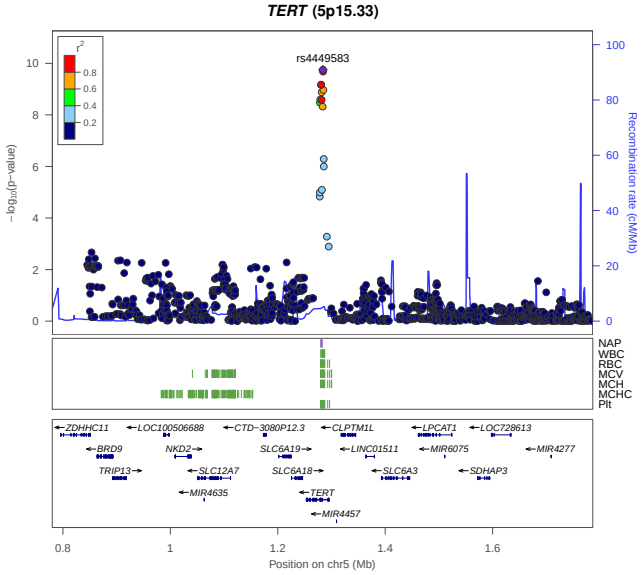


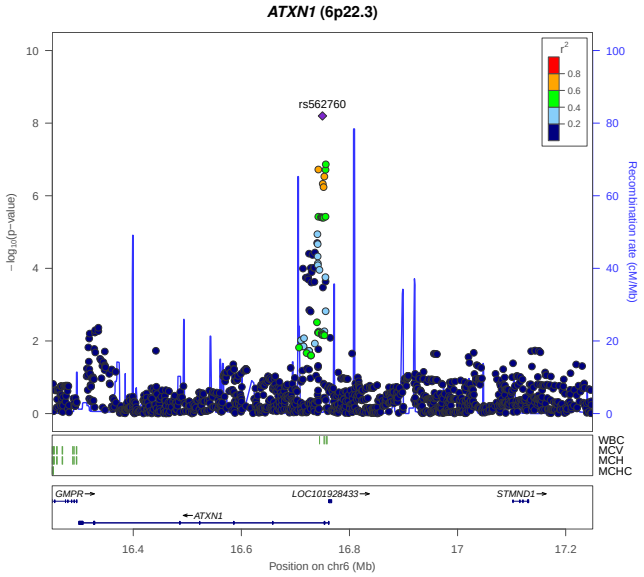


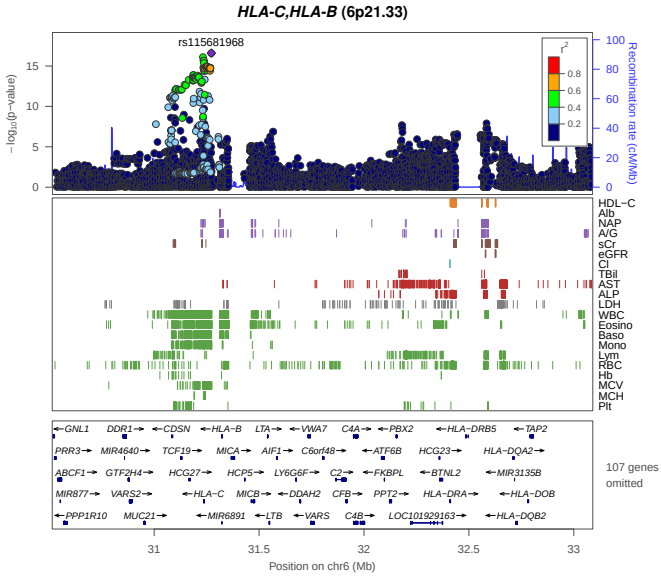


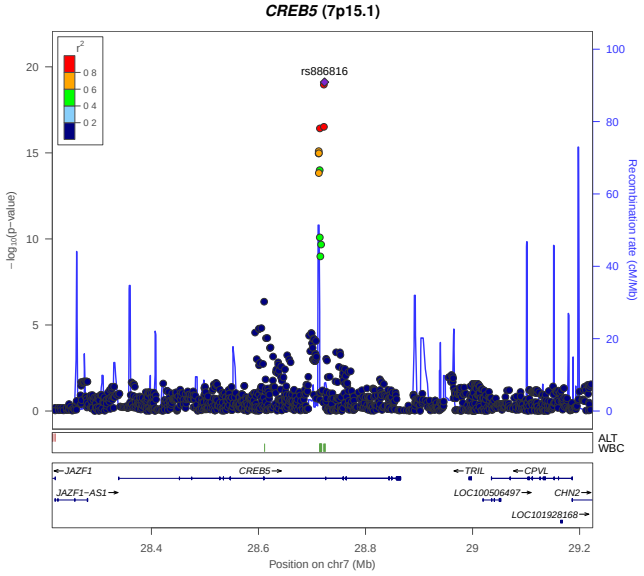


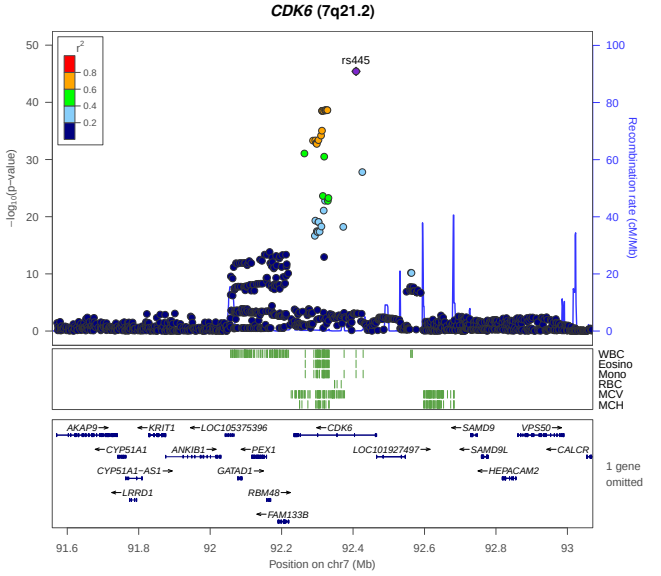


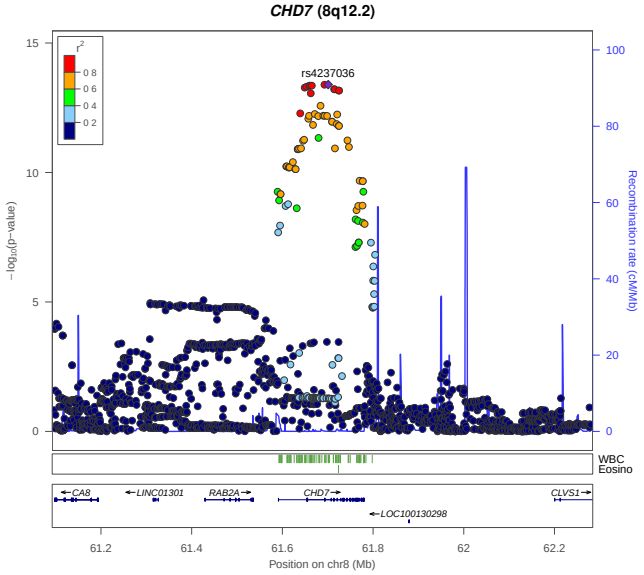


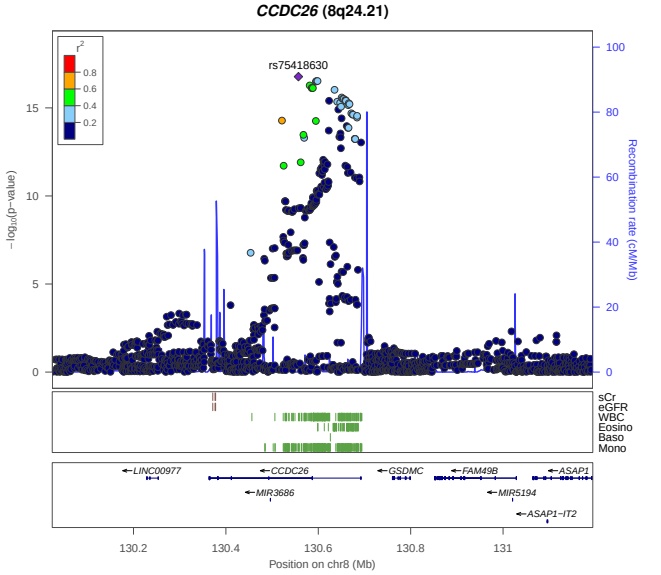

ATXN1 (6p22.3)
rs562760
−log10(p−value)
Recombination rate (cM/Mb)
WBC
MCV
MCH
MCHC
GMPR
LOC101928433
STMND1
ATXN1
Position on chr6 (Mb)

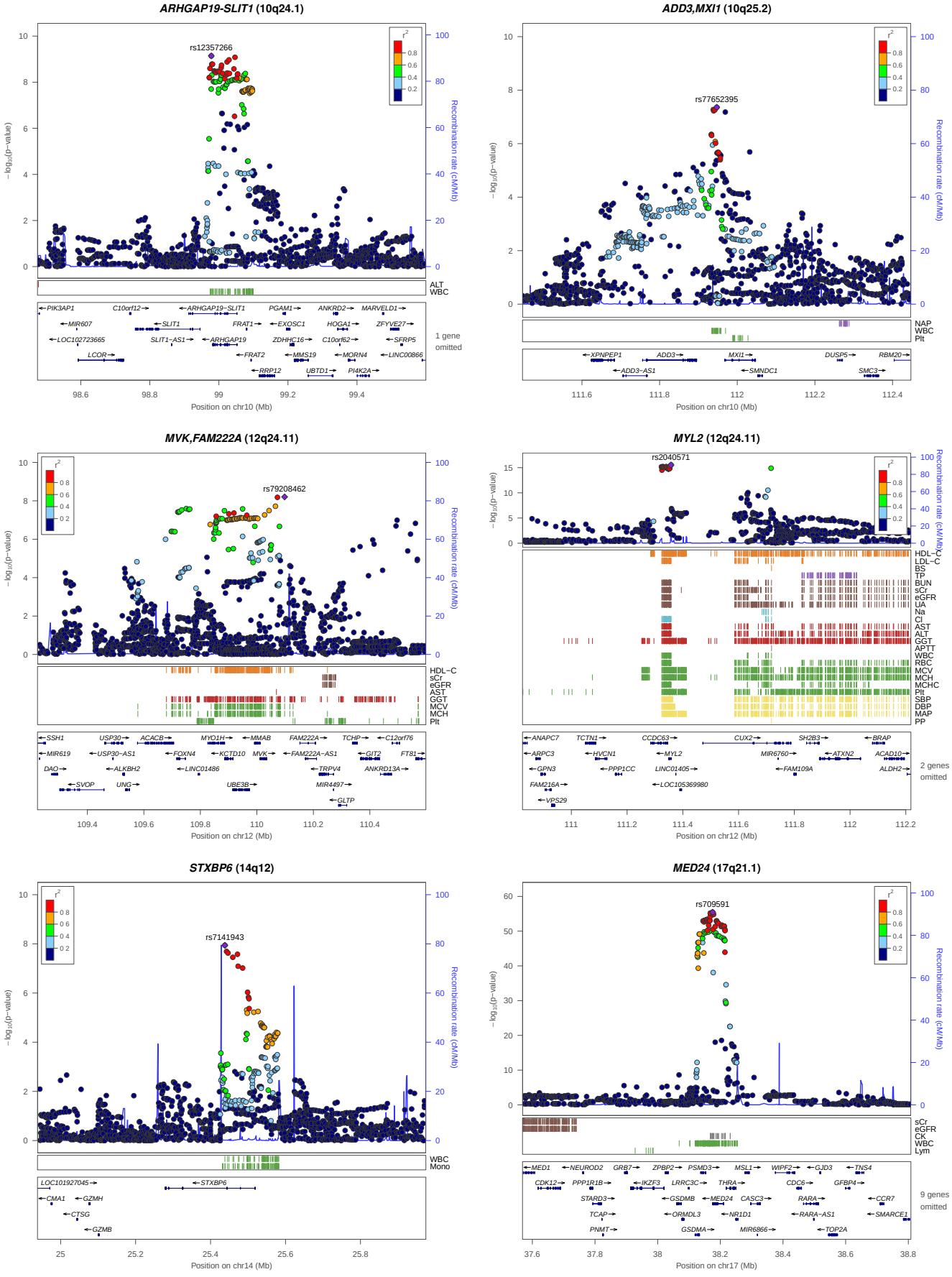

HLA-C,HLA-B (6p21.33)
rs115681968
−log10(p−value)
Recombination rate (cM/Mb)
HDL−C
Alb
NAP
A/G
sCr
eGFR
CI
TBil
AST
ALP
LDH
WBC
Eosino
Baso
Mono
Lym
RBC
Hb
MCV
MCH
Plt
GNL1 DDR1 CDSN HLA−B LTA VWA7 C4A PBX2 HLA−DRB5 TAP2
PRR3 MIR4640 TCF19 MICA AIF1 C6orf48 ATF6B HCG23 HLA−DQA2
ABCF1 GTF2H4 HCG27 HCP5 LY6G6F C2 FKBPL BTNL2 MIR3135B
MIR877 VARS2 HLA−C MICB DDAH2 CFB PPT2 HLA−DRA HLA−DOB
PPP1R10 MUC21 MIR6891 LTB VARS C4B LOC101929163 HLA−DQB2
107 genes omitted
Position on chr6 (Mb)


CREB5 (7p15.1)
rs886816
−log10(p−value)
Recombination rate (cM/Mb)
ALT
WBC
JAZF1
CREB5
TRIL
CPVL
JAZF1−AS1
LOC100506497
CHN2
LOC101928168
Position on chr7 (Mb)

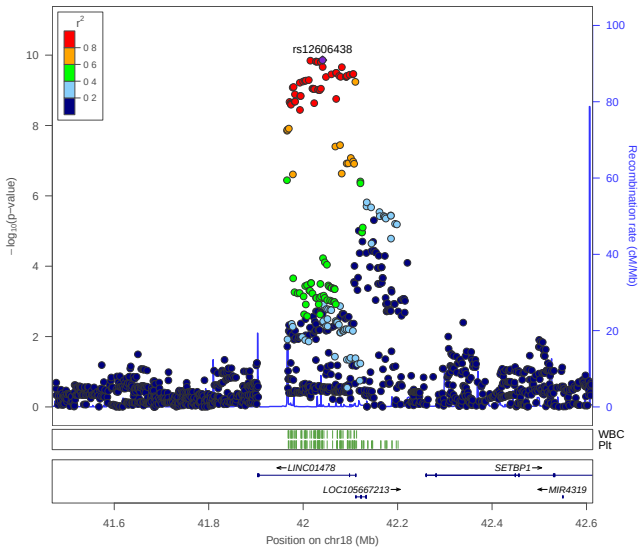

CDK6 (7q21.2)
rs445
−log10(p−value)
Recombination rate (cM/Mb)
WBC
Eosino
Mono
RBC
MCV
MCH
AKAP9 KRIT1 LOC105375396 CDK6 SAMD9 VPS50
CYP51A1 ANKIB1 PEX1 LOC101927497 SAMD9L CALCR
CYP51A1−AS1 GATAD1 HEPACAM2
LRRD1 RBM48
FAM133B
1 gene omitted
Position on chr7 (Mb)


CHD7 (8q12.2)
rs4237036
−log10(p−value)
Recombination rate (cM/Mb)
WBC
Eosino
CA8
LINC01301
RAB2A
CHD7
CLVS1
LOC100130298
Position on chr8 (Mb)

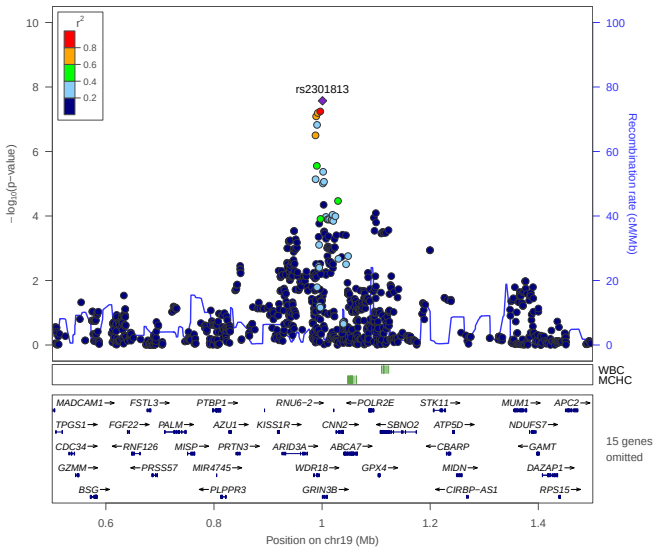

CCDC26 (8q24.21)
rs75418630
−log10(p−value)
Recombination rate (cM/Mb)
sCr
eGFR
WBC
Eosino
Baso
Mono
LINC00977
CCDC26
GSDMC
FAM49B
ASAP1
MIR3686
MIR5194
ASAP1−IT2
Position on chr8 (Mb)


ARHGAP19-SLIT1 (10q24.1)
rs12357266
ALT
WBC
1 gene omitted
Position on chr10 (Mb)
ADD3,MXI1 (10q25.2)
rs77652395
NAP
WBC
Plt
Position on chr10 (Mb)
MVK,FAM222A (12q24.11)
rs79208462
HDL
sCr
eGFR
AST
GGT
MCV
MCH
Plt
Position on chr12 (Mb)
MYL2 (12q24.11)
rs2040571
HDL
LDL
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
RBC
MCV
MCH
MCHC
Plt
SBP
DBP
MAP
PP
2 genes omitted
Position on chr12 (Mb)
STXBP6 (14q12)
rs7141943
WBC
Mono
Position on chr14 (Mb)
MED24 (17q21.1)
rs709591
sCr
eGFR
CK
WBC
Lym
9 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)

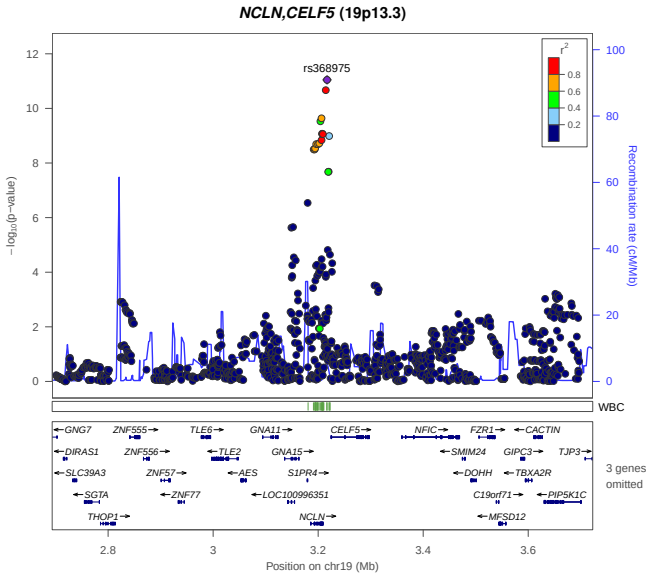
LINC01478 **(18q12.3)**



GRIN3B **(19p13.3)**

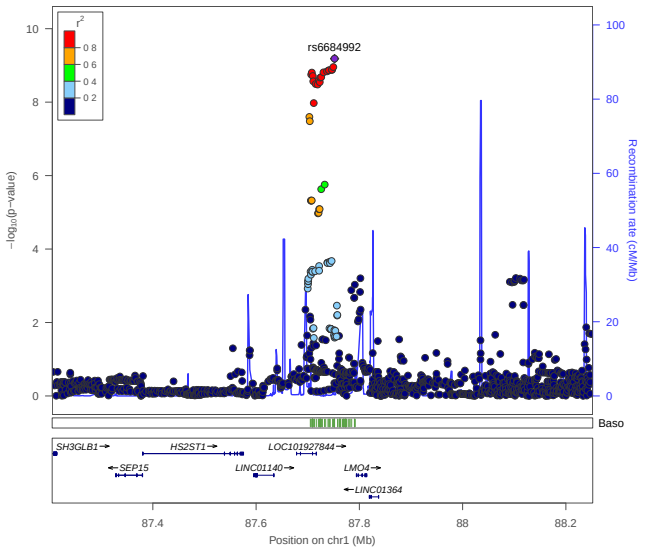


NCLN,CELF5 **(19p13.3)**

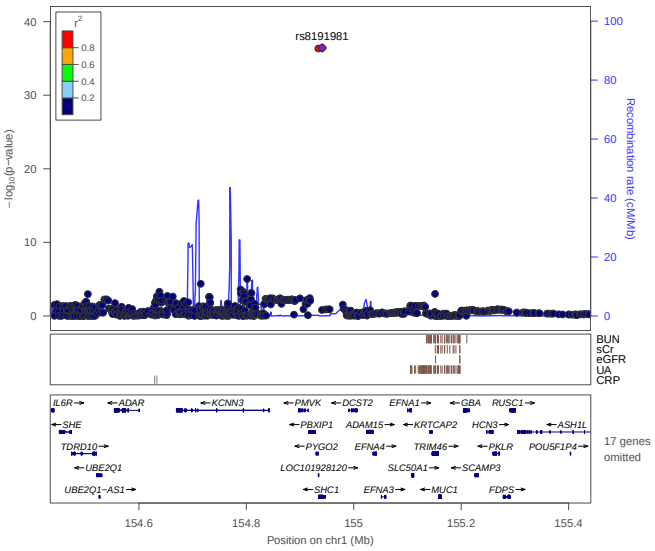


2.34 Eosino (n = 62,076)

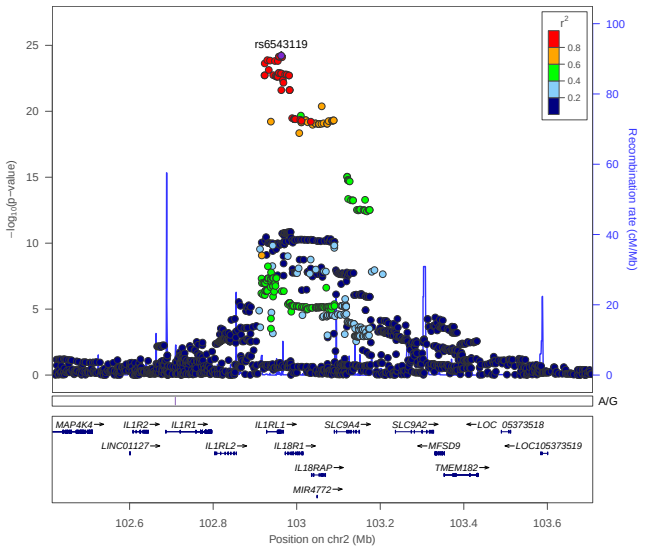
LOC101927844,LMO4 **(1p22.3)**



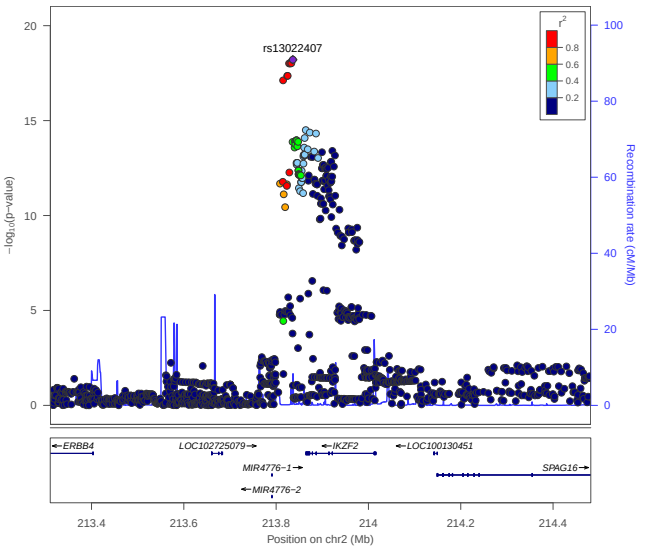
SHC1 **(1q21.3)**



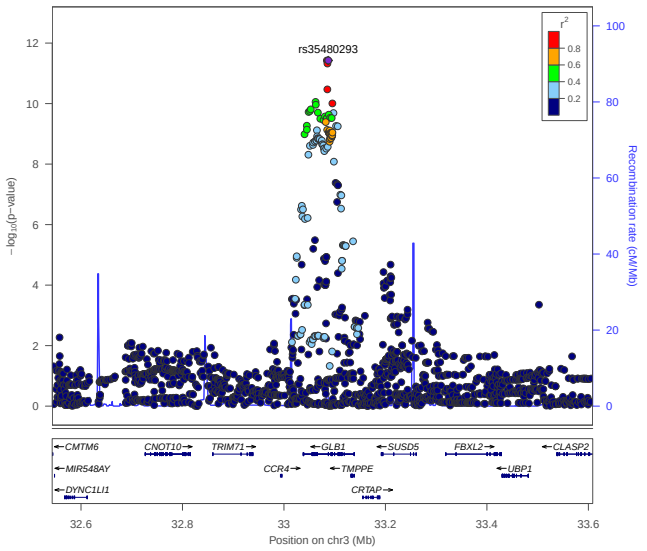
IL1RL1 **(2q12.1)**



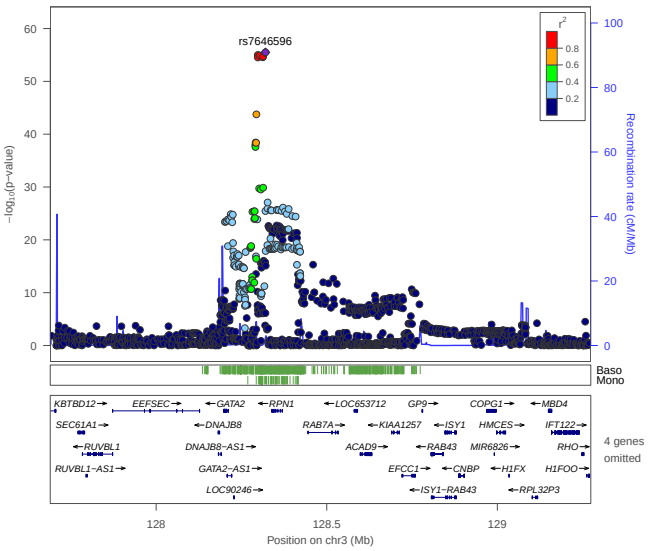
MIR4776-2,IKZF2 **(2q34)**

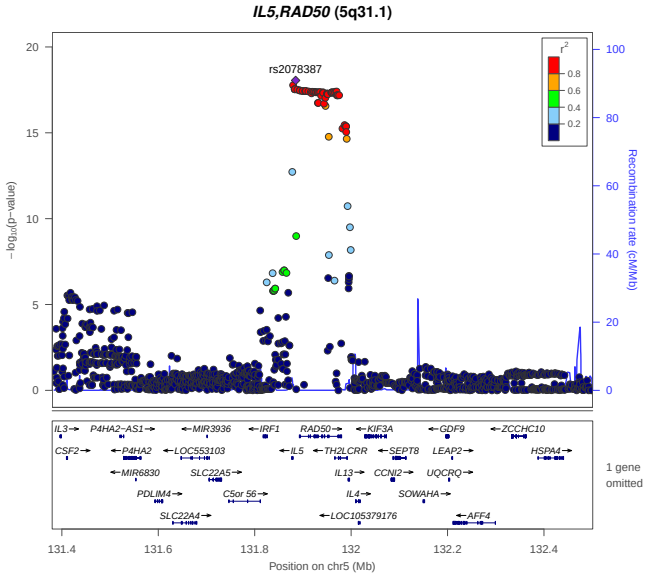


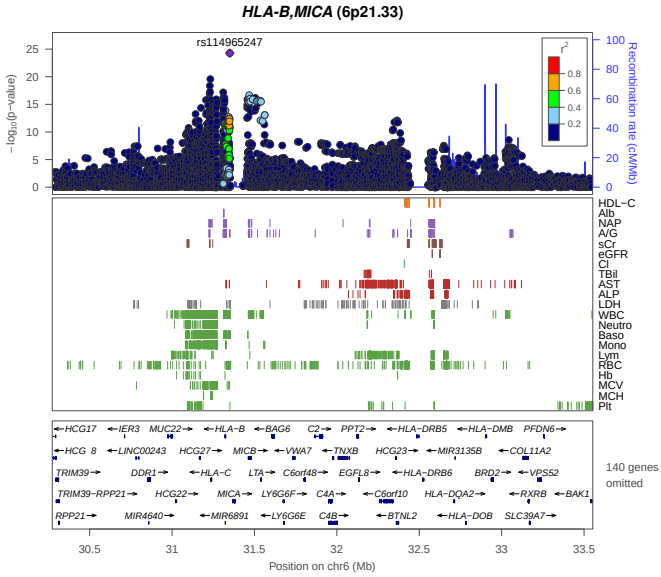
GLB1 **(3p22.3)**

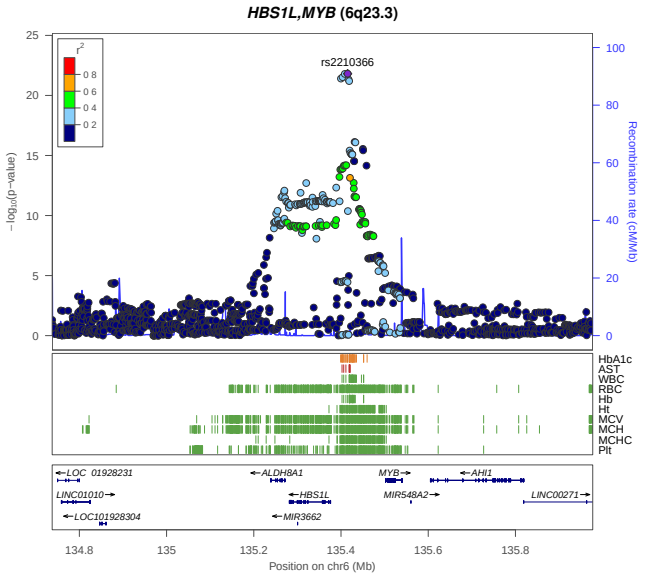


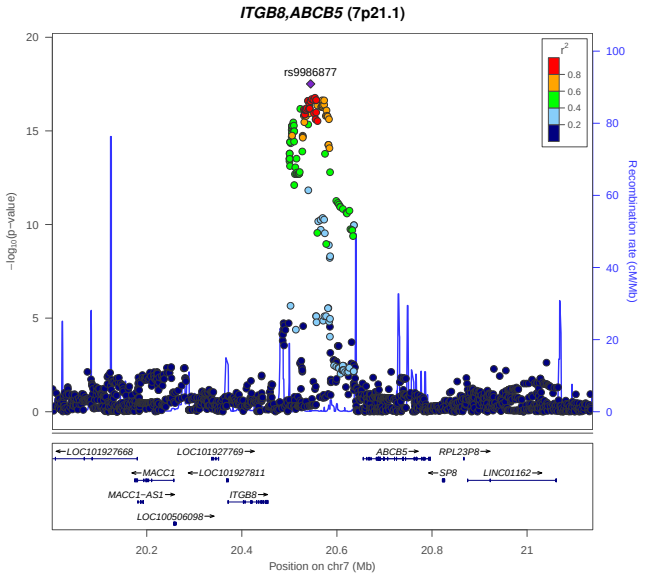
LINC01565,RPN1 **(3q21.3)**

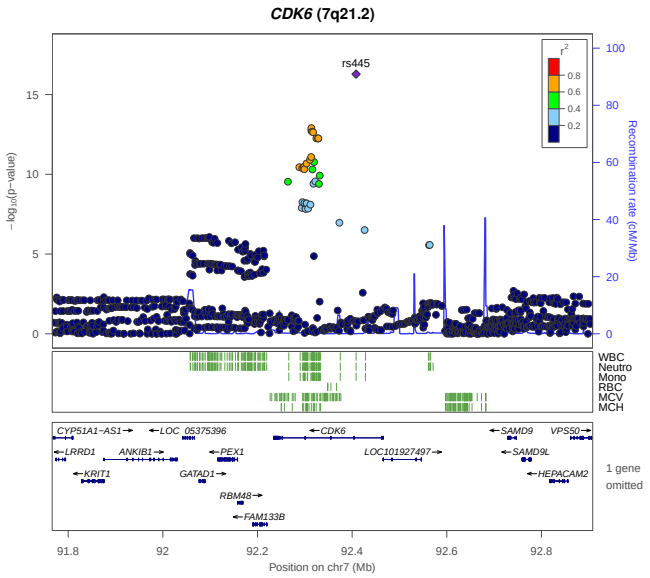


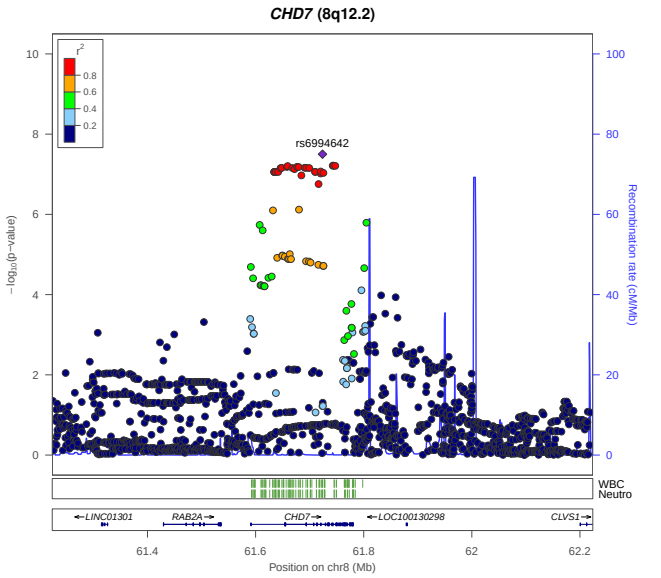

IL5,RAD50 (5q31.1)
rs2078387
Position on chr5 (Mb)
1 gene omitted


HLA-B,MICA (6p21.33)
rs114965247
Position on chr6 (Mb)
140 genes omitted

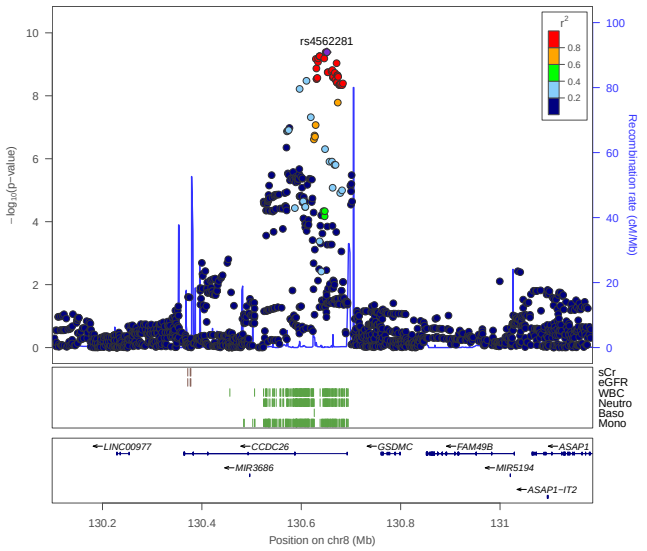

HBS1L,MYB (6q23.3)
rs2210366
Position on chr6 (Mb)


ITGB8,ABCB5 (7p21.1)
rs9986877
Position on chr7 (Mb)

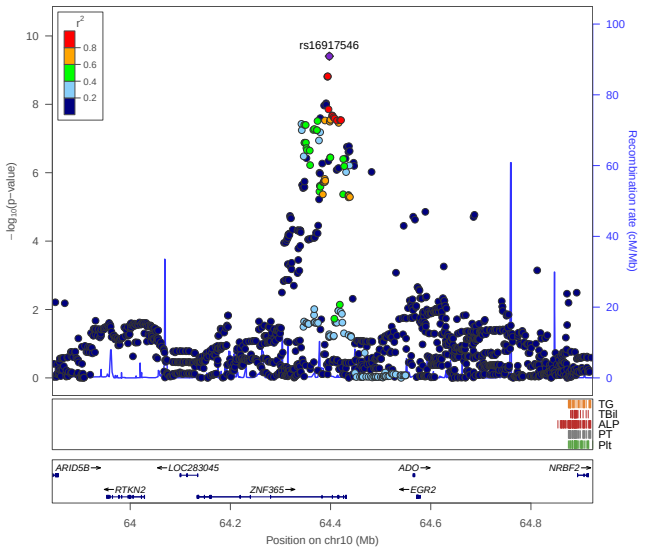

CDK6 (7q21.2)
rs445
Position on chr7 (Mb)
1 gene omitted


CHD7 (8q12.2)
rs6994642
Position on chr8 (Mb)

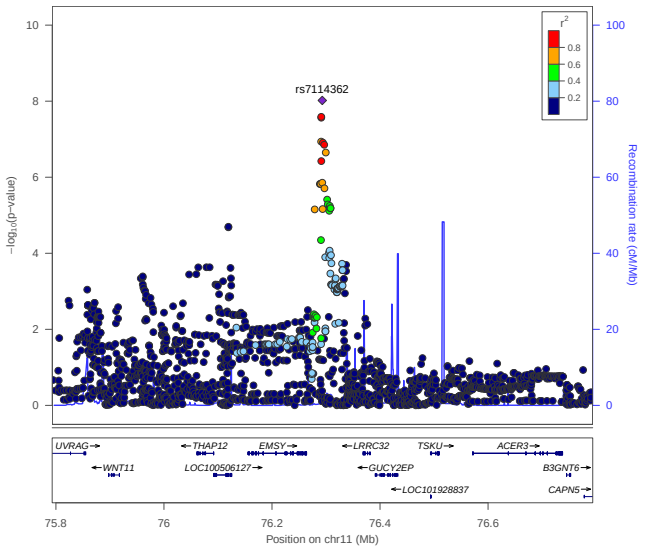
***CCDC26* (8q24.21)**



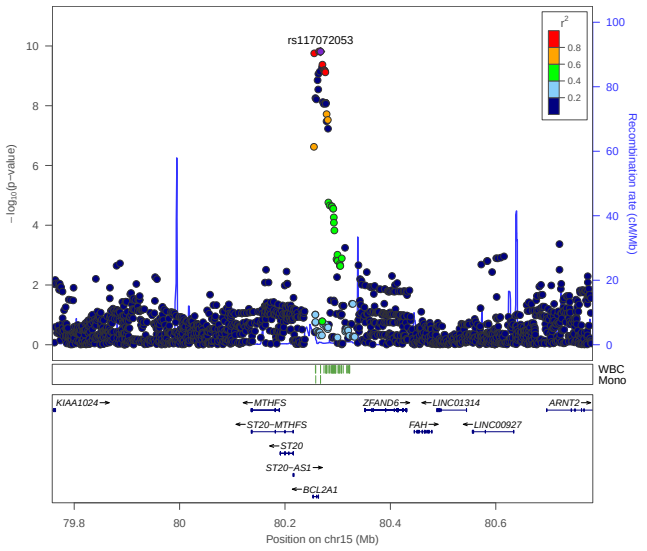
***ZNF365* (10q21.2)**



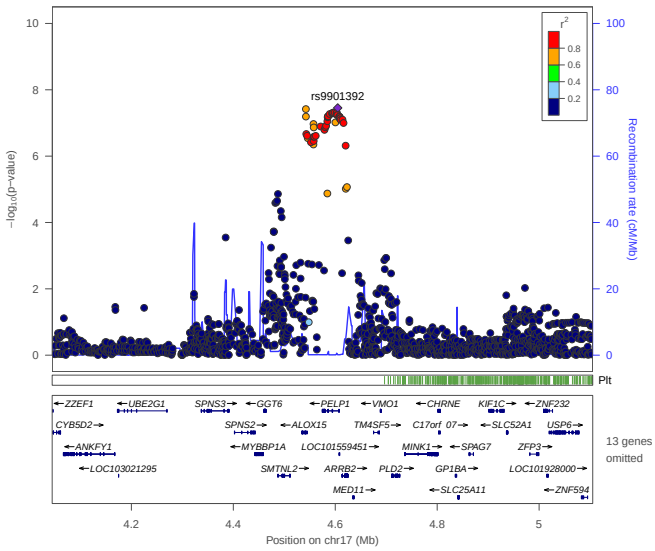
***EMSY,LRRC32* (11q13.5)**



***BCL2A1,ZFAND6* (15q25.1)**

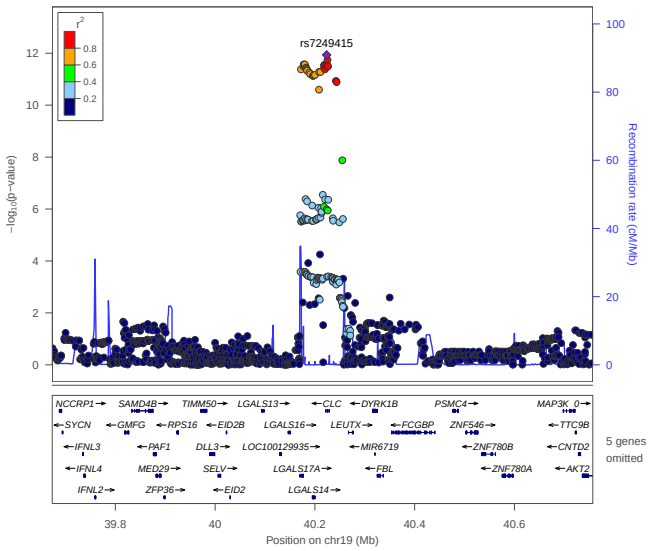


***PELP1* (17p13.2)**



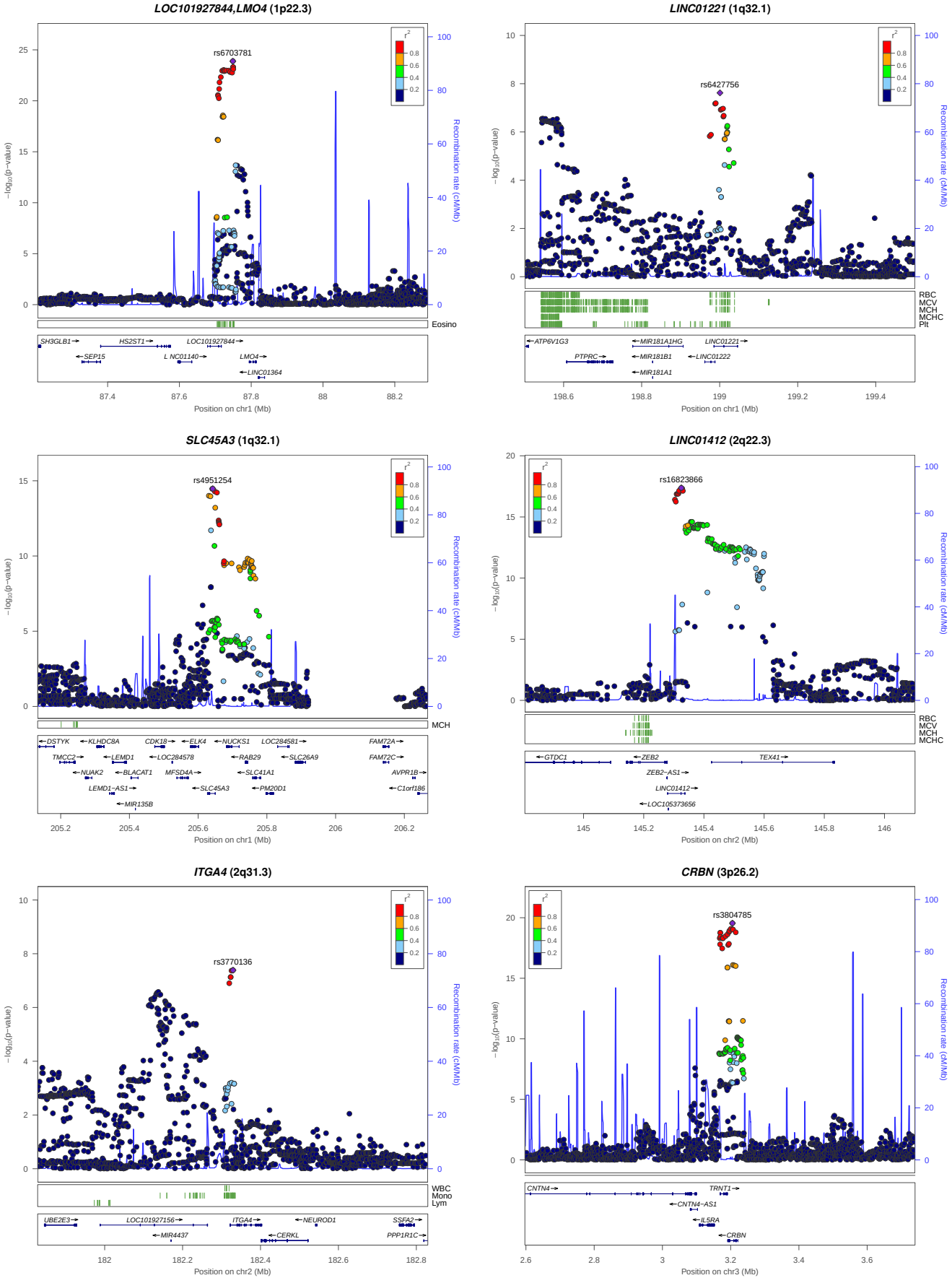
13 genes omitted

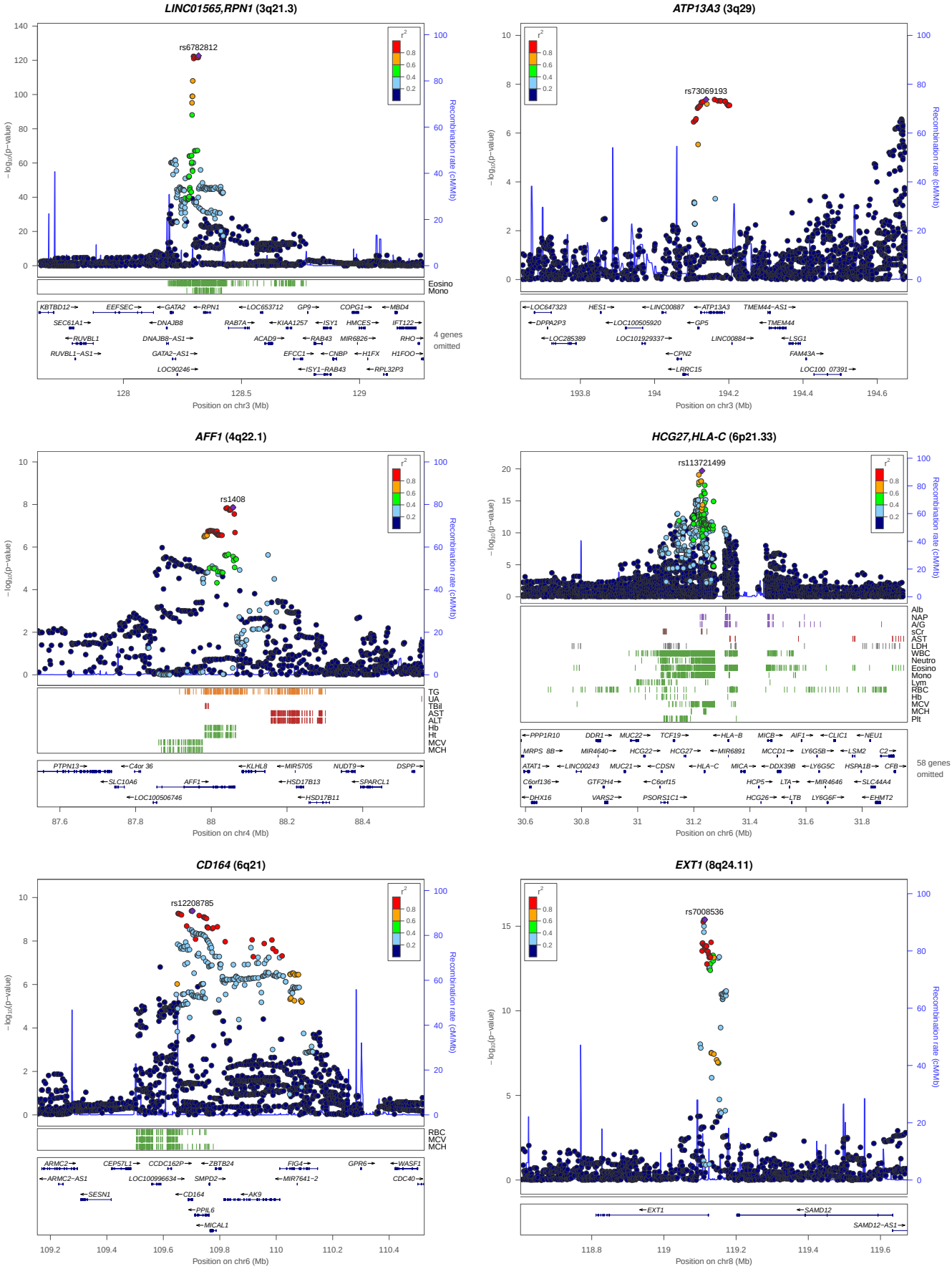
***CLC* (19q13.2)**

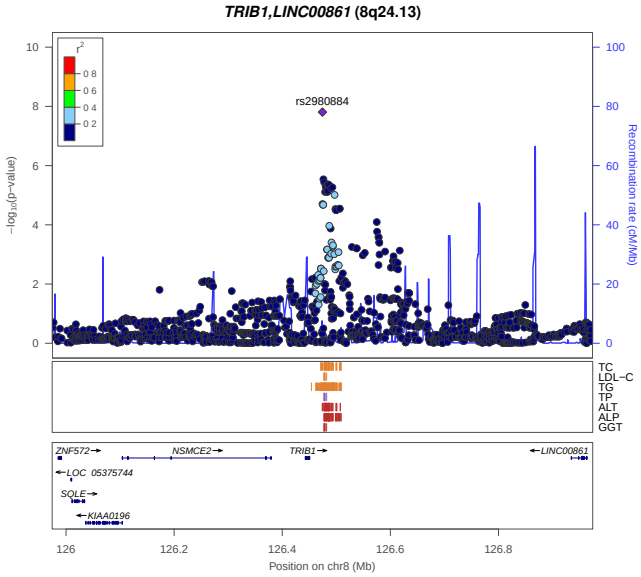


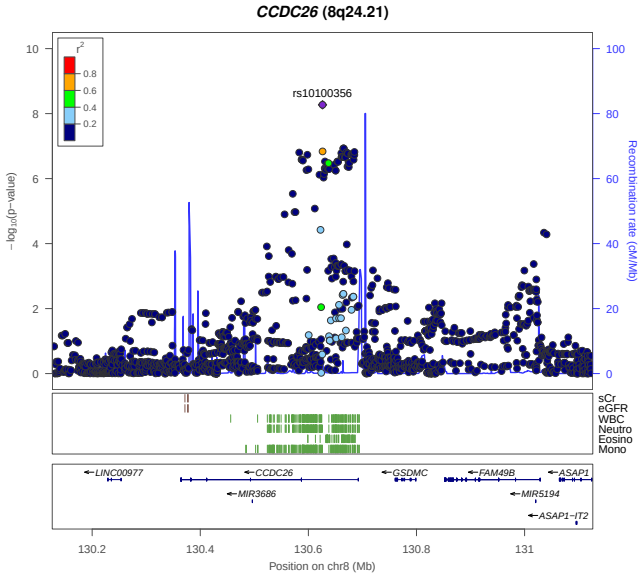
5 genes omitted

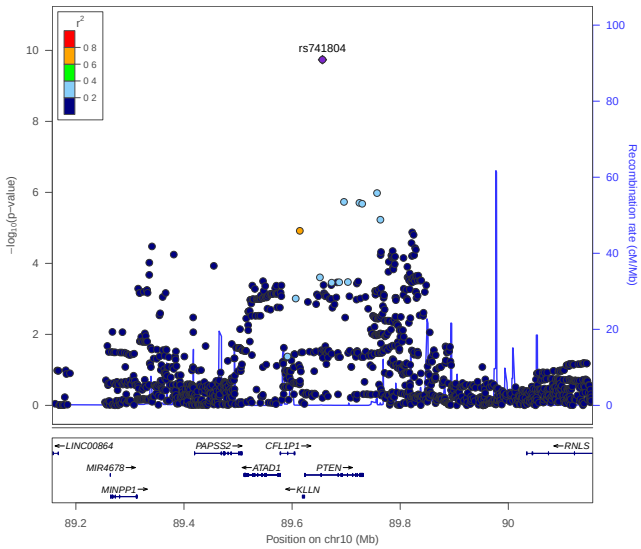
2.35 Baso (n = 62,076)

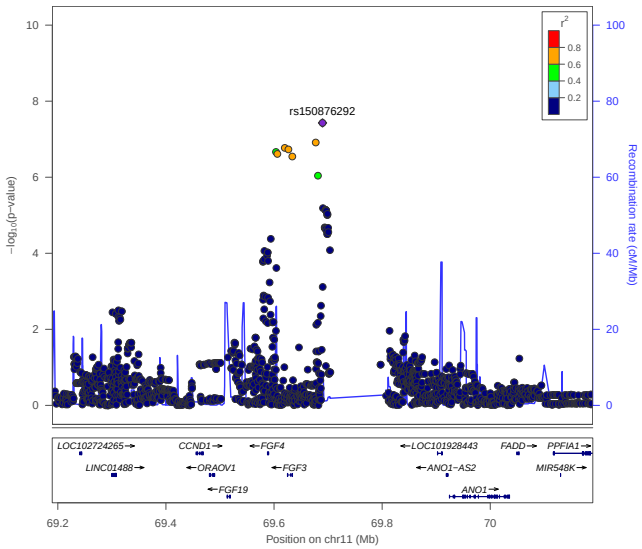


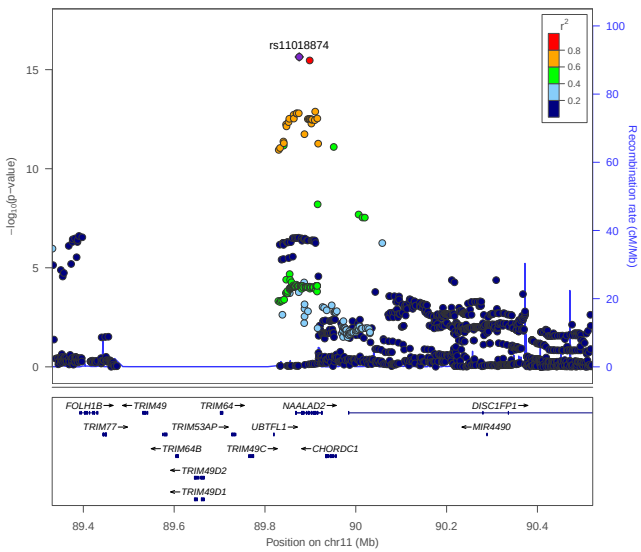

LINC01565,RPN1 (3q21.3)
rs6782812
Eosino
Mono
4 genes omitted
Position on chr3 (Mb)
ATP13A3 (3q29)
rs73069193
Position on chr3 (Mb)
AFF1 (4q22.1)
rs1408
TG
UA
TBil
AST
ALT
Hb
Ht
MCV
MCH
Position on chr4 (Mb)
HCG27,HLA-C (6p21.33)
rs113721499
Alb
NAP
A/G
sCr
AST
LDH
WBC
Neutro
Eosino
Mono
Lym
RBC
Hb
MCV
MCH
Plt
58 genes omitted
Position on chr6 (Mb)
CD164 (6q21)
rs12208785
RBC
MCV
MCH
Position on chr6 (Mb)
EXT1 (8q24.11)
rs7008536
Position on chr8 (Mb)
Recombination rate (cM/Mb)

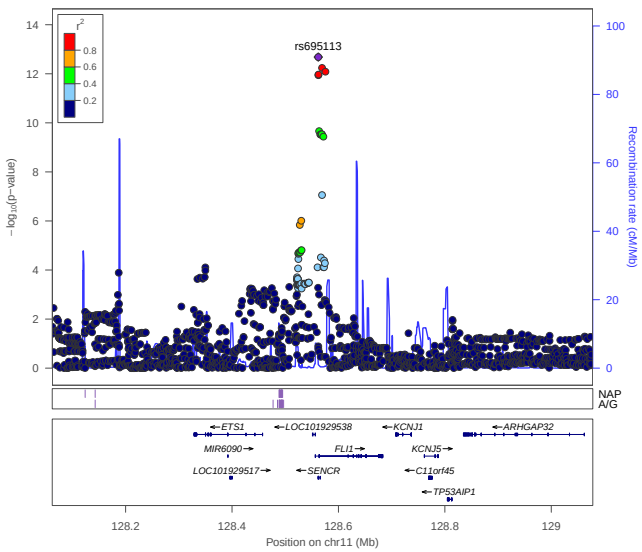

TRIB1,LINC00861 (8q24.13)
rs2980884
TC
LDL−C
TG
TP
ALT
ALP
GGT
ZNF572
NSMCE2
TRIB1
LINC00861
LOC 05375744
SQLE
KIAA0196
Position on chr8 (Mb)
Recombination rate (cM/Mb)

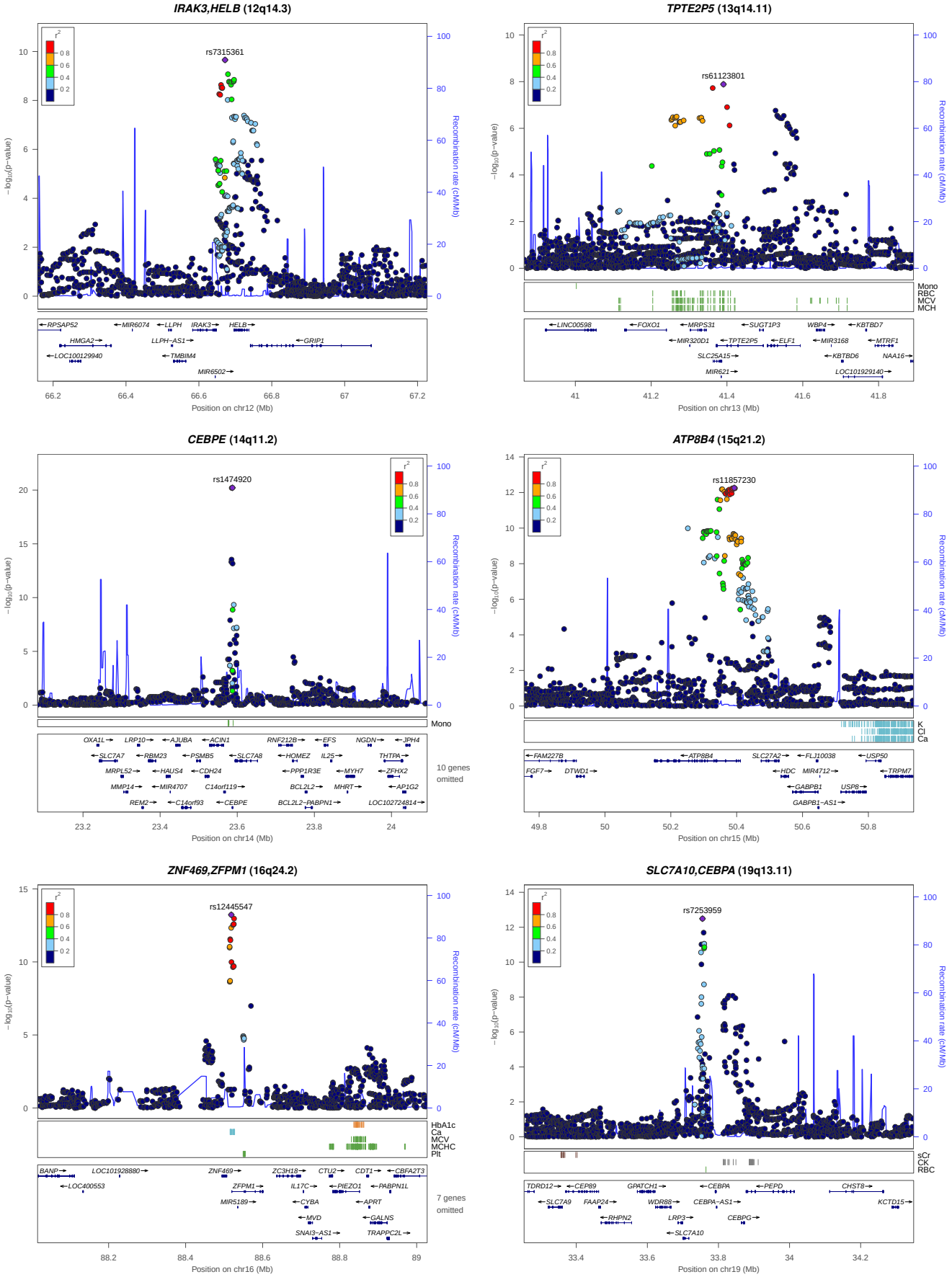

CCDC26 (8q24.21)
rs10100356
sCr
eGFR
WBC
Neutro
Eosino
Mono
LINC00977
CCDC26
GSDMC
FAM49B
ASAP1
MIR3686
MIR5194
ASAP1−IT2
Position on chr8 (Mb)
Recombination rate (cM/Mb)

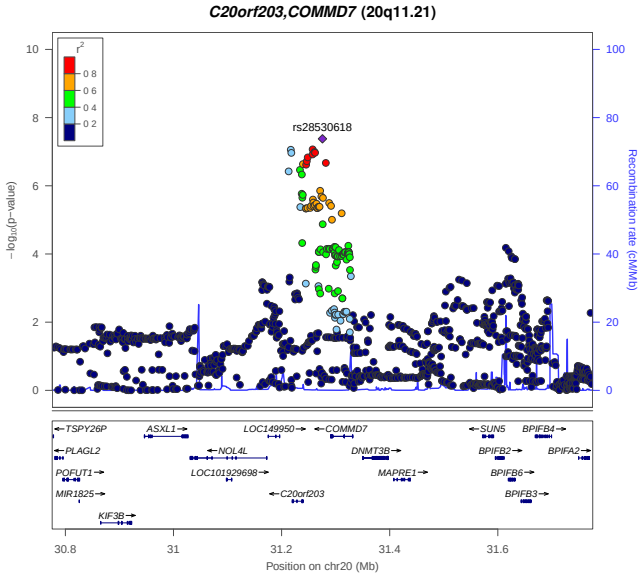

PTEN (10q23.31)
rs741804
LINC00864
PAPSS2
CFL1P1
RNLS
MIR4678
ATAD1
PTEN
MINPP1
KLLN
Position on chr10 (Mb)
Recombination rate (cM/Mb)

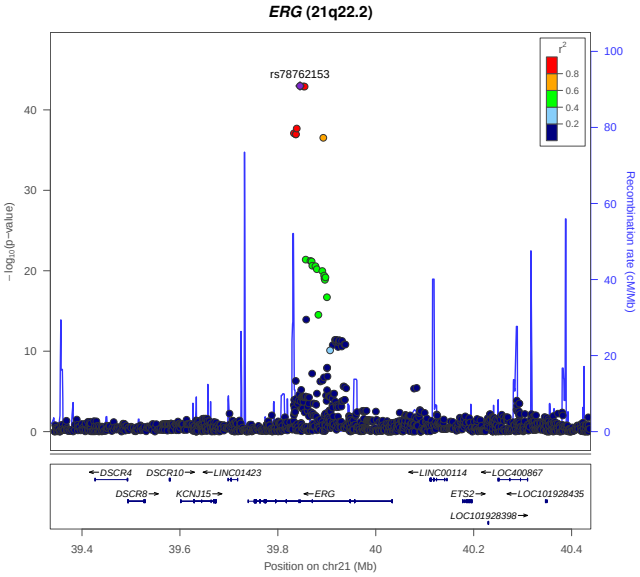

FGF3,LOC101928443 (11q13.3)
rs150876292
LOC102724265
CCND1
FGF4
LOC101928443
FADD
PPFIA1
LINC01488
ORAOV1
FGF3
ANO1−AS2
MIR548K
FGF19
ANO1
Position on chr11 (Mb)
Recombination rate (cM/Mb)


NAALAD2 (11q14.3)
rs11018874
FOLH1B
TRIM49
TRIM64
NAALAD2
DISC1FP1
TRIM77
TRIM53AP
UBTFL1
MIR4490
TRIM64B
TRIM49C
CHORDC1
TRIM49D2
TRIM49D1
Position on chr11 (Mb)
Recombination rate (cM/Mb)

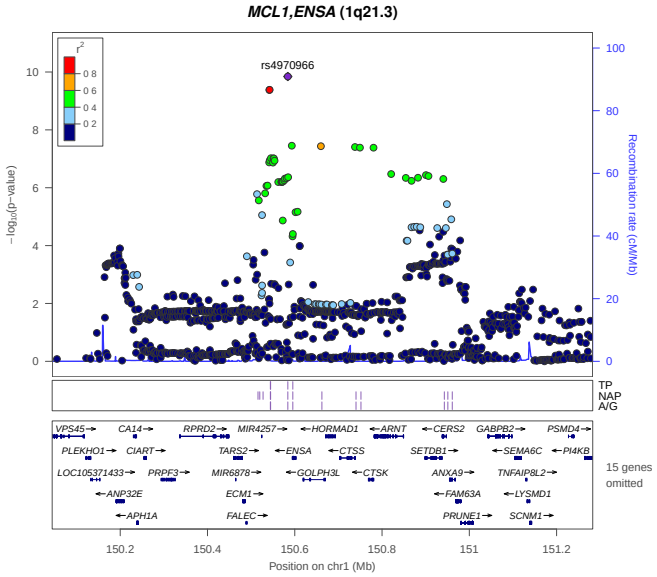

SENCR (11q24.3)
rs695113
NAP
A/G
ETS1
LOC101929538
KCNJ1
ARHGAP32
MIR6090
FLI1
KCNJ5
LOC101929517
SENCR
C11orf45
TP53AIP1
Position on chr11 (Mb)
Recombination rate (cM/Mb)

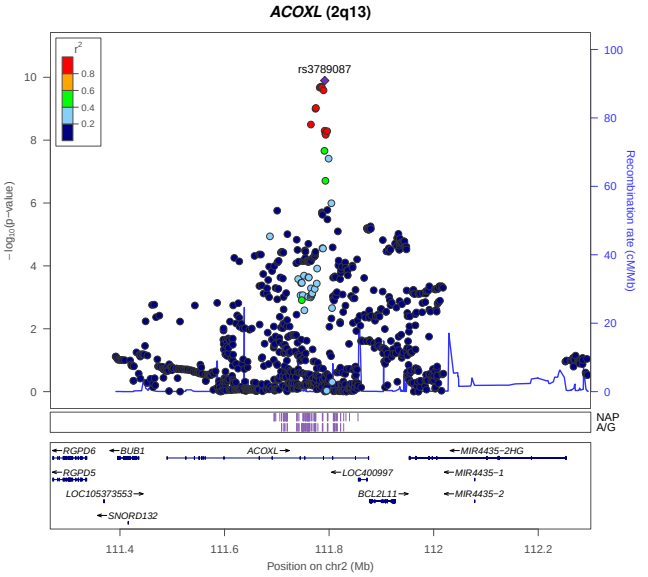

IRAK3,HELB (12q14.3)
rs7315361
TPTE2P5 (13q14.11)
rs61123801
CEBPE (14q11.2)
rs1474920
ATP8B4 (15q21.2)
rs11857230
ZNF469,ZFPM1 (16q24.2)
rs12445547
SLC7A10,CEBPA (19q13.11)
rs7253959
Recombination rate (cM/Mb)
Position on chr12 (Mb)
Position on chr13 (Mb)
Position on chr14 (Mb)
Position on chr15 (Mb)
Position on chr16 (Mb)
Position on chr19 (Mb)
Mono
RBC
MCV
MCH
K
Cl
Ca
HbA1c
Ca
MCV
MCHC
Plt
sCr
CK
RBC
10 genes omitted
7 genes omitted

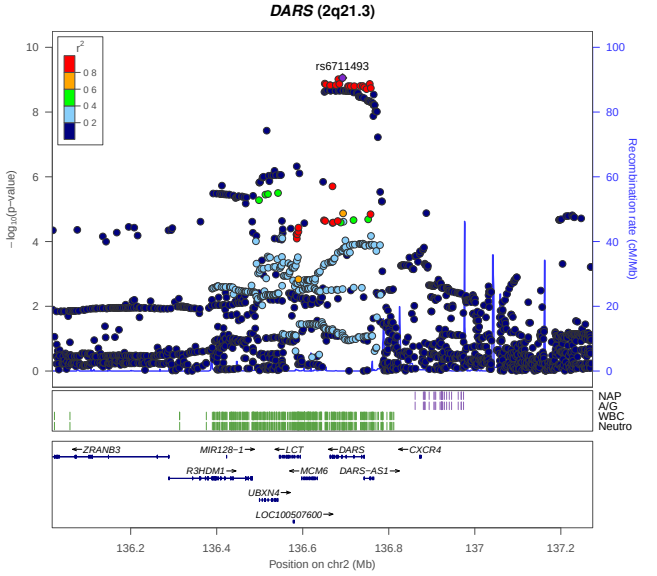

C20orf203,COMMD7 (20q11.21)
rs28530618
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
TSPY26P
ASXL1
LOC149950
COMMD7
SUN5
BPIFB4
PLAGL2
NOL4L
DNMT3B
BPIFB2
BPIFA2
POFUT1
LOC101929698
MAPRE1
BPIFB6
MIR1825
C20orf203
BPIFB3
KIF3B
30.8
31
31.2
31.4
31.6
Position on chr20 (Mb)

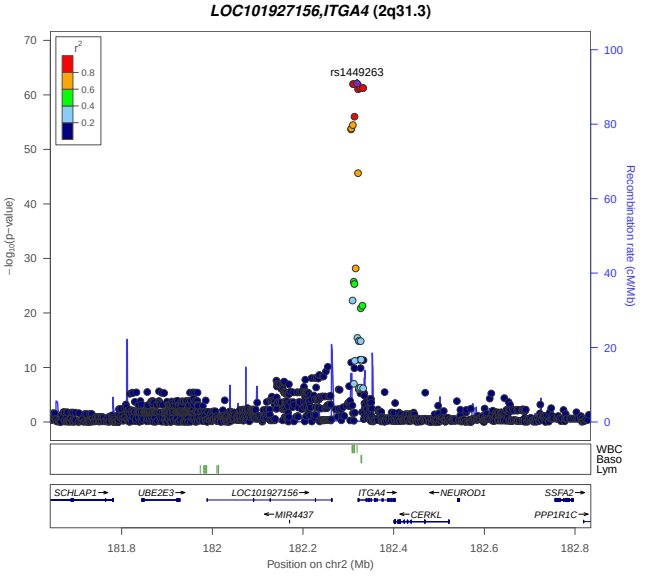

ERG (21q22.2)
rs78762153
r²
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
DSCR4
DSCR10
LINC01423
LINC00114
LOC400867
DSCR8
KCNJ15
ERG
ETS2
LOC101928435
LOC101928398
39.4
39.6
39.8
40
40.2
40.4
Position on chr21 (Mb)

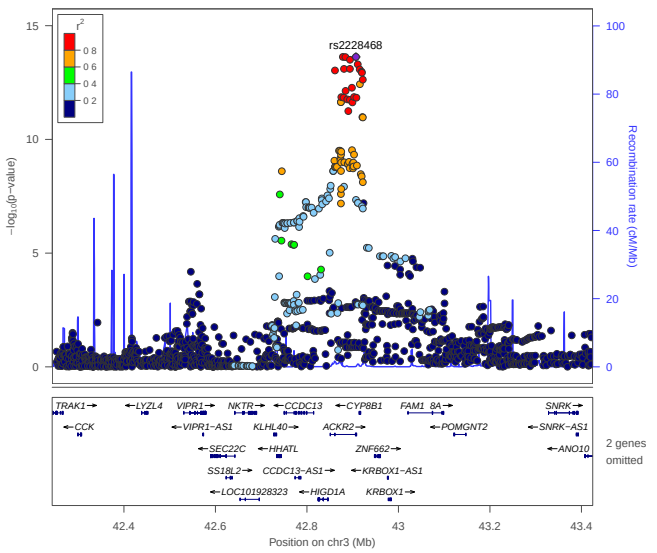
2.36 Mono (n = 62,076)

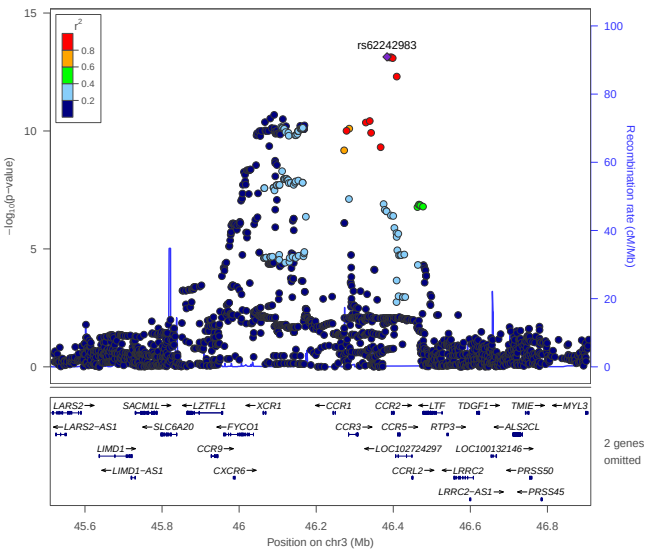


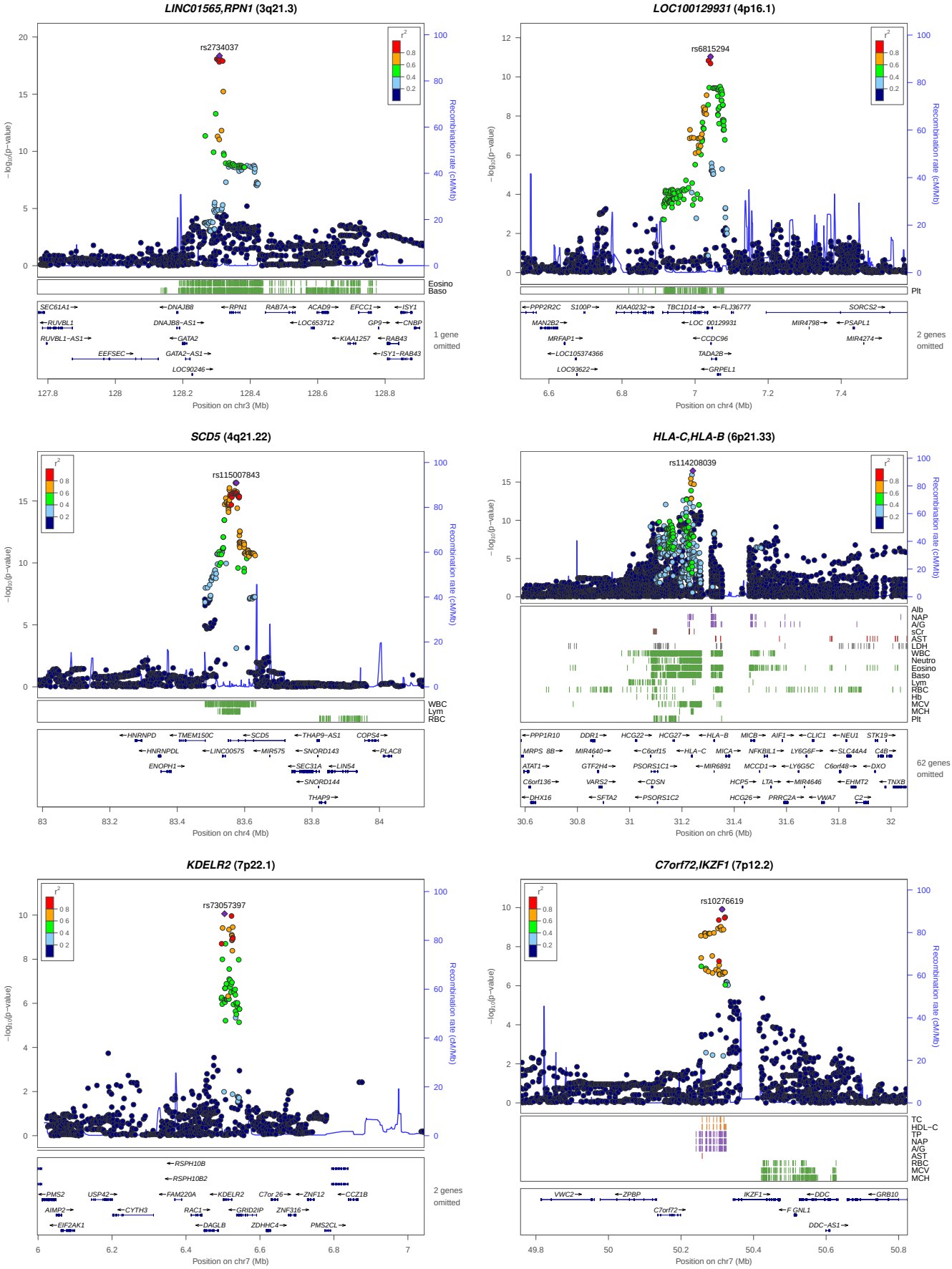


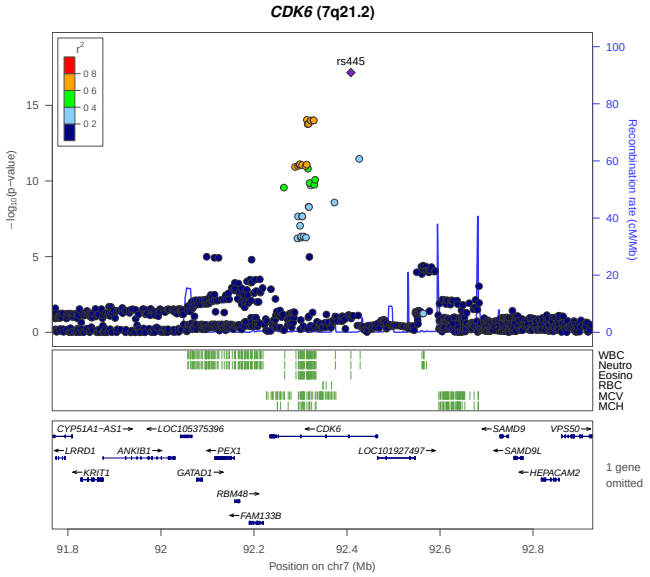


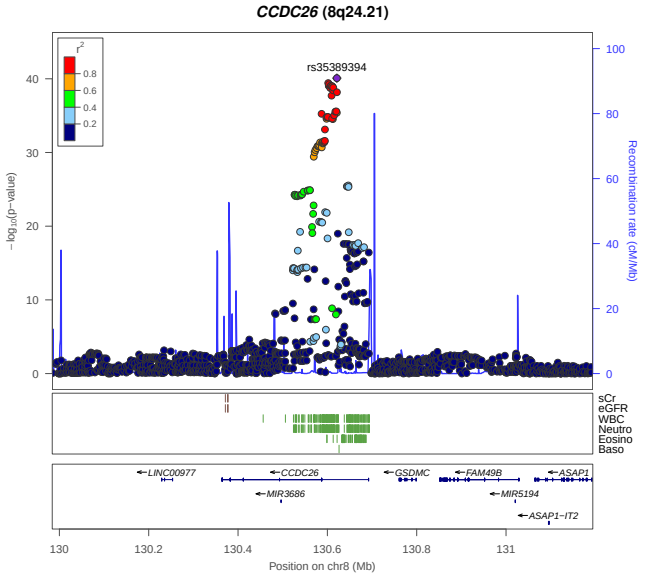


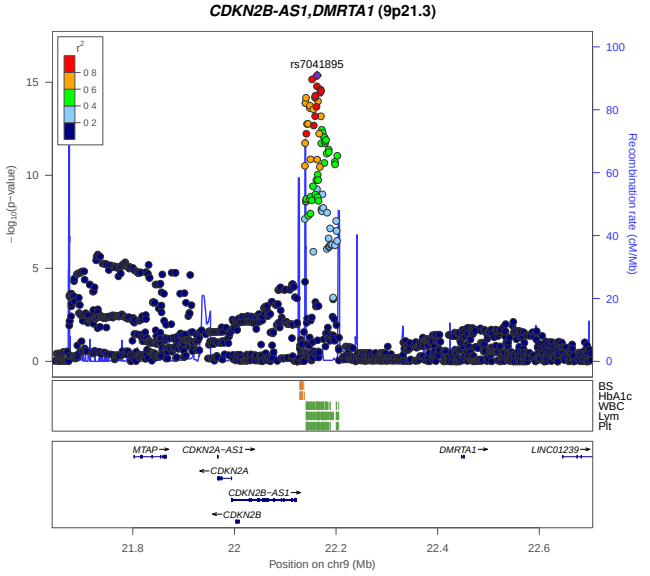


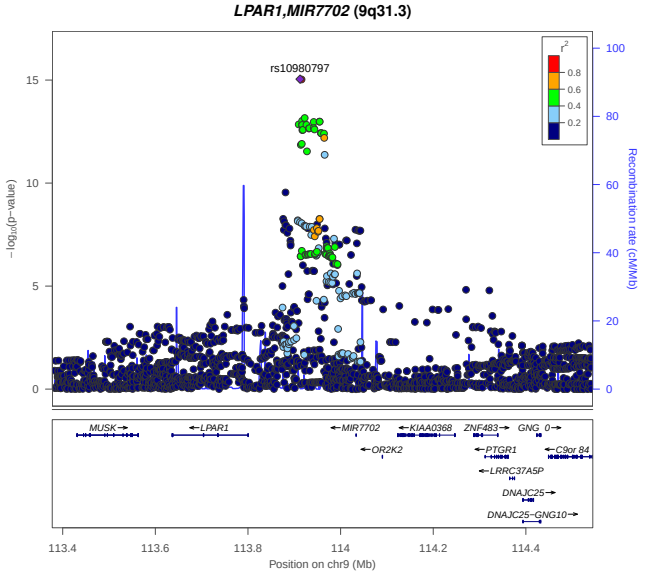


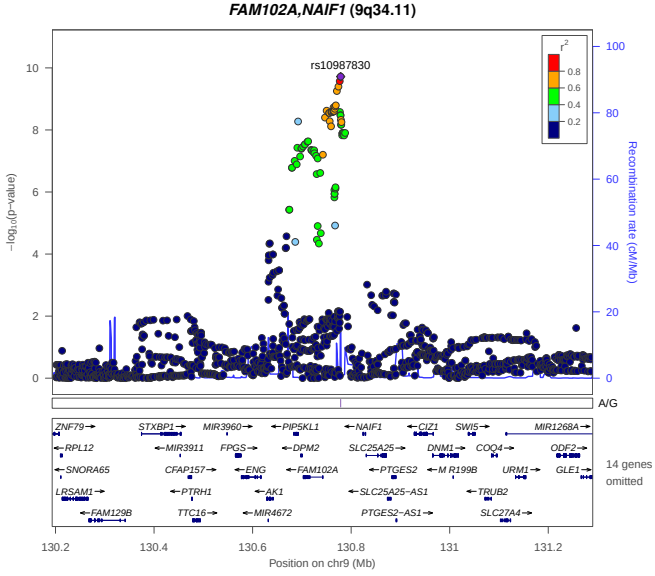

LINC01565,RPN1 (3q21.3)
rs2734037
Eosino
Baso
1 gene omitted
Position on chr3 (Mb)
LOC100129931 (4p16.1)
rs6815294
Plt
2 genes omitted
Position on chr4 (Mb)
SCD5 (4q21.22)
rs115007843
WBC
Lym
RBC
Position on chr4 (Mb)
HLA-C,HLA-B (6p21.33)
rs114208039
Alb
NAP
A/G
sCr
AST
LDH
WBC
Neutro
Eosino
Baso
Lym
RBC
Hb
MCV
MCH
Plt
62 genes omitted
Position on chr6 (Mb)
KDELR2 (7p22.1)
rs73057397
2 genes omitted
Position on chr7 (Mb)
C7orf72,IKZF1 (7p12.2)
rs10276619
TC
HDL-C
TP
NAP
A/G
AST
RBC
MCV
MCH
Position on chr7 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

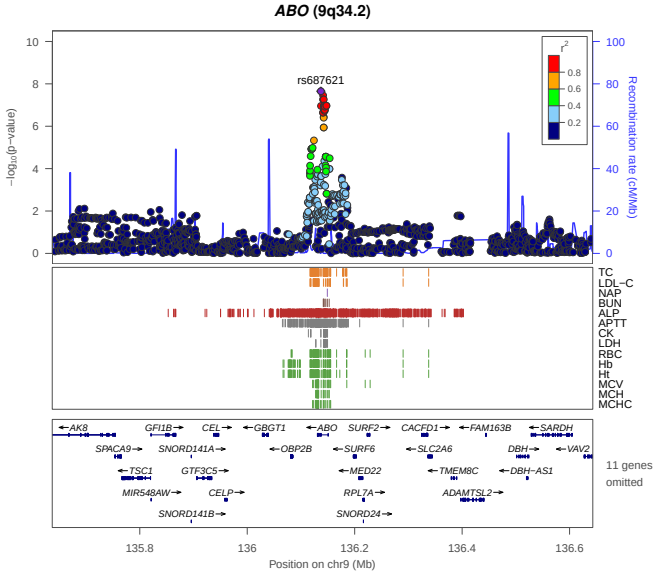

CDK6 (7q21.2)
rs445
WBC
Neutro
Eosino
RBC
MCV
MCH
1 gene omitted
Position on chr7 (Mb)
Recombination rate (cM/Mb)


CCDC26 (8q24.21)
rs35389394
sCr
eGFR
WBC
Neutro
Eosino
Baso
Position on chr8 (Mb)
Recombination rate (cM/Mb)

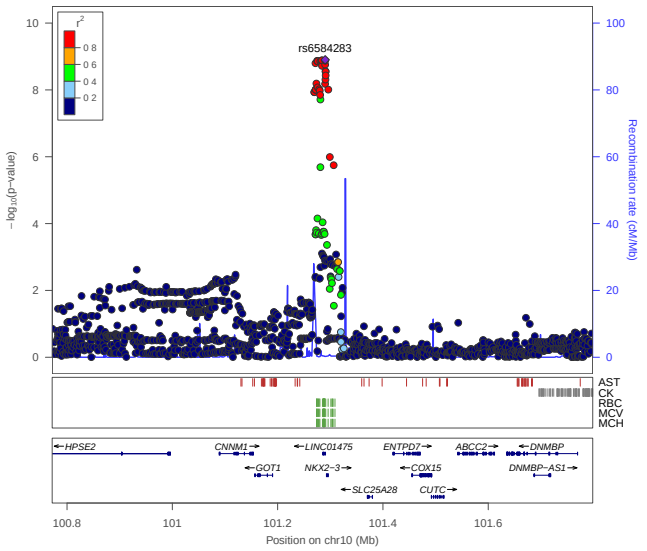

CDKN2B-AS1,DMRTA1 (9p21.3)
rs7041895
BS
HbA1c
WBC
Lym
Plt
Position on chr9 (Mb)
Recombination rate (cM/Mb)


LPAR1,MIR7702 (9q31.3)
rs10980797
Position on chr9 (Mb)
Recombination rate (cM/Mb)

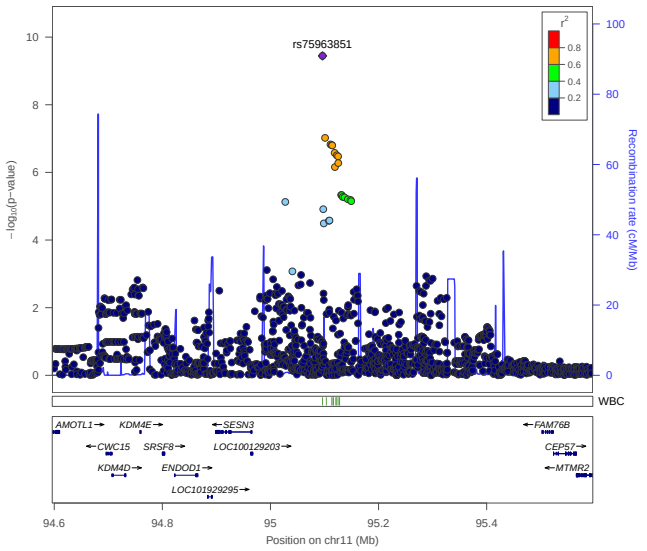

FAM102A,NAIF1 (9q34.11)
rs10987830
A/G
14 genes omitted
Position on chr9 (Mb)
Recombination rate (cM/Mb)


ABO (9q34.2)
rs687621
TC
LDL-C
NAP
BUN
ALP
APTT
CK
LDH
RBC
Hb
Ht
MCV
MCH
MCHC
11 genes omitted
Position on chr9 (Mb)
Recombination rate (cM/Mb)

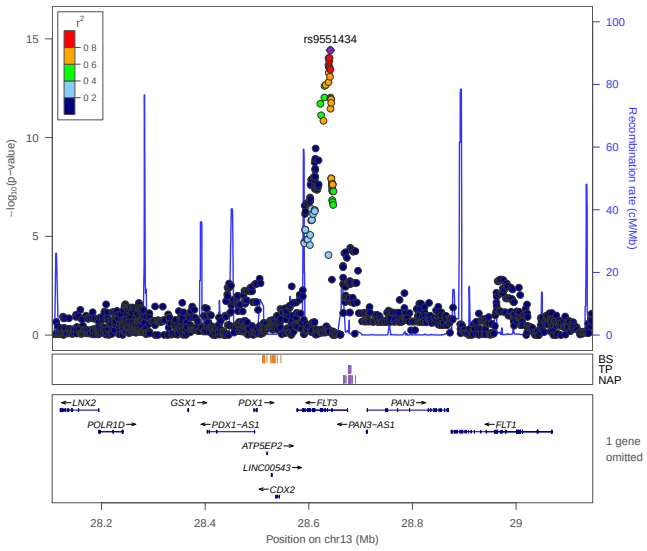
LINC01475 **(10q24.2)**



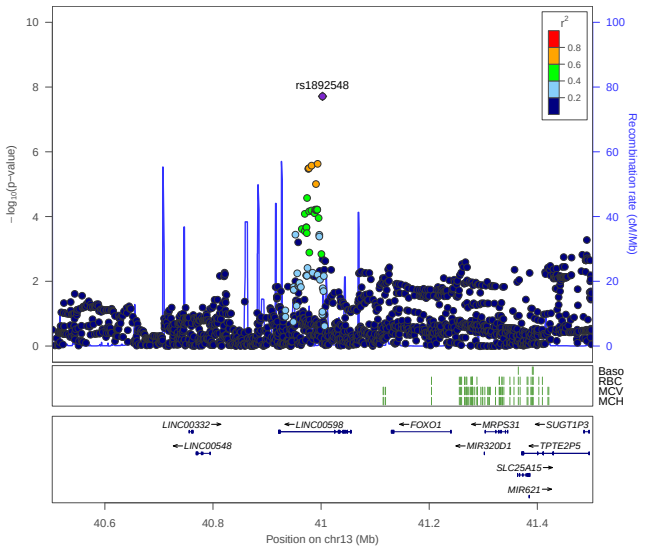
LOC100129203,FAM76B **(11q21)**



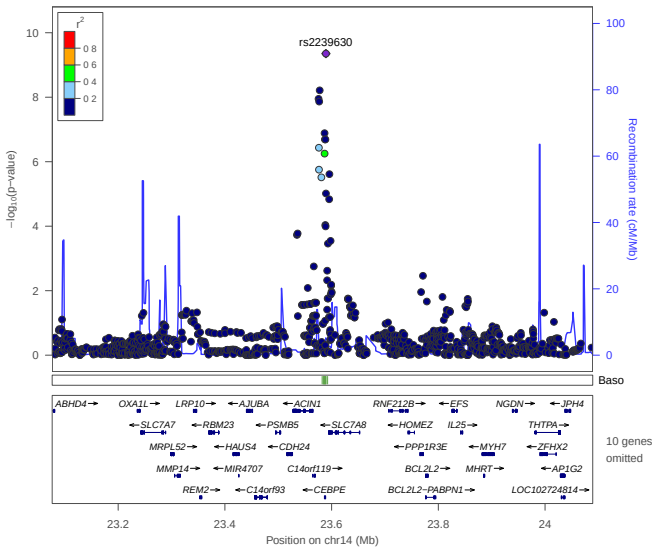
FLT3 **(13q12.2)**



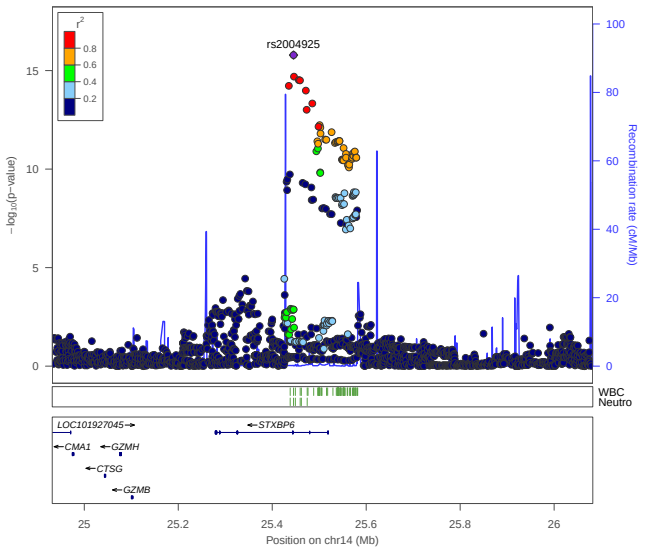
LINC00598 **(13q14.11)**

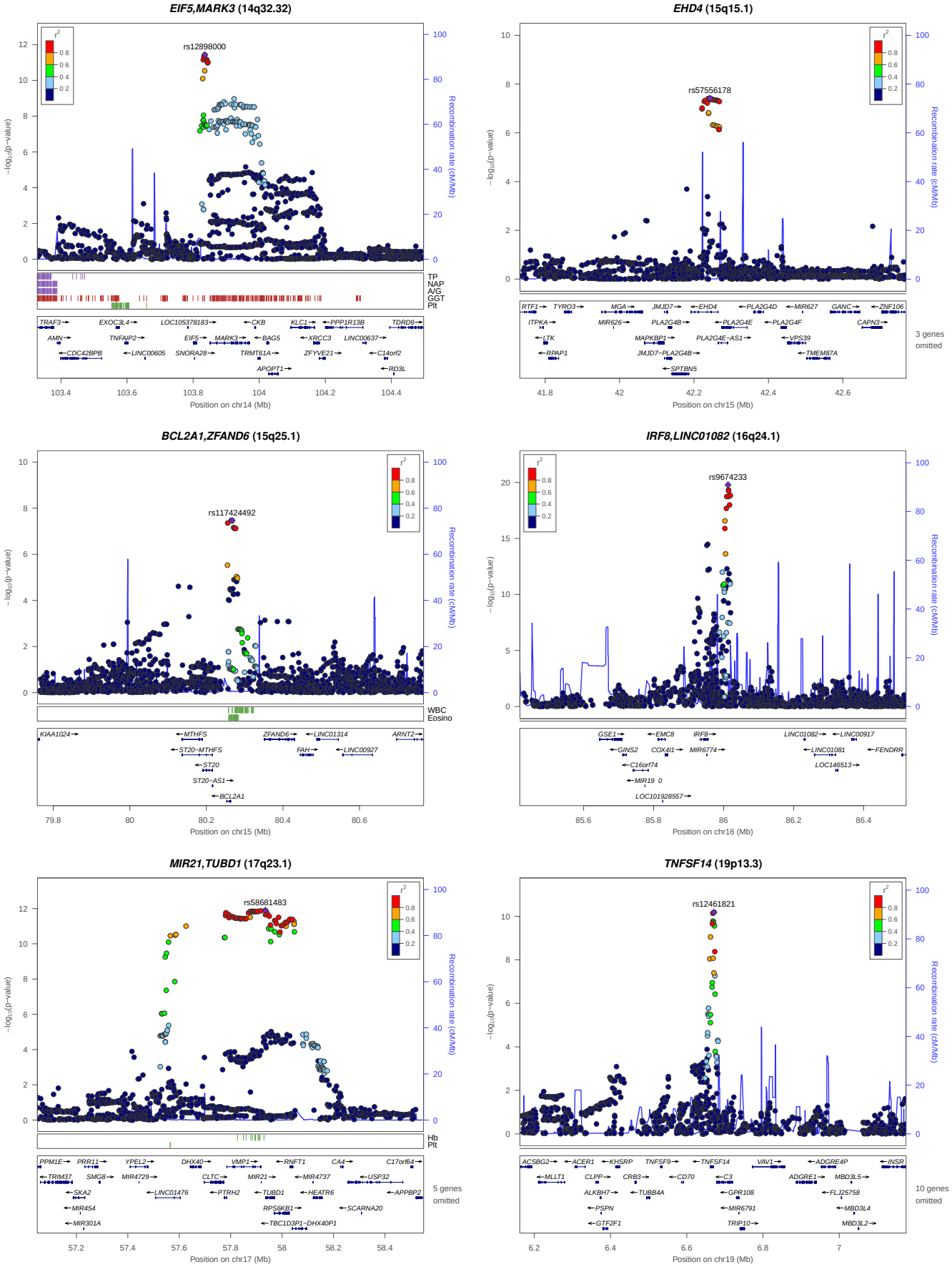


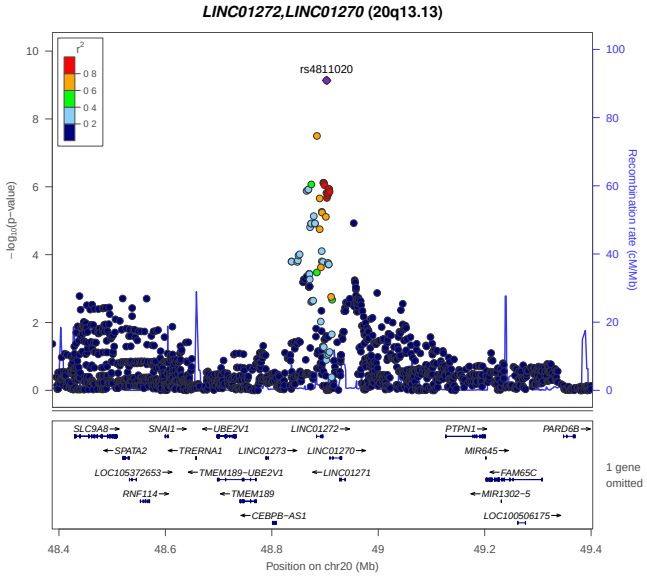
CEBPE **(14q11.2)**



STXBP6 **(14q12)**

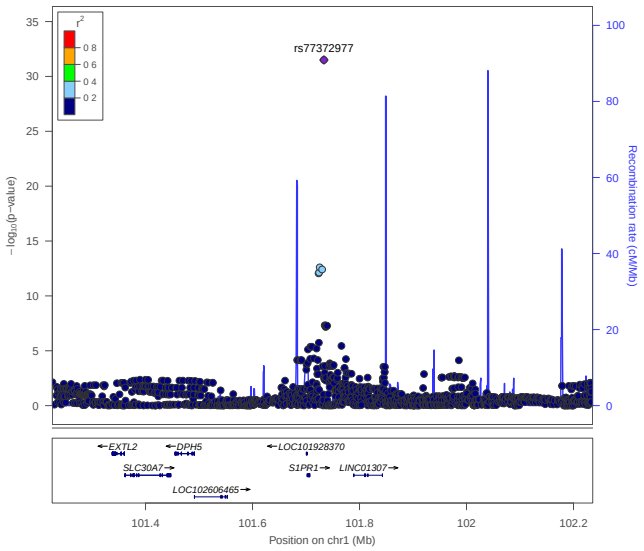



EIF5,MARK3 (14q32.32)
rs12898000
EHD4 (15q15.1)
rs57556178
BCL2A1,ZFAND6 (15q25.1)
rs117424492
IRF8,LINC01082 (16q24.1)
rs9674233
MIR21,TUBD1 (17q23.1)
rs58681483
TNFSF14 (19p13.3)
rs12461821
Recombination rate (cM/Mb)
Position on chr14 (Mb)
Position on chr15 (Mb)
Position on chr15 (Mb)
Position on chr16 (Mb)
Position on chr17 (Mb)
Position on chr19 (Mb)
3 genes omitted
5 genes omitted
10 genes omitted

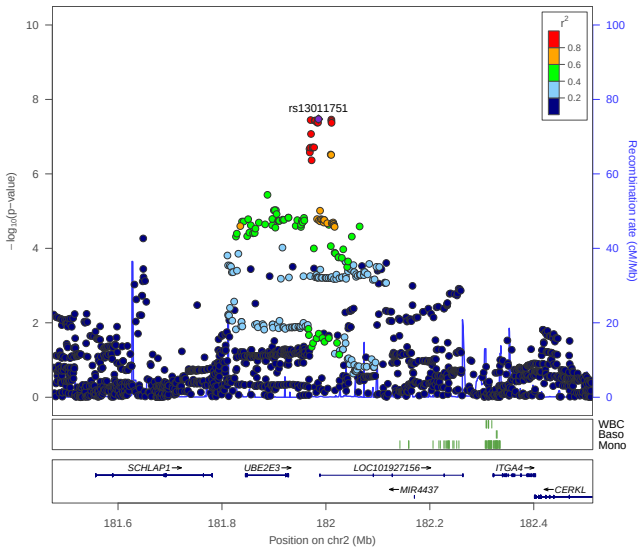

LINC01272,LINC01270 (20q13.13)
rs4811020
r2
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
SLC9A8
SNAI1
UBE2V1
LINC01272
PTPN1
PARD6B
SPATA2
TRERNA1
LINC01273
LINC01270
MIR645
LOC105372653
TMEM189−UBE2V1
LINC01271
FAM65C
RNF114
TMEM189
MIR1302−5
CEBPB−AS1
LOC100506175
1 gene omitted
Position on chr20 (Mb)

2.37 Lym (n = 62,076)

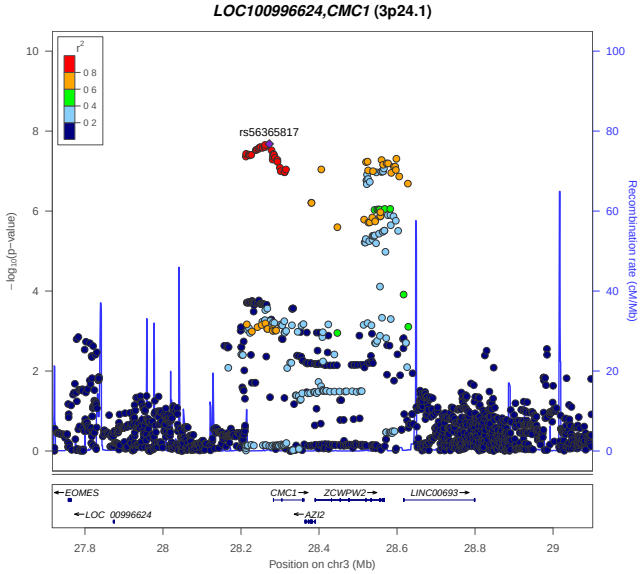
S1PR1,LINC01307 **(1p21.2)**



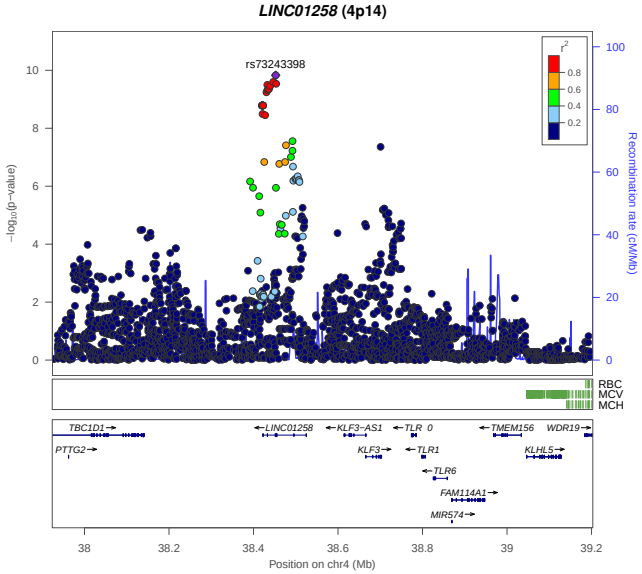
UBE2E3,LOC101927156 **(2q31.3)**



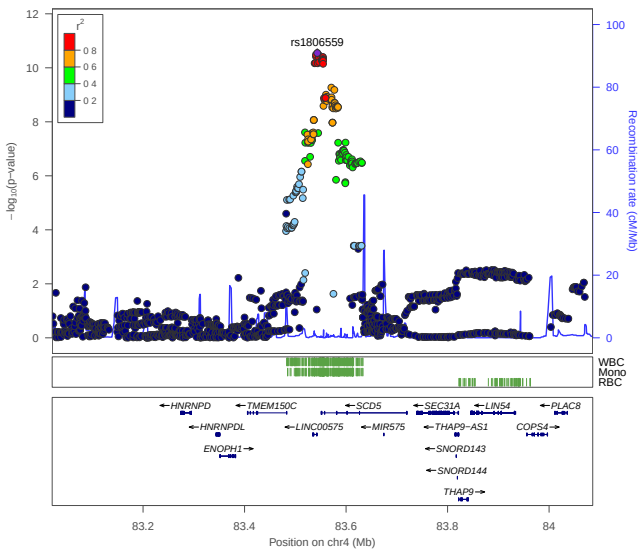
LOC100996624,CMC1 **(3p24.1)**



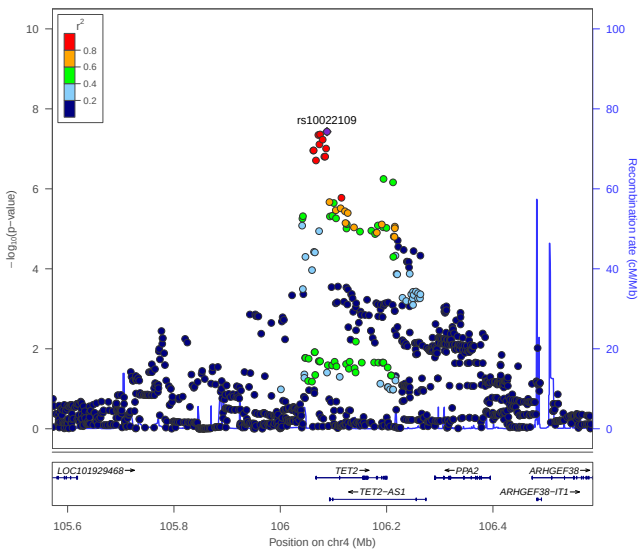
LINC01258 **(4p14)**

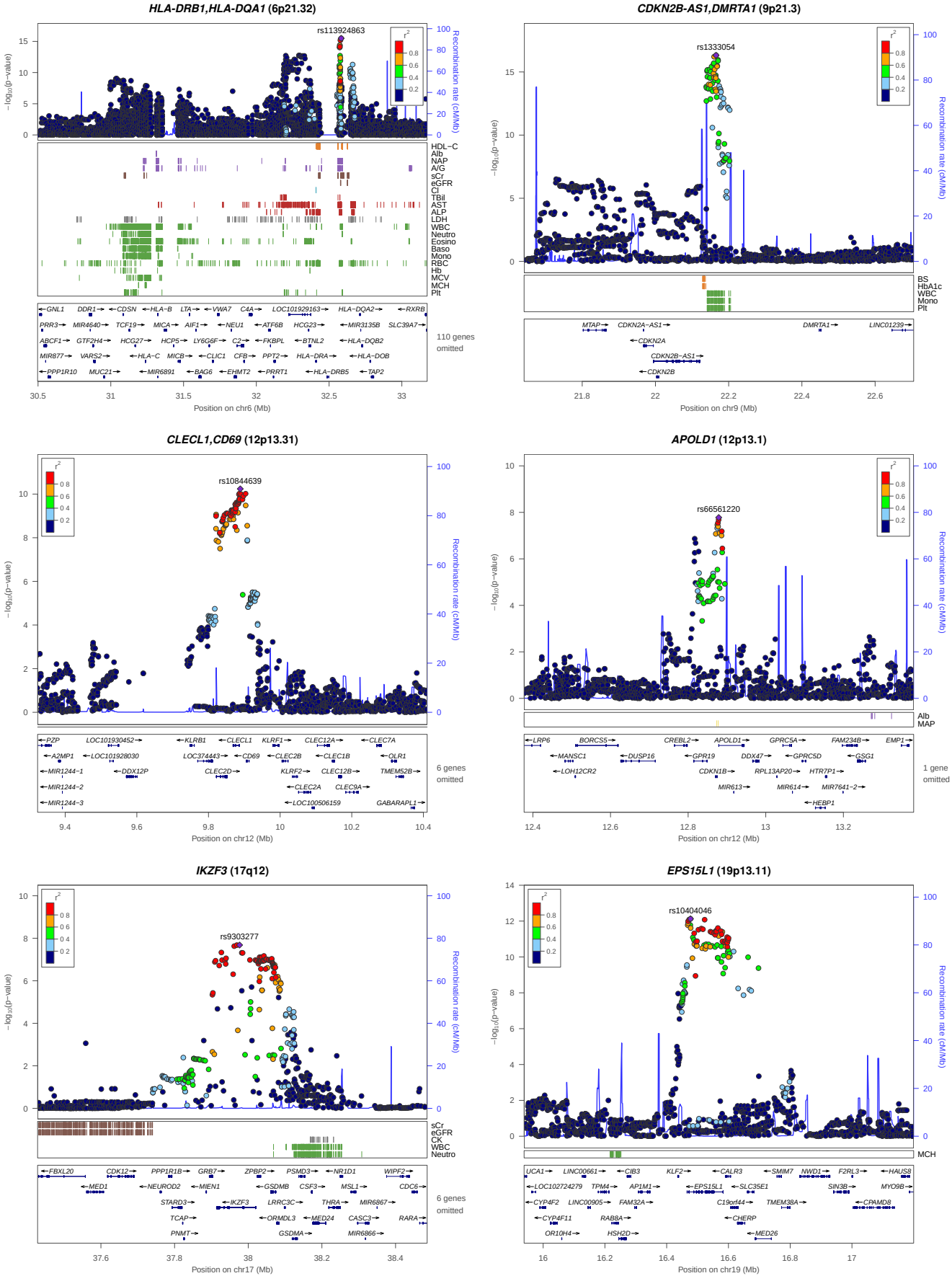


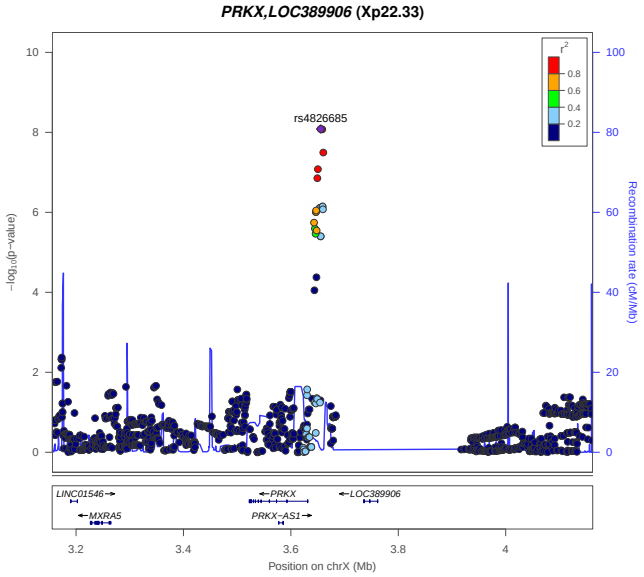
LINC00575 **(4q21.22)**



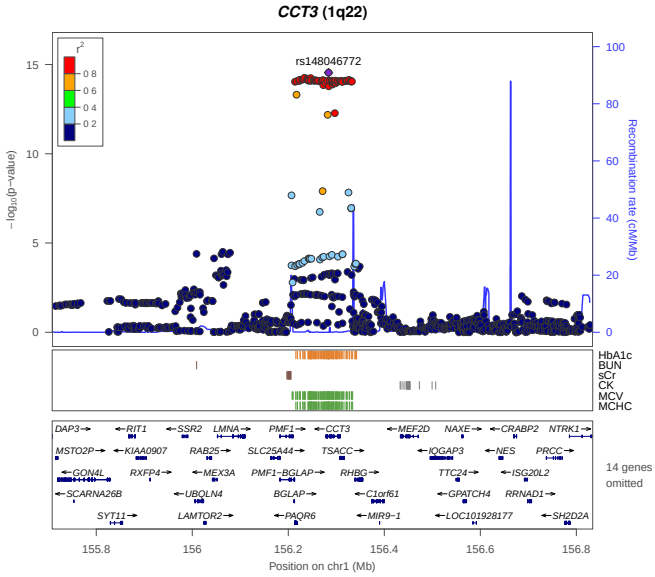
TET2 **(4q24)**

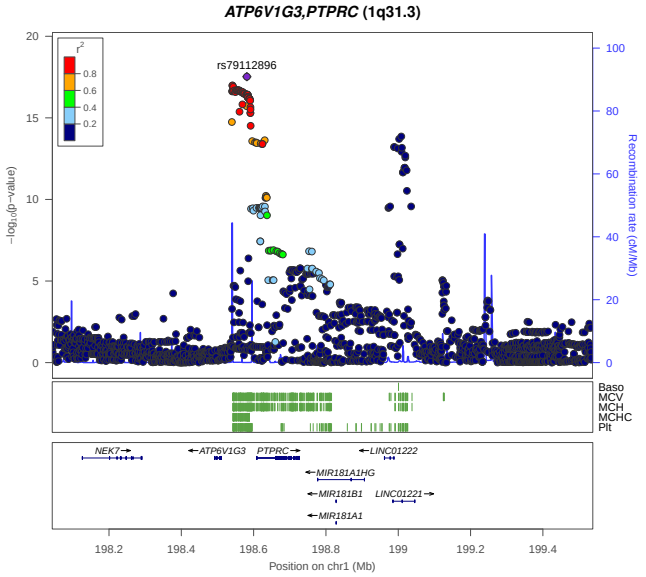


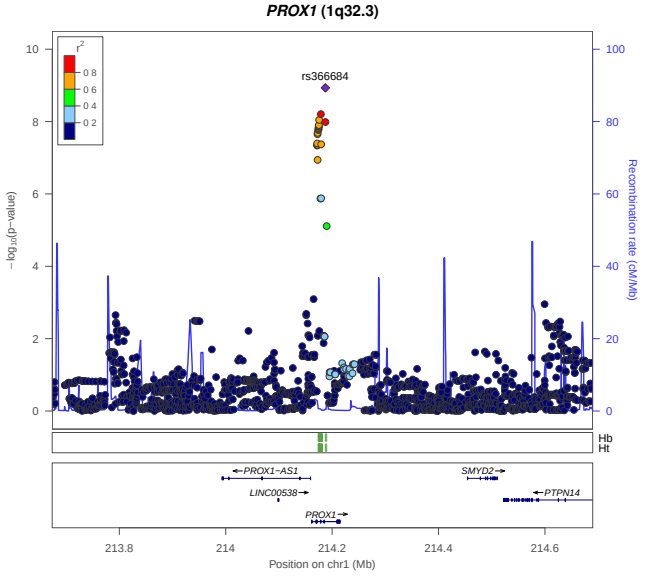

HLA-DRB1,HLA-DQA1 (6p21.32)
rs113924863
Recombination rate (cM/Mb)
HDL
Alb
NAP
A/G
sCr
eGFR
CI
TBil
AST
ALP
LDH
WBC
Neutro
Eosino
Baso
Mono
RBC
Hb
MCV
MCH
Plt
110 genes omitted
Position on chr6 (Mb)
CDKN2B-AS1,DMRTA1 (9p21.3)
rs1333054
BS
HbA1c
WBC
Mono
Plt
Position on chr9 (Mb)
CLECL1,CD69 (12p13.31)
rs10844639
6 genes omitted
Position on chr12 (Mb)
APOLD1 (12p13.1)
rs66561220
Alb
MAP
1 gene omitted
Position on chr12 (Mb)
IKZF3 (17q12)
rs9303277
sCr
eGFR
CK
WBC
Neutro
6 genes omitted
Position on chr17 (Mb)
EPS15L1 (19p13.11)
rs10404046
MCH
Position on chr19 (Mb)

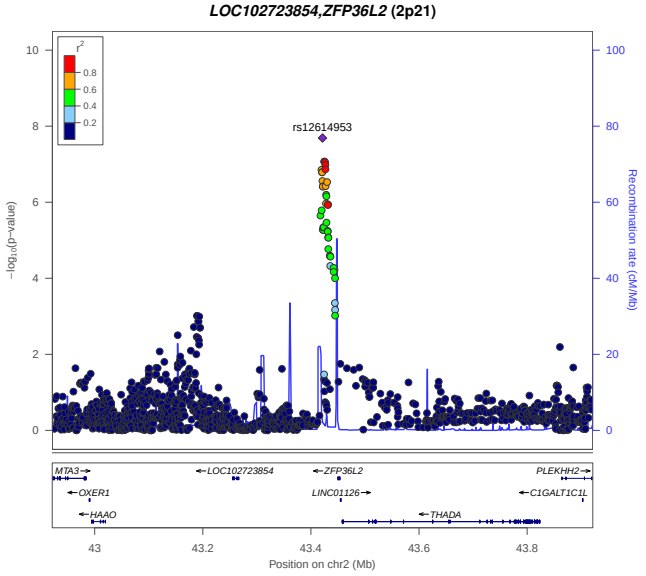

PRKX,LOC389906 (Xp22.33)
rs4826685
r2
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
LINC01546
MXRA5
PRKX
PRKX-AS1
LOC389906
Position on chrX (Mb)

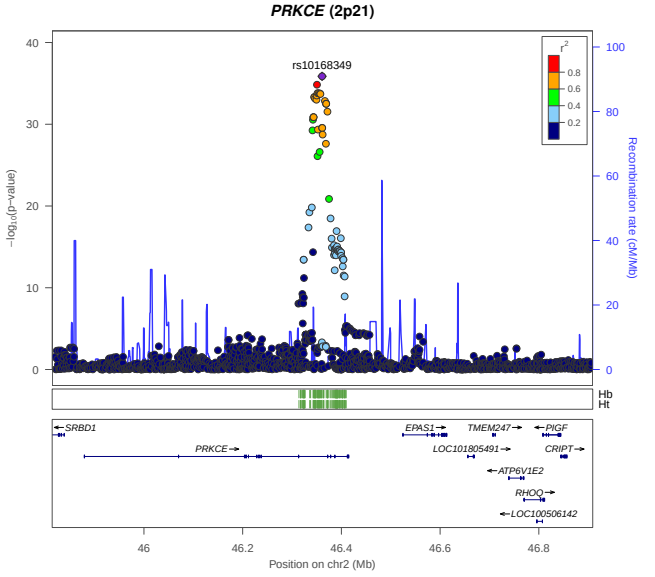
2.38 RBC (n = 108,794)

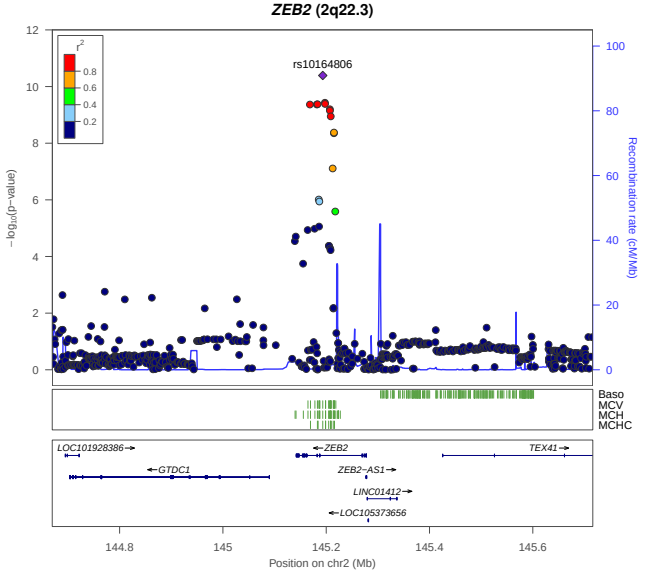


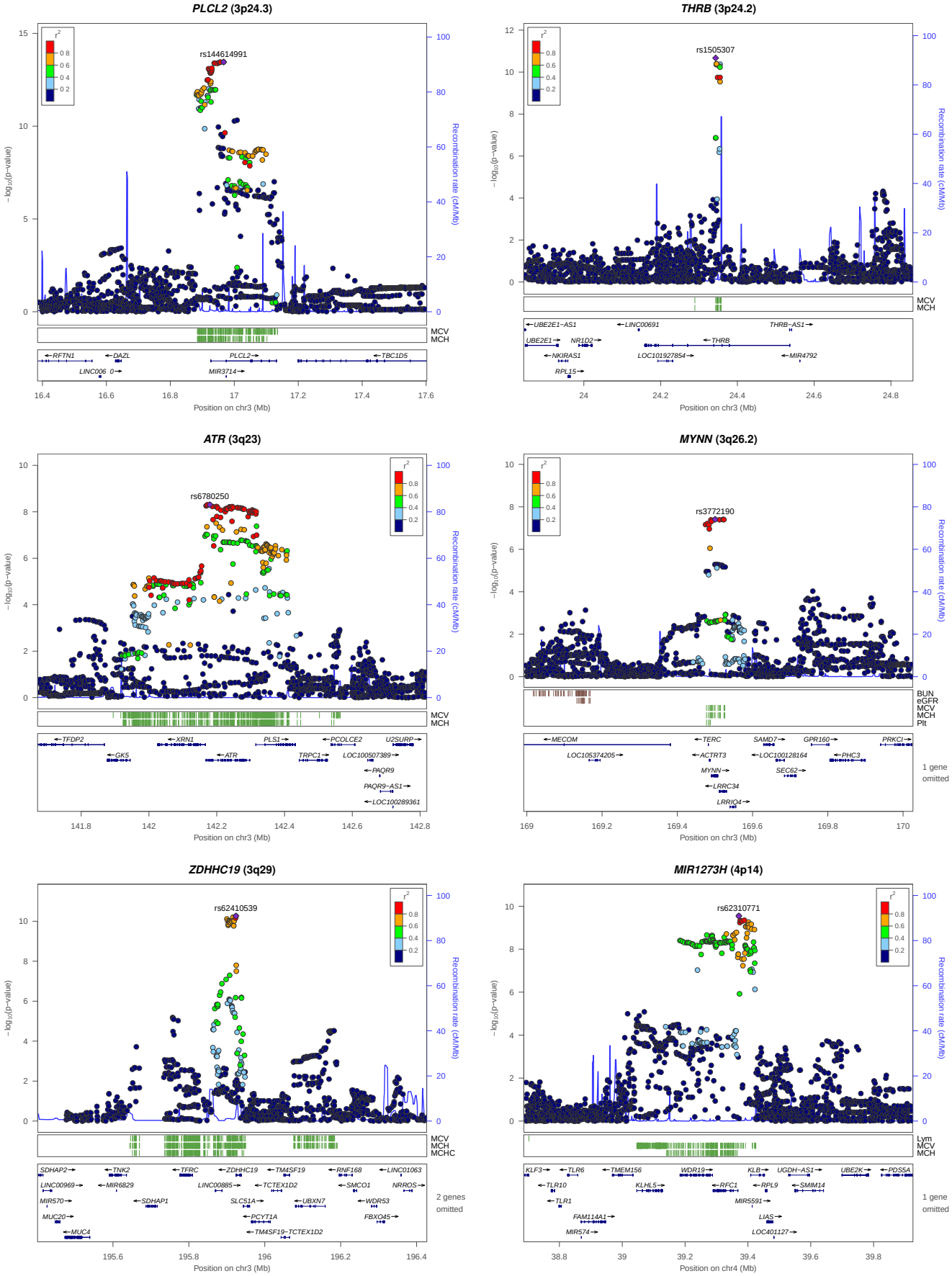


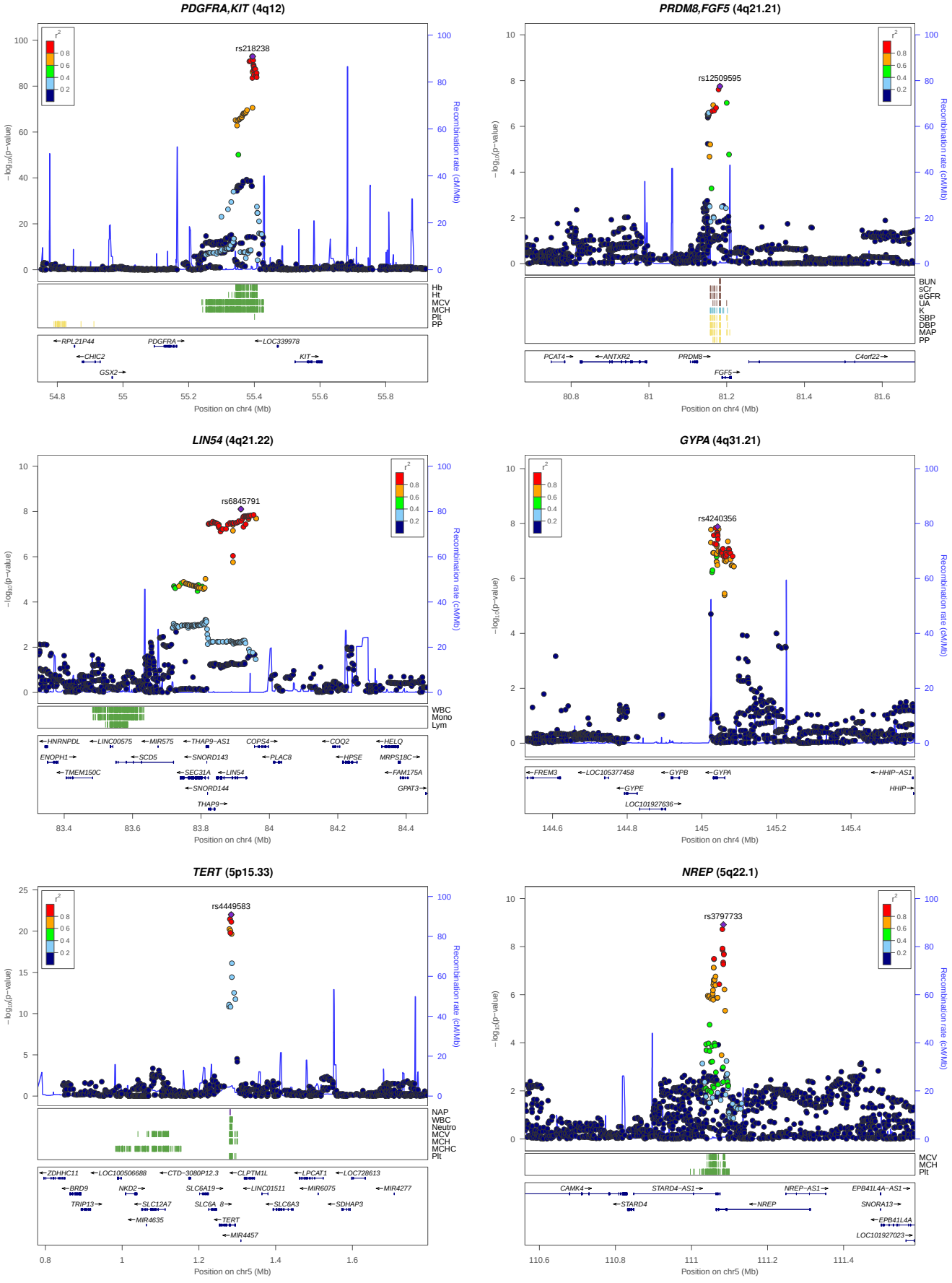


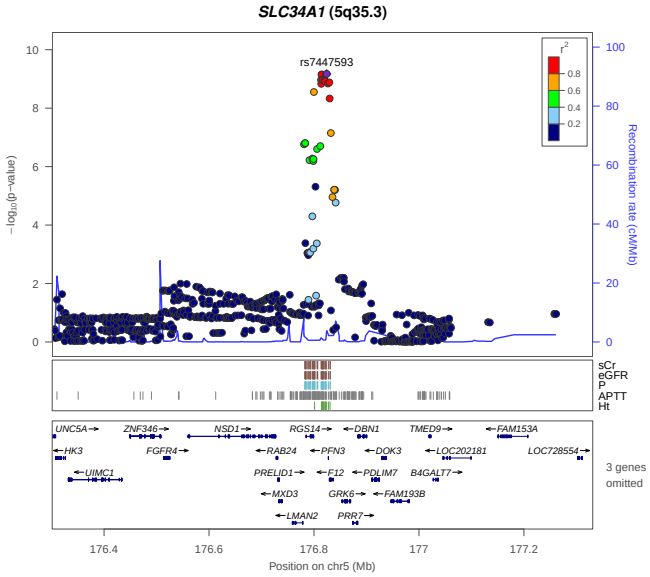


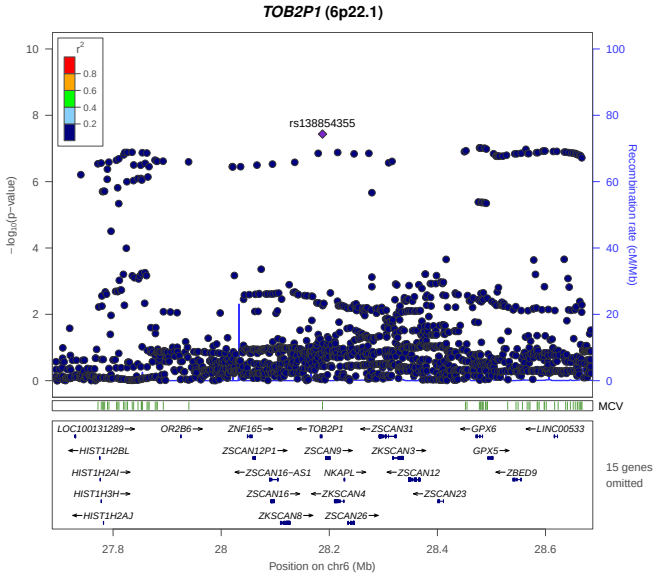


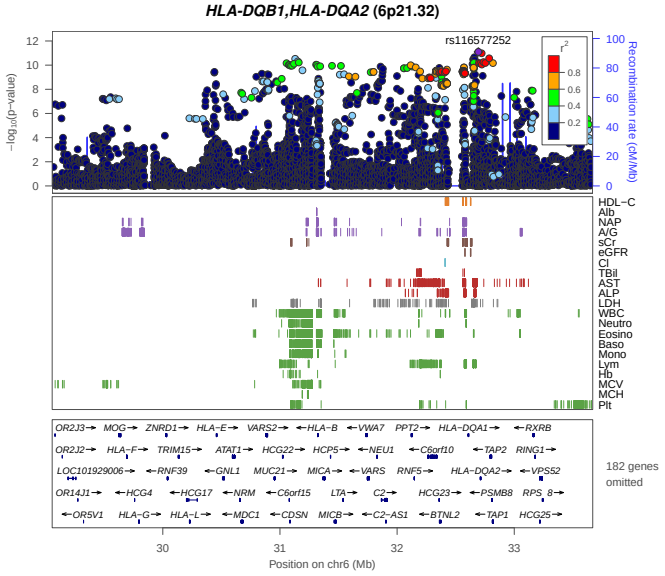


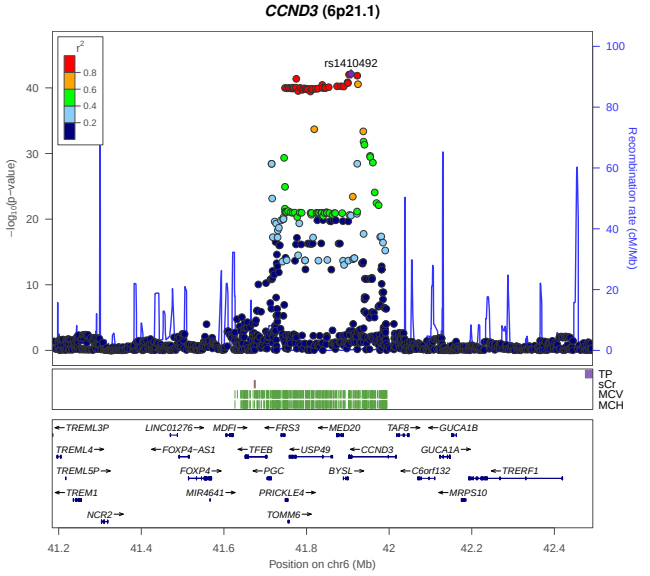

PLCL2 (3p24.3)
rs144614991
MCV
MCH
RFTN1
DAZL
PLCL2
TBC1D5
LINC006 0
MIR3714
Position on chr3 (Mb)
THRB (3p24.2)
rs1505307
MCV
MCH
UBE2E1-AS1
LINC00691
THRB-AS1
UBE2E1
NR1D2
THRB
NKIRAS1
LOC101927854
MIR4792
RPL15
Position on chr3 (Mb)
ATR (3q23)
rs6780250
MCV
MCH
TFDP2
XRN1
PLS1
PCOLCE2
U2SURP
GK5
ATR
TRPC1
LOC100507389
PAQR9
PAQR9-AS1
LOC100289361
Position on chr3 (Mb)
MYNN (3q26.2)
rs3772190
BUN
eGFR
MCV
MCH
Plt
MECOM
TERC
SAMD7
GPR160
PRKCI
LOC105374205
ACTRT3
LOC100128164
PHC3
MYNN
SEC62
LRRC34
LRRIQ4
1 gene omitted
Position on chr3 (Mb)
ZDHHC19 (3q29)
rs62410539
MCV
MCH
MCHC
SDHAP2
TNK2
TFRC
ZDHHC19
TM4SF19
RNF168
LINC01063
LINC00969
MIR6829
LINC00885
TCTEX1D2
SMCO1
NRROS
MIR570
SDHAP1
SLC51A
UBXN7
WDR53
MUC20
PCYT1A
FBXO45
MUC4
TM4SF19-TCTEX1D2
2 genes omitted
Position on chr3 (Mb)
MIR1273H (4p14)
rs62310771
Lym
MCV
MCH
KLF3
TLR6
TMEM156
WDR19
KLB
UGDH-AS1
UBE2K
PDS5A
TLR10
KLHL5
RFC1
RPL9
SMIM14
TLR1
MIR5591
FAM114A1
LIAS
MIR574
LOC401127
1 gene omitted
Position on chr4 (Mb)
Recombination rate (cM/Mb)
−log10(p-value)

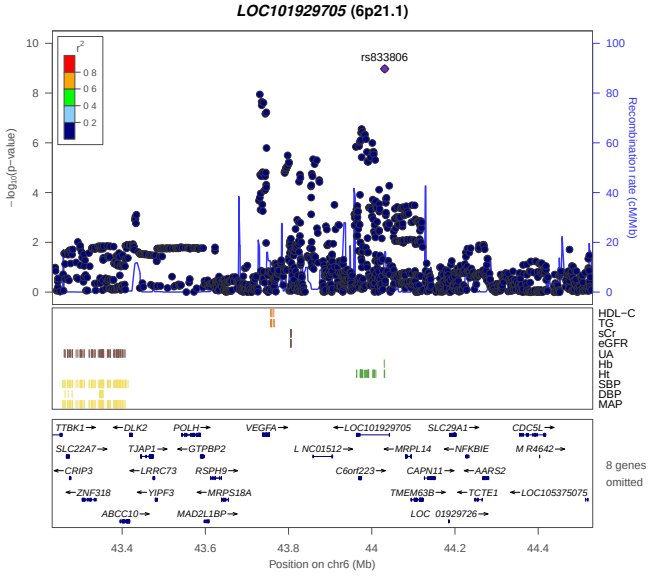

PDGFRA,KIT (4q12)
rs218238
Hb
Ht
MCV
MCH
Plt
PP
RPL21P44
PDGFRA
LOC339978
CHIC2
KIT
GSX2
Position on chr4 (Mb)
PRDM8,FGF5 (4q21.21)
rs12509595
BUN
sCr
eGFR
UA
K
SBP
DBP
MAP
PP
PCAT4
ANTXR2
PRDM8
C4orf22
FGF5
Position on chr4 (Mb)
LIN54 (4q21.22)
rs6845791
WBC
Mono
Lym
HNRNPDL
LINC00575
MIR575
THAP9-AS1
COPS4
COQ2
HELO
ENOPH1
SCD5
SNORD143
PLAC8
HPSE
MRPS18C
TMEM150C
SEC31A
LIN54
FAM175A
SNORD144
GPAT3
THAP9
Position on chr4 (Mb)
GYPA (4q31.21)
rs4240356
FREM3
LOC105377458
GYPB
GYPA
HHIP-AS1
GYPE
HHIP
LOC101927636
Position on chr4 (Mb)
TERT (5p15.33)
rs4449583
NAP
WBC
Neutro
MCV
MCH
MCHC
Plt
ZDHHC11
LOC100506688
CTD-3080P12.3
CLPTM1L
LPCAT1
LOC728613
BRD9
NKD2
SLC6A19
LINC01511
MIR6075
MIR4277
TRIP13
SLC12A7
SLC6A 8
SLC6A3
SDHAP3
MIR4635
TERT
MIR4457
Position on chr5 (Mb)
NREP (5q22.1)
rs3797733
MCV
MCH
Plt
CAMK4
STARD4-AS1
NREP-AS1
EPB41L4A-AS1
STARD4
NREP
SNORA13
EPB41L4A
LOC101927023
Position on chr5 (Mb)

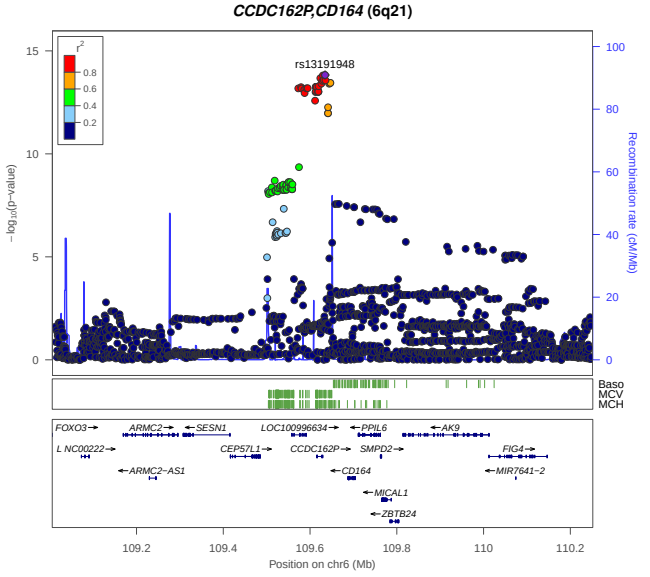

SLC34A1 (5q35.3)
rs7447593
Recombination rate (cM/Mb)
sCr
eGFR
P
APTT
Ht
3 genes omitted
Position on chr5 (Mb)

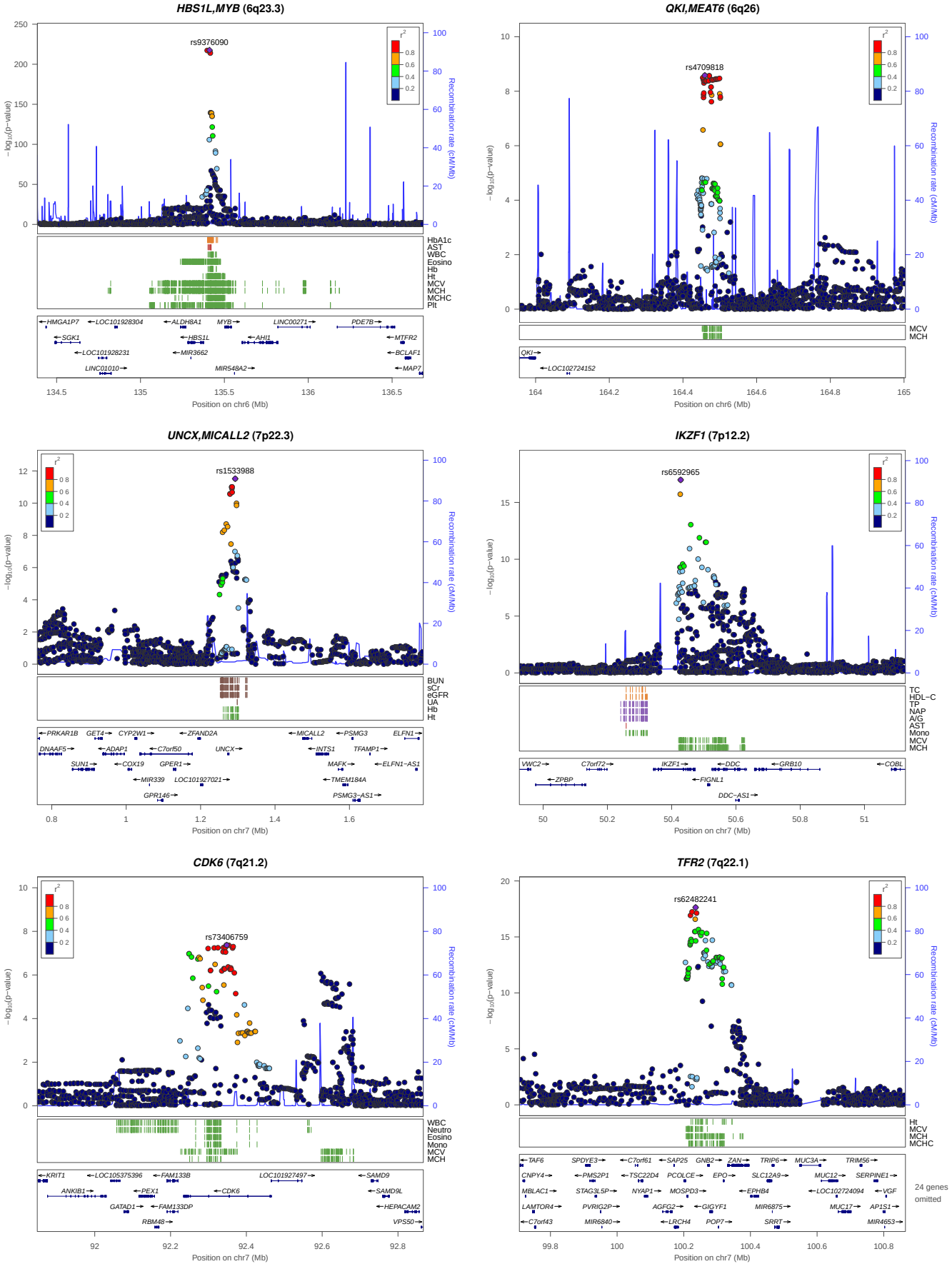

TOB2P1 (6p22.1)
rs138854355
Recombination rate (cM/Mb)
MCV
15 genes omitted
Position on chr6 (Mb)

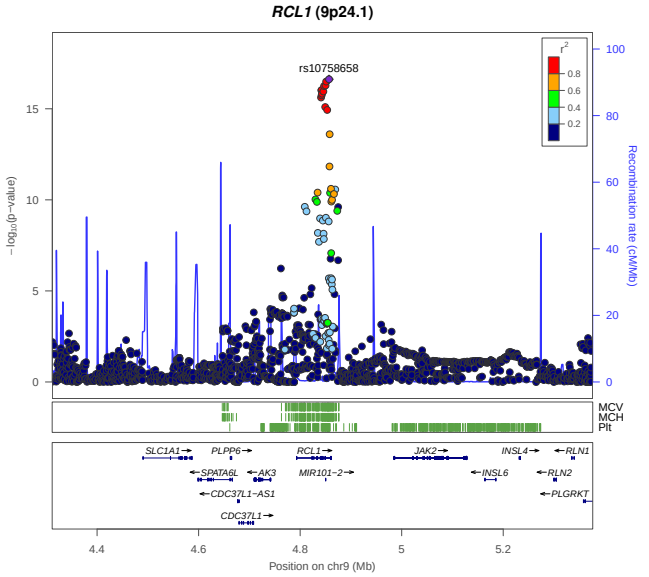

HLA-DQB1,HLA-DQA2 (6p21.32)
rs116577252
Recombination rate (cM/Mb)
HDL-C
Alb
NAP
AG
sCr
eGFR
Cr
TBil
AST
ALP
LDH
WBC
Neutro
Eosino
Baso
Mono
Lym
Hb
MCV
MCH
Plt
182 genes omitted
Position on chr6 (Mb)

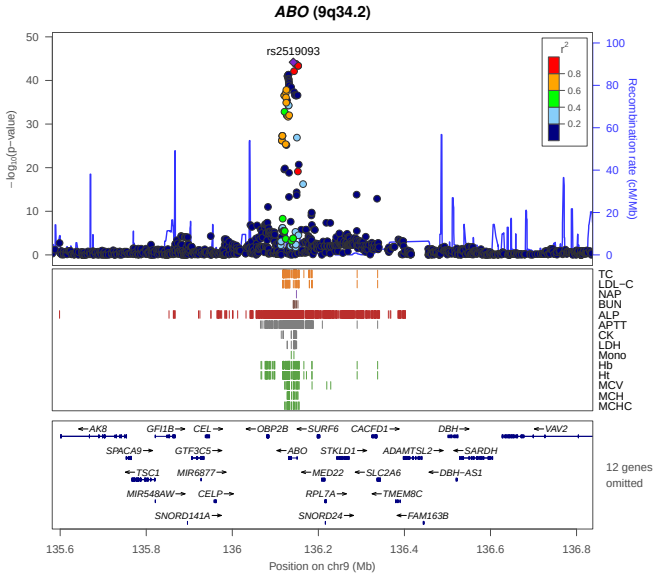

CCND3 (6p21.1)
rs1410492
Recombination rate (cM/Mb)
TP
sCr
MCV
MCH
Position on chr6 (Mb)

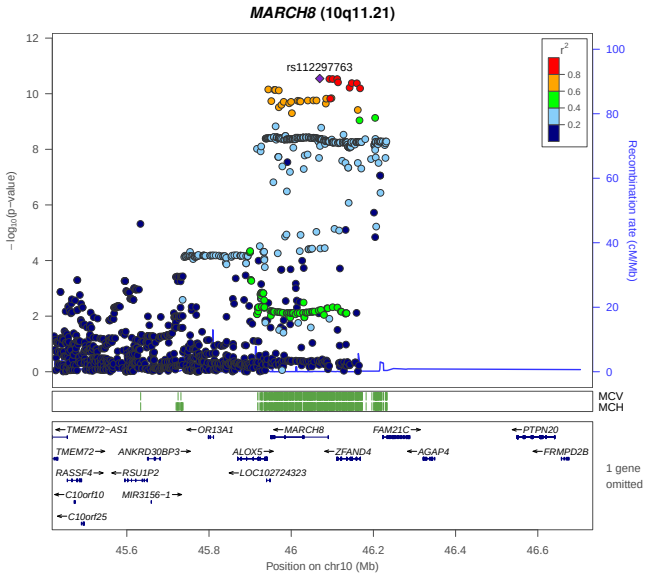

LOC101929705 (6p21.1)
rs833806
Recombination rate (cM/Mb)
HDL-C
TG
sCr
eGFR
UA
Hb
Ht
SBP
DBP
MAP
8 genes omitted
Position on chr6 (Mb)

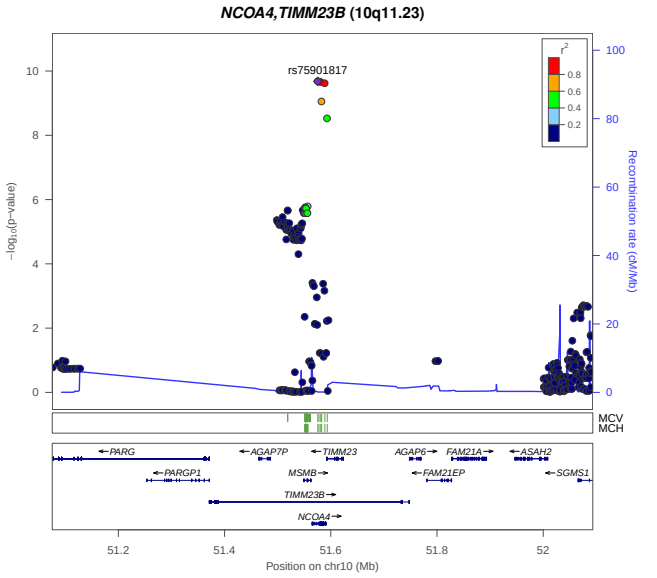

CCDC162P,CD164 (6q21)
rs13191948
Recombination rate (cM/Mb)
Baso
MCV
MCH
Position on chr6 (Mb)

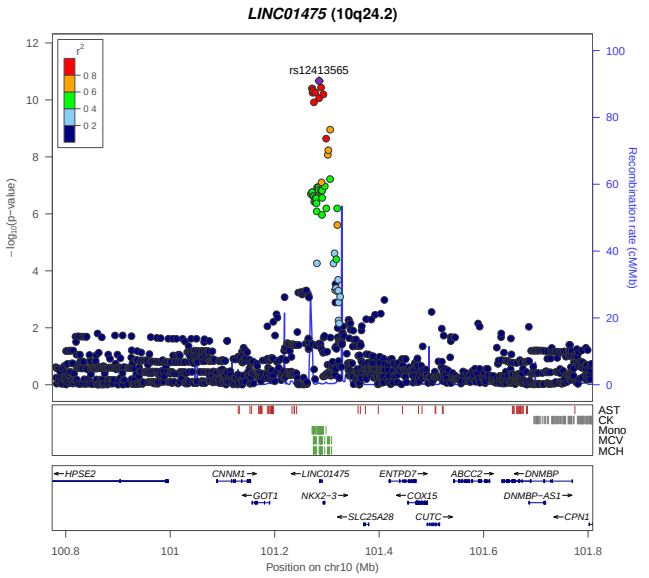

HBS1L,MYB (6q23.3)
rs9376090
HbA1c
AST
WBC
Eosino
Hb
Ht
MCV
MCH
MCHC
Plt
HMGA1P7
LOC101928304
ALDH8A1
MYB
LINC00271
PDE7B
SGK1
HBS1L
AHI1
MTFR2
LOC101928231
MIR3662
BCLAF1
LINC01010
MIR548A2
MAP7
Position on chr6 (Mb)
QKI,MEAT6 (6q26)
rs4709818
MCV
MCH
QKI
LOC102724152
Position on chr6 (Mb)
UNCX,MICALL2 (7p22.3)
rs1533988
BUN
sCr
eGFR
UA
Hb
Ht
PRKAR1B
GET4
CYP2W1
ZFAND2A
MICALL2
PSMG3
ELFN1
DNAAF5
ADAP1
C7orf50
UNCX
INTS1
TFAMP1
SUN1
COX19
GPER1
MAFK
ELFN1-AS1
MIR339
LOC101927021
TMEM184A
GPR146
PSMG3-AS1
Position on chr7 (Mb)
IKZF1 (7p12.2)
rs6592965
TC
HDL-C
TP
NAP
A/G
AST
Mono
MCV
MCH
VWC2
C7orf72
IKZF1
DDC
GRB10
COBL
ZPBP
FIGNL1
DDC-AS1
Position on chr7 (Mb)
CDK6 (7q21.2)
rs73406759
WBC
Neutro
Eosino
Mono
MCV
MCH
KRIT1
LOC105375396
FAM133B
LOC101927497
SAMD9
ANKIB1
PEX1
CDK6
SAMD9L
GATAD1
FAM133DP
HEPACAM2
RBM48
VPS50
Position on chr7 (Mb)
TFR2 (7q22.1)
rs62482241
Ht
MCV
MCH
MCHC
TAF6
SPDYE3
C7orf61
SAP25
GNB2
ZAN
TRIP6
MUC3A
TRIM56
CNPY4
PMS2P1
TSC22D4
PCOLCE
EPO
SLC12A9
MUC12
SERPINE1
MBLAC1
STAG3L5P
NYAP1
MOSPD3
EPHB4
LOC102724094
VGF
LAMTOR4
PVRIG2P
AGFG2
GIGYF1
MIR6875
MUC17
AP1S1
C7orf43
MIR6840
LRCH4
POP7
SRRT
MIR4653
24 genes omitted
Position on chr7 (Mb)
Recombination rate (cM/Mb)
−log10(p-value)

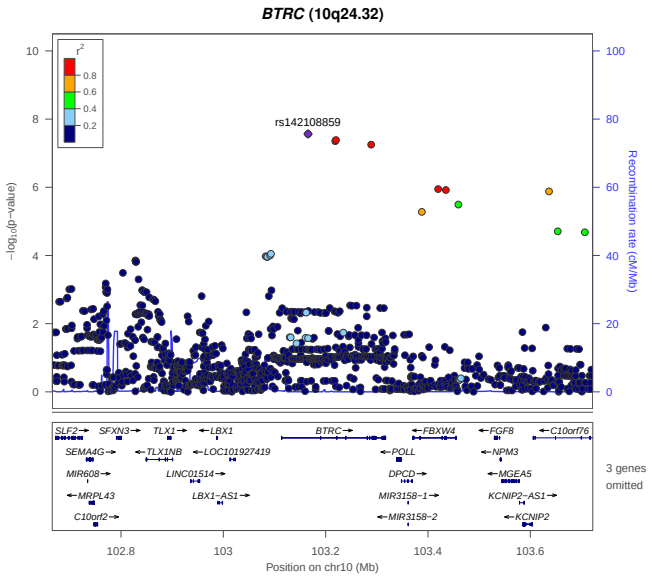

RCL1 (9p24.1)
rs10758658
MCV
MCH
Plt
Position on chr9 (Mb)
Recombination rate (cM/Mb)

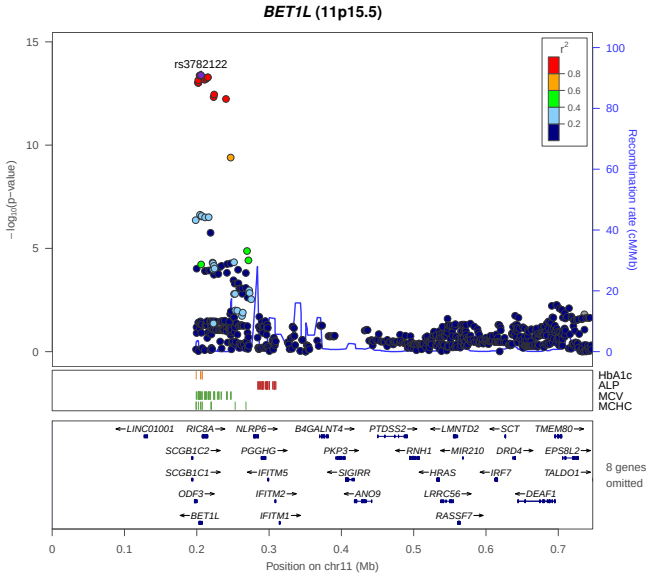

ABO (9q34.2)
rs2519093
TC
LDL−C
NAP
BUN
ALP
APTT
CK
LDH
Mono
Hb
Ht
MCV
MCH
MCHC
12 genes omitted
Position on chr9 (Mb)
Recombination rate (cM/Mb)

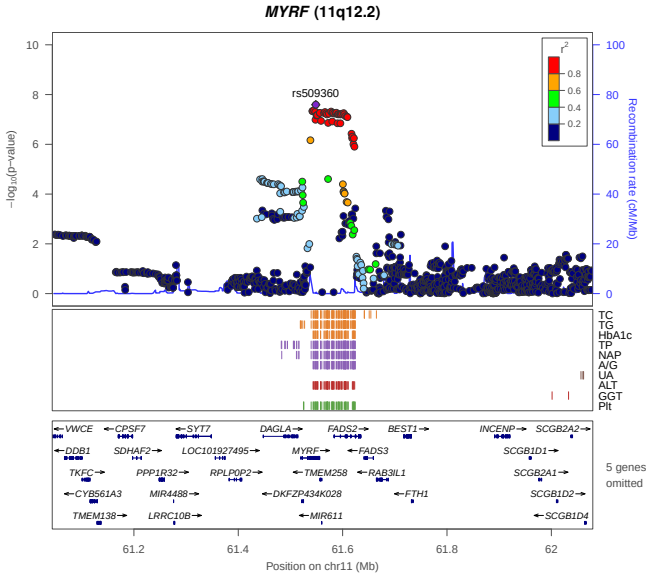

MARCH8 (10q11.21)
rs112297763
MCV
MCH
1 gene omitted
Position on chr10 (Mb)
Recombination rate (cM/Mb)

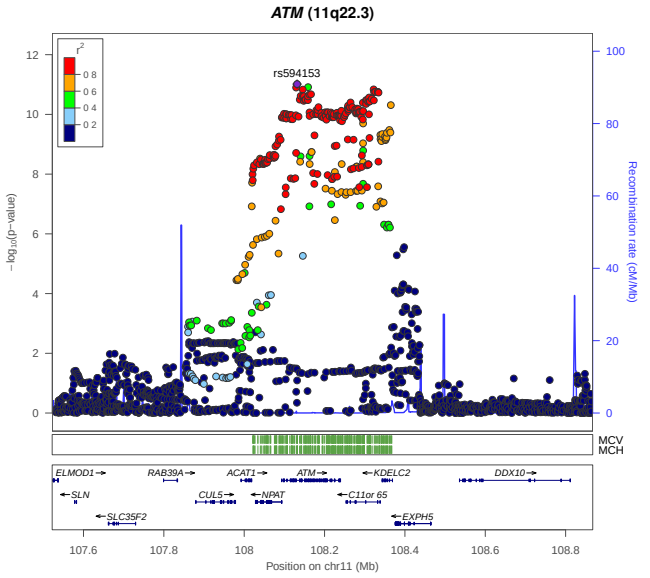

NCOA4,TIMM23B (10q11.23)
rs75901817
MCV
MCH
Position on chr10 (Mb)
Recombination rate (cM/Mb)

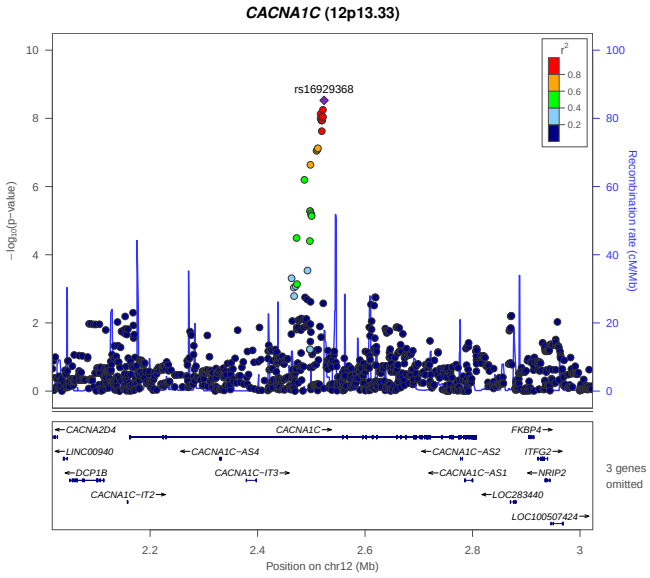

LINC01475 (10q24.2)
rs12413565
AST
CK
Mono
MCV
MCH
Position on chr10 (Mb)
Recombination rate (cM/Mb)

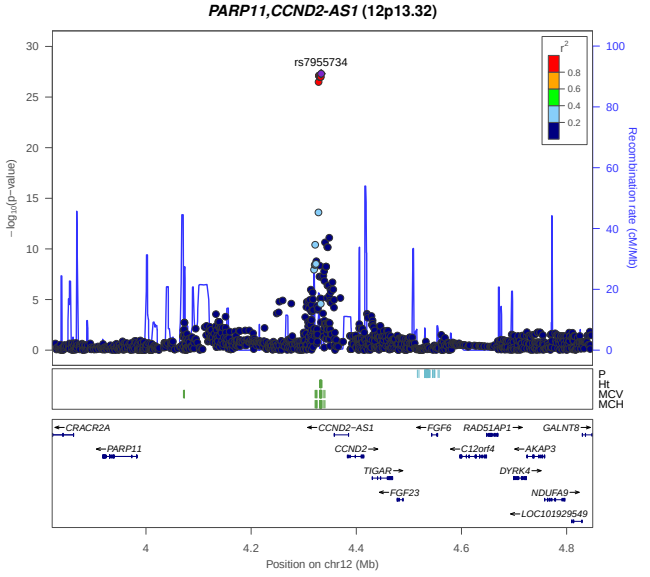

BTRC (10q24.32)
rs142108859
3 genes omitted
Position on chr10 (Mb)
Recombination rate (cM/Mb)

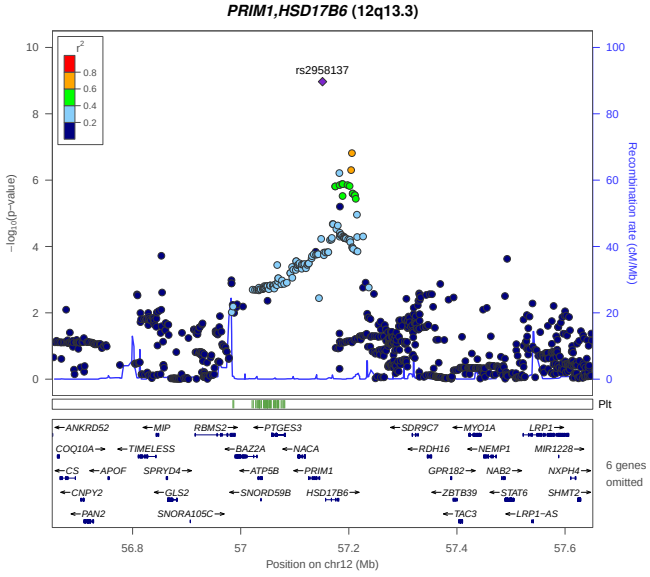

BET1L (11p15.5)
rs3782122
HbA1c
ALP
MCV
MCHC
8 genes omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)

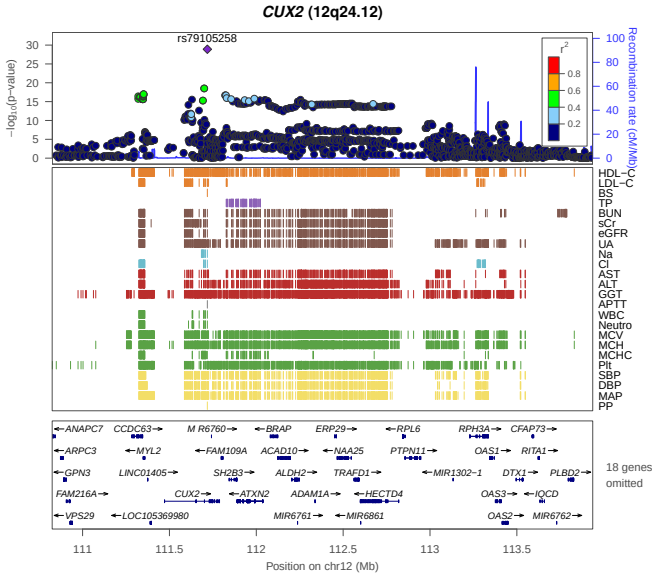

MYRF (11q12.2)
rs509360
TC
TG
HbA1c
TP
NAP
A/G
UA
ALT
GGT
Plt
5 genes omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)


ATM (11q22.3)
rs594153
MCV
MCH
Position on chr11 (Mb)
Recombination rate (cM/Mb)

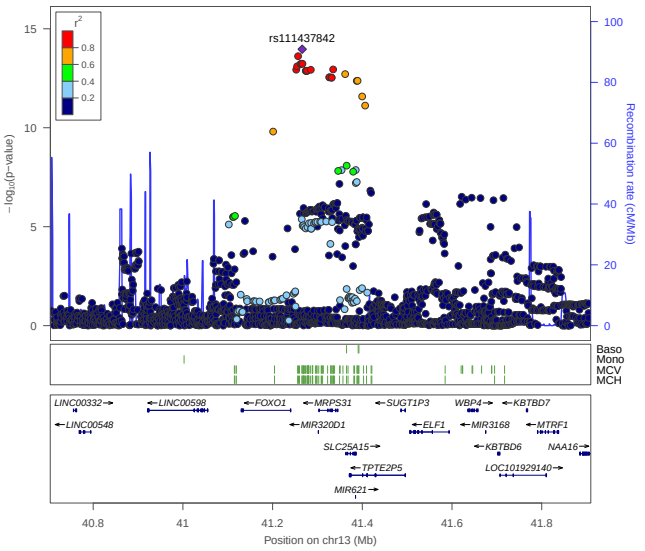

CACNA1C (12p13.33)
rs16929368
3 genes omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)


PARP11,CCND2-AS1 (12p13.32)
rs7955734
P
Ht
MCV
MCH
Position on chr12 (Mb)
Recombination rate (cM/Mb)

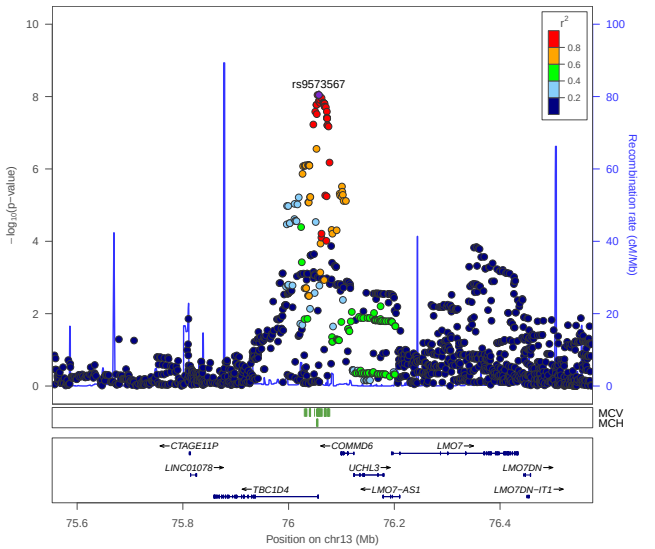

PRIM1,HSD17B6 (12q13.3)
rs2958137
Plt
6 genes omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)



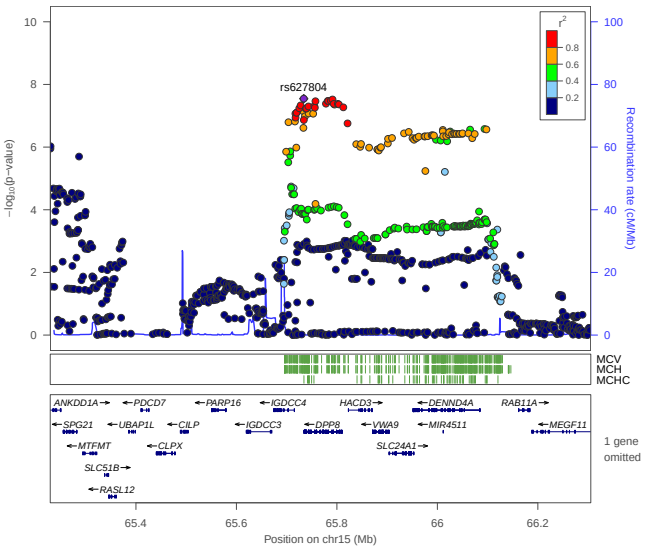
***CUX2* (12q24.12)**



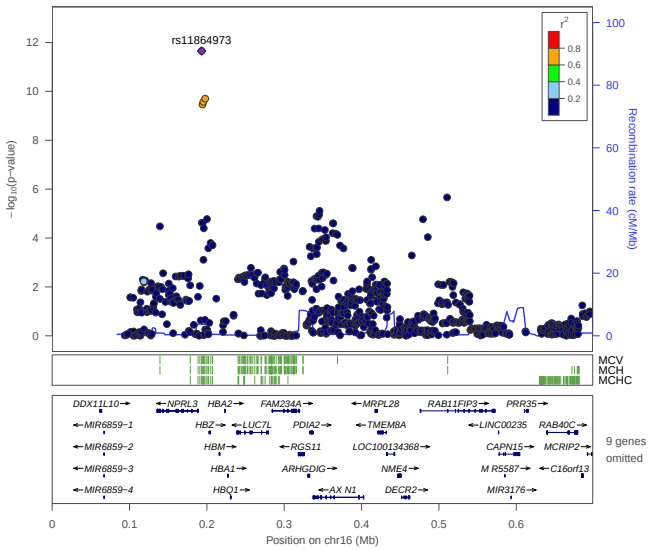
***FOXO1,MIR320D1* (13q14.11)**



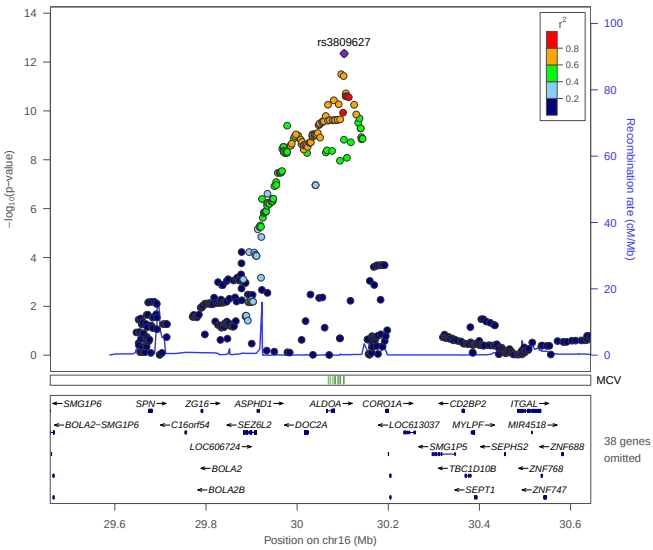
***TBC1D4,COMMD6* (13q22.2)**



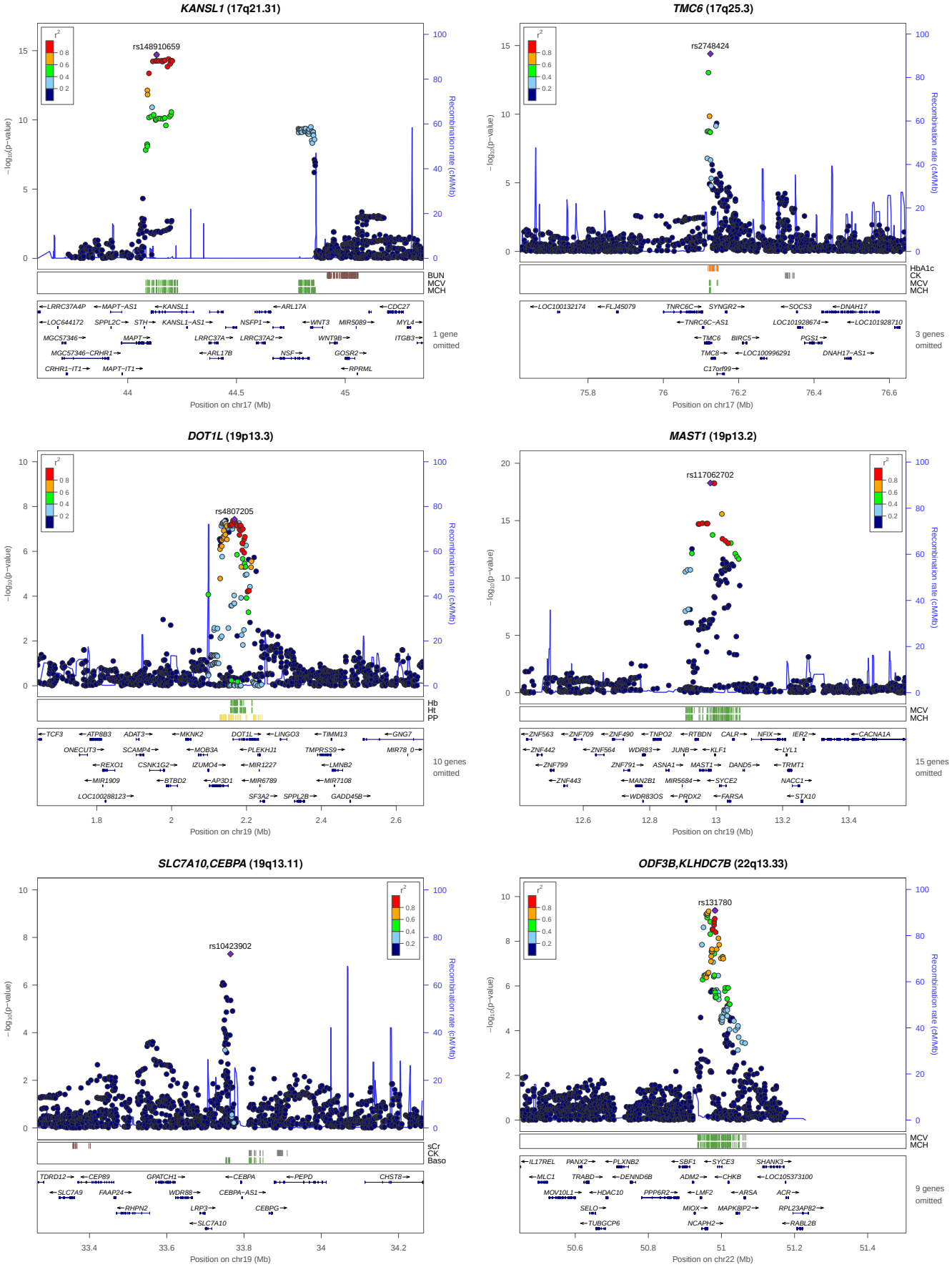
***IGDCC4,DPP8* (15q22.31)**



***NPRL3,HBZ* (16p13.3)**

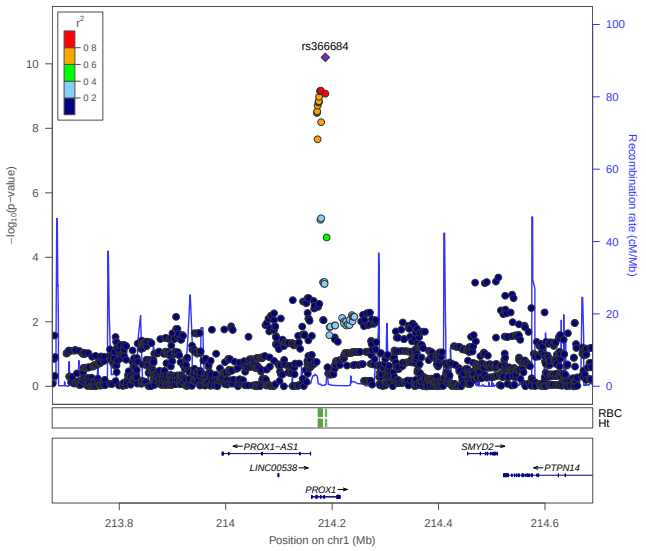


***TBX6* (16p11.2)**

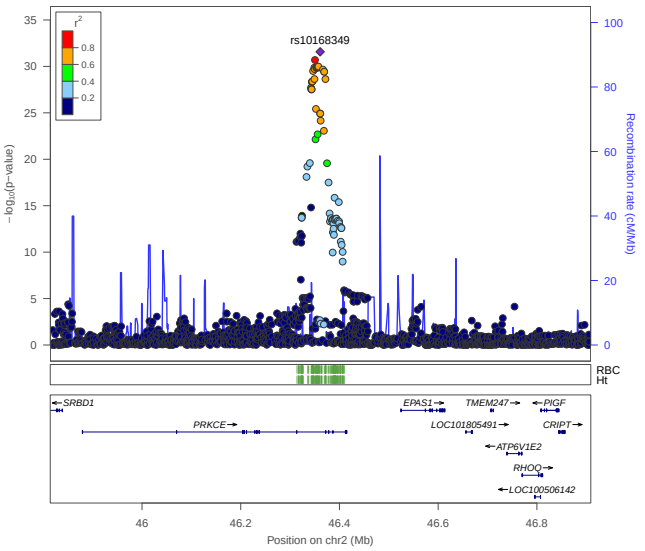

KANSL1 (17q21.31)
rs148910659
TMC6 (17q25.3)
rs2748424
DOT1L (19p13.3)
rs4807205
MAST1 (19p13.2)
rs117062702
SLC7A10,CEBPA (19q13.11)
rs10423902
ODF3B,KLHDC7B (22q13.33)
rs131780
Recombination rate (cM/Mb)
Position on chr17 (Mb)
Position on chr19 (Mb)
Position on chr22 (Mb)
1 gene omitted
3 genes omitted
10 genes omitted
15 genes omitted
9 genes omitted

2.39 Hb (n = 108,769)

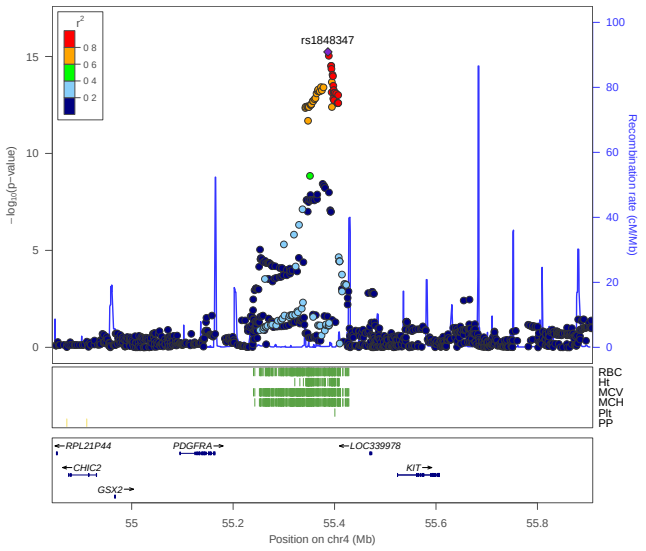
PROX1 **(1q32.3)**



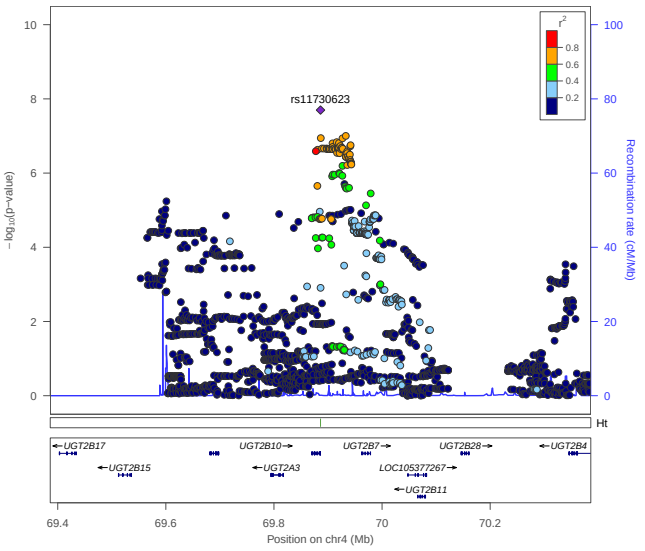
PRKCE **(2p21)**



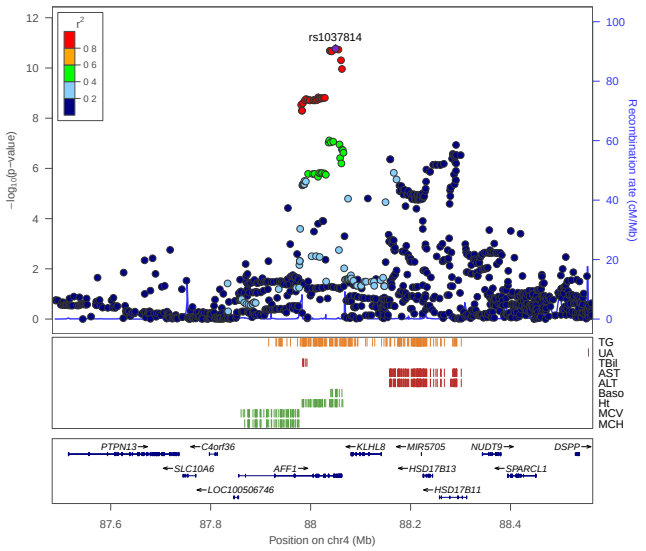
PDGFRA,KIT **(4q12)**



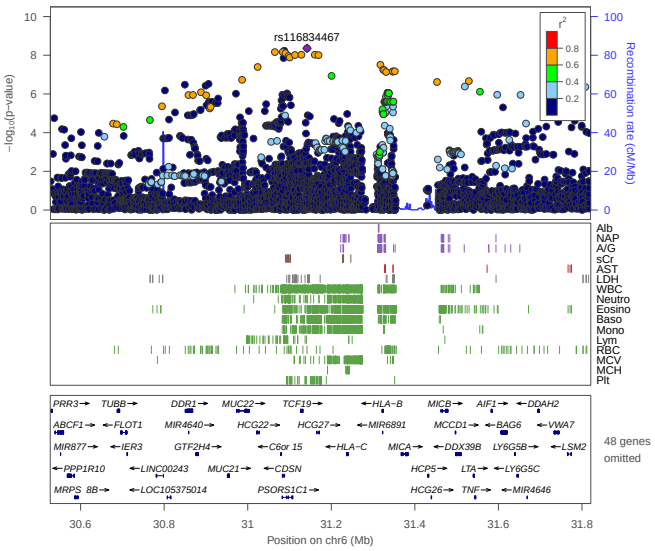
UGT2B10 **(4q13.2)**



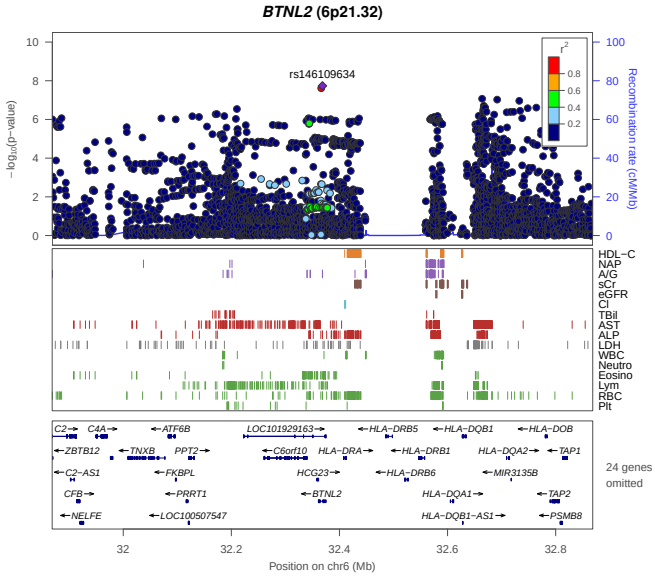
AFF1 **(4q22.1)**

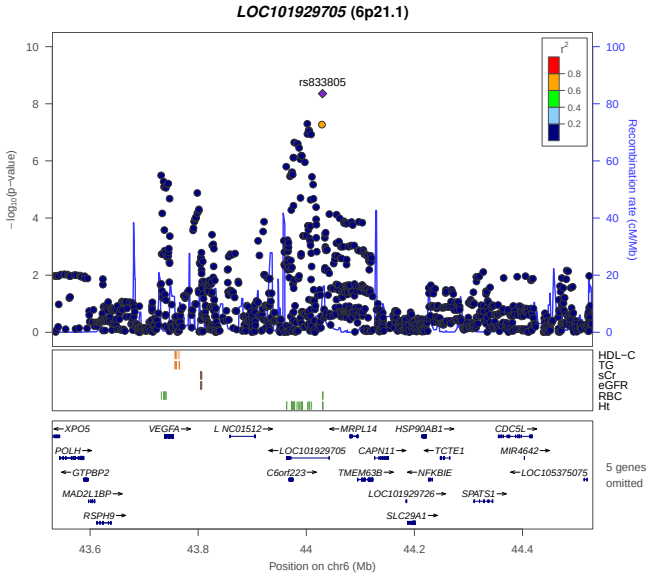


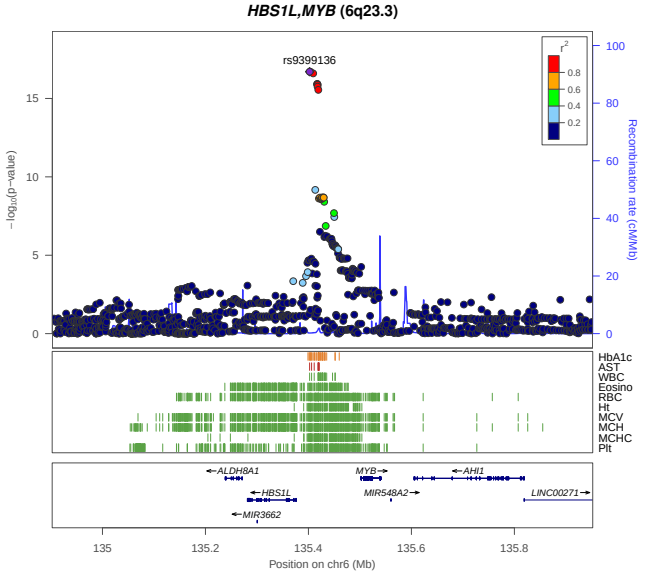
PSORS1C3 **(6p21.33)**

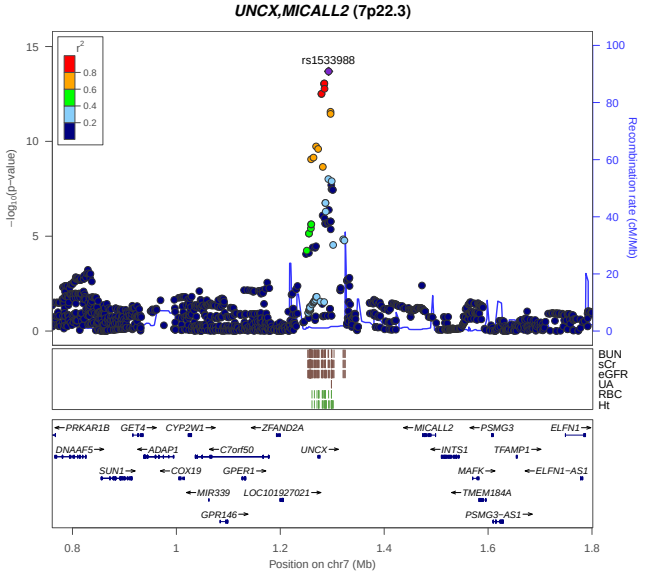


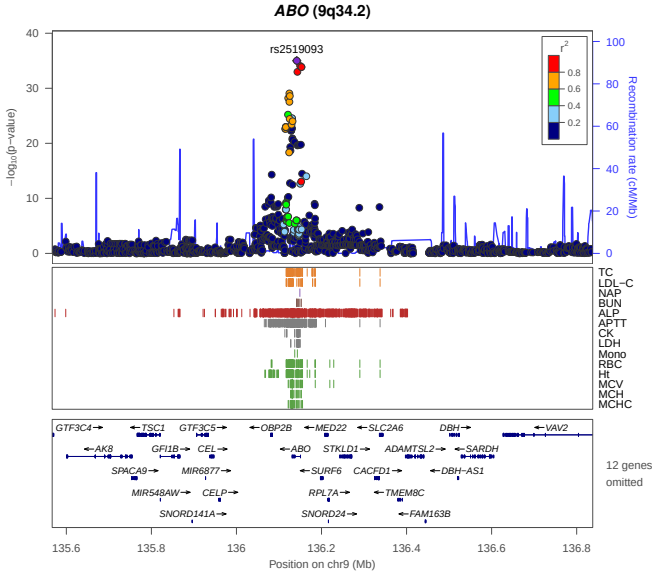
48 genes omitted

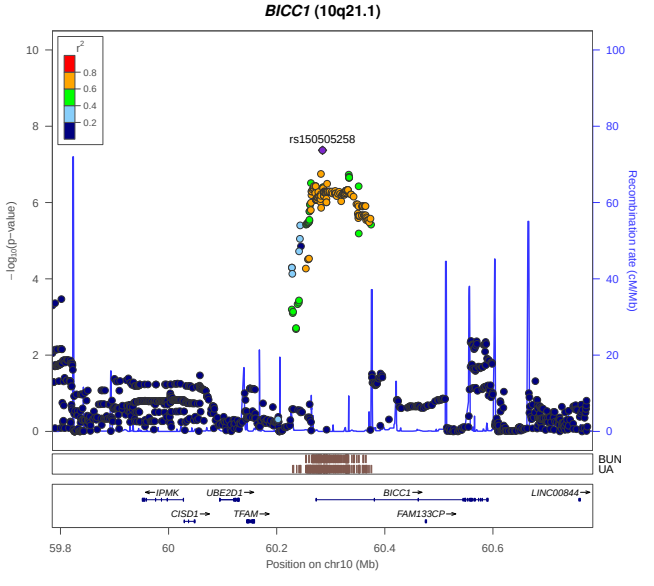

BTNL2 (6p21.32)
rs146109634
HDL−C
NAP
A/G
sCr
eGFR
Cl
TBil
AST
ALP
LDH
WBC
Neutro
Eosino
Lym
RBC
Plt
24 genes omitted
Position on chr6 (Mb)
Recombination rate (cM/Mb)

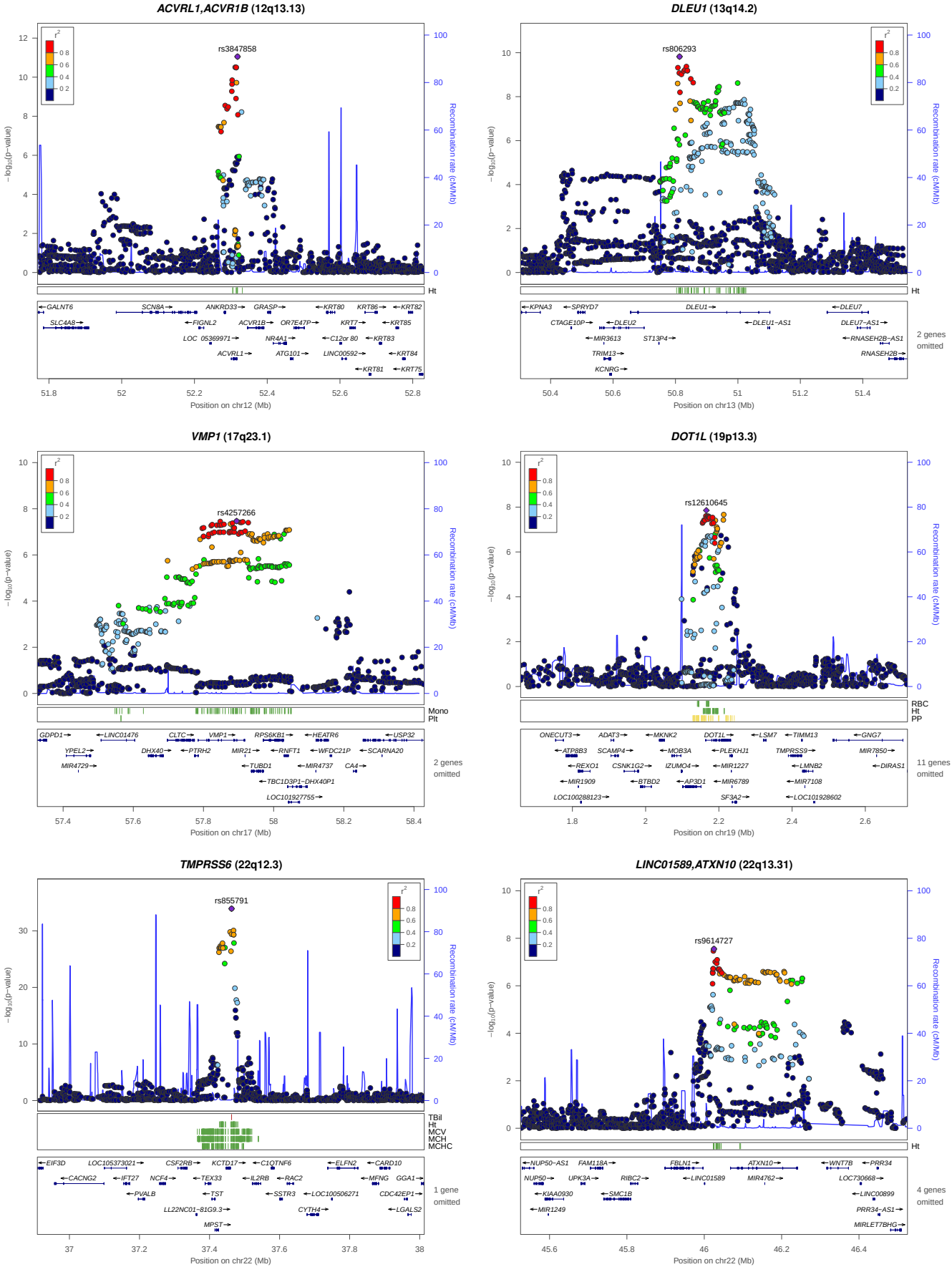

LOC101929705 (6p21.1)
rs833805
HDL−C
TG
sCr
eGFR
RBC
Ht
5 genes omitted
Position on chr6 (Mb)
Recombination rate (cM/Mb)

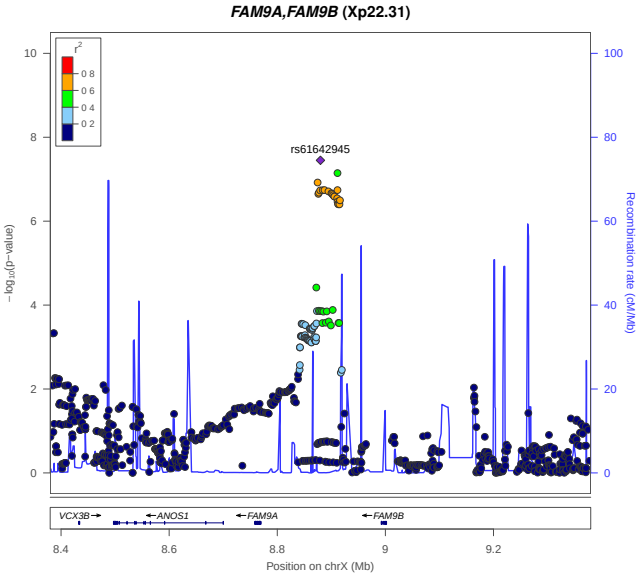

HBS1L,MYB (6q23.3)
rs9399136
HbA1c
AST
WBC
Eosino
RBC
Ht
MCV
MCH
MCHC
Plt
Position on chr6 (Mb)
Recombination rate (cM/Mb)


UNCX,MICALL2 (7p22.3)
rs1533988
BUN
sCr
eGFR
UA
RBC
Ht
Position on chr7 (Mb)
Recombination rate (cM/Mb)

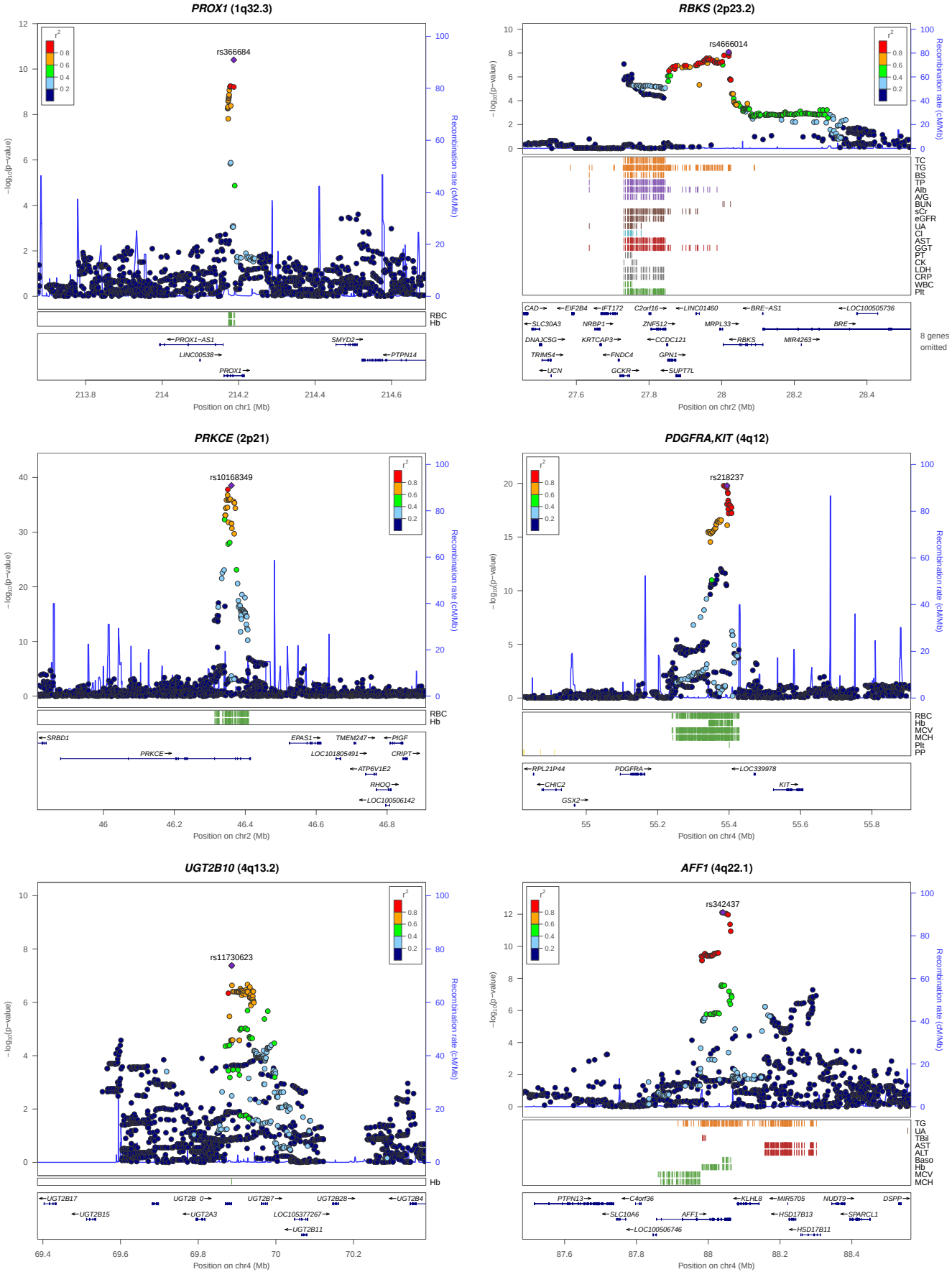

ABO (9q34.2)
rs2519093
TC
LDL−C
NAP
BUN
ALP
APTT
CK
LDH
Mono
RBC
Ht
MCV
MCH
MCHC
12 genes omitted
Position on chr9 (Mb)
Recombination rate (cM/Mb)

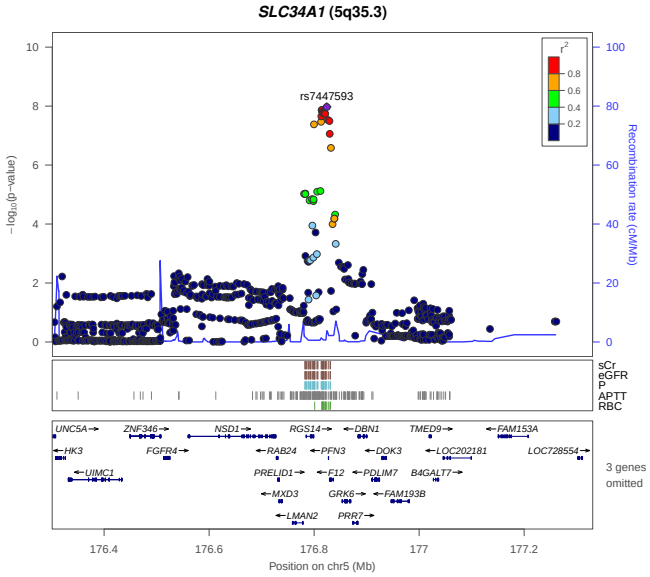

BICC1 (10q21.1)
rs150505258
BUN
UA
Position on chr10 (Mb)
Recombination rate (cM/Mb)

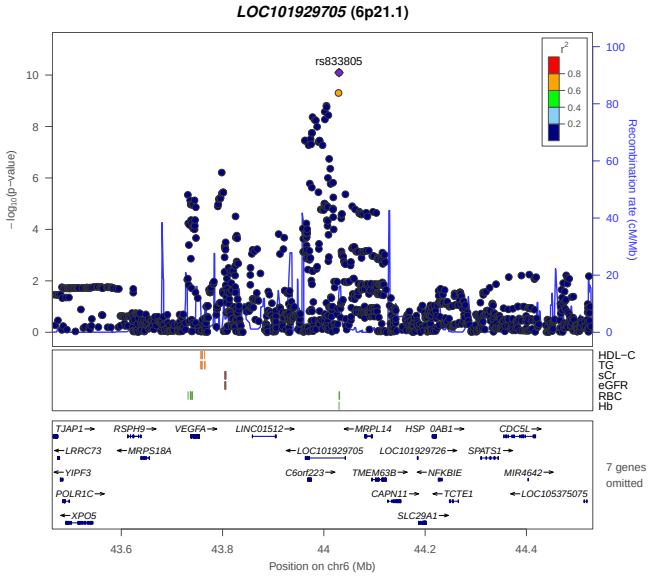

ACVRL1,ACVR1B (12q13.13)
rs3847858
Position on chr12 (Mb)
DLEU1 (13q14.2)
rs806293
2 genes omitted
Position on chr13 (Mb)
VMP1 (17q23.1)
rs4257266
Mono
Plt
2 genes omitted
Position on chr17 (Mb)
DOT1L (19p13.3)
rs12610645
RBC
Ht
PP
11 genes omitted
Position on chr19 (Mb)
TMPRSS6 (22q12.3)
rs855791
TBil
Ht
MCV
MCH
MCHC
1 gene omitted
Position on chr22 (Mb)
LINC01589,ATXN10 (22q13.31)
rs9614727
Ht
4 genes omitted
Position on chr22 (Mb)
Recombination rate (cM/Mb)

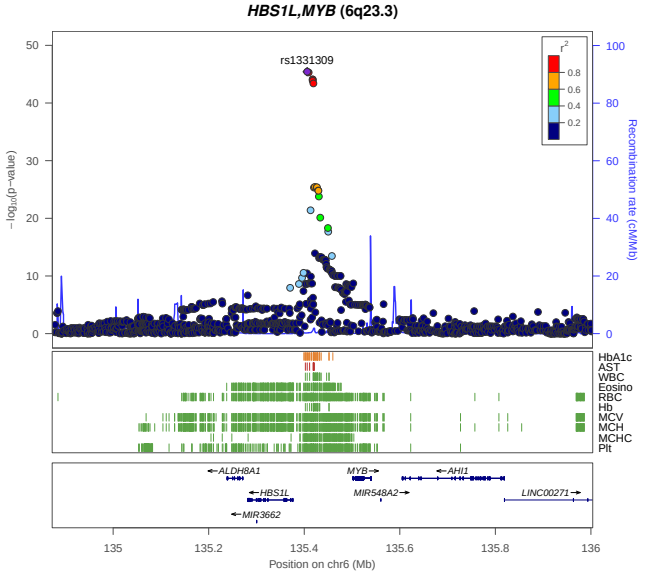

FAM9A,FAM9B (Xp22.31)
rs61642945
VCX3B
ANOS1
FAM9A
FAM9B
Position on chrX (Mb)
Recombination rate (cM/Mb)

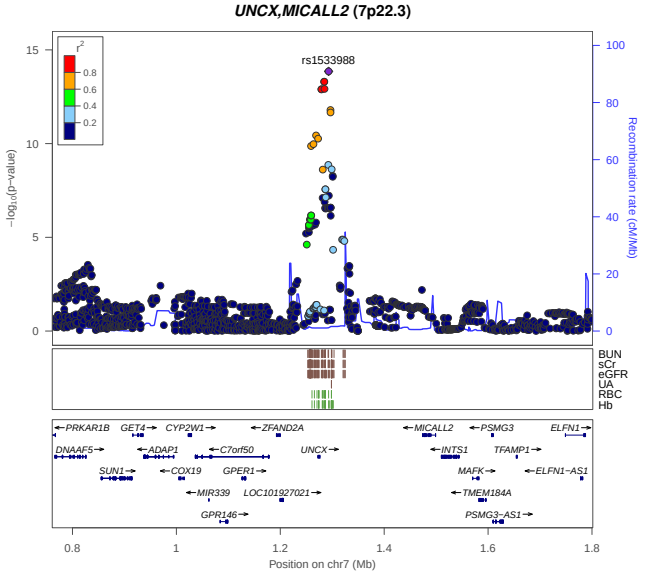
2.40 Ht (n = 108,757)

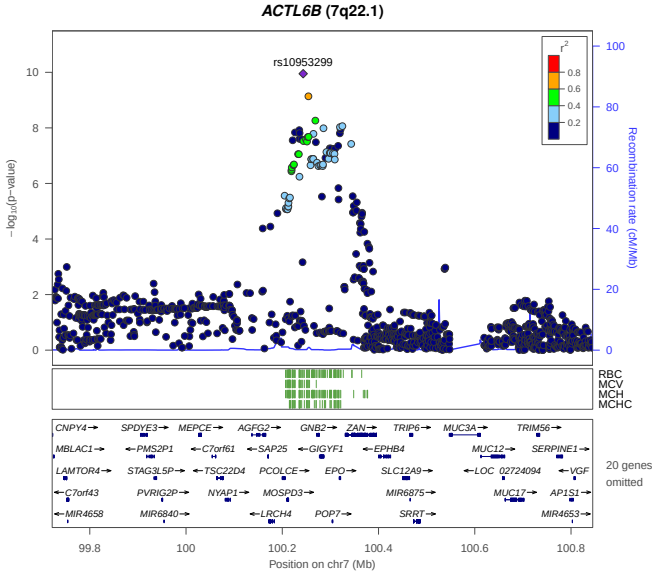


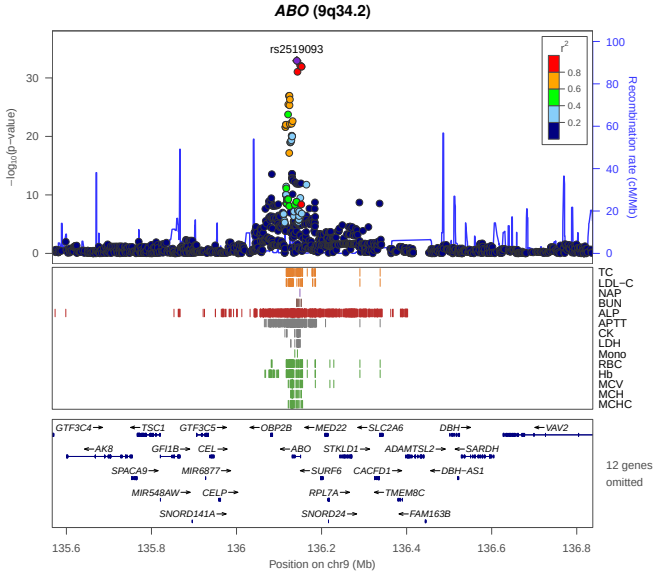

SLC34A1 (5q35.3)
rs7447593
Recombination rate (cM/Mb)
sCr
eGFR
P
APTT
RBC
3 genes omitted
Position on chr5 (Mb)

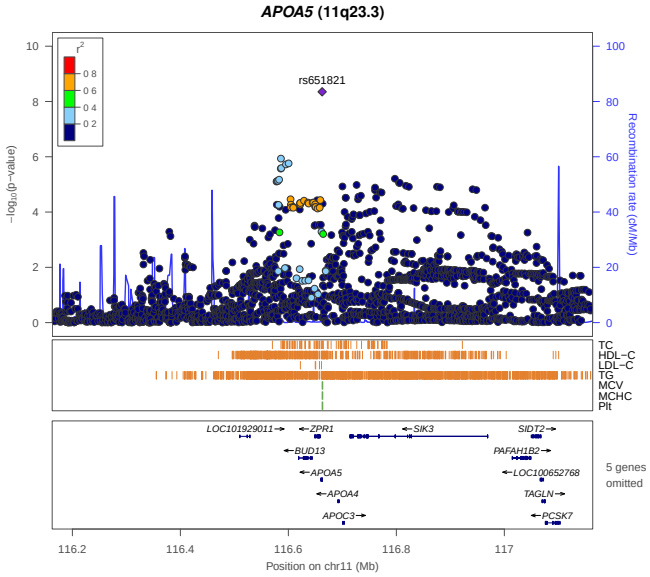

LOC101929705 (6p21.1)
rs833805
Recombination rate (cM/Mb)
HDL−C
TG
sCr
eGFR
RBC
Hb
7 genes omitted
Position on chr6 (Mb)

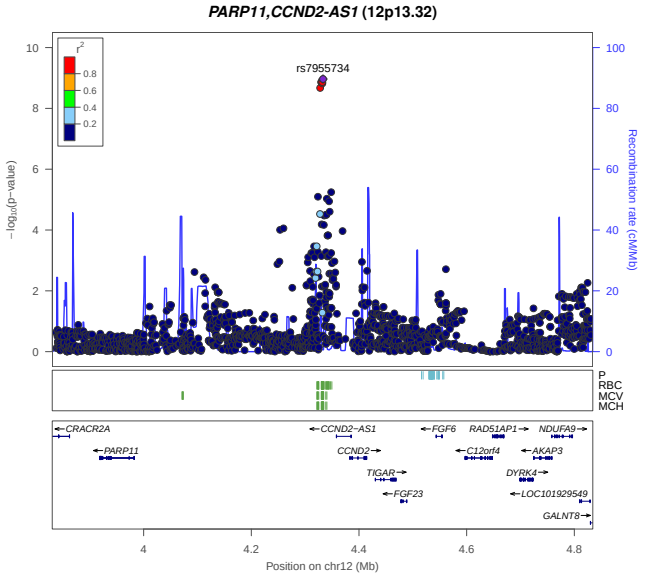

HBS1L,MYB (6q23.3)
rs1331309
Recombination rate (cM/Mb)
HbA1c
AST
WBC
Eosino
RBC
Hb
MCV
MCH
MCHC
Plt
Position on chr6 (Mb)

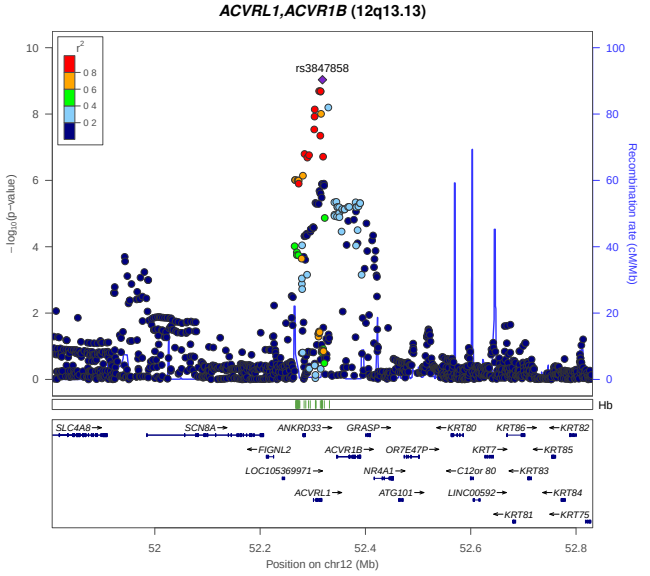

UNCX,MICALL2 (7p22.3)
rs1533988
Recombination rate (cM/Mb)
BUN
sCr
eGFR
UA
RBC
Hb
Position on chr7 (Mb)

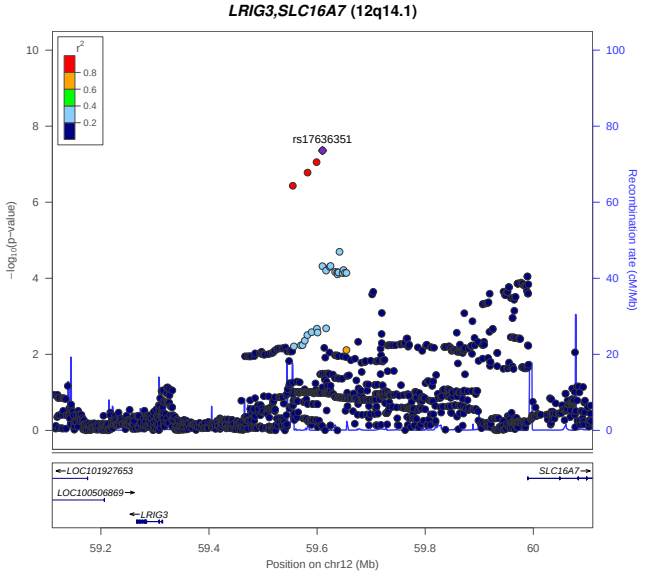

ACTL6B (7q22.1)
rs10953299
Recombination rate (cM/Mb)
RBC
MCV
MCH
MCHC
20 genes omitted
Position on chr7 (Mb)

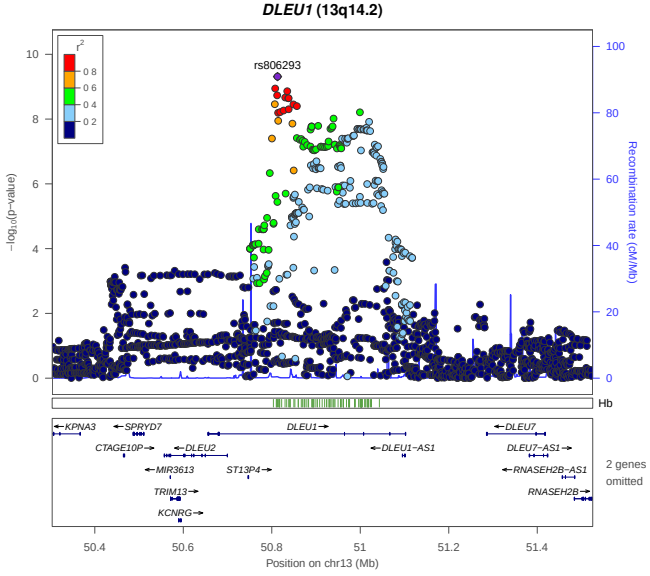

ABO (9q34.2)
rs2519093
Recombination rate (cM/Mb)
TC
LDL−C
NAP
BUN
ALP
APTT
CK
LDH
Mono
RBC
Hb
MCV
MCH
MCHC
12 genes omitted
Position on chr9 (Mb)

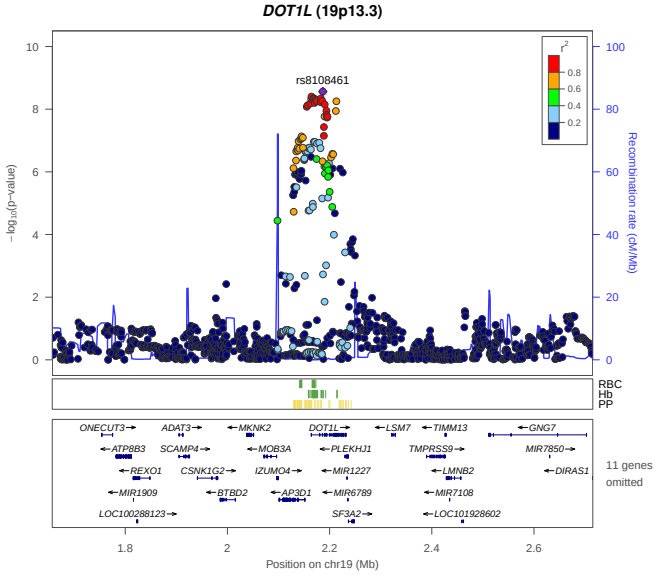

APOA5 (11q23.3)
rs651821
TC
HDL_C
LDL_C
TG
MCV
MCHC
Plt
5 genes omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)

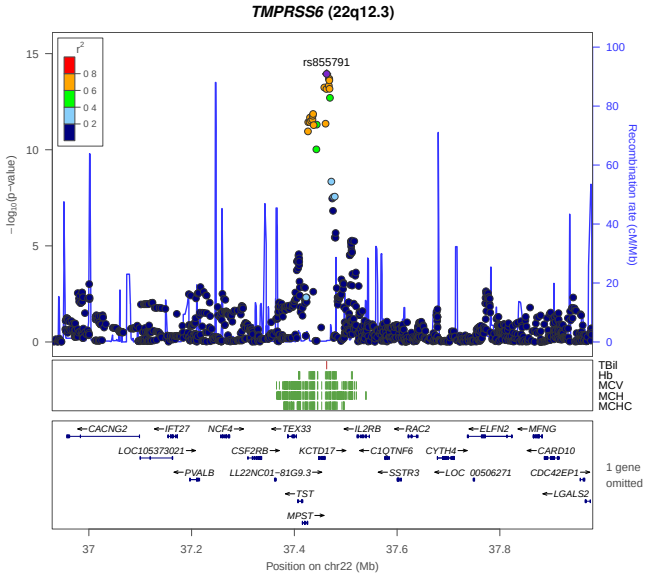

PARP11,CCND2-AS1 (12p13.32)
rs7955734
P
RBC
MCV
MCH
Position on chr12 (Mb)
Recombination rate (cM/Mb)

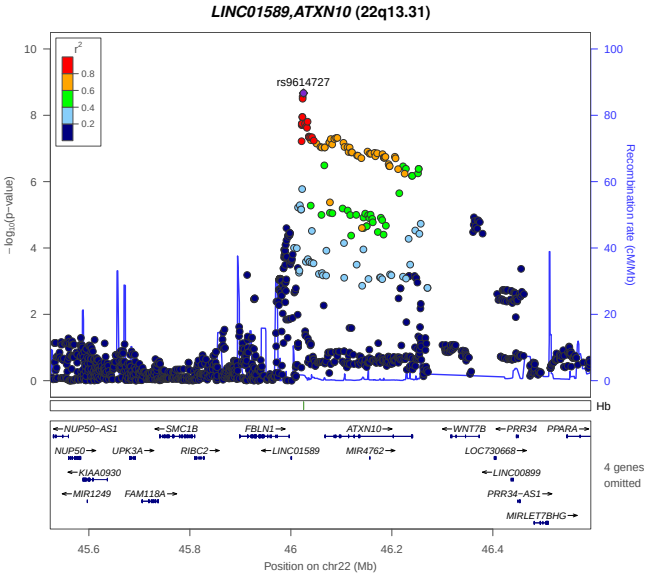

ACVRL1,ACVR1B (12q13.13)
rs3847858
Hb
Position on chr12 (Mb)
Recombination rate (cM/Mb)

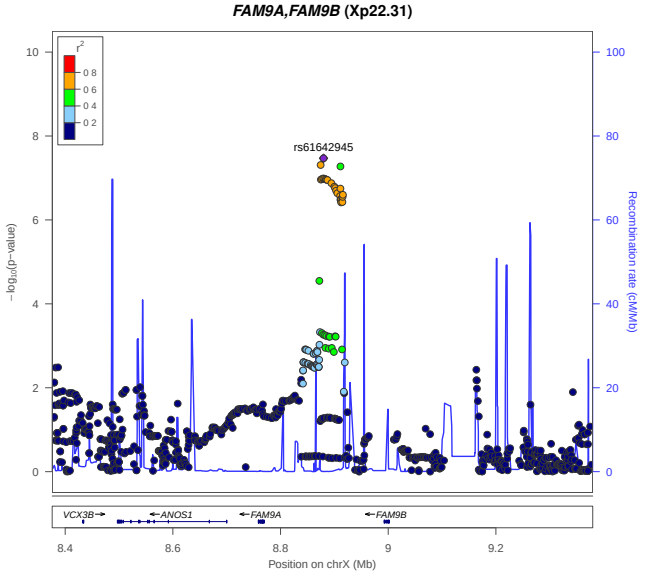

LRIG3,SLC16A7 (12q14.1)
rs17636351
Position on chr12 (Mb)
Recombination rate (cM/Mb)

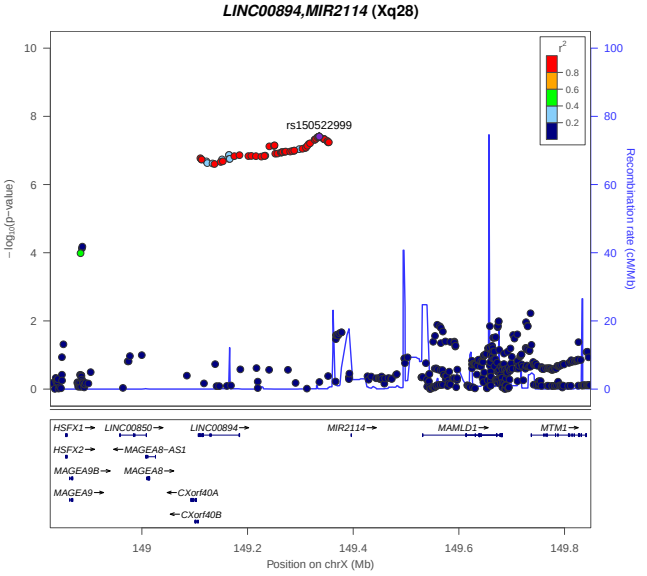

DLEU1 (13q14.2)
rs806293
Hb
2 genes omitted
Position on chr13 (Mb)
Recombination rate (cM/Mb)


DOT1L (19p13.3)
rs8108461
RBC
Hb
PP
11 genes omitted
Position on chr19 (Mb)
Recombination rate (cM/Mb)

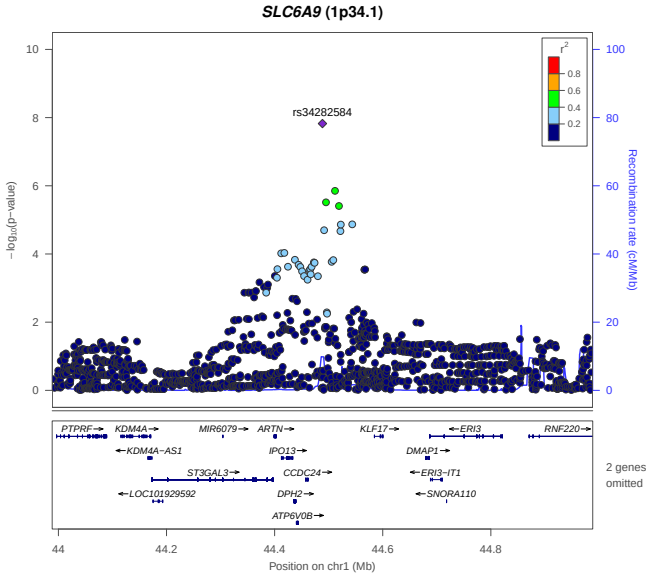

TMPRSS6 (22q12.3)
rs855791
Recombination rate (cM/Mb)
TBil
Hb
MCV
MCH
MCHC
1 gene omitted
Position on chr22 (Mb)

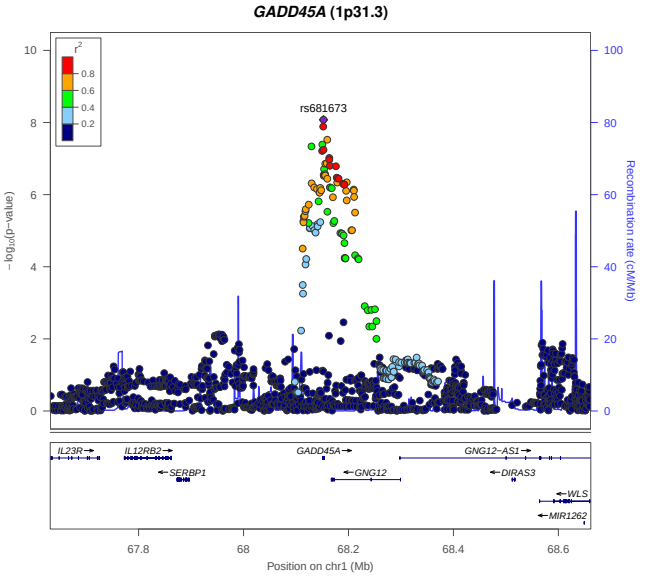

LINC01589,ATXN10 (22q13.31)
rs9614727
Recombination rate (cM/Mb)
Hb
4 genes omitted
Position on chr22 (Mb)

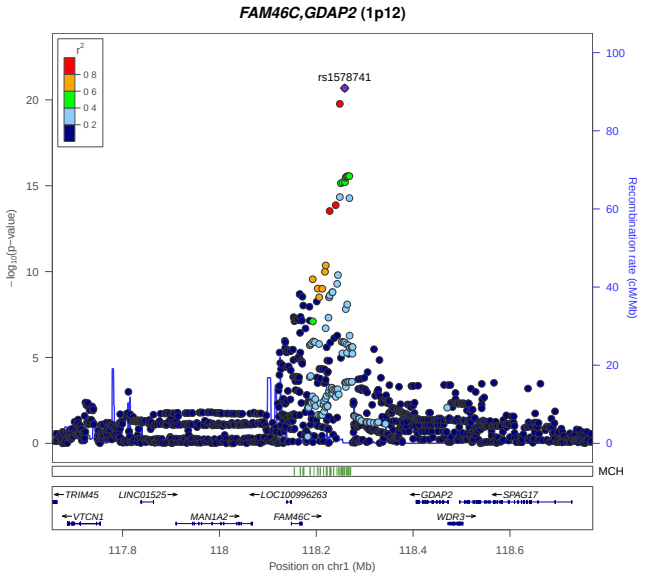

FAM9A,FAM9B (Xp22.31)
rs61642945
Recombination rate (cM/Mb)
Position on chrX (Mb)

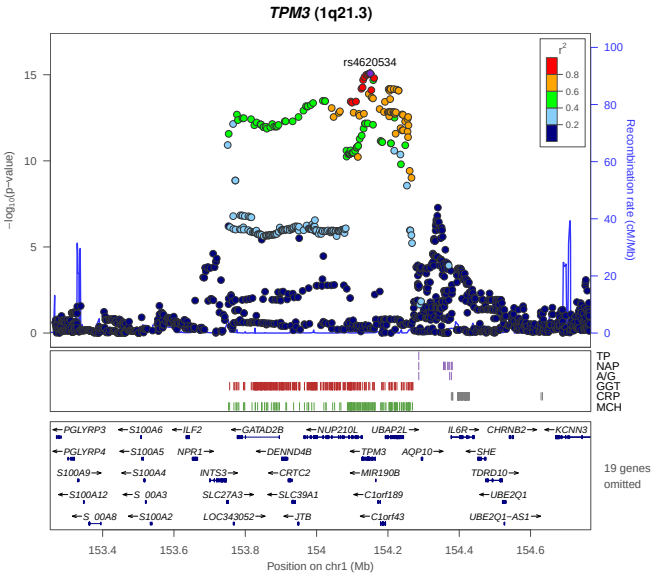

LINC00894,MIR2114 (Xq28)
rs150522999
Recombination rate (cM/Mb)
Position on chrX (Mb)

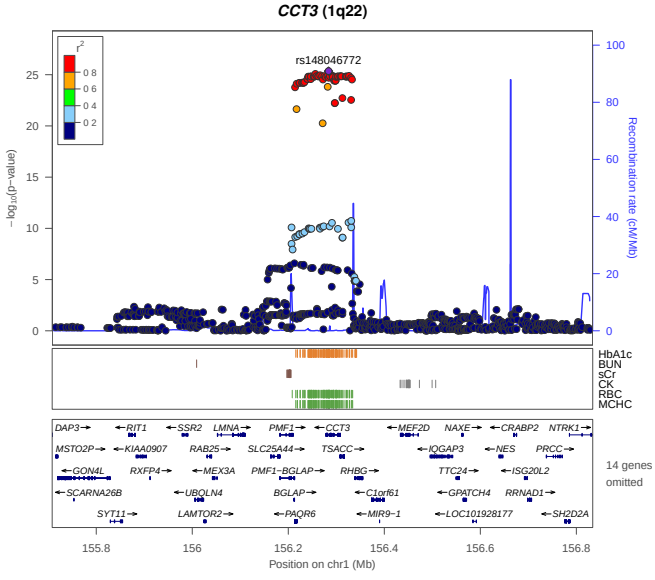
2.41 MCV (n = 108,256)

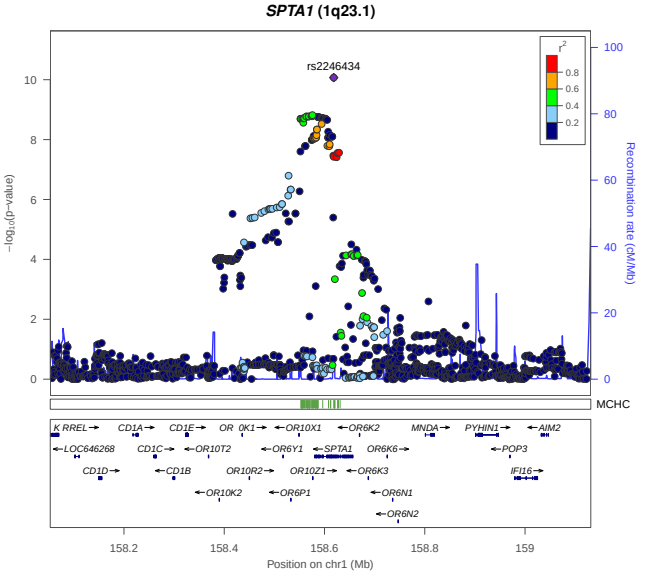


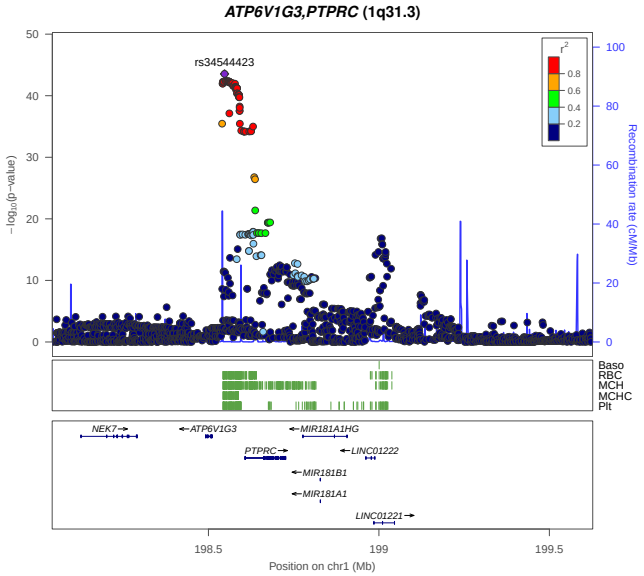


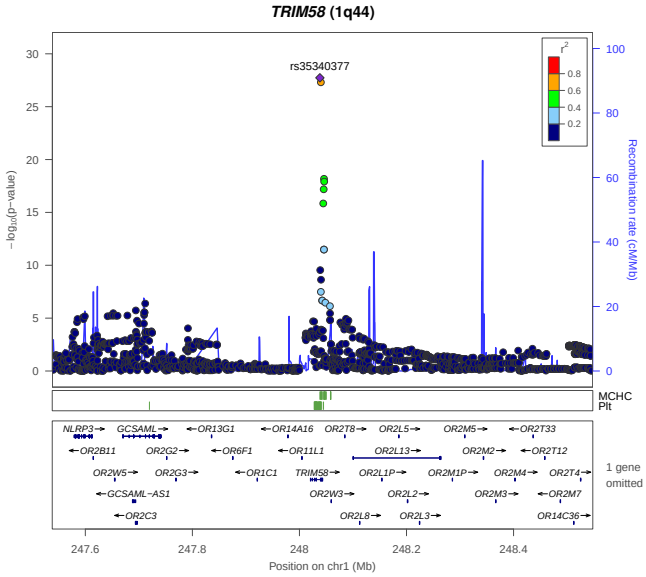


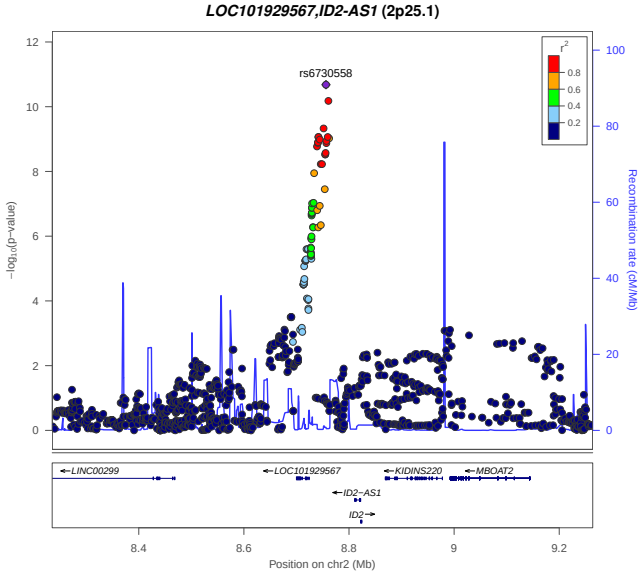


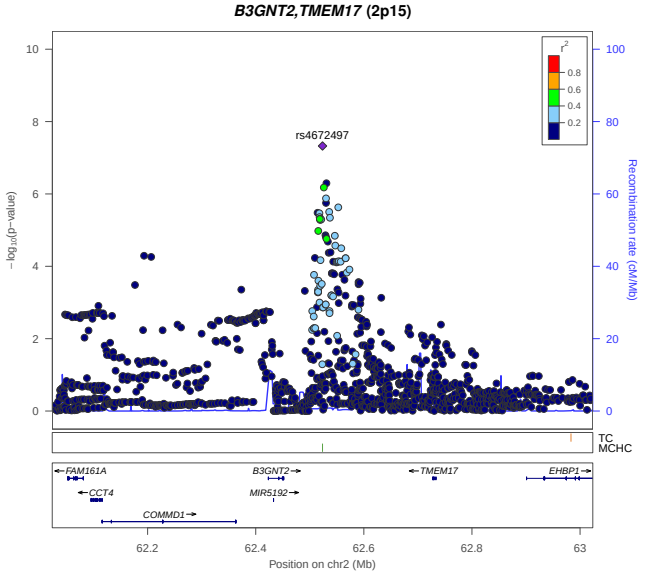


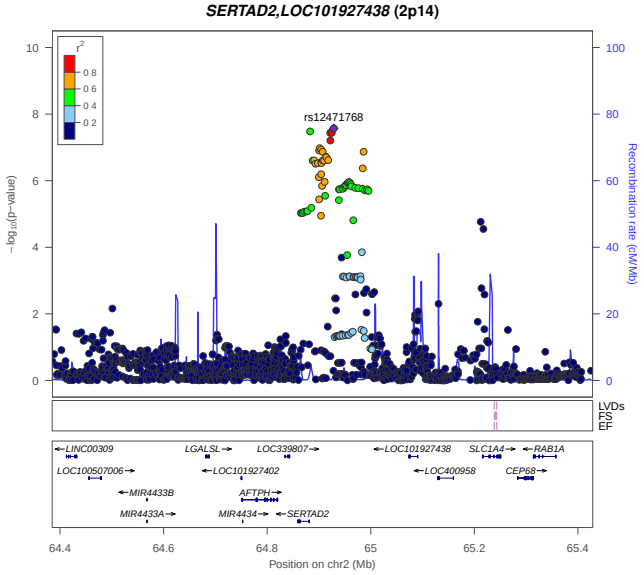


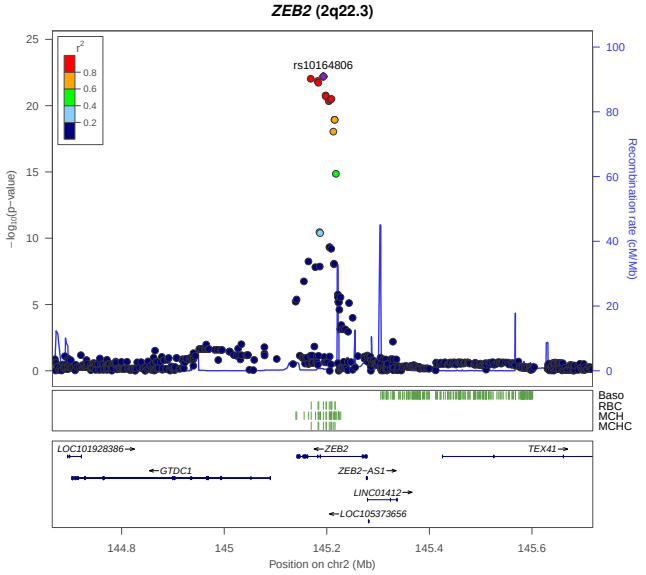

ATP6V1G3,PTPRC (1q31.3)
rs34544423
Baso
RBC
MCH
MCHC
Plt
NEK7
ATP6V1G3
MIR181A1HG
PTPRC
LINC01222
MIR181B1
MIR181A1
LINC01221
Position on chr1 (Mb)
Recombination rate (cM/Mb)

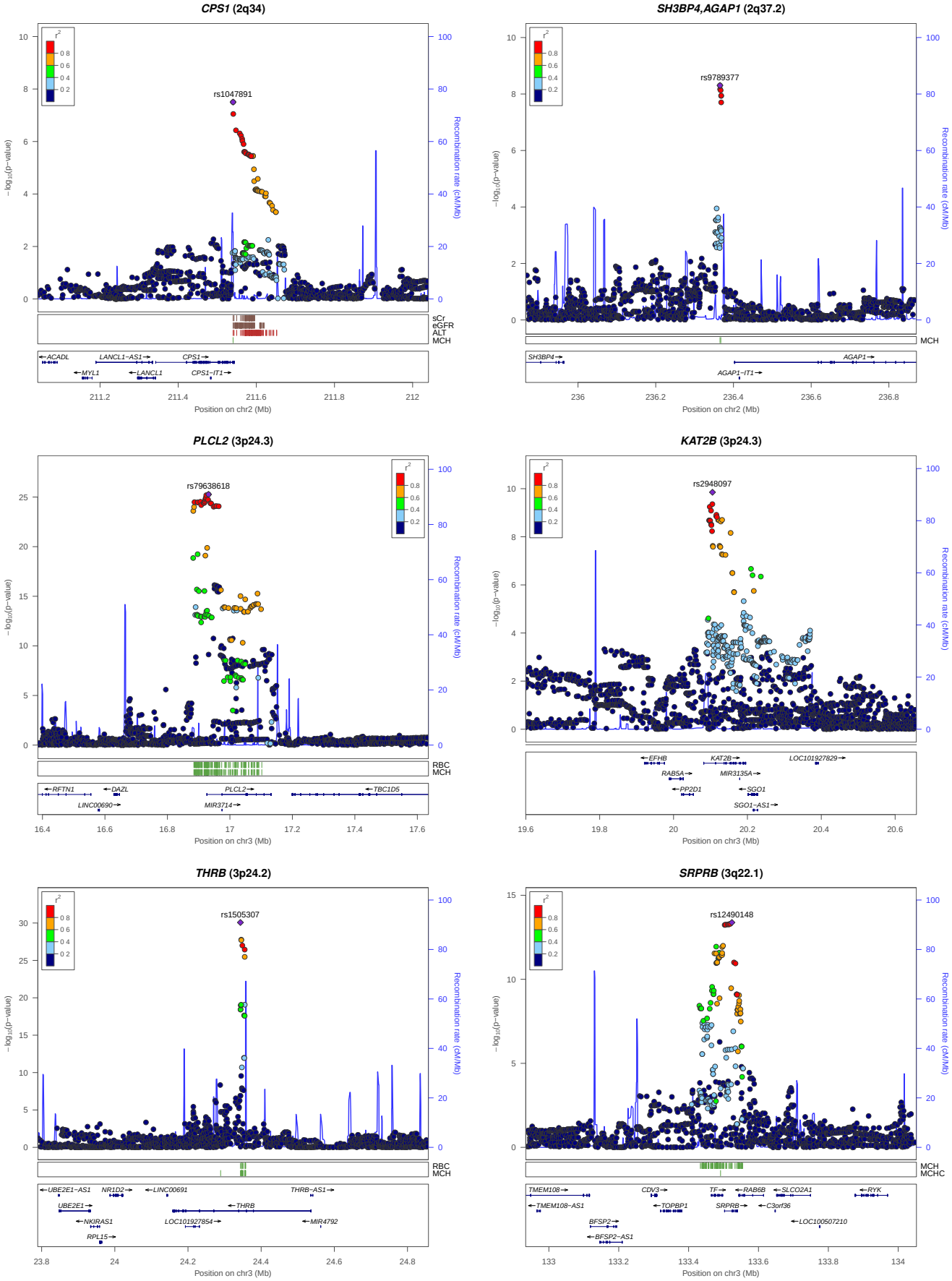

TRIM58 (1q44)
rs35340377
MCHC
Plt
1 gene omitted
Position on chr1 (Mb)
Recombination rate (cM/Mb)

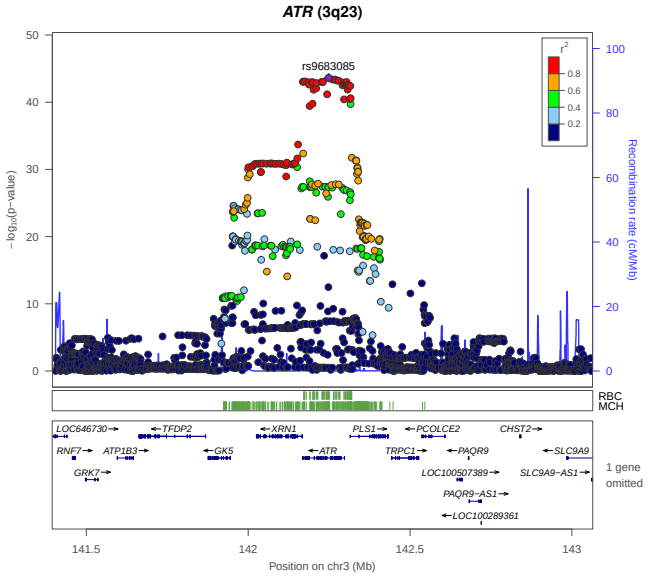

LOC101929567,ID2-AS1 (2p25.1)
rs6730558
LINC00299
LOC101929567
KIDINS220
MBOAT2
ID2-AS1
ID2
Position on chr2 (Mb)
Recombination rate (cM/Mb)

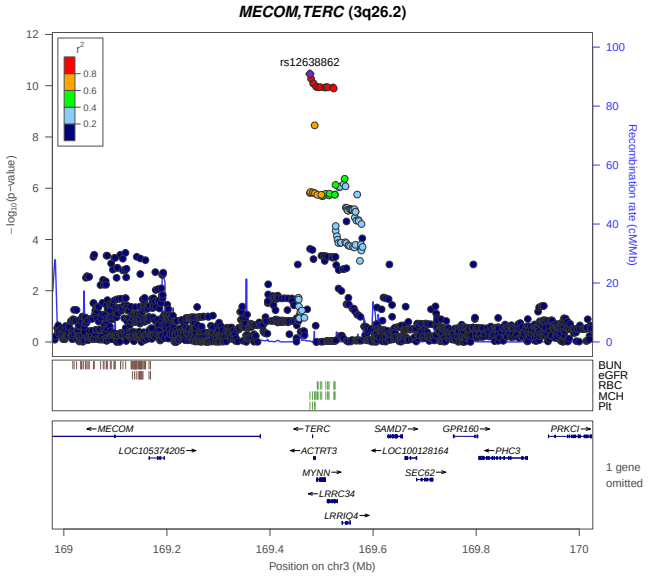

B3GNT2,TMEM17 (2p15)
rs4672497
TC
MCHC
FAM161A
B3GNT2
TMEM17
EHBP1
CCT4
MIR5192
COMMD1
Position on chr2 (Mb)
Recombination rate (cM/Mb)

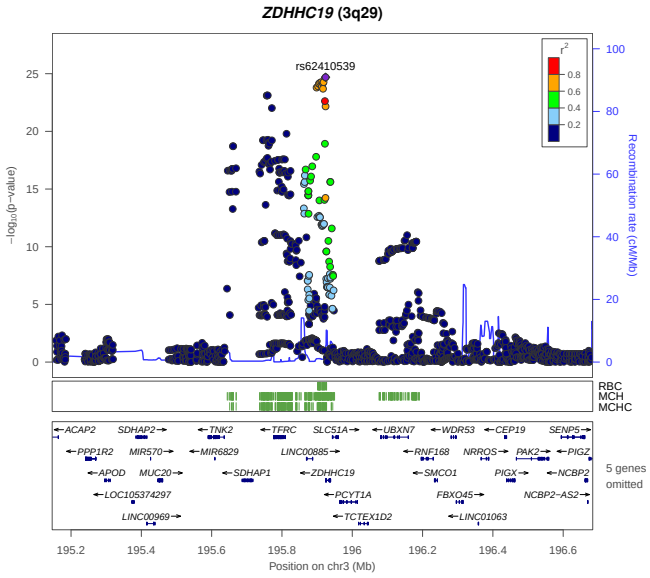

SERTAD2,LOC101927438 (2p14)
rs12471768
LVDs
FS
EF
LINC00309
LGALSL
LOC339807
LOC101927438
SLC1A4
RAB1A
LOC100507006
LOC101927402
LOC400958
CEP68
MIR4433B
AFTPH
MIR4433A
MIR4434
SERTAD2
Position on chr2 (Mb)
Recombination rate (cM/Mb)

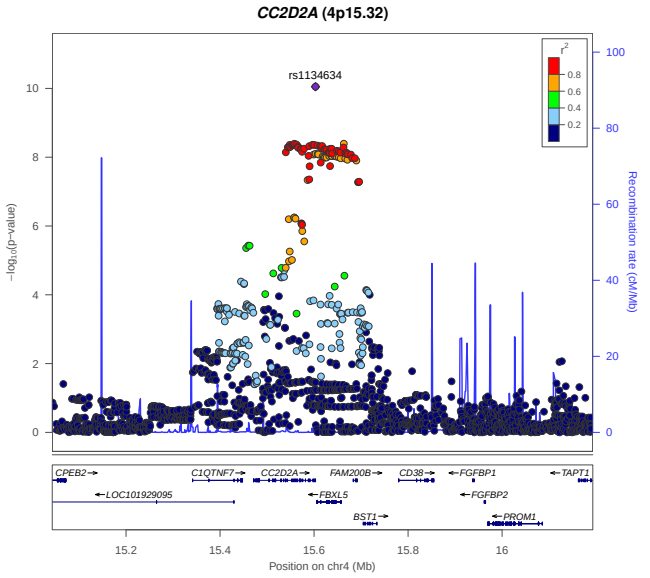

ZEB2 (2q22.3)
rs10164806
Baso
RBC
MCH
MCHC
LOC101928386
ZEB2
TEX41
GTDC1
ZEB2-AS1
LINC01412
LOC105373656
Position on chr2 (Mb)
Recombination rate (cM/Mb)

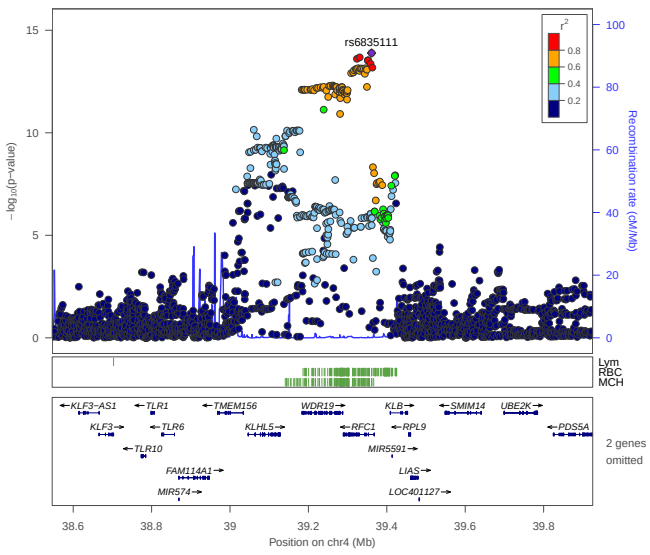

CPS1 (2q34)
rs1047891
sCr
eGFR
ALT
MCH
ACADL
LANCL1-AS1
CPS1
MYL1
LANCL1
CPS1-IT1
Position on chr2 (Mb)
Recombination rate (cM/Mb)
SH3BP4,AGAP1 (2q37.2)
rs9789377
MCH
SH3BP4
AGAP1
AGAP1-IT1
Position on chr2 (Mb)
PLCL2 (3p24.3)
rs79638618
RBC
MCH
RFTN1
DAZL
PLCL2
TBC1D5
LINC00690
MIR3714
Position on chr3 (Mb)
KAT2B (3p24.3)
rs2948097
EFHB
KAT2B
LOC101927829
RAB5A
MIR3135A
PP2D1
SGO1
SGO1-AS1
Position on chr3 (Mb)
THRB (3p24.2)
rs1505307
RBC
MCH
UBE2E1-AS1
NR1D2
LINC00691
THRB-AS1
UBE2E1
THRB
NKIRAS1
LOC101927854
MIR4792
RPL15
Position on chr3 (Mb)
SRPRB (3q22.1)
rs12490148
MCH
MCHC
TMEM108
CDV3
TF
RAB6B
SLCO2A1
RYK
TMEM108-AS1
TOPBP1
SRPRB
C3orf36
BFSP2
LOC100507210
BFSP2-AS1
Position on chr3 (Mb)

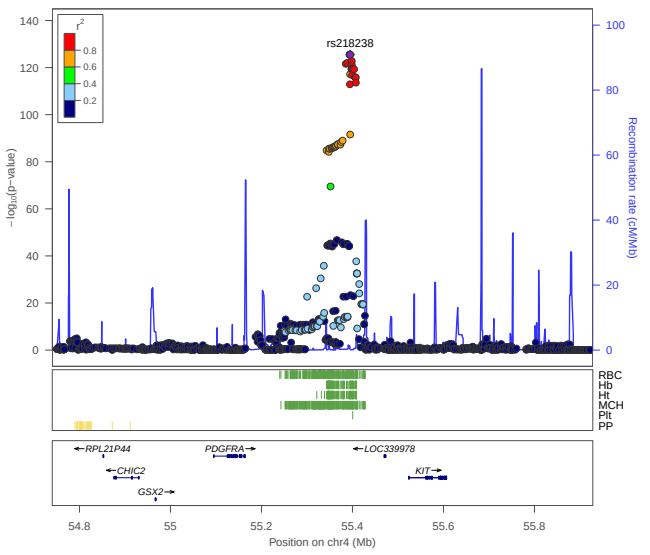

ATR (3q23)
rs9683085
−log10(p-value)
Recombination rate (cM/Mb)
RBC
MCH
LOC646730 TFDP2 XRN1 PLS1 PCOLCE2 CHST2
RNF7 ATP1B3 GK5 ATR TRPC1 PAQR9 SLC9A9
GRK7 LOC100507389 SLC9A9-AS1
PAQR9-AS1
LOC100289361
1 gene omitted
Position on chr3 (Mb)

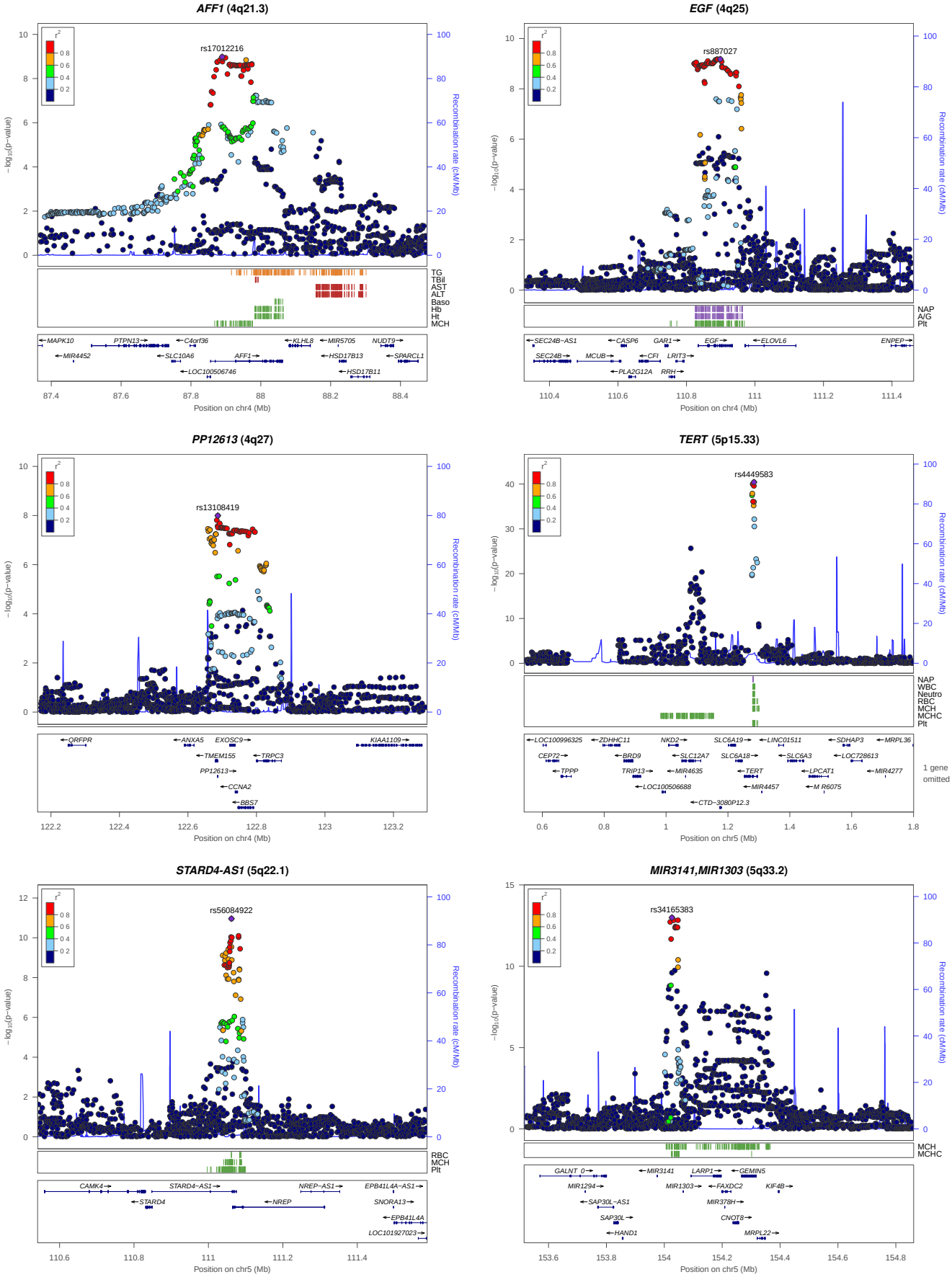

MECOM,TERC (3q26.2)
rs12638862
−log10(p-value)
Recombination rate (cM/Mb)
BUN
eGFR
RBC
MCH
Plt
MECOM TERC SAMD7 GPR160 PRKCI
LOC105374205 ACTRT3 LOC100128164 PHC3
MYNN SEC62
LRRC34
LRRIQ4
1 gene omitted
Position on chr3 (Mb)

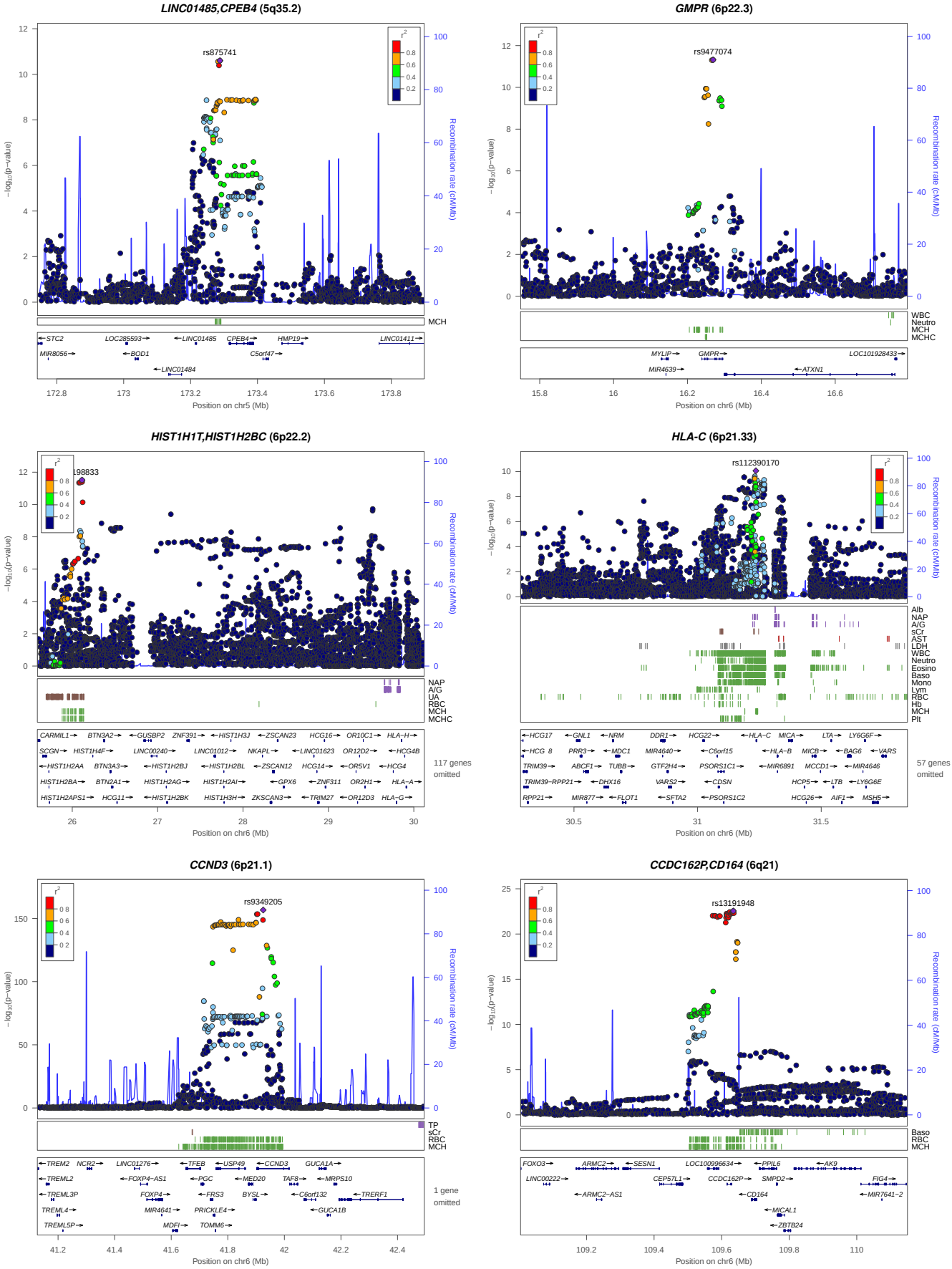

ZDHHC19 (3q29)
rs62410539
−log10(p-value)
Recombination rate (cM/Mb)
RBC
MCH
MCHC
ACAP2 SDHAP2 TNK2 TFRC SLC51A UBXN7 WDR53 CEP19 SENP5
PPP1R2 MIR570 MIR6829 LINC00885 RNF168 NRROS PAK2 PIGZ
APOD MUC20 SDHAP1 ZDHHC19 SMCO1 PIGX NCBP2
LOC105374297 PCYT1A FBXO45 NCBP2-AS2
LINC00969 TCTEX1D2 LINC01063
5 genes omitted
Position on chr3 (Mb)

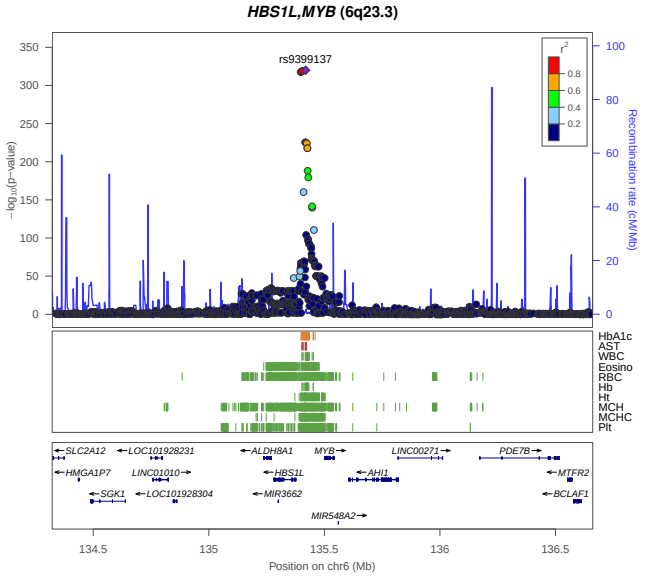

CC2D2A (4p15.32)
rs1134634
−log10(p-value)
Recombination rate (cM/Mb)
CPEB2 C1QTNF7 CC2D2A FAM200B CD38 FGFBP1 TAPT1
LOC101929095 FBXL5 FGFBP2
BST1 PROM1
Position on chr4 (Mb)

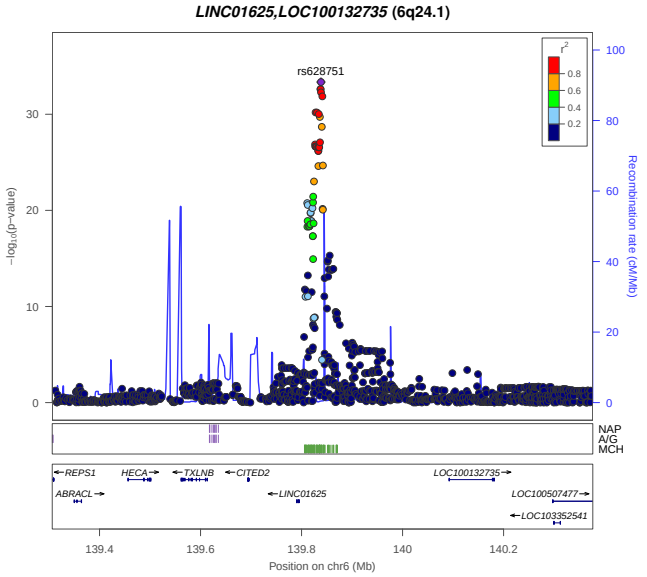

MIR1273H (4p14)
rs6835111
−log10(p-value)
Recombination rate (cM/Mb)
Lym
RBC
MCH
KLF3-AS1 TLR1 TMEM156 WDR19 KLB SMIM14 UBE2K
KLF3 TLR6 KLHL5 RFC1 RPL9 PDS5A
TLR10 MIR5591
FAM114A1 LIAS
MIR574 LOC401127
2 genes omitted
Position on chr4 (Mb)

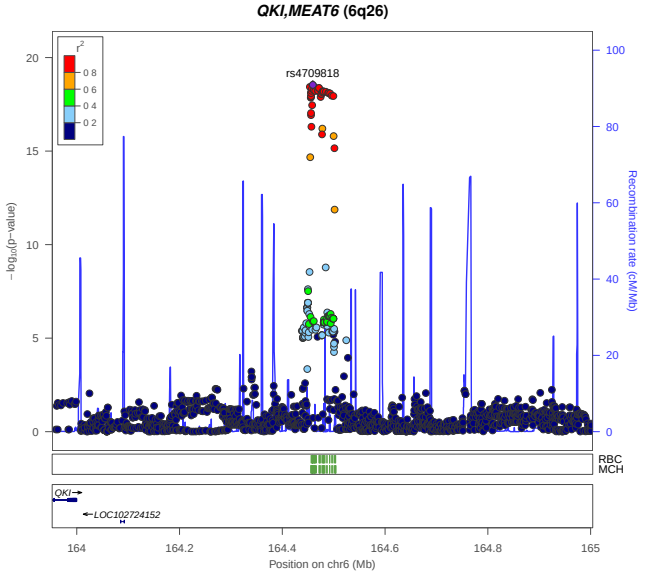

PDGFRA,KIT (4q12)
rs218238
−log10(p-value)
Recombination rate (cM/Mb)
RBC
Hb
Ht
MCH
Plt
PP
RPL21P44 PDGFRA LOC339978
CHIC2 KIT
GSX2
Position on chr4 (Mb)

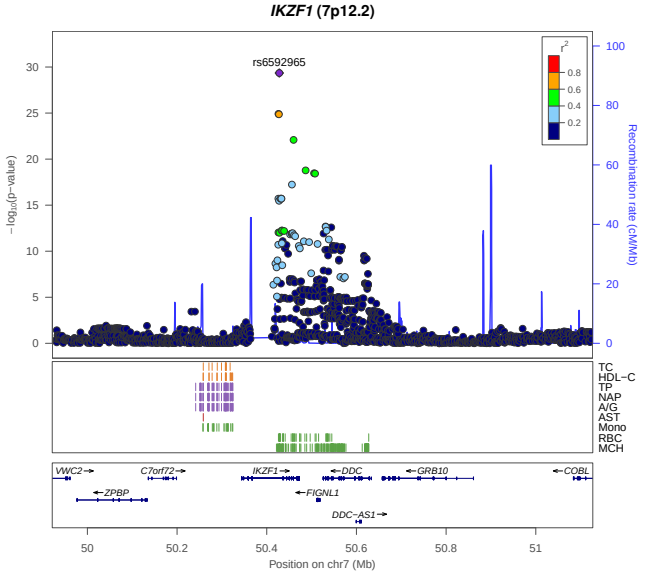

AFF1 (4q21.3)
rs17012216
EGF (4q25)
rs887027
PP12613 (4q27)
rs13108419
TERT (5p15.33)
rs4449583
STARD4-AS1 (5q22.1)
rs56084922
MIR3141,MIR1303 (5q33.2)
rs34165383
Recombination rate (cM/Mb)
Position on chr4 (Mb)
Position on chr5 (Mb)
1 gene omitted

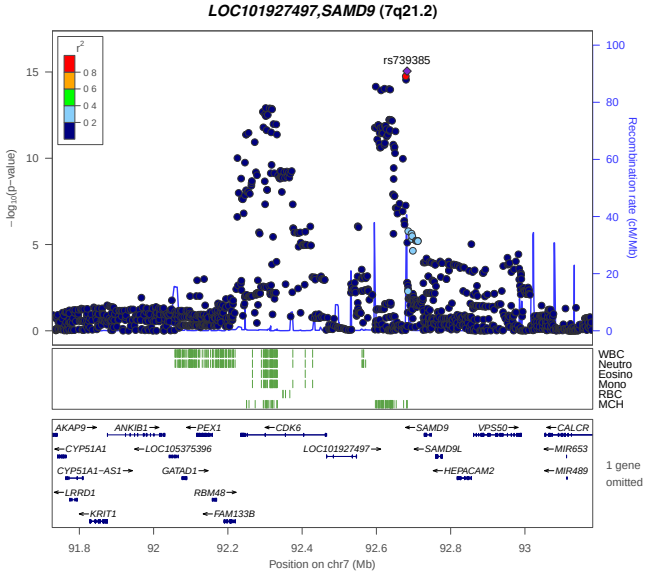

LINC01485,CPEB4 (5q35.2)
rs875741
MCH
STC2 LOC285593 LINC01485 CPEB4 HMP19 LINC01411
MIR8056 BOD1 C5orf47
LINC01484
Position on chr5 (Mb)
GMPR (6p22.3)
rs9477074
WBC
Neutro
MCH
MCHC
MYLIP GMPR LOC101928433
MIR4639 ATXN1
Position on chr6 (Mb)
HIST1H1T,HIST1H2BC (6p22.2)
rs198833
NAP
A/G
UA
RBC
MCH
MCHC
CARMIL1 BTN3A2 GUSBP2 ZNF391 HIST1H3J ZSCAN23 HCG16 OR10C1 HLA-H
SCGN HIST1H4F LINC00240 LINC01012 NKAPL LINC01623 OR12D2 HCG4B
HIST1H2AA BTN3A3 HIST1H2BJ HIST1H2BL ZSCAN12 HCG14 OR5V1 HCG4
HIST1H2BA BTN2A1 HIST1H2AG HIST1H2AI GPX6 ZNF311 OR2H1 HLA-A
HIST1H2APS1 HCG11 HIST1H2BK HIST1H3H ZKSCAN3 TRIM27 OR12D3 HLA-G
117 genes omitted
Position on chr6 (Mb)
HLA-C (6p21.33)
rs112390170
Alb
NAP
A/G
sCr
AST
LDH
WBC
Neutro
Eosino
Baso
Mono
Lym
RBC
Hb
MCH
Plt
HCG17 GNL1 NRM DDR1 HCG22 HLA-C MICA LTA LY6G6F
HCG 8 PRR3 MDC1 MIR4640 C6orf15 HLA-B MICB BAG6 VARS
TRIM39 ABCF1 TUBB GTF2H4 PSORS1C1 MIR6891 MCCD1 MIR4646
TRIM39-RPP21 DHX16 VARS2 CDSN HCP5 LTB LY6G6E
RPP21 MIR877 FLOT1 SFTA2 PSORS1C2 HCG26 AIF1 MSH5
57 genes omitted
Position on chr6 (Mb)
CCND3 (6p21.1)
rs9349205
TP
sCr
RBC
MCH
TREM2 NCR2 LINC01276 TFEB USP49 CCND3 GUCA1A
TREML2 FOXP4-AS1 PGC MED20 TAF8 MRPS10
TREML3P FOXP4 FRS3 BYSL C6orf132 TRERF1
TREML4 MIR4641 PRICKLE4 GUCA1B
TREML5P MDFI TOMM6
1 gene omitted
Position on chr6 (Mb)
CCDC162P,CD164 (6q21)
rs13191948
Baso
RBC
MCH
FOXO3 ARMC2 SESN1 LOC100996634 PPIL6 AK9
LINC00222 CEP57L1 CCDC162P SMPD2 FIG4
ARMC2-AS1 CD164 MIR7641-2
MICAL1
ZBTB24
Position on chr6 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

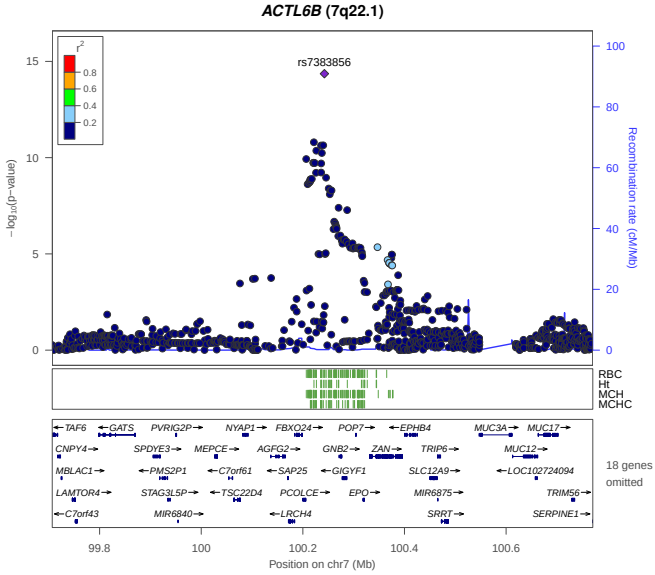

HBS1L,MYB (6q23.3)
rs9399137
HbA1c
AST
WBC
Eosino
RBC
Hb
Ht
MCH
MCHC
Plt
Position on chr6 (Mb)

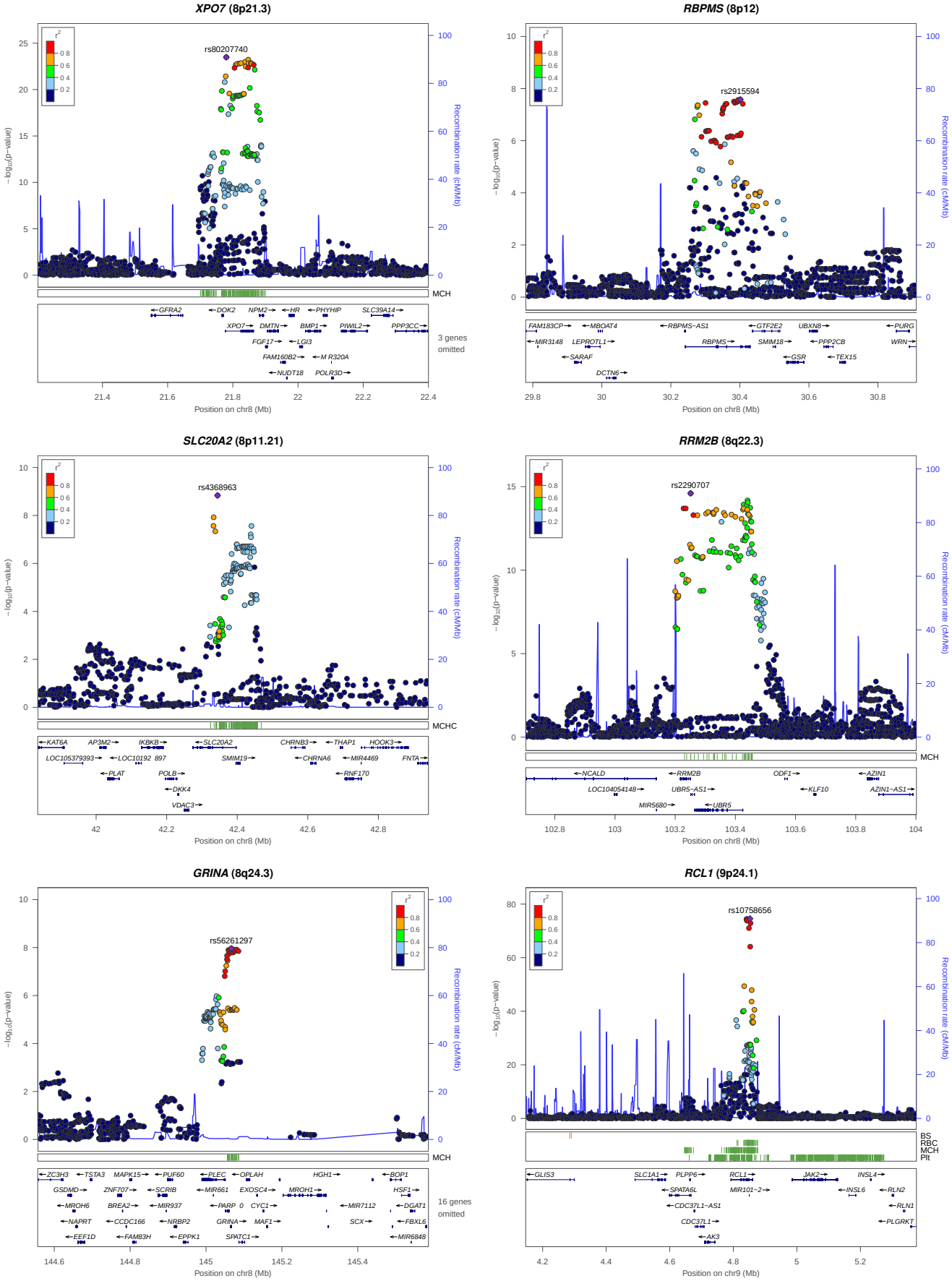

LINC01625,LOC100132735 (6q24.1)
rs628751
NAP
A/G
MCH
Position on chr6 (Mb)

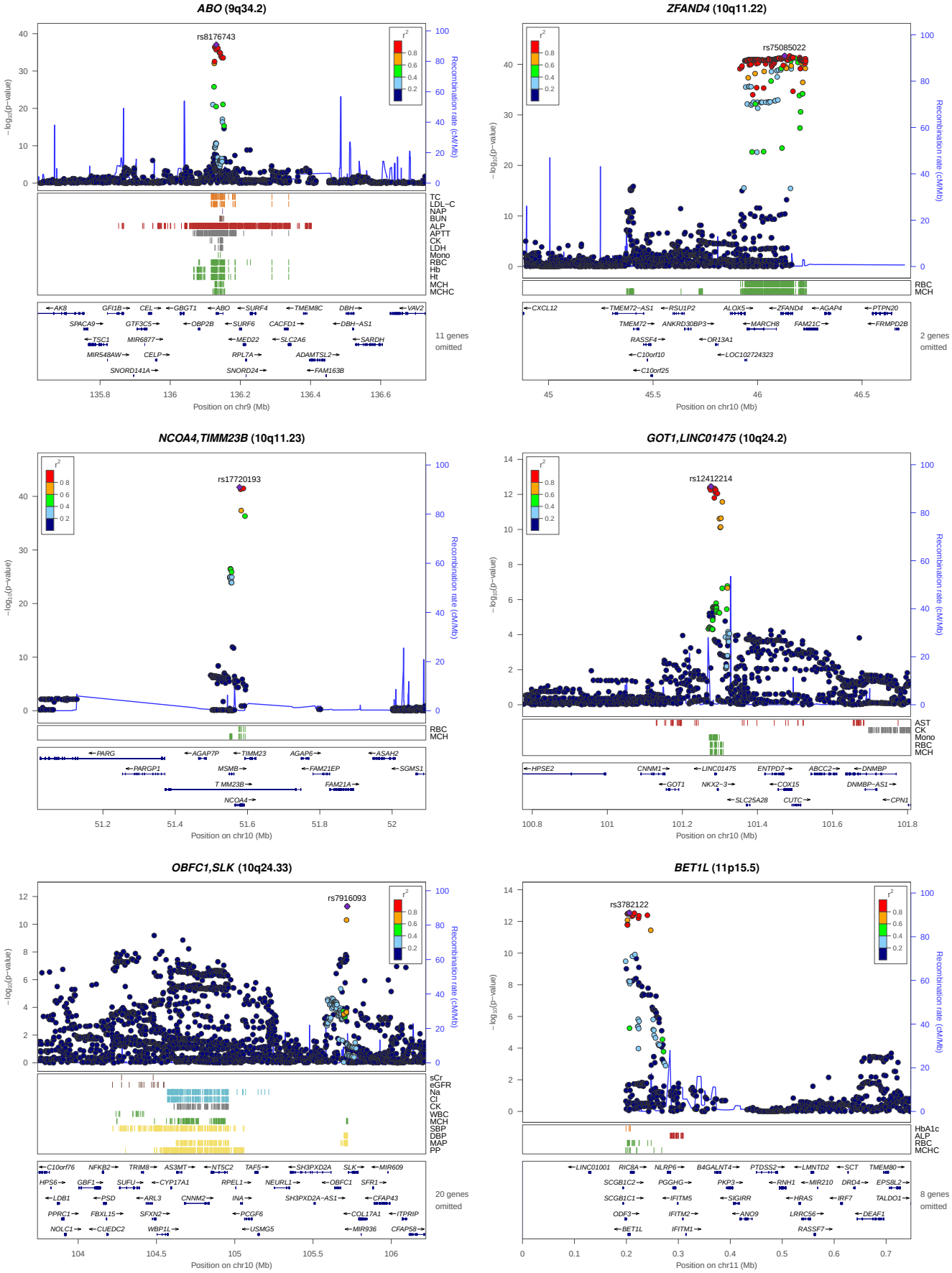

QKI,MEAT6 (6q26)
rs4709818
RBC
MCH
Position on chr6 (Mb)

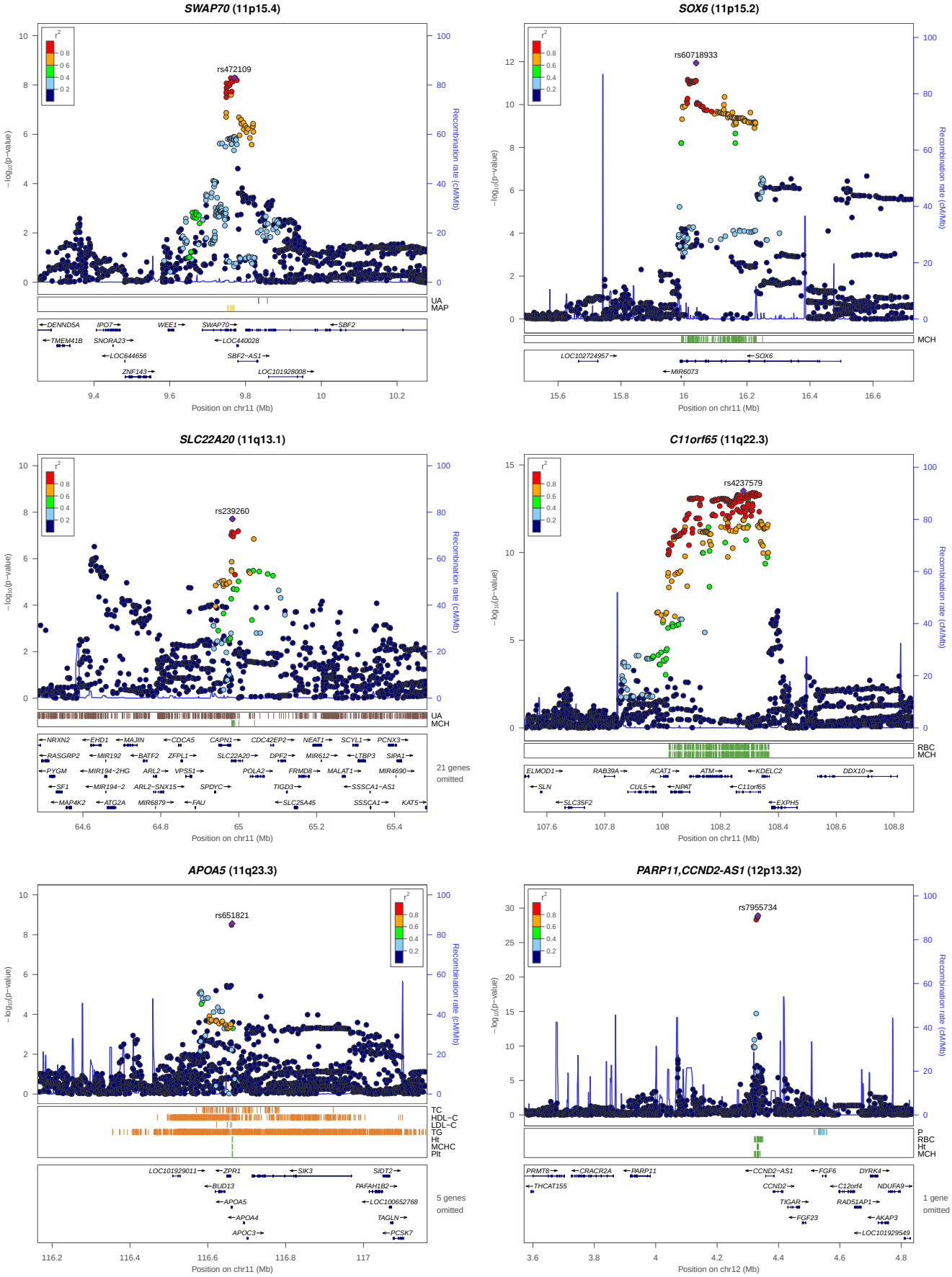

IKZF1 (7p12.2)
rs6592965
TC
HDL−C
TP
NAP
A/G
AST
Mono
RBC
MCH
Position on chr7 (Mb)

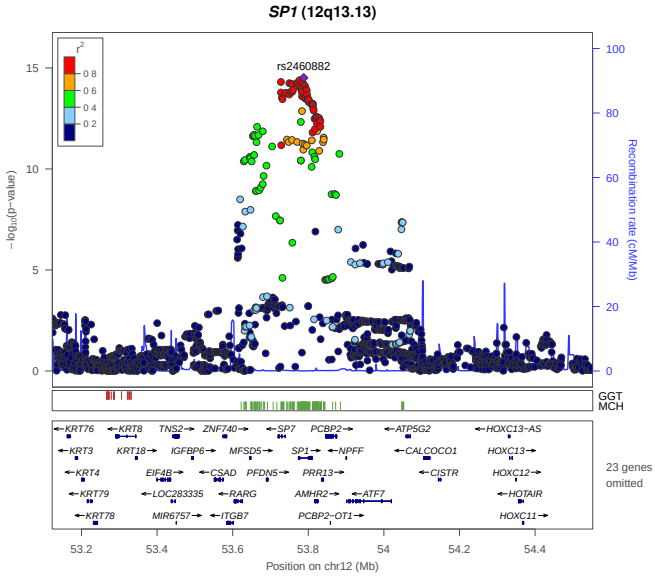

LOC101927497,SAMD9 (7q21.2)
rs739385
WBC
Neutro
Eosino
Mono
RBC
MCH
1 gene
omitted
Position on chr7 (Mb)

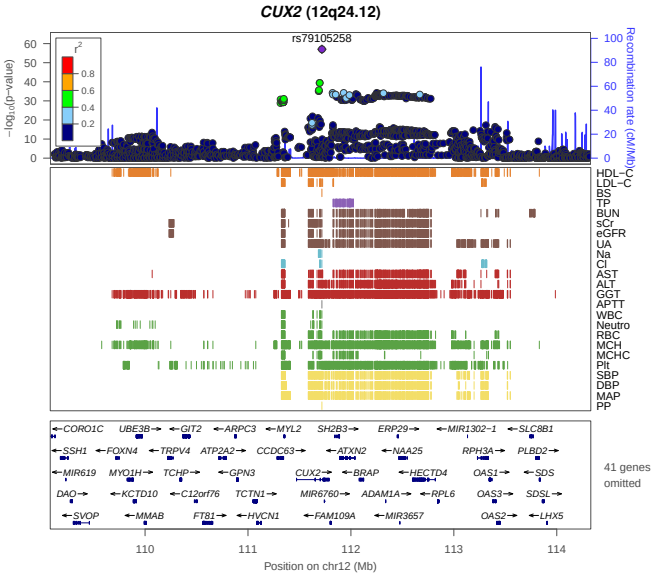

ACTL6B (7q22.1)
rs7383856
RBC
Ht
MCH
MCHC
18 genes
omitted
Position on chr7 (Mb)

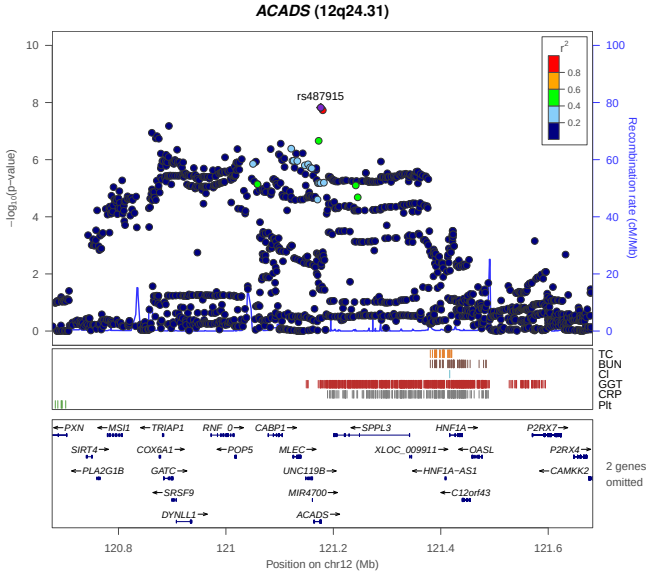

XPO7 (8p21.3)
rs80207740
MCH
3 genes omitted
Position on chr8 (Mb)
RBPMS (8p12)
rs2915594
Position on chr8 (Mb)
SLC20A2 (8p11.21)
rs4368963
MCHC
Position on chr8 (Mb)
RRM2B (8q22.3)
rs2290707
MCH
Position on chr8 (Mb)
GRINA (8q24.3)
rs56261297
MCH
16 genes omitted
Position on chr8 (Mb)
RCL1 (9p24.1)
rs10758656
BS
RBC
MCH
Plt
Position on chr9 (Mb)
Recombination rate (cM/Mb)

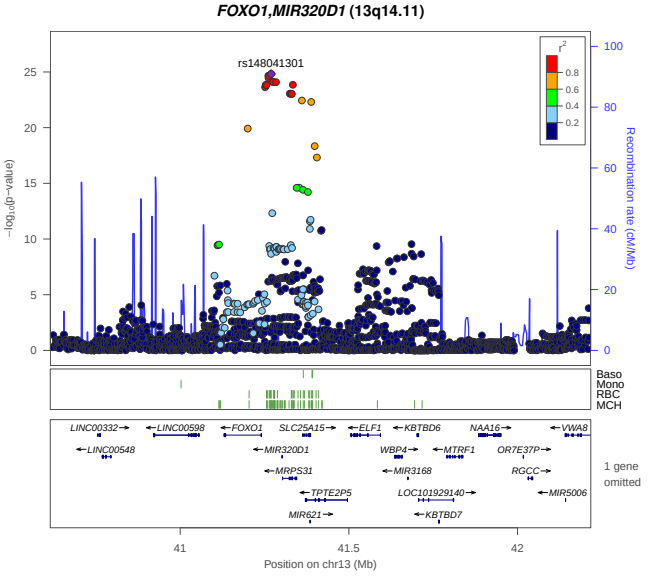

ABO (9q34.2)
rs8176743
TC
LDL−C
NAP
BUN
ALP
APTT
CK
LDH
Mono
RBC
Hb
Ht
MCH
MCHC
11 genes omitted
Position on chr9 (Mb)
ZFAND4 (10q11.22)
rs75085022
RBC
MCH
2 genes omitted
Position on chr10 (Mb)
NCOA4,TIMM23B (10q11.23)
rs17720193
RBC
MCH
Position on chr10 (Mb)
GOT1,LINC01475 (10q24.2)
rs12412214
AST
CK
Mono
RBC
MCH
Position on chr10 (Mb)
OBFC1,SLK (10q24.33)
rs7916093
sCr
eGFR
Na
Cl
CK
WBC
MCH
SBP
DBP
MAP
PP
20 genes omitted
Position on chr10 (Mb)
BET1L (11p15.5)
rs3782122
HbA1c
ALP
RBC
MCHC
8 genes omitted
Position on chr11 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

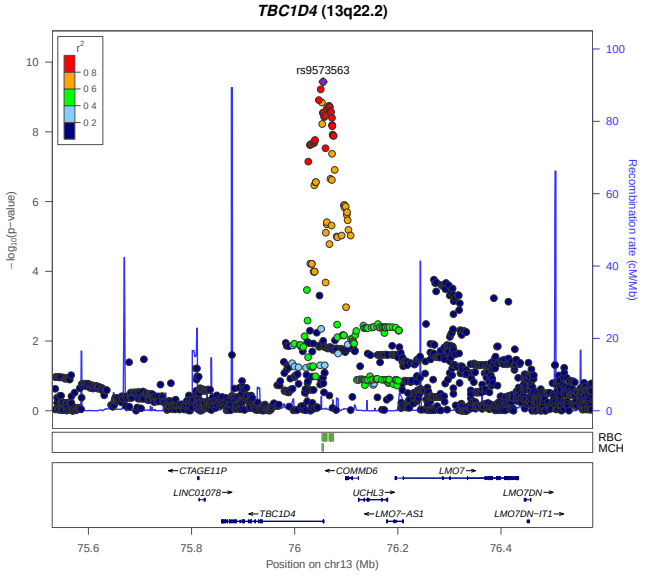

SWAP70 (11p15.4)
rs472109
UA
MAP
DENND5A
IPO7
WEE1
SWAP70
SBF2
TMEM41B
SNORA23
LOC440028
LOC644656
SBF2-AS1
ZNF143
LOC101928008
Position on chr11 (Mb)
SOX6 (11p15.2)
rs60718933
MCH
LOC102724957
SOX6
MIR6073
Position on chr11 (Mb)
SLC22A20 (11q13.1)
rs239260
UA
MCH
21 genes omitted
Position on chr11 (Mb)
C11orf65 (11q22.3)
rs4237579
RBC
MCH
Position on chr11 (Mb)
APOA5 (11q23.3)
rs651821
TC
HDL-C
LDL-C
TG
Ht
MCHC
Plt
5 genes omitted
Position on chr11 (Mb)
PARP11,CCND2-AS1 (12p13.32)
rs7955734
P
RBC
Ht
MCH
1 gene omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

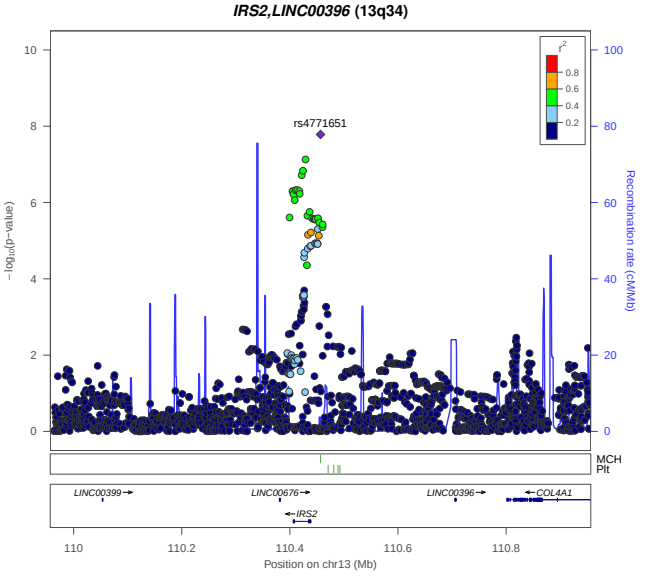

SP1 (12q13.13)
rs2460882
−log10(p-value)
Recombination rate (cM/Mb)
GGT
MCH
23 genes omitted
Position on chr12 (Mb)


CUX2 (12q24.12)
rs79105258
−log10(p-value)
Recombination rate (cM/Mb)
HDL_C
LDL_C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCH
MCHC
Plt
SBP
DBP
MAP
PP
41 genes omitted
Position on chr12 (Mb)

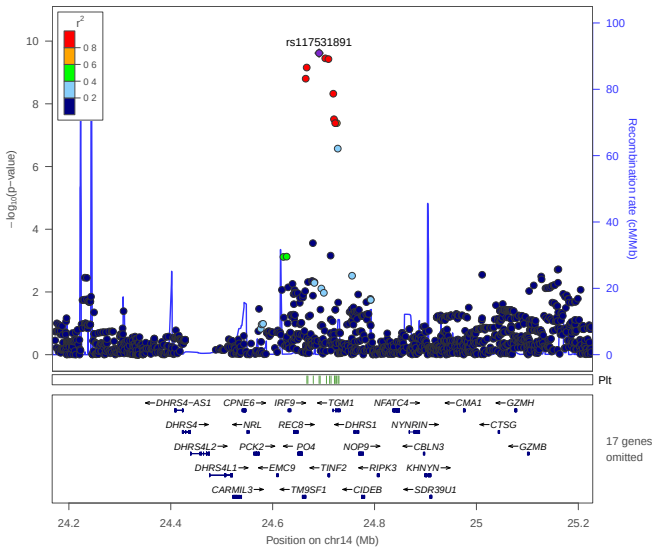

ACADS (12q24.31)
rs487915
−log10(p-value)
Recombination rate (cM/Mb)
TC
BUN
Cl
GGT
CRP
Plt
2 genes omitted
Position on chr12 (Mb)


FOXO1,MIR320D1 (13q14.11)
rs148041301
−log10(p-value)
Recombination rate (cM/Mb)
Baso
Mono
RBC
MCH
1 gene omitted
Position on chr13 (Mb)

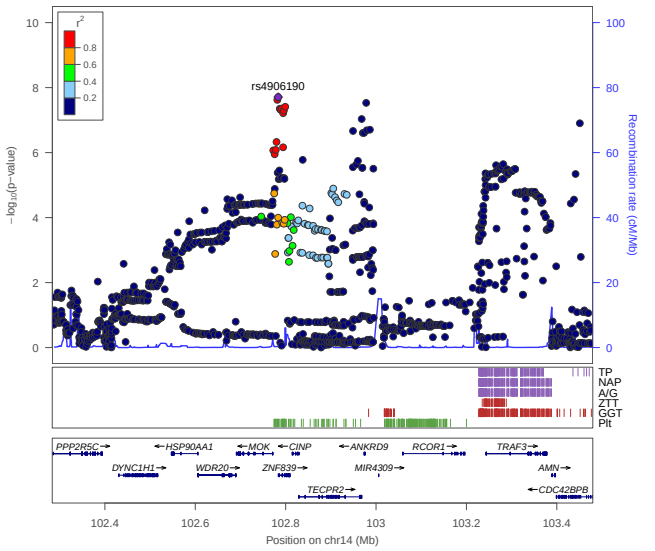

TBC1D4 (13q22.2)
rs9573563
−log10(p-value)
Recombination rate (cM/Mb)
RBC
MCH
Position on chr13 (Mb)


IRS2,LINC00396 (13q34)
rs4771651
−log10(p-value)
Recombination rate (cM/Mb)
MCH
Plt
Position on chr13 (Mb)

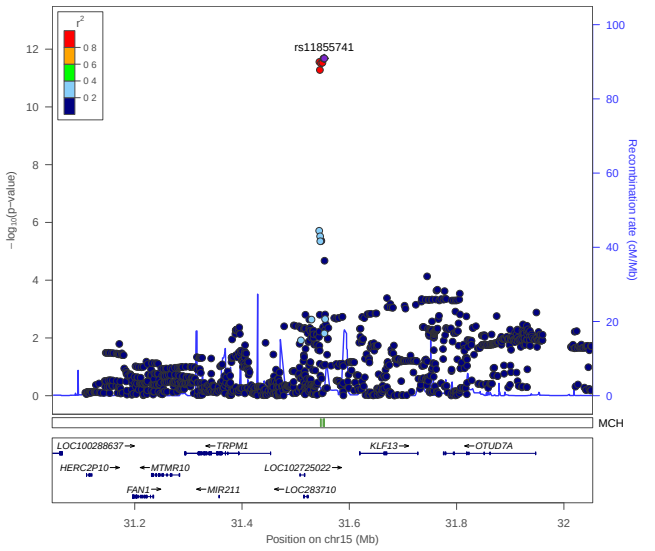
NEDD8,NEDD8-MDP1 **(14q12)**



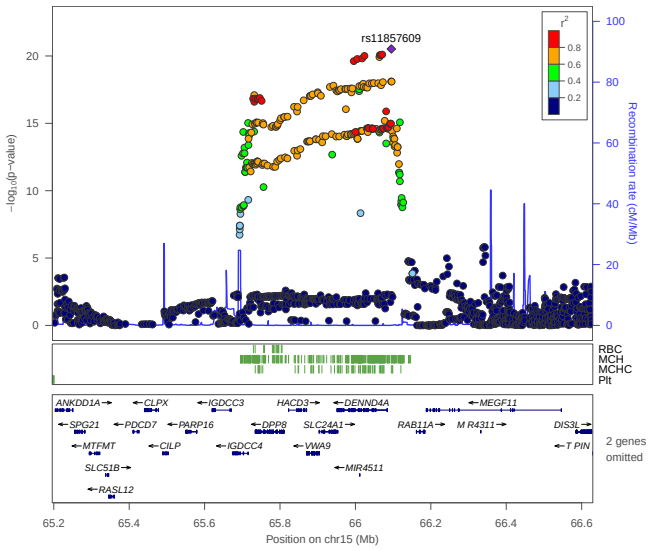
ZNF839 **(14q32.31)**



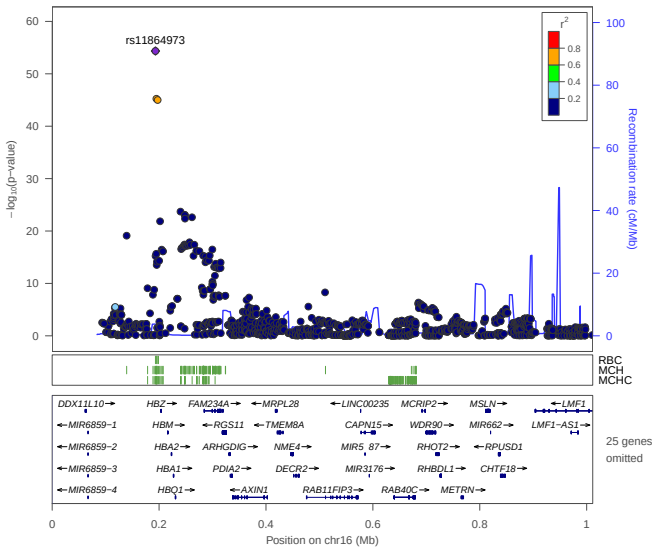
LOC283710,KLF13 **(15q13.3)**



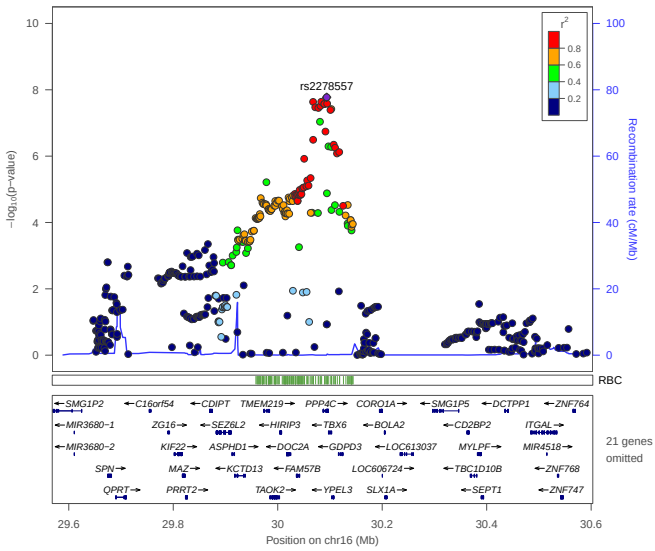
DENND4A,RAB11A **(15q22.31)**

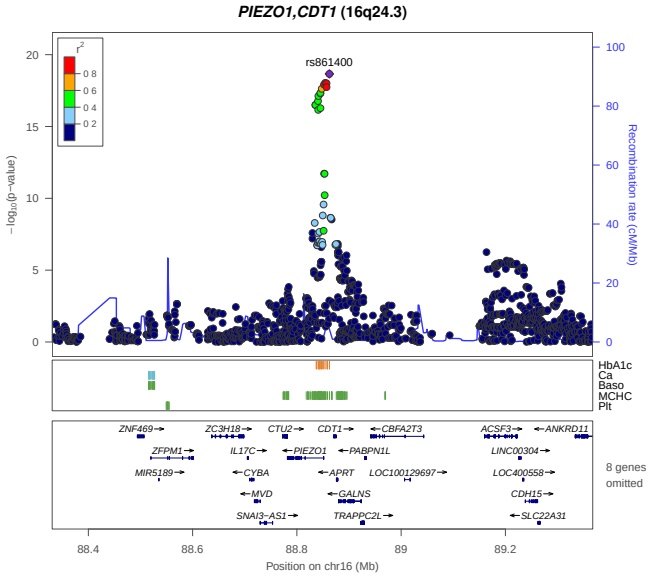


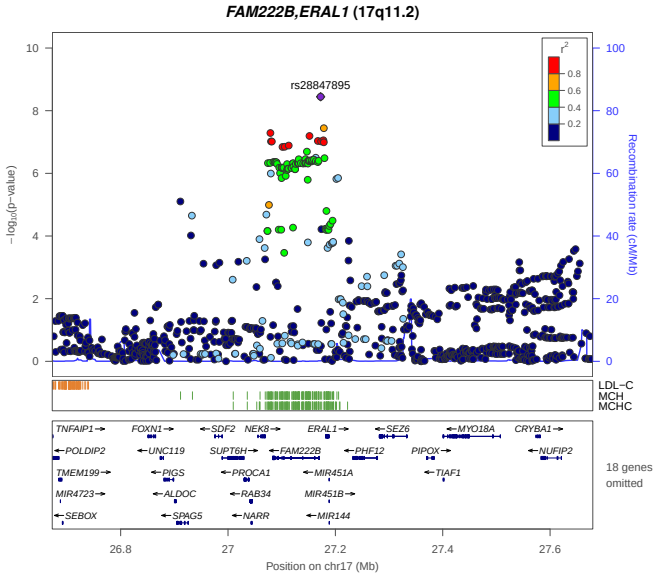
NPRL3,HBZ **(16p13.3)**

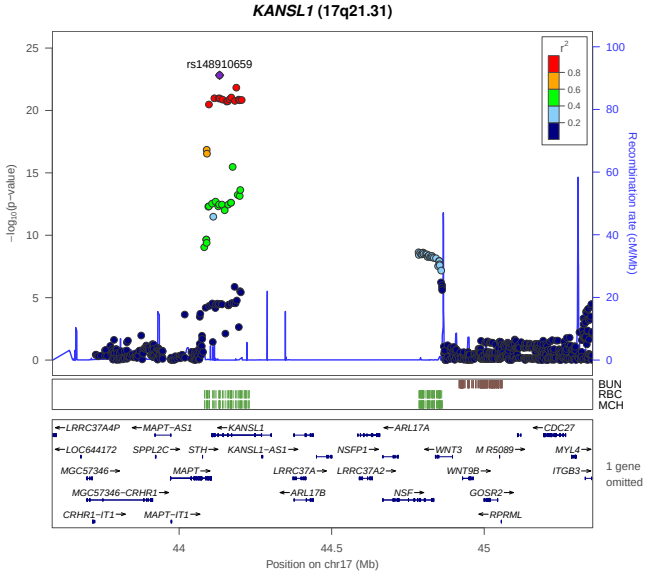


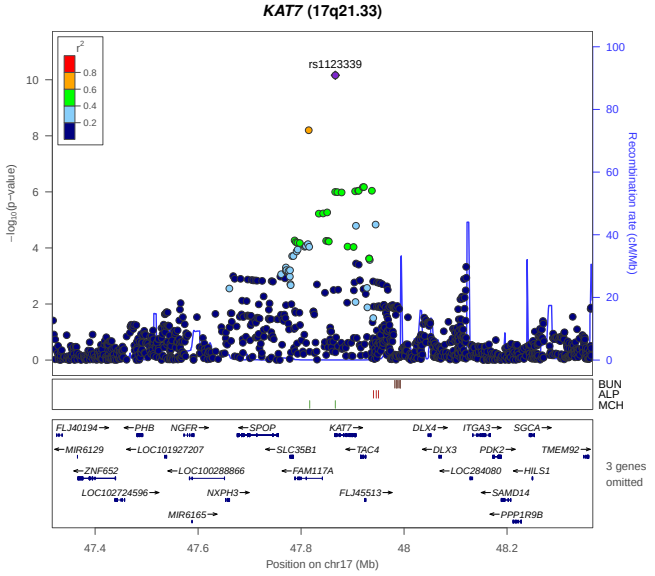
PPP4C **(16p11.2)**

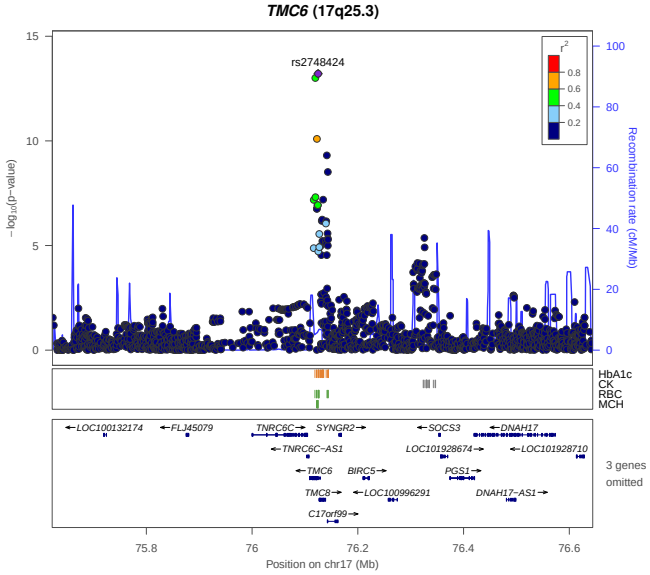


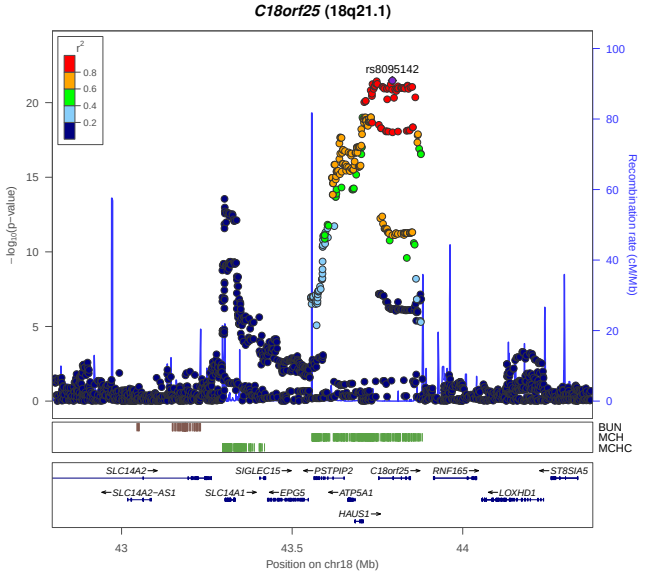

PIEZO1,CDT1 (16q24.3)
rs861400
HbA1c
Ca
Baso
MCHC
Plt
8 genes omitted
Position on chr16 (Mb)
Recombination rate (cM/Mb)


FAM222B,ERAL1 (17q11.2)
rs28847895
LDL−C
MCH
MCHC
18 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)

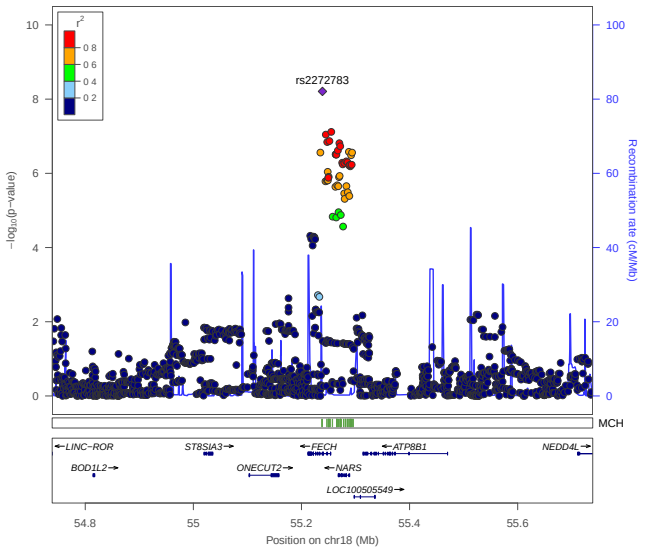

KANSL1 (17q21.31)
rs148910659
BUN
RBC
MCH
1 gene omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)


KAT7 (17q21.33)
rs1123339
BUN
ALP
MCH
3 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)

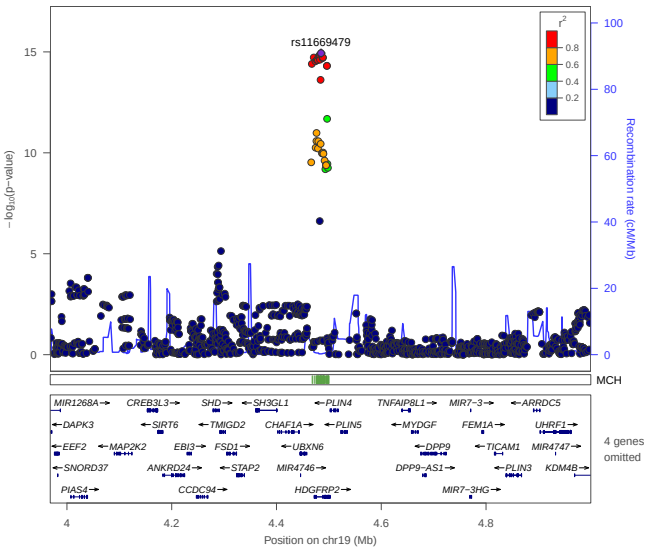

TMC6 (17q25.3)
rs2748424
HbA1c
CK
RBC
MCH
3 genes omitted
Position on chr17 (Mb)
Recombination rate (cM/Mb)


C18orf25 (18q21.1)
rs8095142
BUN
MCH
MCHC
Position on chr18 (Mb)
Recombination rate (cM/Mb)

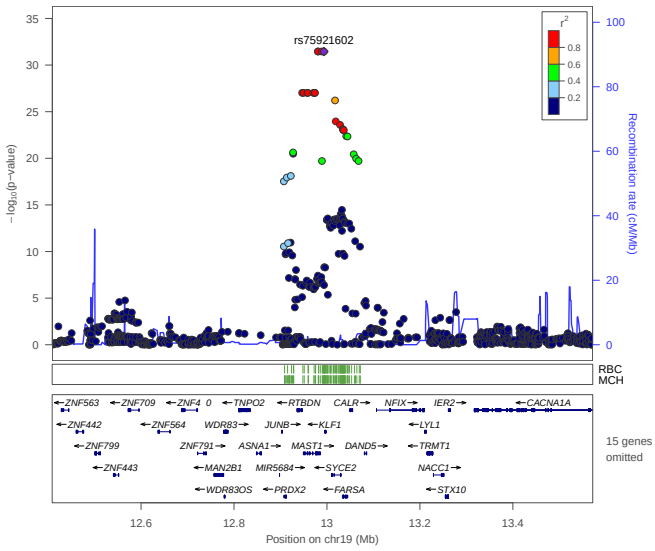
***FECH* (18q21.31)**



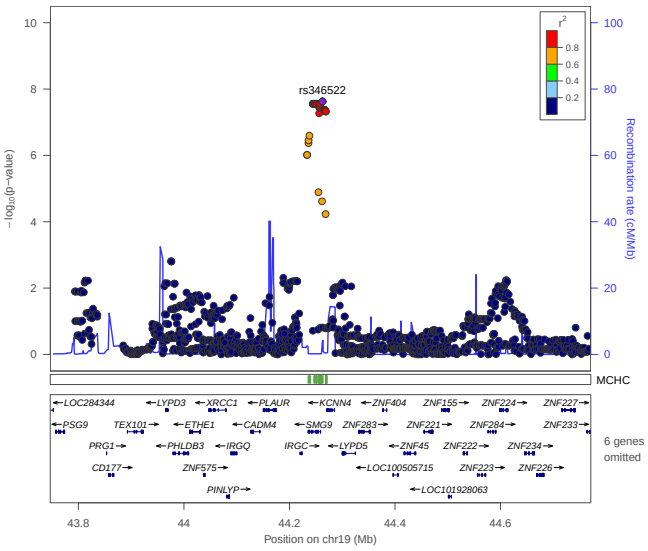
***HDGFRP2* (19p13.3)**



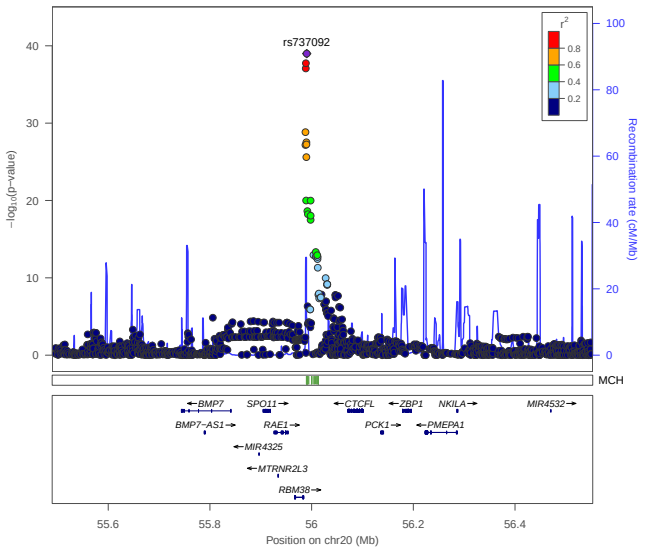
***DNASE2,KLF1* (19p13.2)**



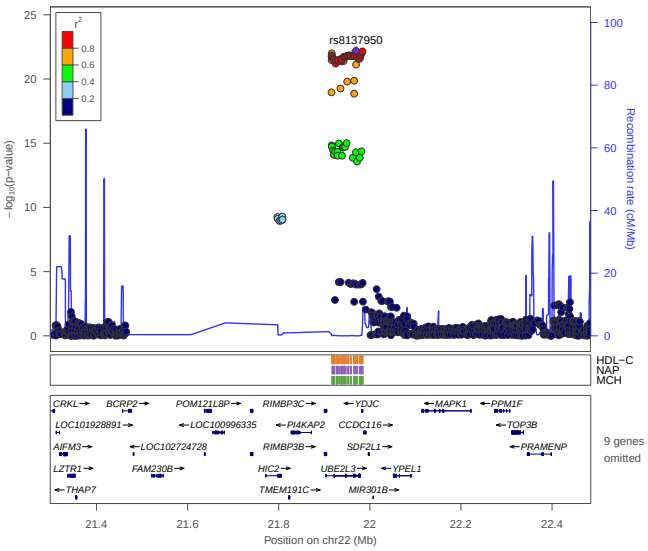
***SMG9,KCNN4* (19q13.31)**

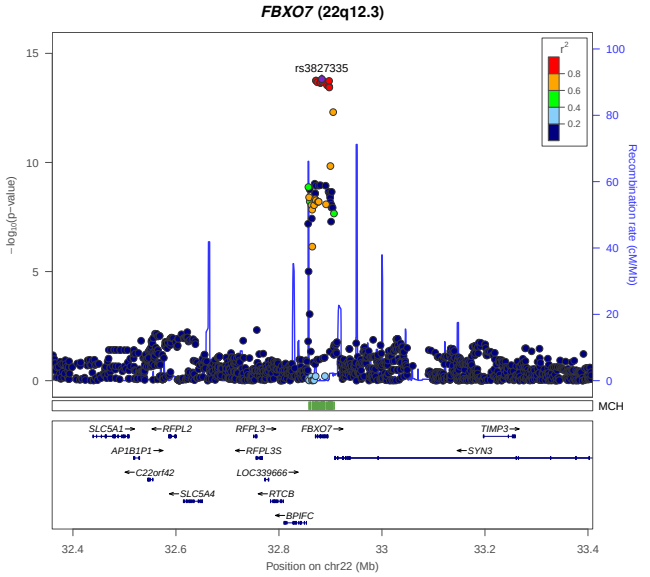


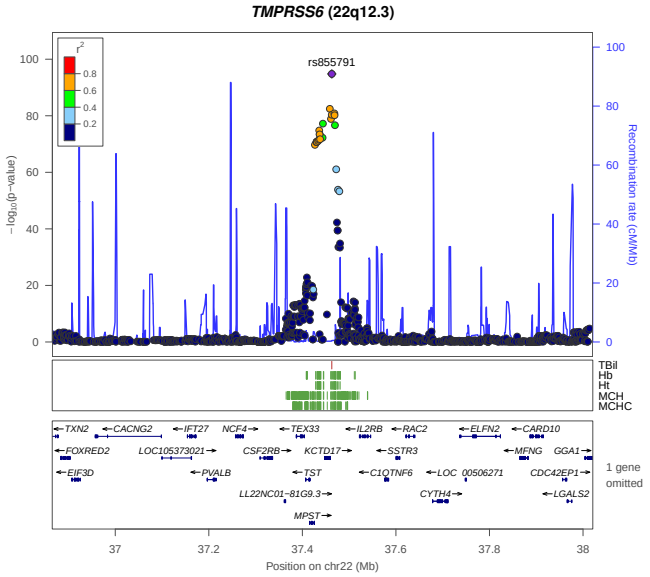
***RBM38,CTCFL* (20q13.31)**

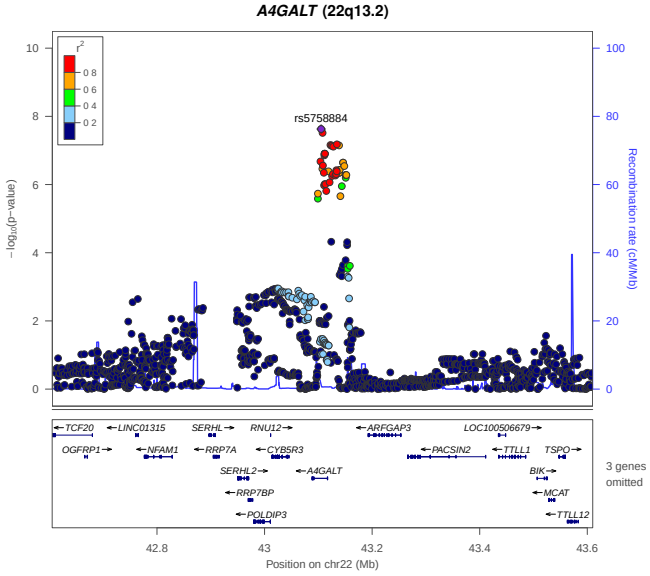


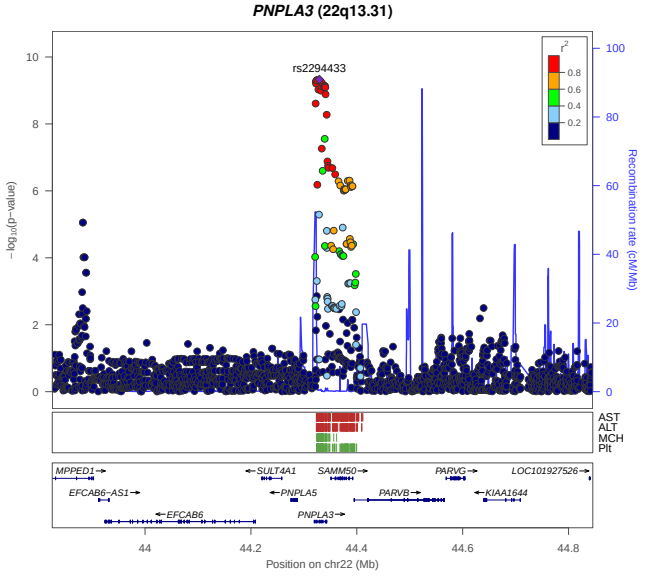
***UBE2L3* (22q11.21)**

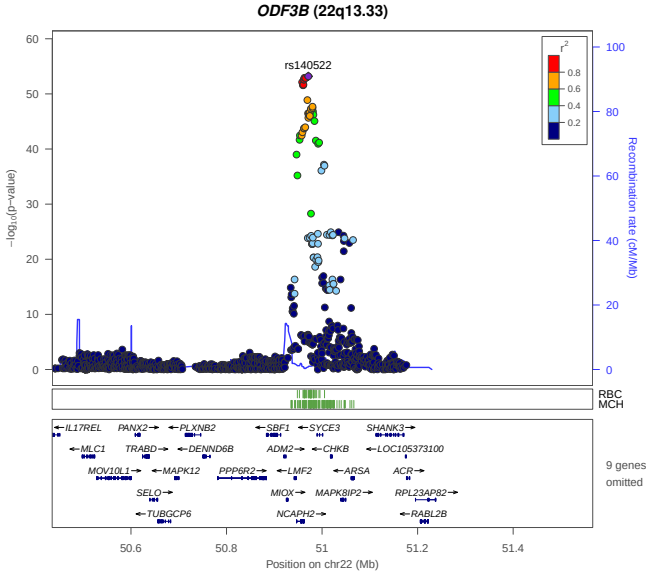


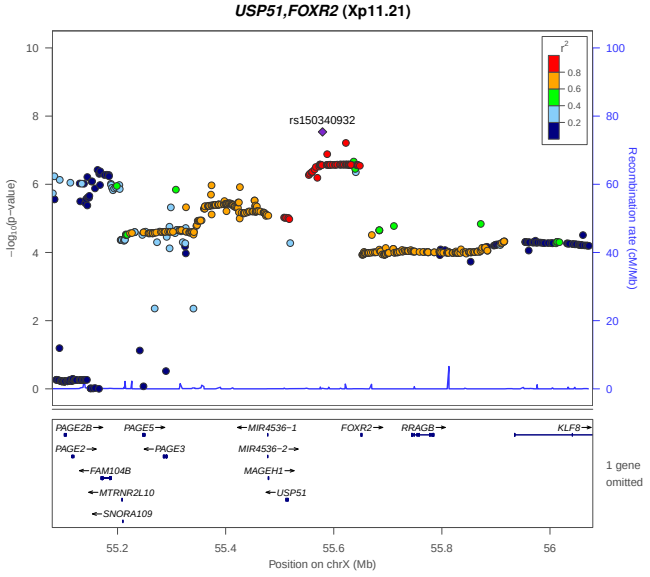

FBXO7 (22q12.3)
rs3827335
MCH
Position on chr22 (Mb)
Recombination rate (cM/Mb)

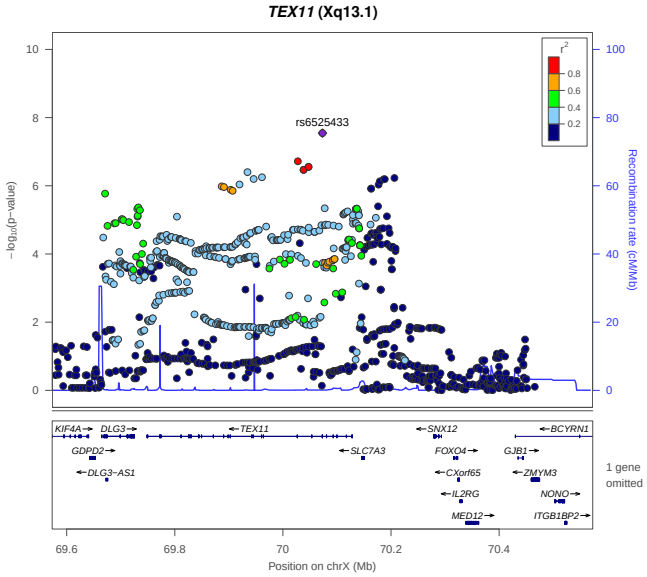

TMPRSS6 (22q12.3)
rs855791
TBil
Hb
Ht
MCH
MCHC
1 gene omitted
Position on chr22 (Mb)
Recombination rate (cM/Mb)


A4GALT (22q13.2)
rs5758884
3 genes omitted
Position on chr22 (Mb)
Recombination rate (cM/Mb)

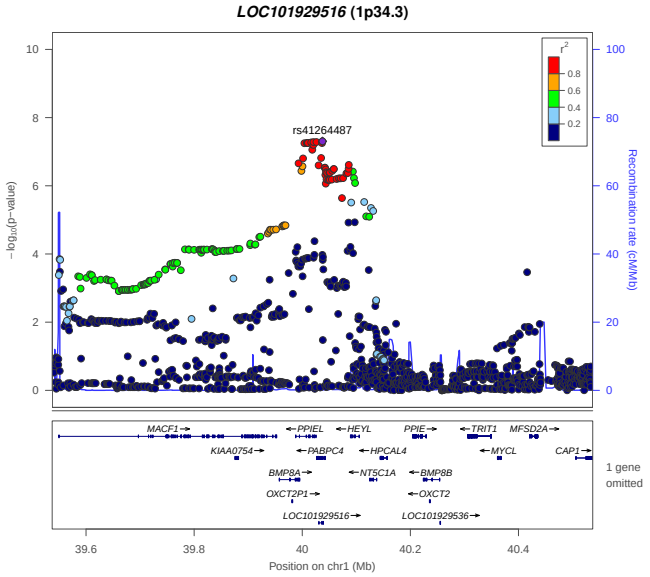

PNPLA3 (22q13.31)
rs2294433
AST
ALT
MCH
Plt
Position on chr22 (Mb)
Recombination rate (cM/Mb)

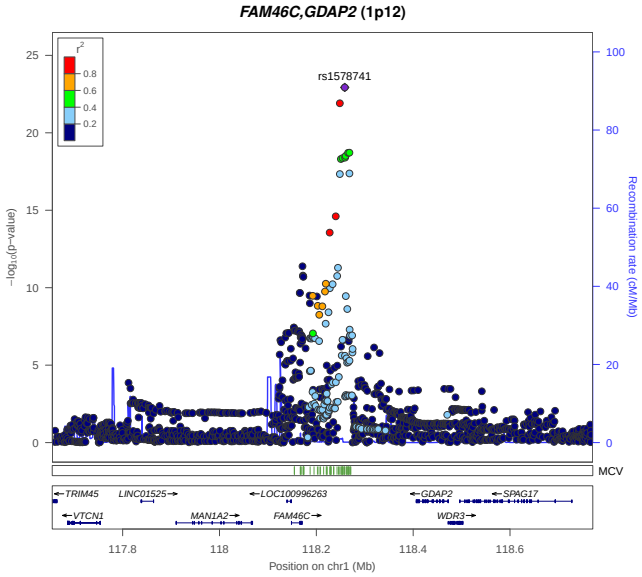

ODF3B (22q13.33)
rs140522
RBC
MCH
9 genes omitted
Position on chr22 (Mb)
Recombination rate (cM/Mb)

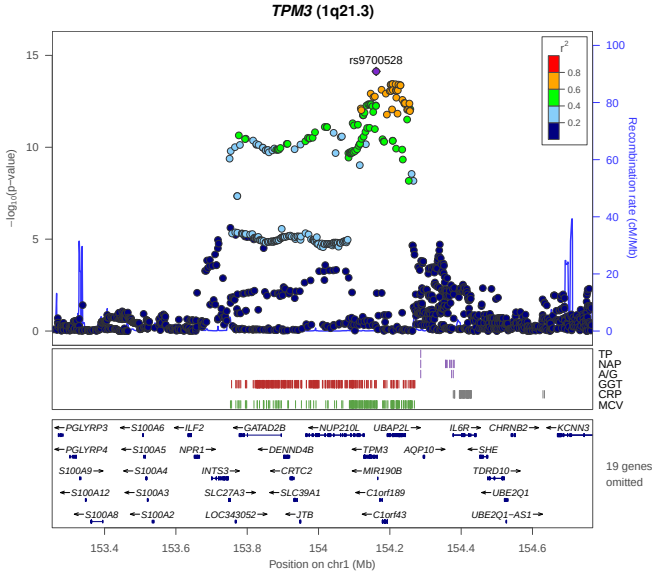

USP51,FOXR2 (Xp11.21)
rs150340932
1 gene omitted
Position on chrX (Mb)
Recombination rate (cM/Mb)

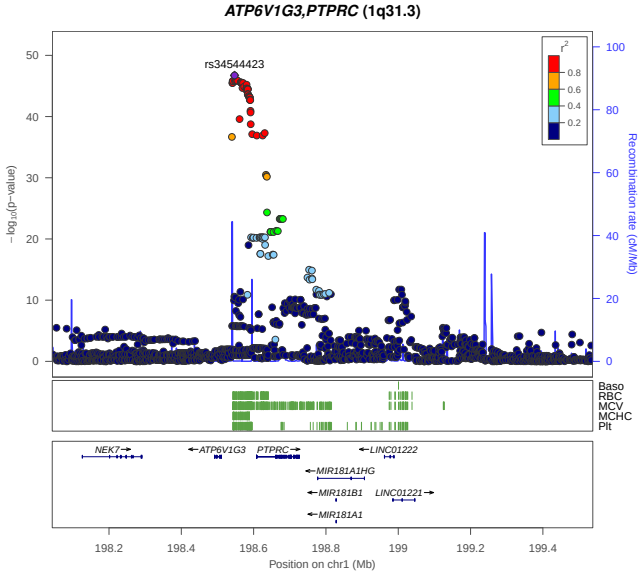

TEX11 (Xq13.1)
rs6525433
r2
0.8
0.6
0.4
0.2
−log10(p-value)
Recombination rate (cM/Mb)
KIF4A
DLG3
TEX11
SNX12
BCYRN1
GDPD2
SLC7A3
FOXO4
GJB1
DLG3-AS1
CXorf65
ZMYM3
IL2RG
NONO
MED12
ITGB1BP2
1 gene omitted
Position on chrX (Mb)

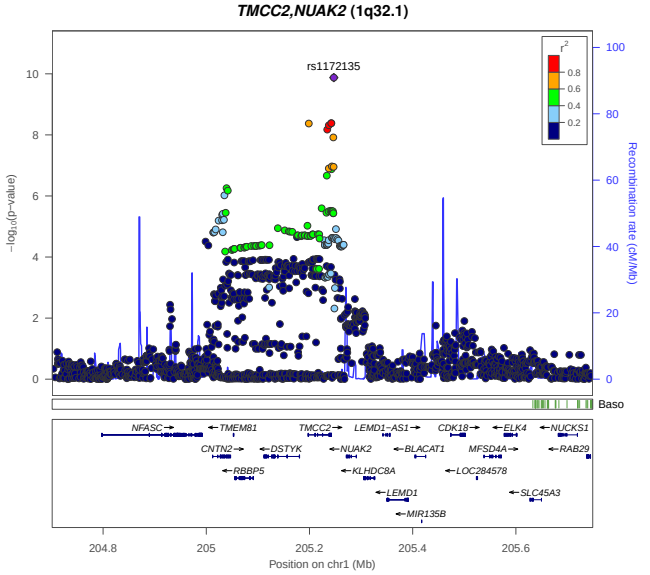
2.42 MCH (n = 108,054)

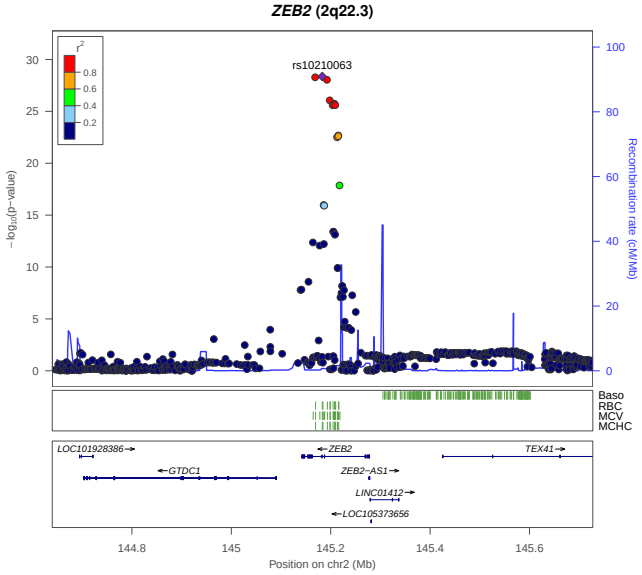


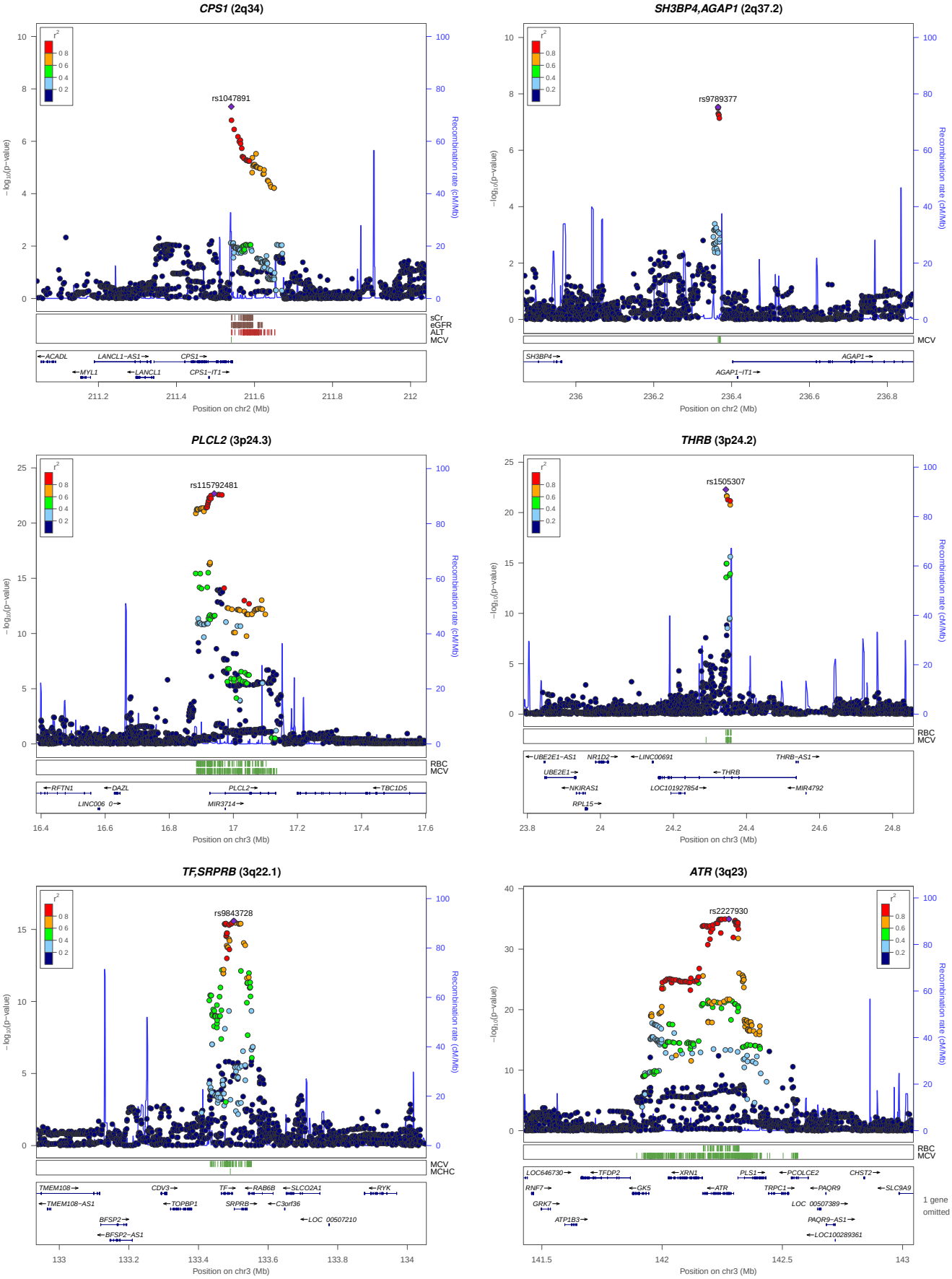


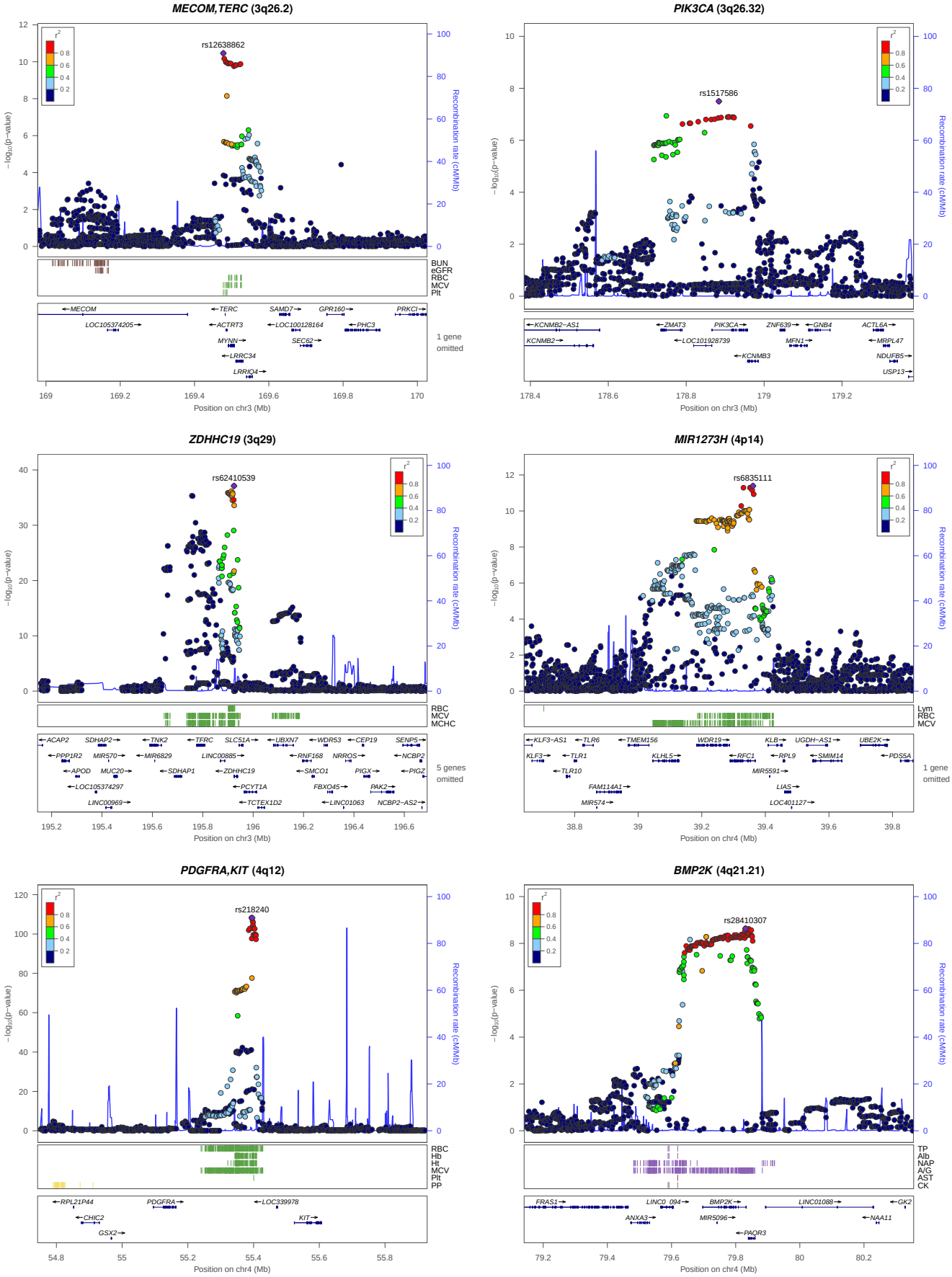


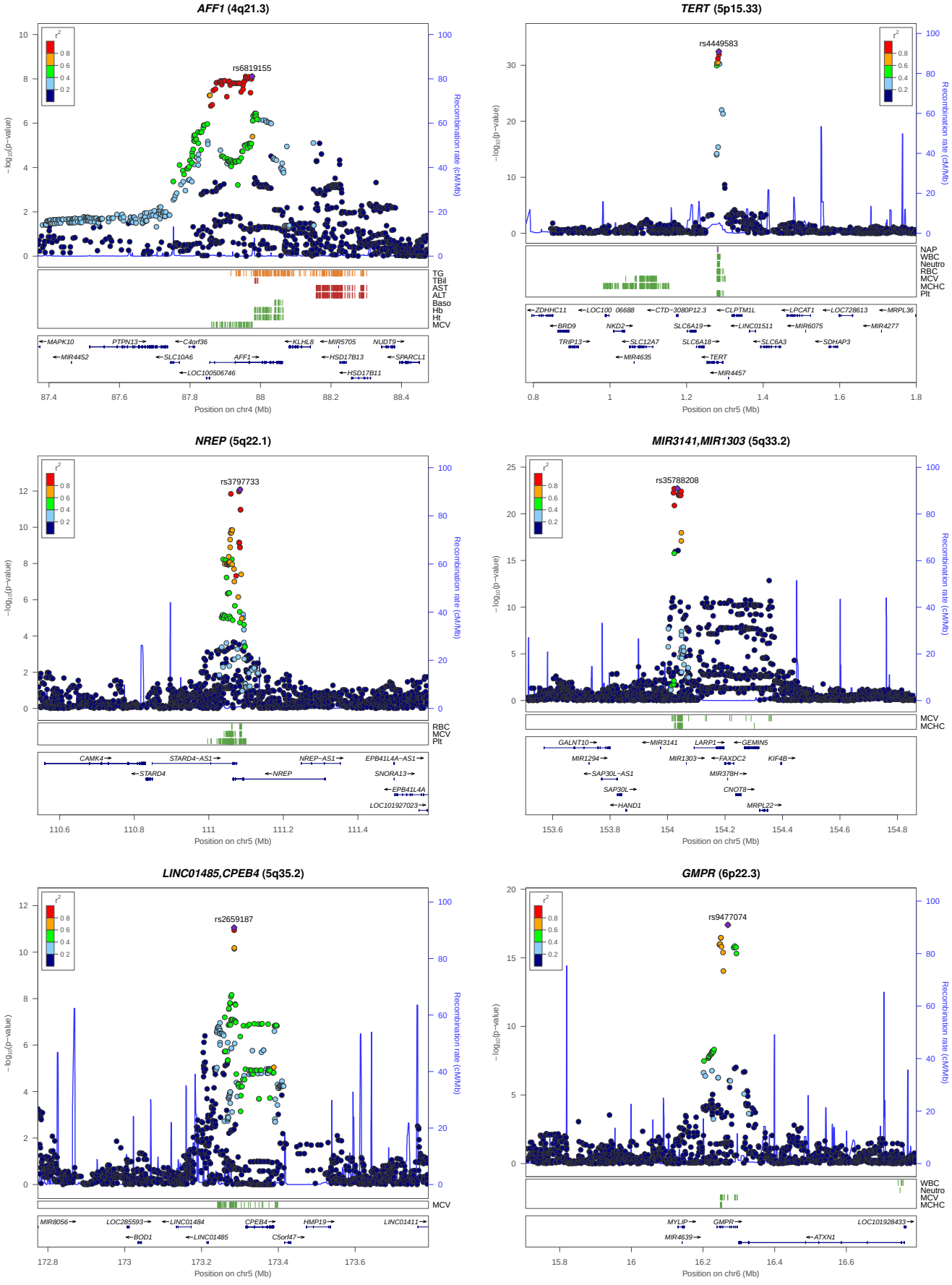




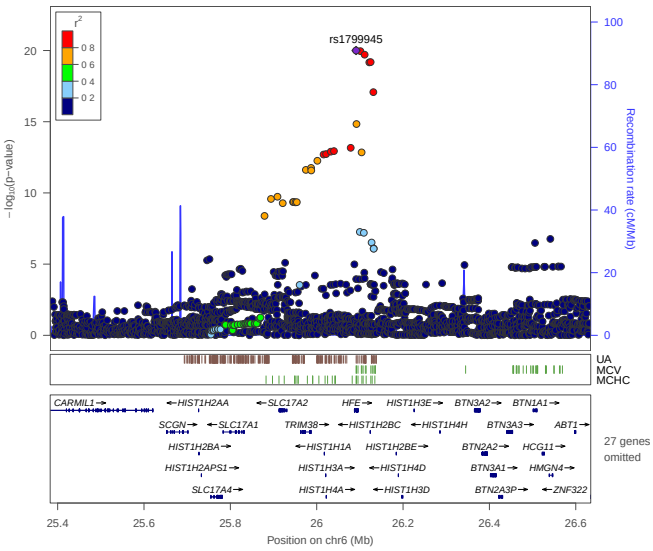



CPS1 (2q34)
rs1047891
SH3BP4,AGAP1 (2q37.2)
rs9789377
PLCL2 (3p24.3)
rs115792481
THRB (3p24.2)
rs1505307
TF,SRPRB (3q22.1)
rs9843728
ATR (3q23)
rs2227930
Recombination rate (cM/Mb)
Position on chr2 (Mb)
Position on chr3 (Mb)
1 gene omitted

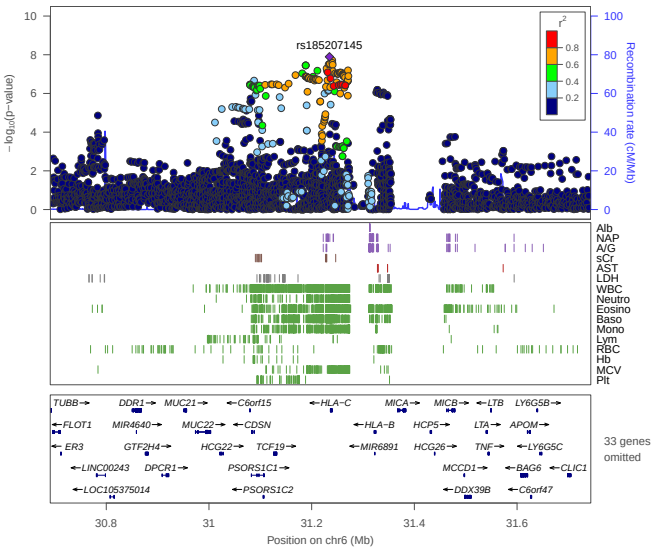

MECOM,TERC (3q26.2)
rs12638862
BUN
eGFR
RBC
MCV
Plt
1 gene omitted
Position on chr3 (Mb)
PIK3CA (3q26.32)
rs1517586
Position on chr3 (Mb)
ZDHHC19 (3q29)
rs62410539
RBC
MCV
MCHC
5 genes omitted
Position on chr3 (Mb)
MIR1273H (4p14)
rs6835111
Lym
RBC
MCV
1 gene omitted
Position on chr4 (Mb)
PDGFRA,KIT (4q12)
rs218240
RBC
Hb
Ht
MCV
Plt
PP
Position on chr4 (Mb)
BMP2K (4q21.21)
rs28410307
TP
Alb
NAP
A/G
AST
CK
Position on chr4 (Mb)
Recombination rate (cM/Mb)


AFF1 (4q21.3)
rs6819155
TERT (5p15.33)
rs4449583
NREP (5q22.1)
rs3797733
MIR3141,MIR1303 (5q33.2)
rs35788208
LINC01485,CPEB4 (5q35.2)
rs2659187
GMPR (6p22.3)
rs9477074
Recombination rate (cM/Mb)
Position on chr4 (Mb)
Position on chr5 (Mb)
Position on chr6 (Mb)

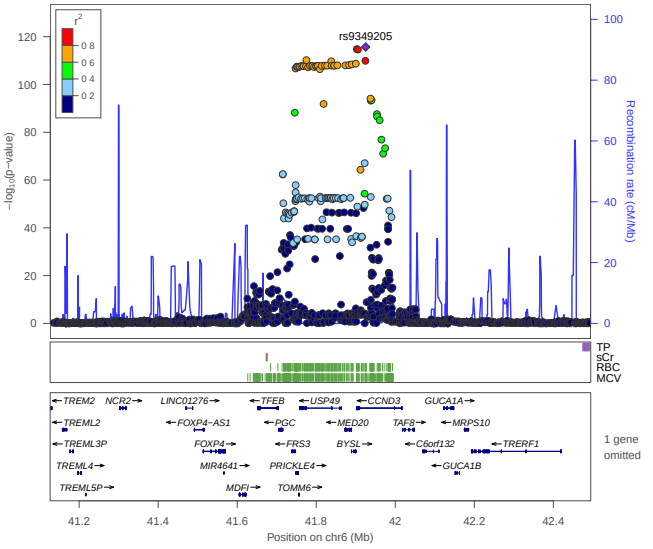
***HFE* (6p22.2)**



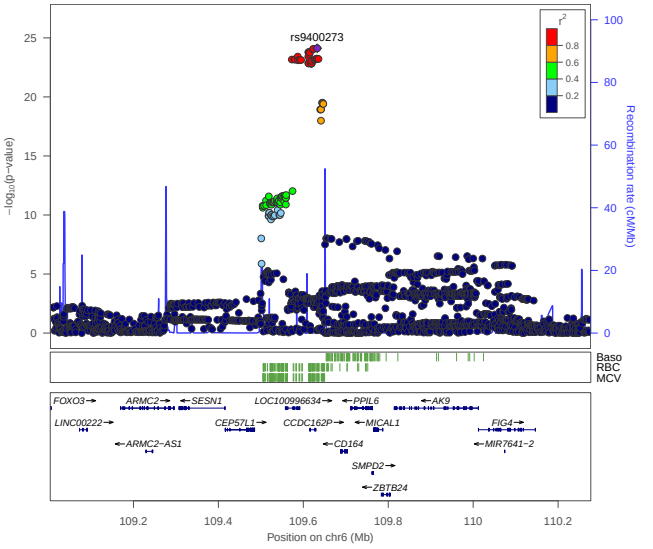
***HCG27,HLA-C* (6p21.33)**



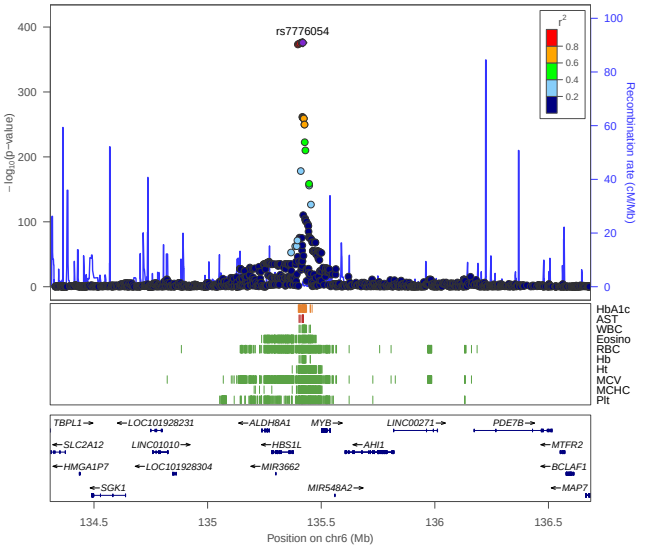
***CCND3* (6p21.1)**



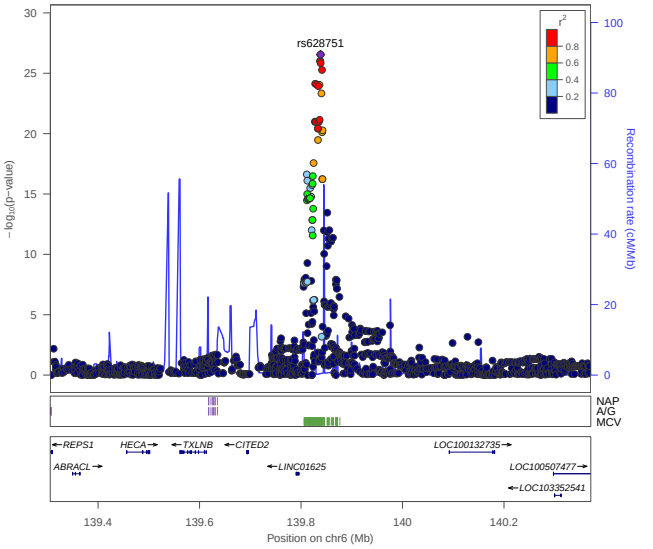
***CCDC162P,CD164* (6q21)**

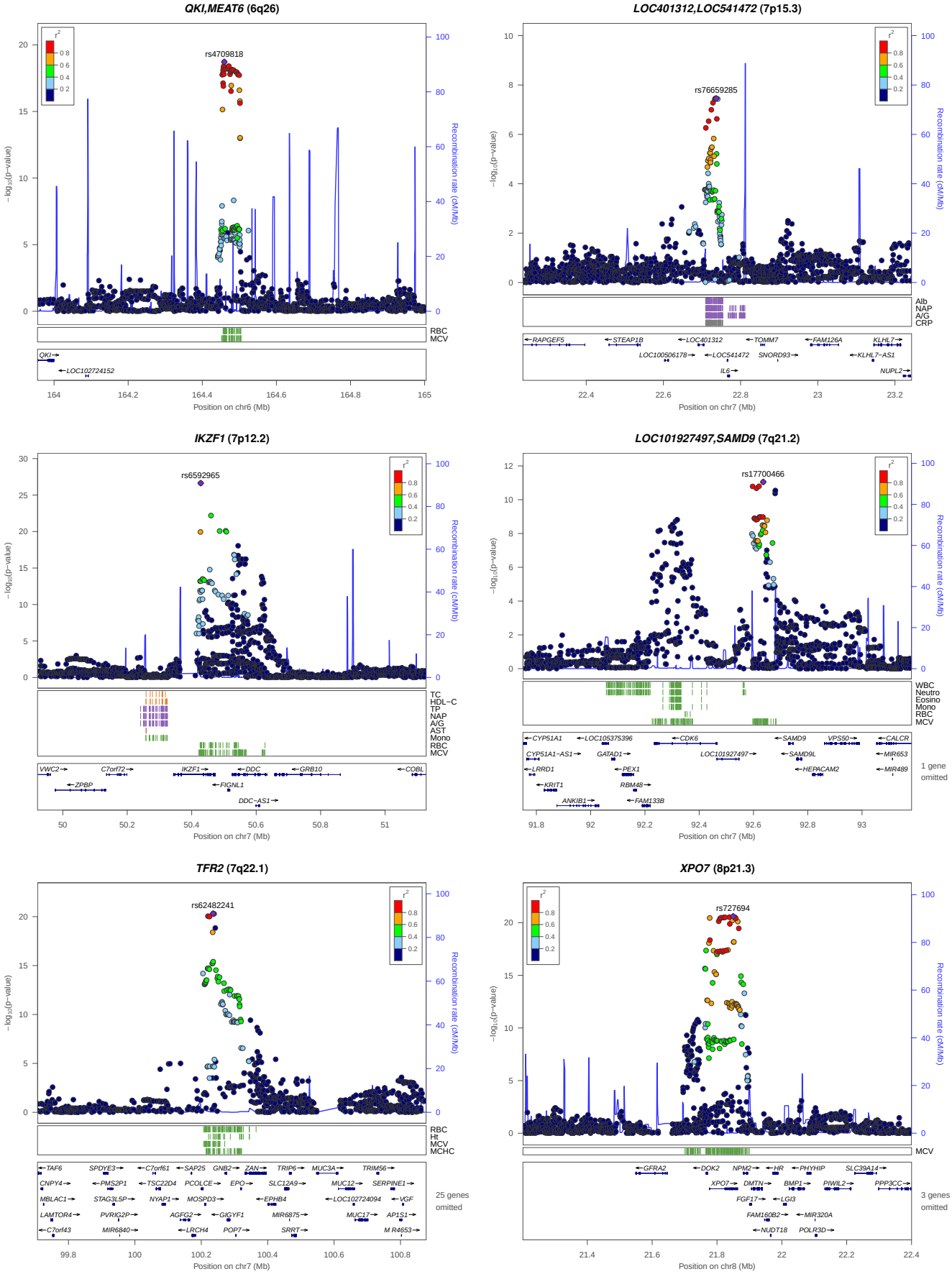


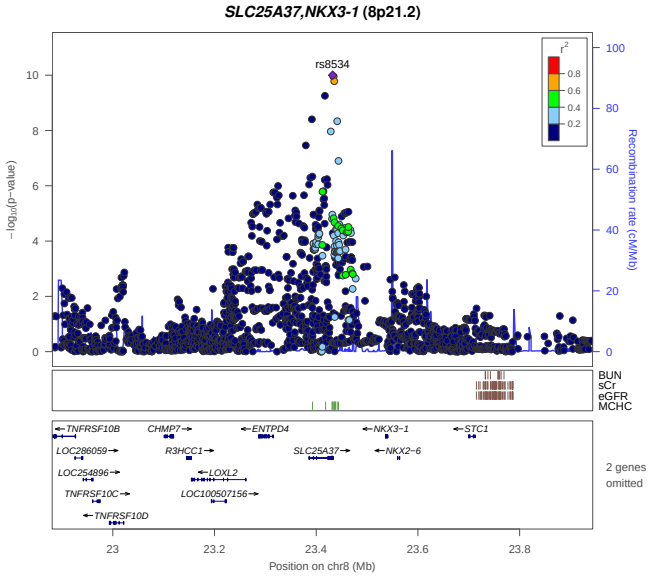
***HBS1L,MYB* (6q23.3)**

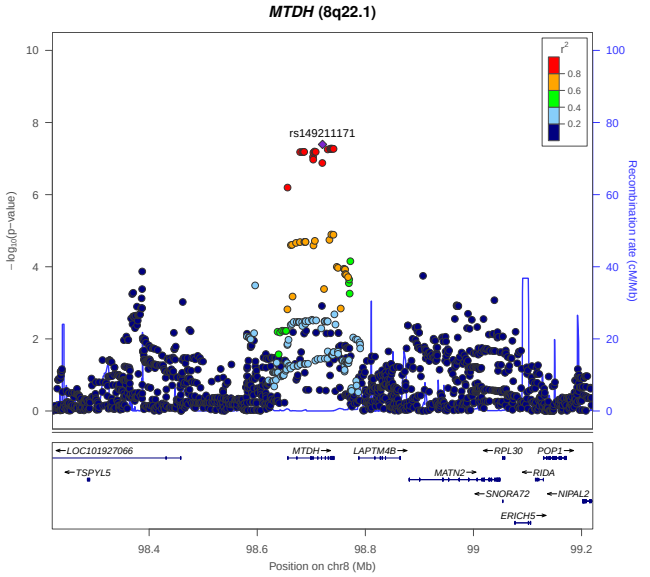


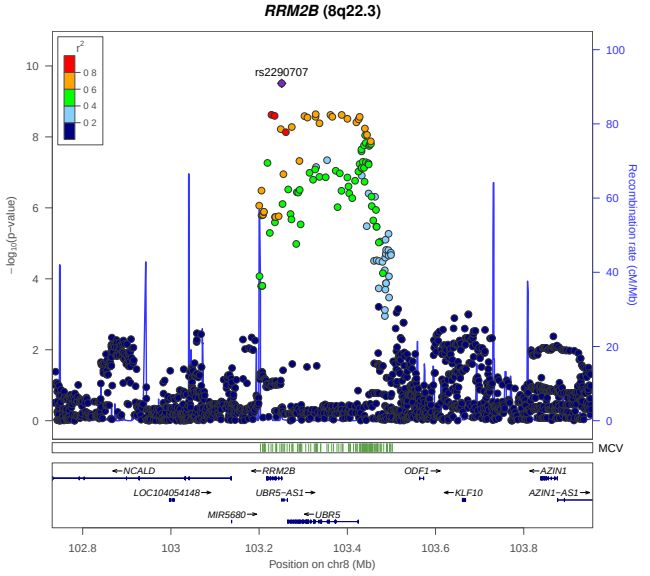
***LINC01625,LOC100132735* (6q24.1)**

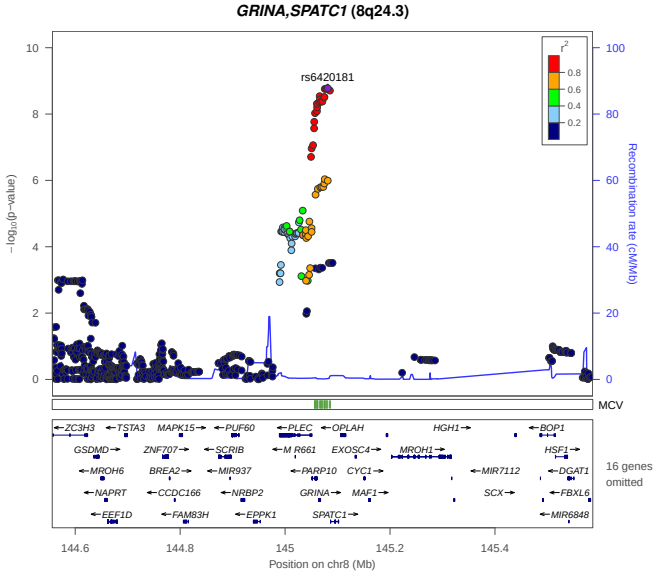


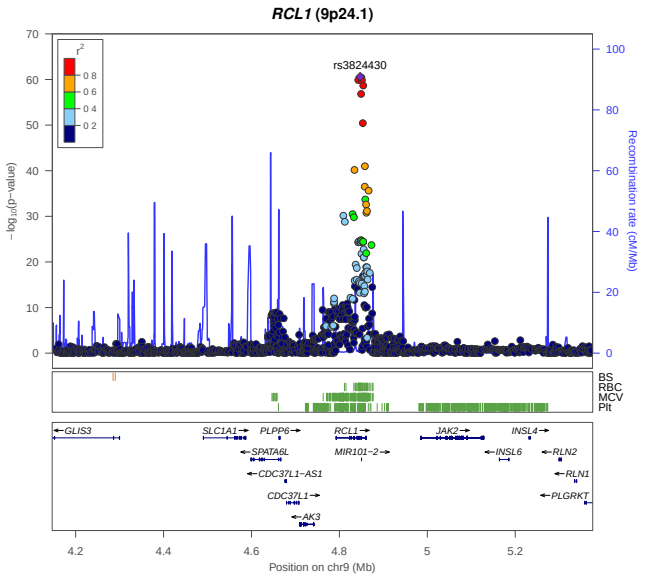

QKI,MEAT6 (6q26)
rs4709818
RBC
MCV
QKI
LOC102724152
Position on chr6 (Mb)
LOC401312,LOC541472 (7p15.3)
rs76659285
Alb
NAP
A/G
CRP
RAPGEF5
STEAP1B
LOC401312
TOMM7
FAM126A
KLHL7
LOC100506178
LOC541472
SNORD93
KLHL7-AS1
IL6
NUPL2
Position on chr7 (Mb)
IKZF1 (7p12.2)
rs6592965
TC
HDL-C
TP
NAP
A/G
AST
Mono
RBC
MCV
VWC2
C7orf72
IKZF1
DDC
GRB10
COBL
ZPBP
FIGNL1
DDC-AS1
Position on chr7 (Mb)
LOC101927497,SAMD9 (7q21.2)
rs17700466
WBC
Neutro
Eosino
Mono
RBC
MCV
CYP51A1
LOC105375396
CDK6
SAMD9
VPS50
CALCR
CYP51A1-AS1
GATAD1
LOC101927497
SAMD9L
MIR653
LRRD1
PEX1
HEPACAM2
MIR489
KRIT1
RBM48
ANKIB1
FAM133B
1 gene omitted
Position on chr7 (Mb)
TFR2 (7q22.1)
rs62482241
RBC
Ht
MCV
MCHC
TAF6
SPDYE3
C7orf61
SAP25
GNB2
ZAN
TRIP6
MUC3A
TRIM56
CNPY4
PMS2P1
TSC22D4
PCOLCE
EPO
SLC12A9
MUC12
SERPINE1
MBLAC1
STAG3L5P
NYAP1
MOSPD3
EPHB4
LOC102724094
VGF
LAMTOR4
PVRIG2P
AGFG2
GIGYF1
MIR6875
MUC17
AP1S1
C7orf43
MIR6840
LRCH4
POP7
SRRT
M R4653
25 genes omitted
Position on chr7 (Mb)
XPO7 (8p21.3)
rs727694
MCV
GFRA2
DOK2
NPM2
HR
PHYHIP
SLC39A14
XPOT
DMTN
BMP1
PIWIL2
PPP3CC
FGF17
LGI3
FAM160B2
MIR320A
NUDT18
POLR3D
3 genes omitted
Position on chr8 (Mb)

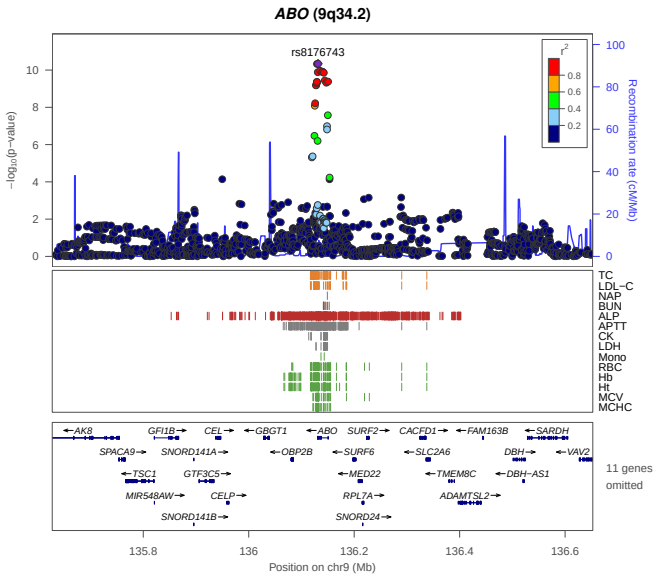

SLC25A37,NKX3-1 (8p21.2)
rs8534
BUN
sCr
eGFR
MCHC
2 genes omitted
Position on chr8 (Mb)
Recombination rate (cM/Mb)

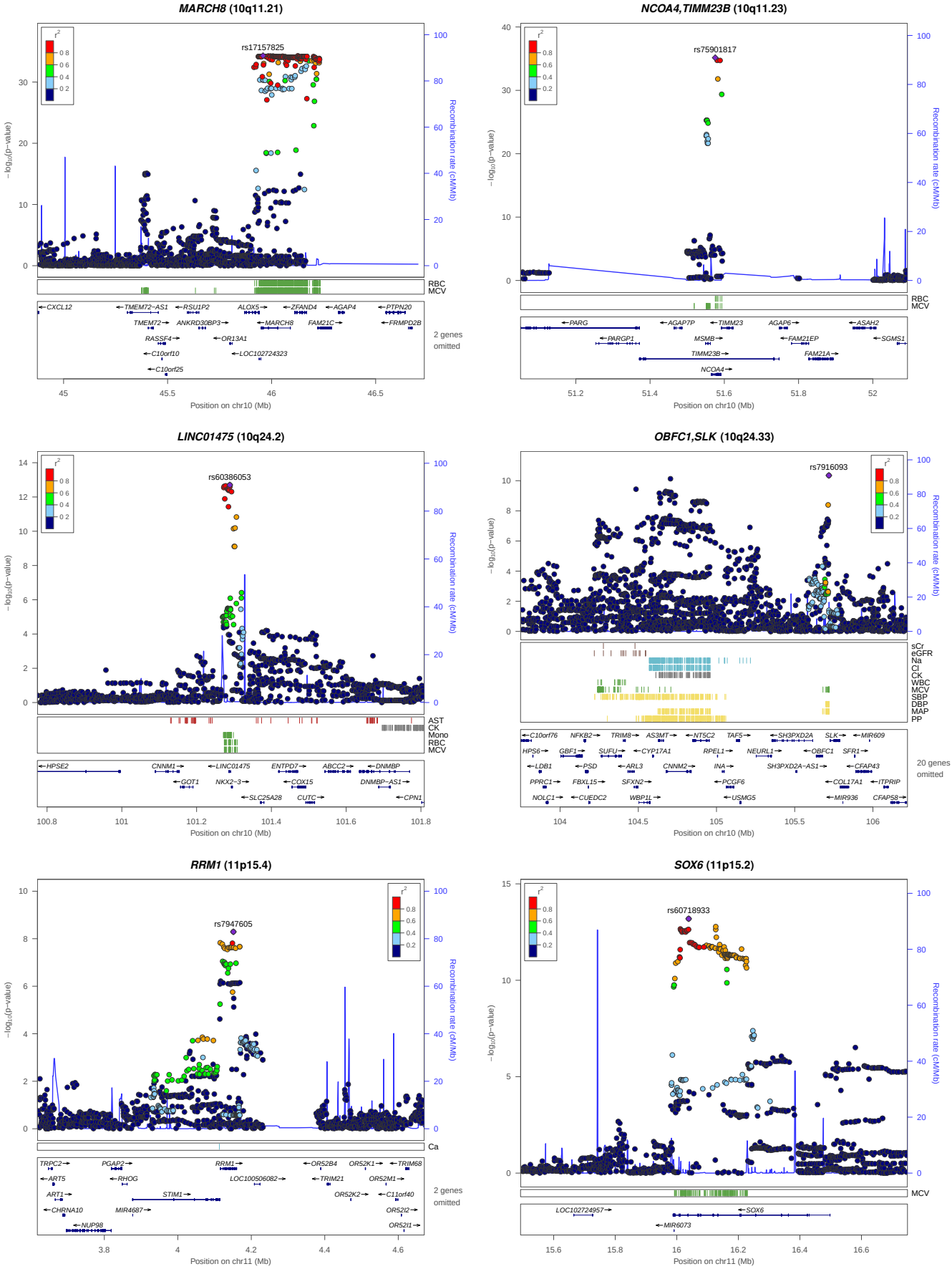

MTDH (8q22.1)
rs149211171
Position on chr8 (Mb)
Recombination rate (cM/Mb)

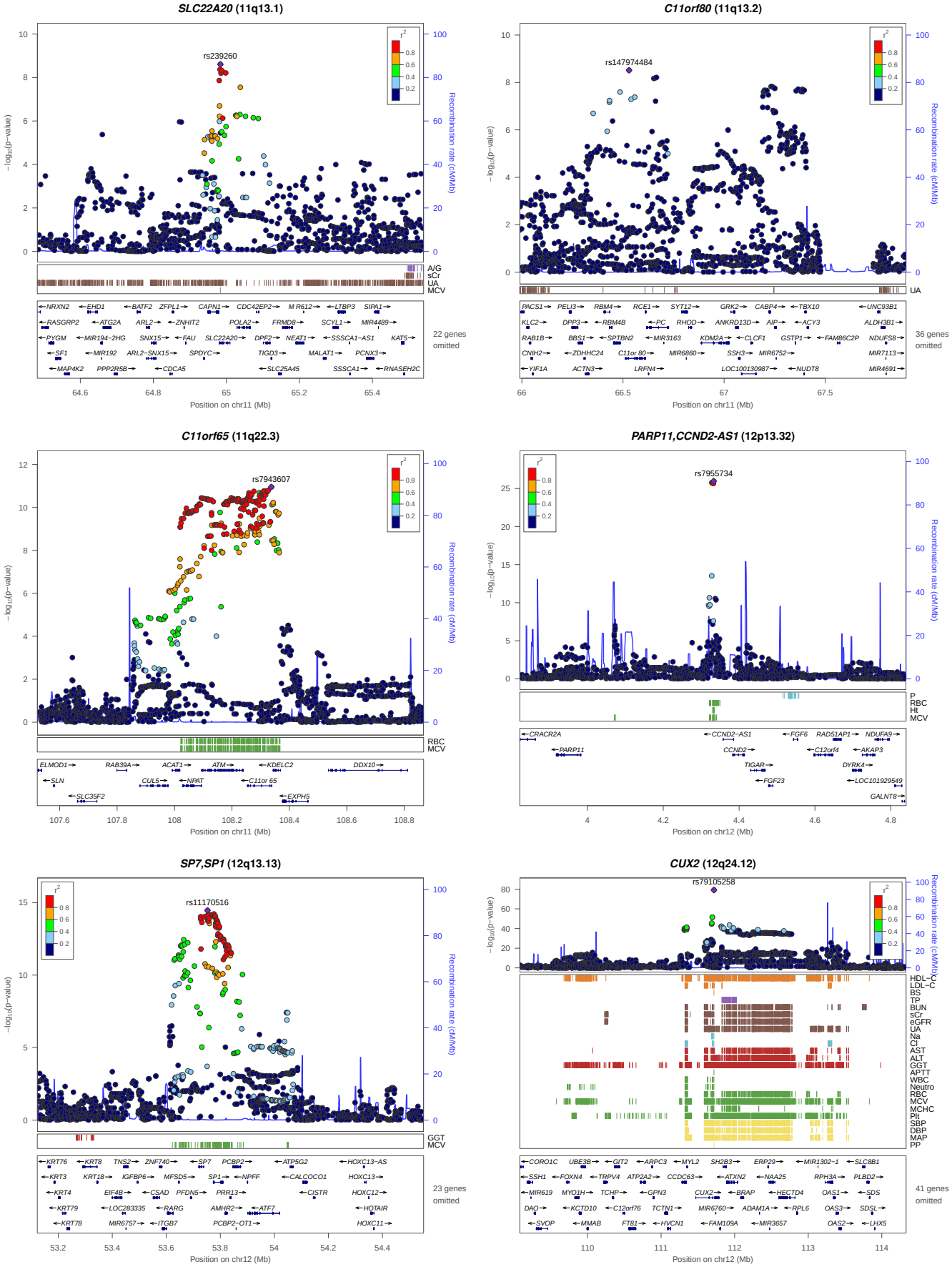

RRM2B (8q22.3)
rs2290707
MCV
Position on chr8 (Mb)
Recombination rate (cM/Mb)

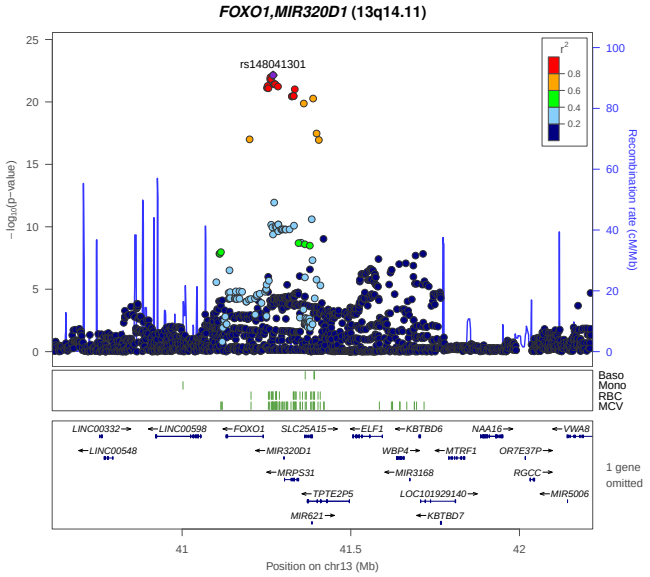

GRINA,SPATC1 (8q24.3)
rs6420181
MCV
16 genes omitted
Position on chr8 (Mb)
Recombination rate (cM/Mb)

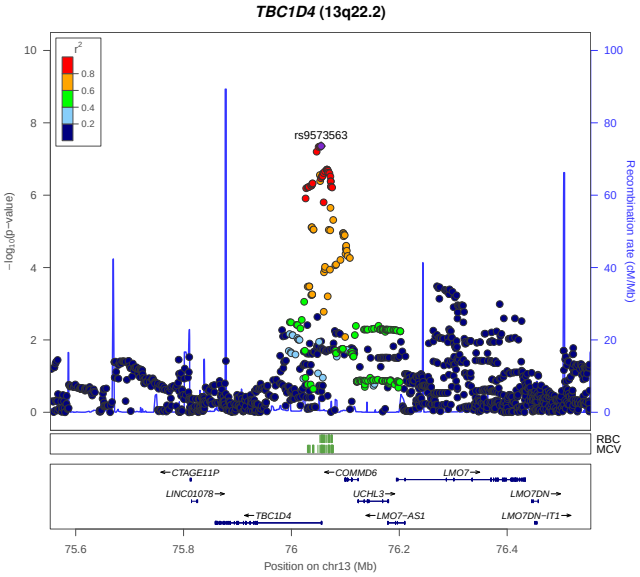

RCL1 (9p24.1)
rs3824430
BS
RBC
MCV
Plt
Position on chr9 (Mb)
Recombination rate (cM/Mb)

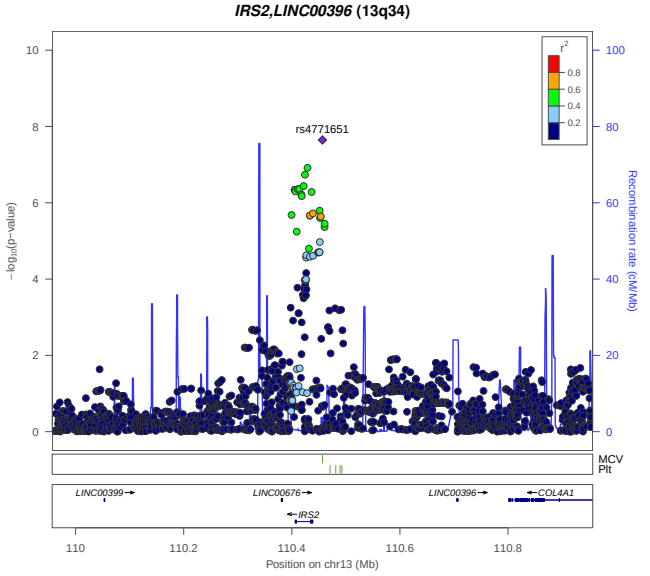

ABO (9q34.2)
rs8176743
TC
LDL-C
NAP
BUN
ALP
APTT
CK
LDH
Mono
RBC
Hb
Ht
MCV
MCHC
11 genes omitted
Position on chr9 (Mb)
Recombination rate (cM/Mb)

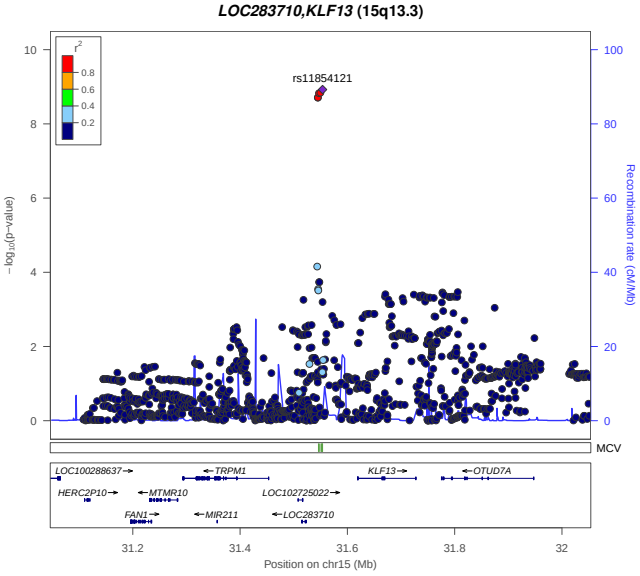

MARCH8 (10q11.21)
rs17157825
RBC
MCV
2 genes omitted
Position on chr10 (Mb)
NCOA4,TIMM23B (10q11.23)
rs75901817
RBC
MCV
Position on chr10 (Mb)
LINC01475 (10q24.2)
rs60386053
AST
CK
Mono
RBC
MCV
Position on chr10 (Mb)
OBFC1,SLK (10q24.33)
rs7916093
sCr
eGFR
Na
Cl
CK
WBC
MCV
SBP
DBP
MAP
PP
20 genes omitted
Position on chr10 (Mb)
RRM1 (11p15.4)
rs7947605
Ca
2 genes omitted
Position on chr11 (Mb)
SOX6 (11p15.2)
rs60718933
MCV
Position on chr11 (Mb)
Recombination rate (cM/Mb)

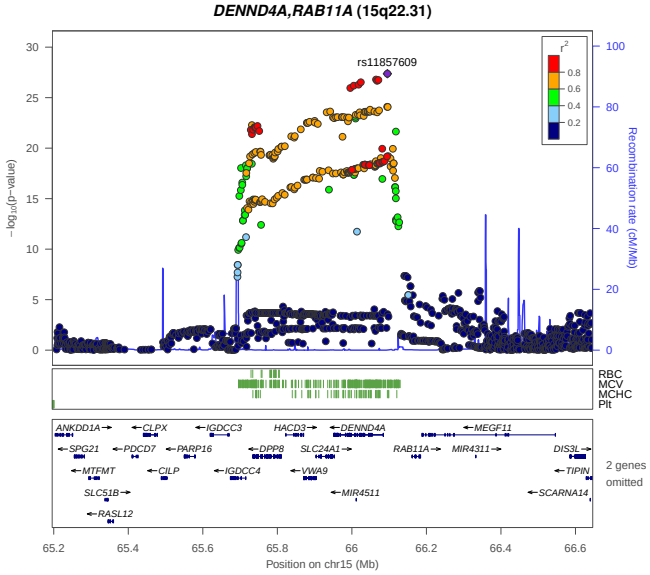

SLC22A20 (11q13.1)
rs239260
A/G
sCr
UA
MCV
22 genes omitted
Position on chr11 (Mb)
C11orf80 (11q13.2)
rs147974484
UA
36 genes omitted
Position on chr11 (Mb)
C11orf65 (11q22.3)
rs7943607
RBC
MCV
Position on chr11 (Mb)
PARP11,CCND2-AS1 (12p13.32)
rs7955734
P
RBC
Ht
MCV
Position on chr12 (Mb)
SP7,SP1 (12q13.13)
rs11170516
GGT
MCV
23 genes omitted
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
HDL-C
LDL-C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCHC
Plt
SBP
DBP
MAP
PP
41 genes omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

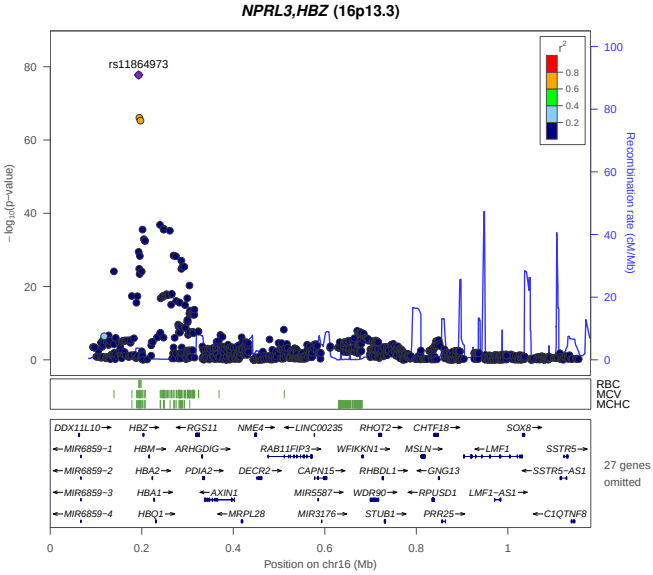

FOXO1,MIR320D1 (13q14.11)
rs148041301
Position on chr13 (Mb)
Recombination rate (cM/Mb)
Baso
Mono
RBC
MCV
1 gene omitted


TBC1D4 (13q22.2)
rs9573563
Position on chr13 (Mb)
Recombination rate (cM/Mb)
RBC
MCV

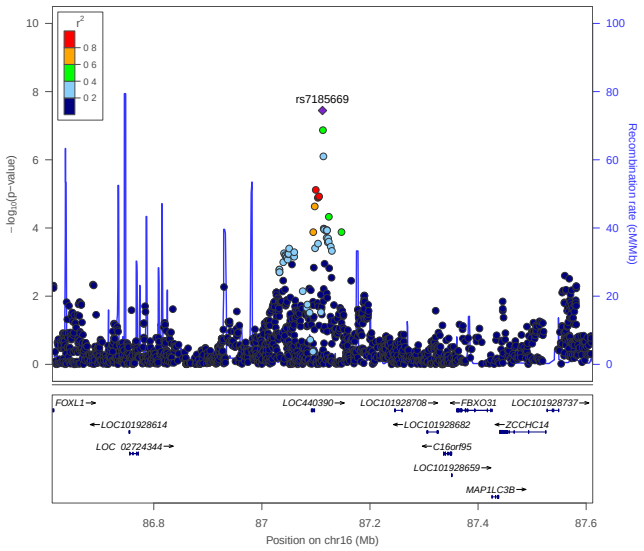

IRS2,LINC00396 (13q34)
rs4771651
Position on chr13 (Mb)
Recombination rate (cM/Mb)
MCV
Plt


LOC283710,KLF13 (15q13.3)
rs11854121
Position on chr15 (Mb)
Recombination rate (cM/Mb)
MCV

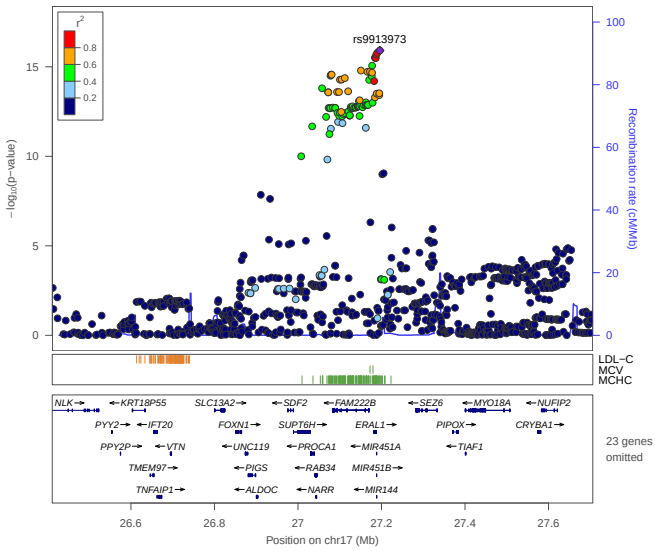

DENND4A,RAB11A (15q22.31)
rs11857609
Position on chr15 (Mb)
Recombination rate (cM/Mb)
RBC
MCV
MCHC
Plt
2 genes omitted


NPRL3,HBZ (16p13.3)
rs11864973
Position on chr16 (Mb)
Recombination rate (cM/Mb)
RBC
MCV
MCHC
27 genes omitted

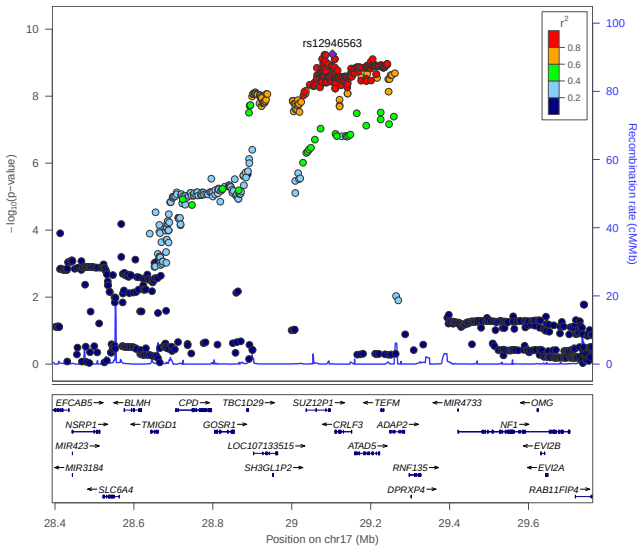
LOC440390,LOC101928708 **(16q24.2)**



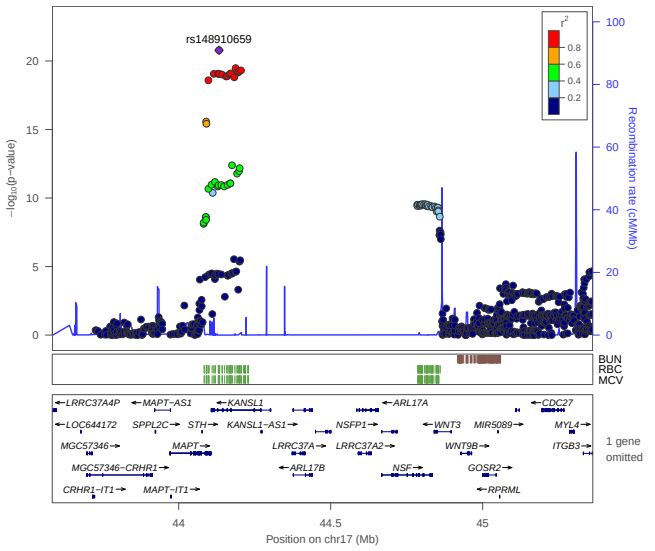
MIR4732,FLOT2 **(17q11.2)**



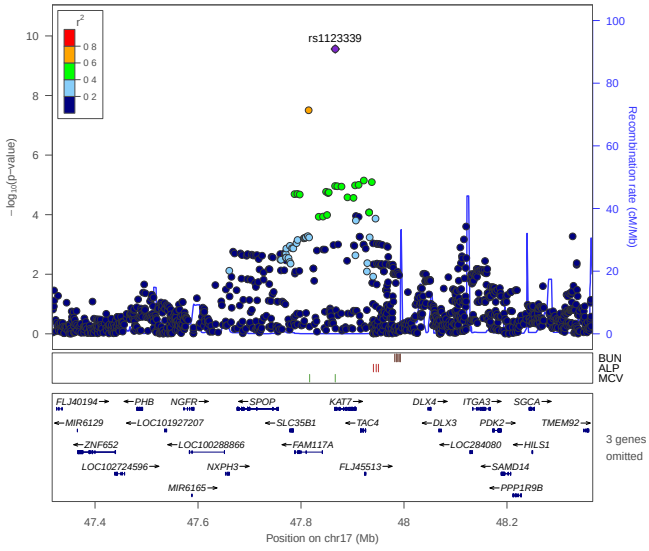
SUZ12P1,CRLF3 **(17q11.2)**



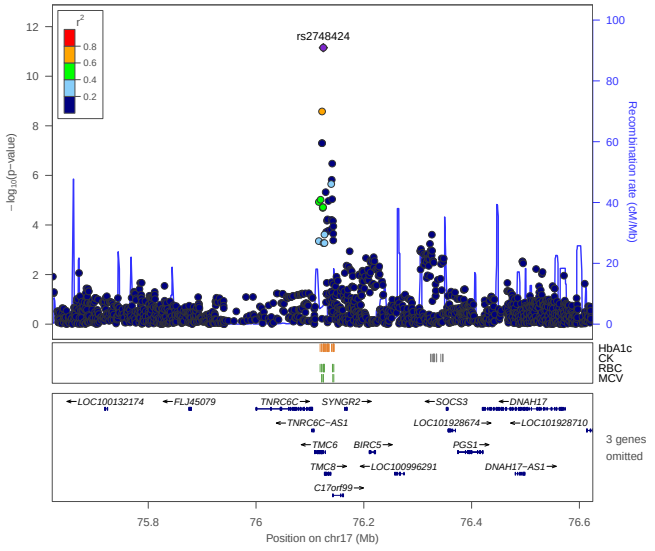
KANSL1 **(17q21.31)**

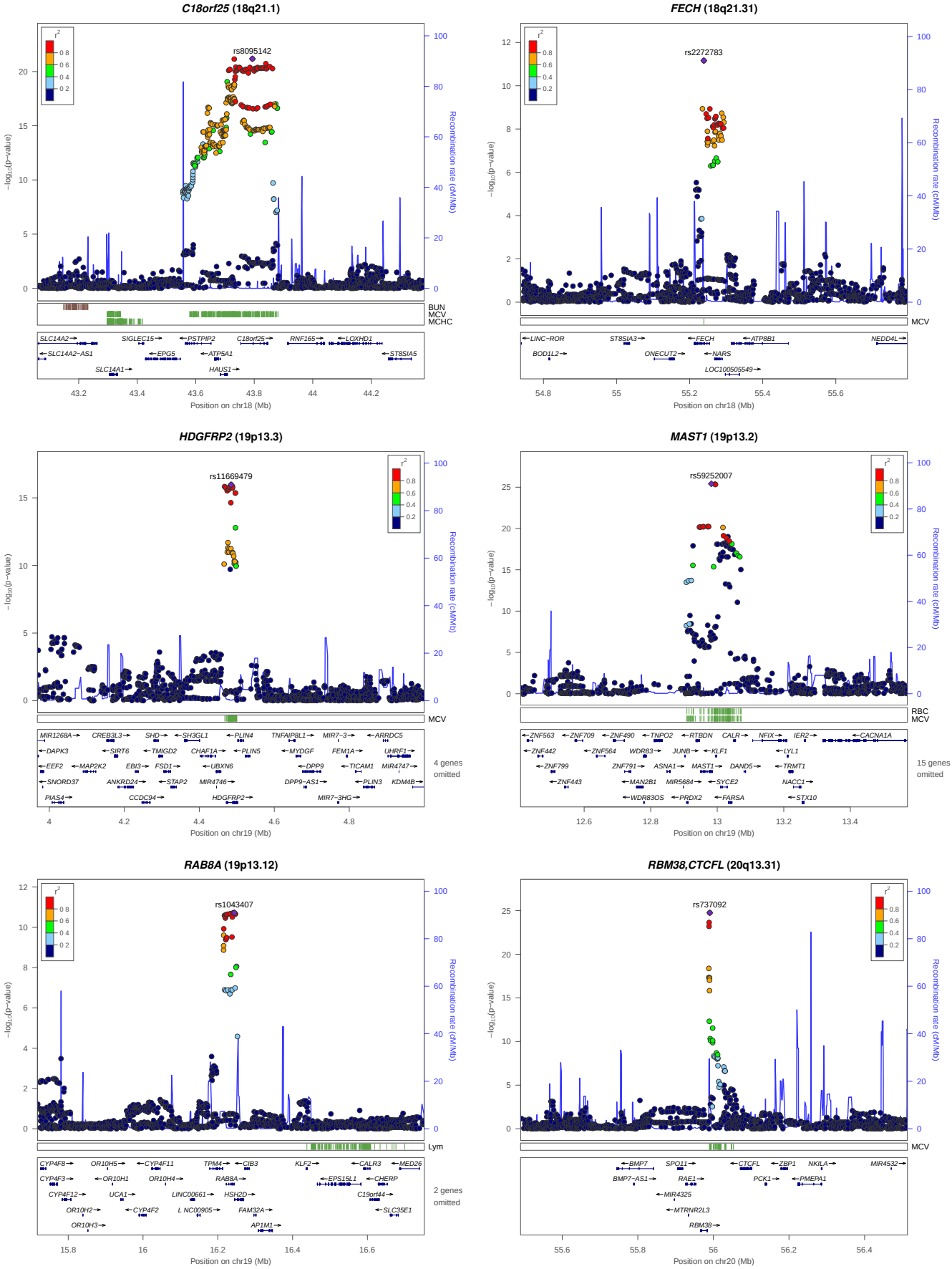


KAT7 **(17q21.33)**

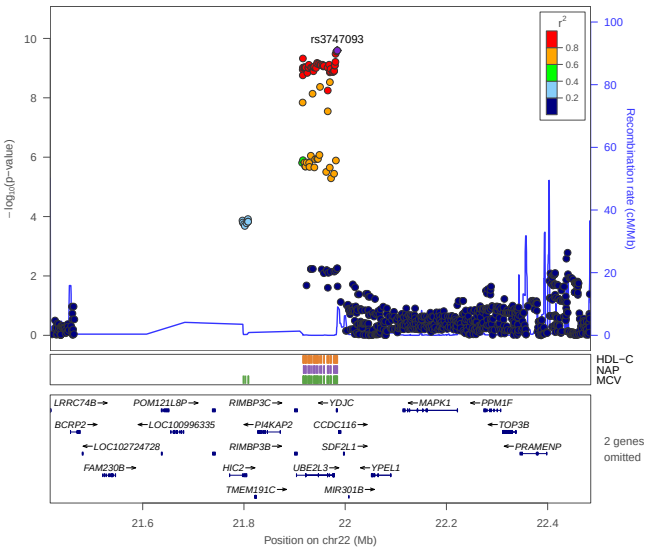


TMC6 **(17q25.3)**

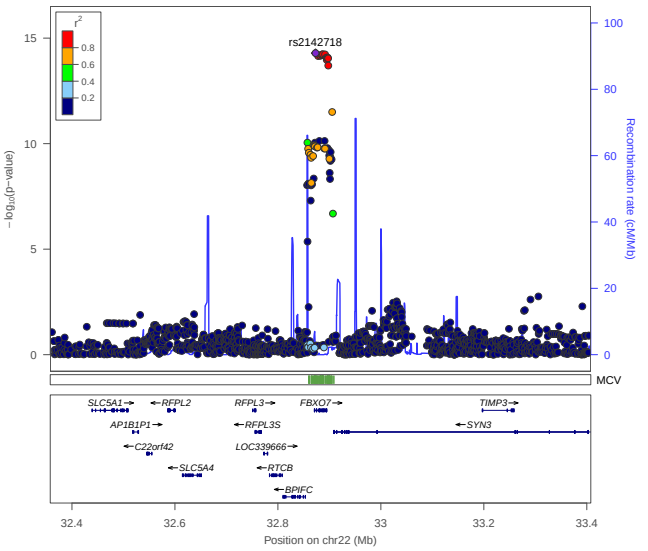



C18orf25 (18q21.1)
rs8095142
BUN
MCV
MCHC
Position on chr18 (Mb)
FECH (18q21.31)
rs2272783
MCV
Position on chr18 (Mb)
HDGFRP2 (19p13.3)
rs11669479
MCV
4 genes omitted
Position on chr19 (Mb)
MAST1 (19p13.2)
rs59252007
RBC
MCV
15 genes omitted
Position on chr19 (Mb)
RAB8A (19p13.12)
rs1043407
Lym
2 genes omitted
Position on chr19 (Mb)
RBM38,CTCFL (20q13.31)
rs737092
MCV
Position on chr20 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)

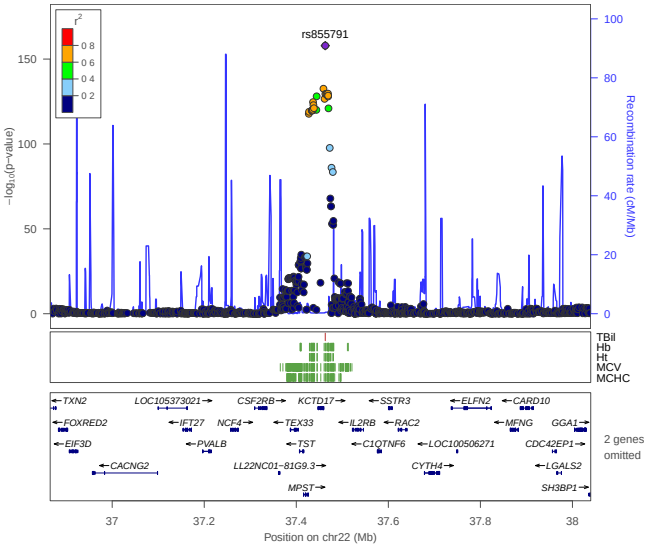
***YDJC* (22q11.21)**



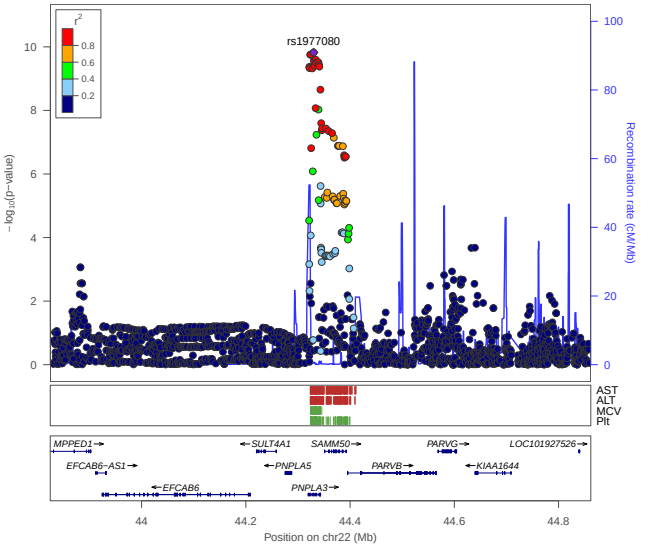
***FBXO7* (22q12.3)**



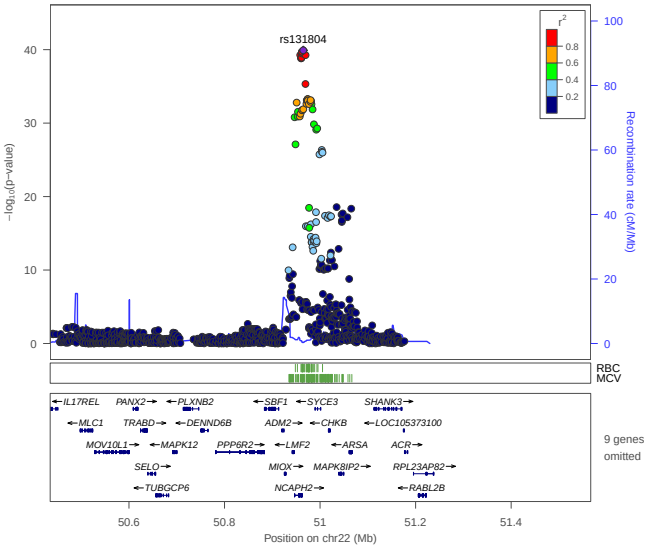
***TMPRSS6* (22q12.3)**



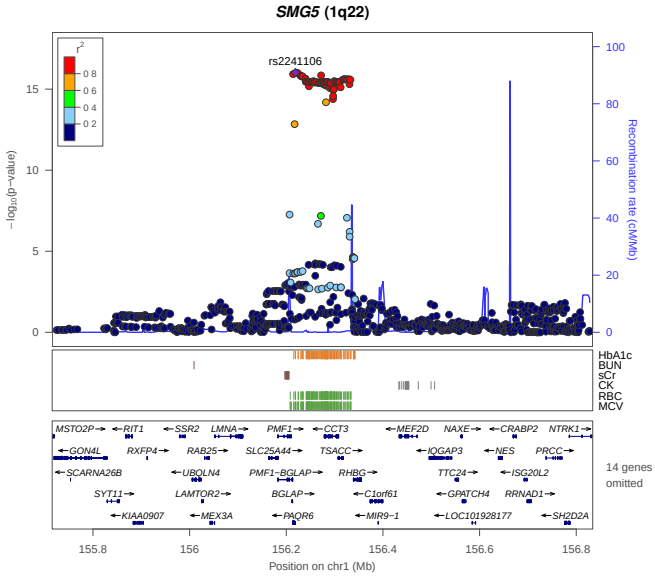
***PNPLA3* (22q13.31)**

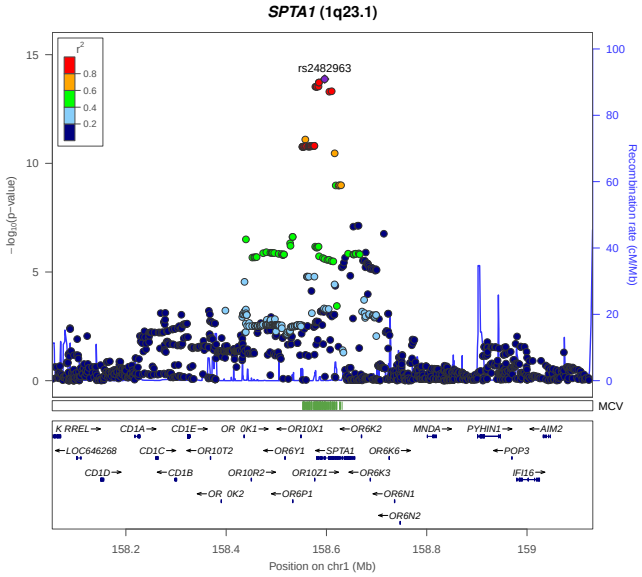


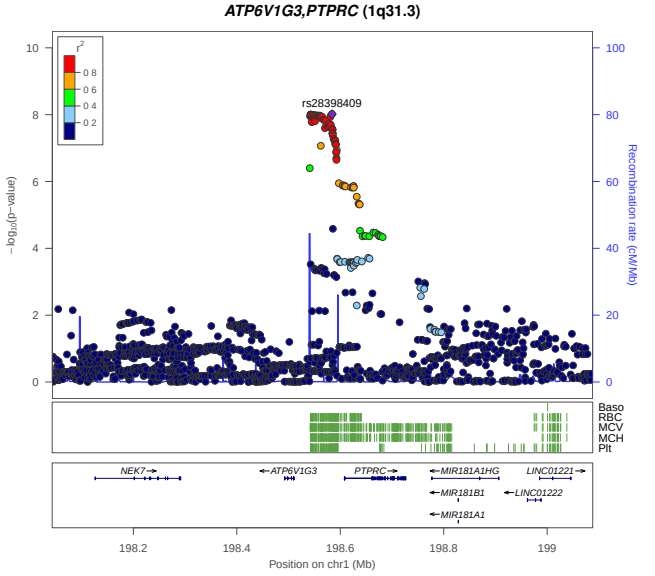
***TYMP* (22q13.33)**

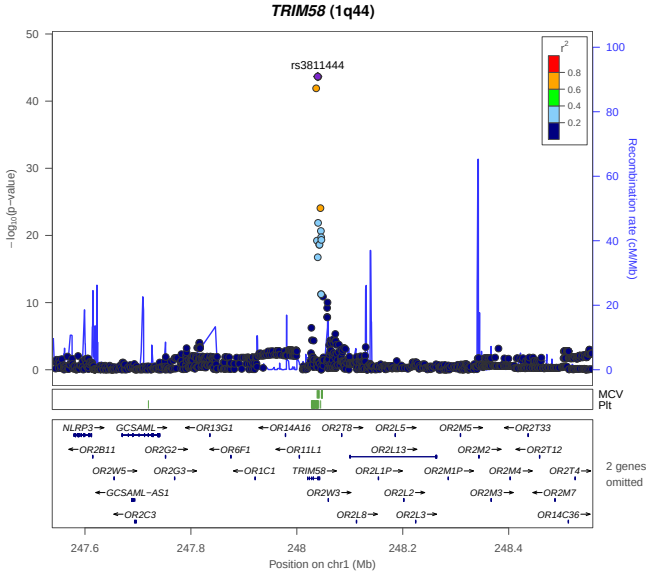


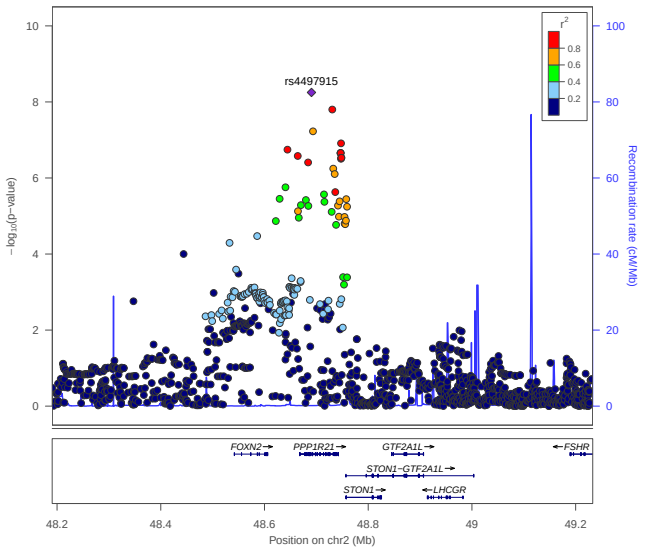
2.43 MCHC (n = 108,728)

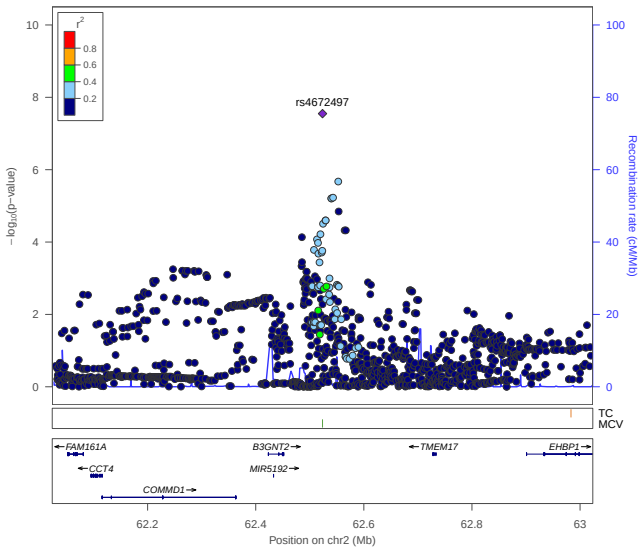


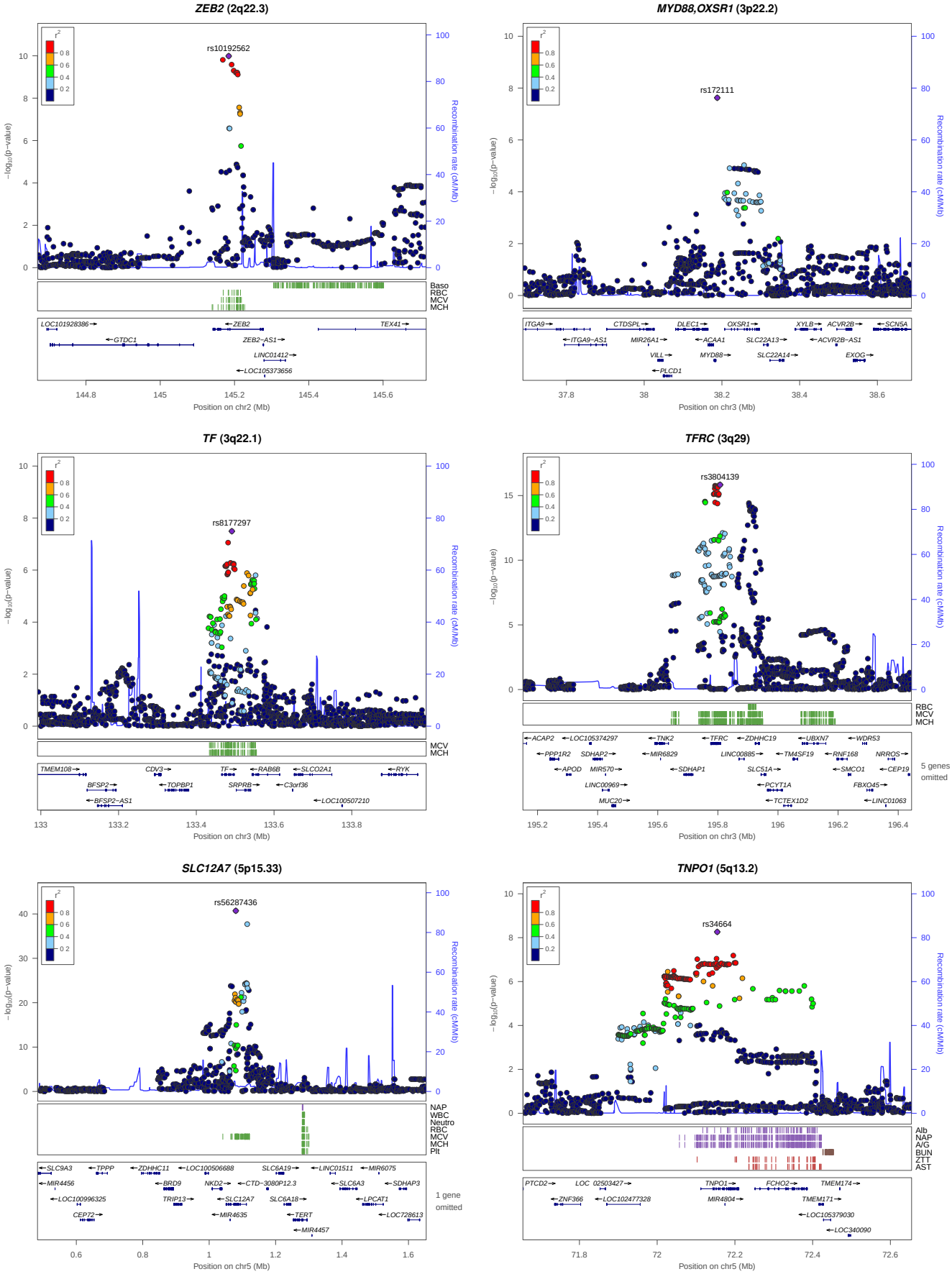


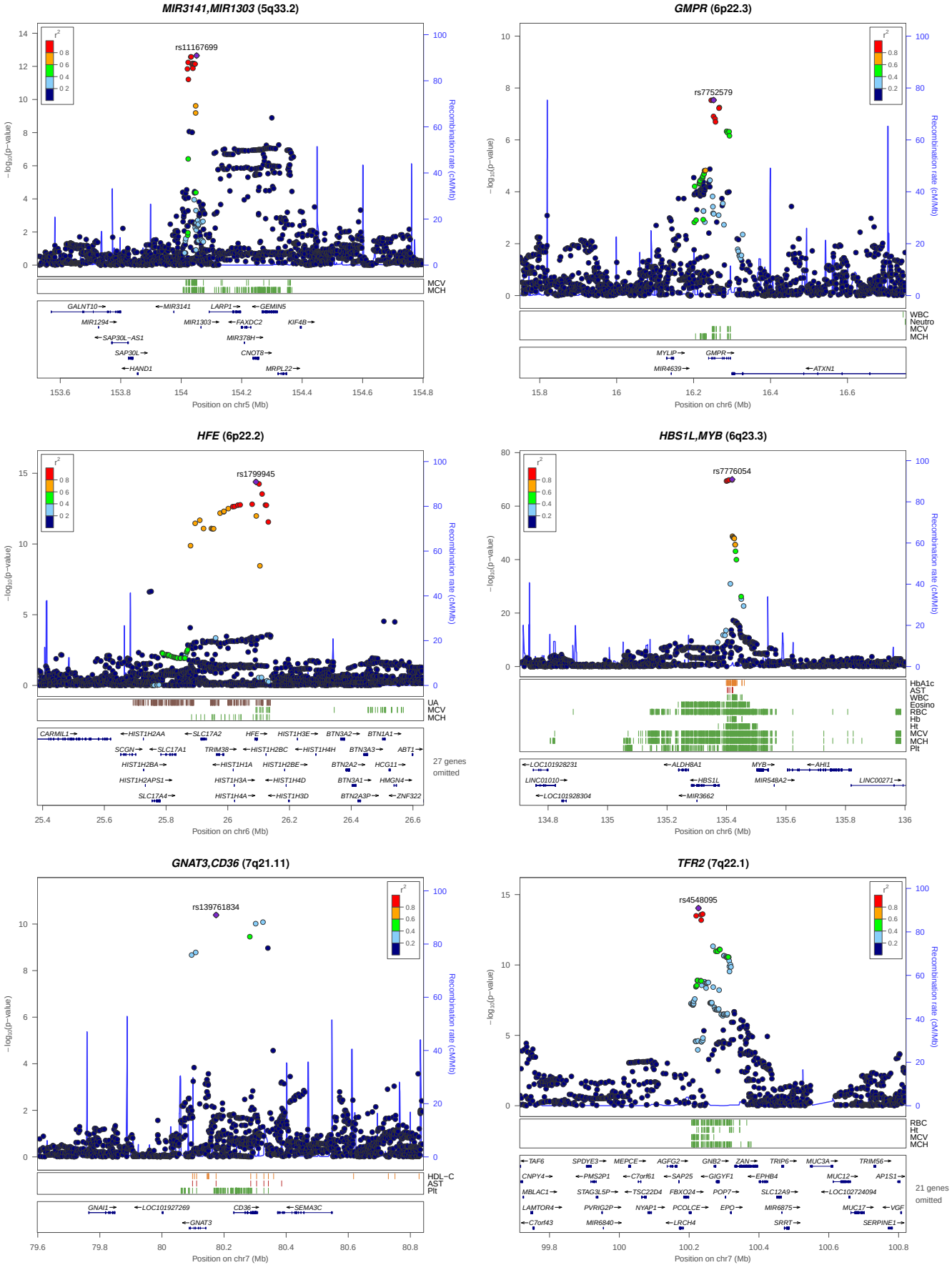


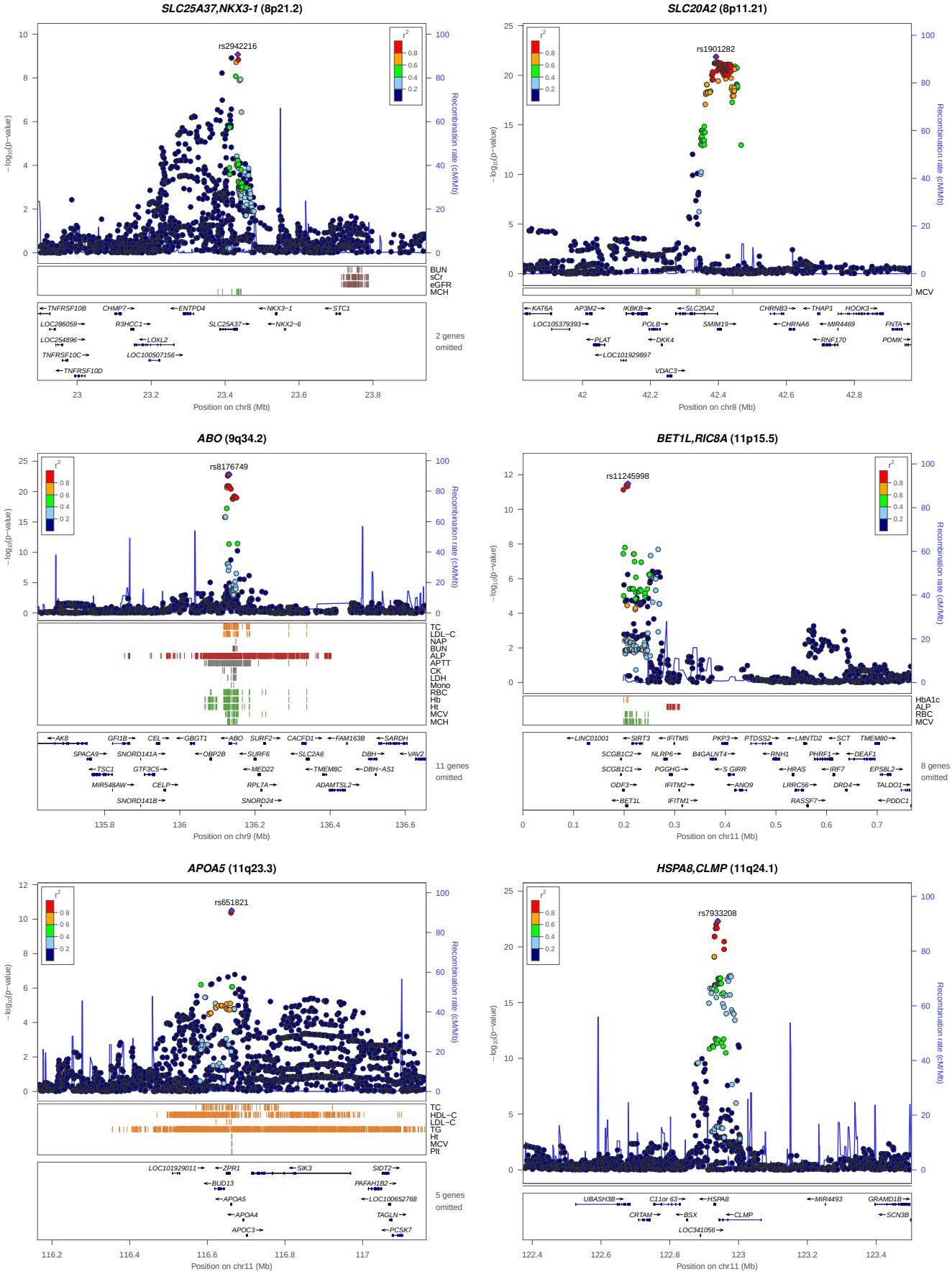


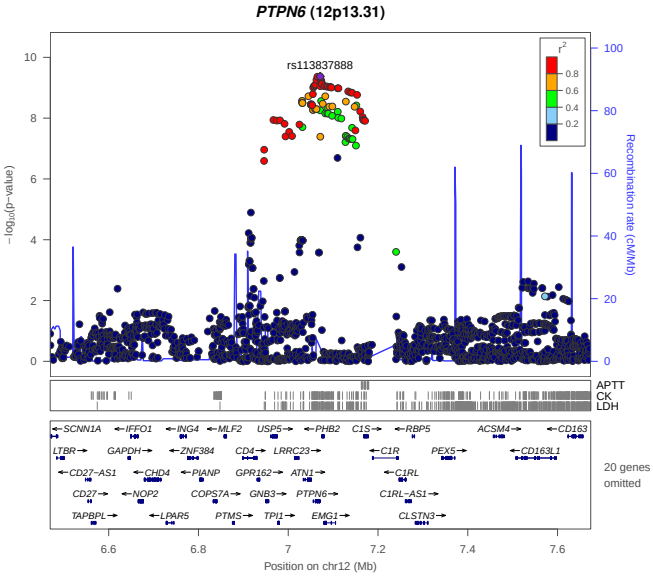


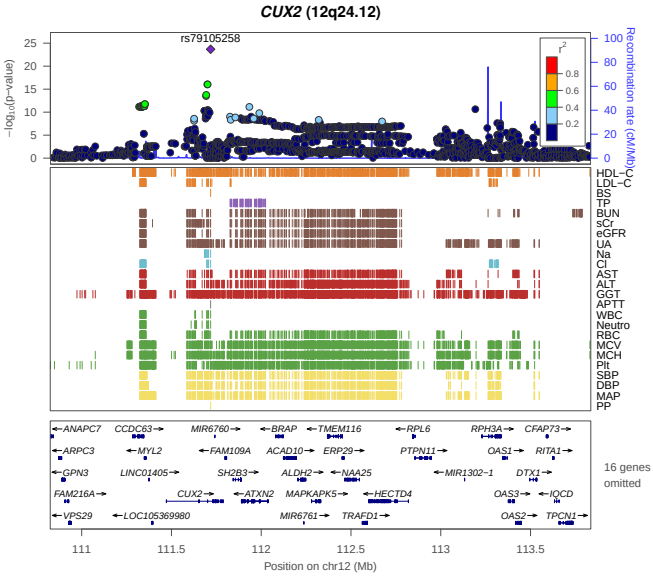


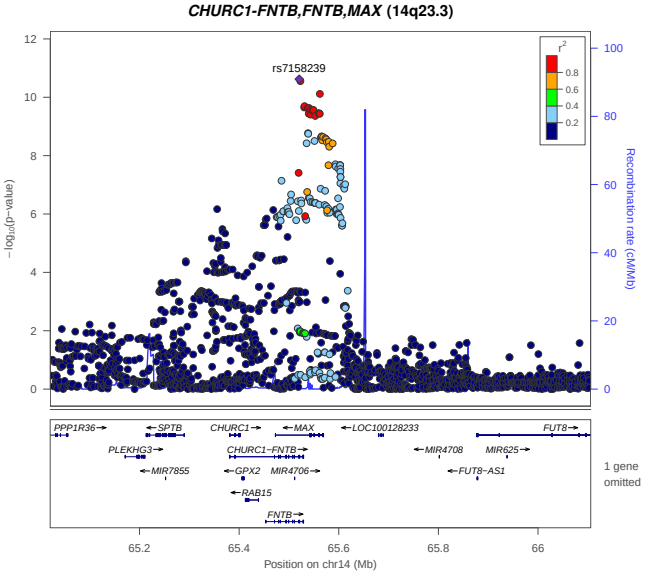

ZEB2 (2q22.3)
rs10192562
MYD88,OXSR1 (3p22.2)
rs172111
TF (3q22.1)
rs8177297
TFRC (3q29)
rs3804139
SLC12A7 (5p15.33)
rs56287436
TNPO1 (5q13.2)
rs34664
Recombination rate (cM/Mb)
Position on chr2 (Mb)
Position on chr3 (Mb)
Position on chr5 (Mb)
Baso
RBC
MCV
MCH
NAP
WBC
Neutro
Plt
Alb
A/G
BUN
ZT
AST
5 genes omitted
1 gene omitted

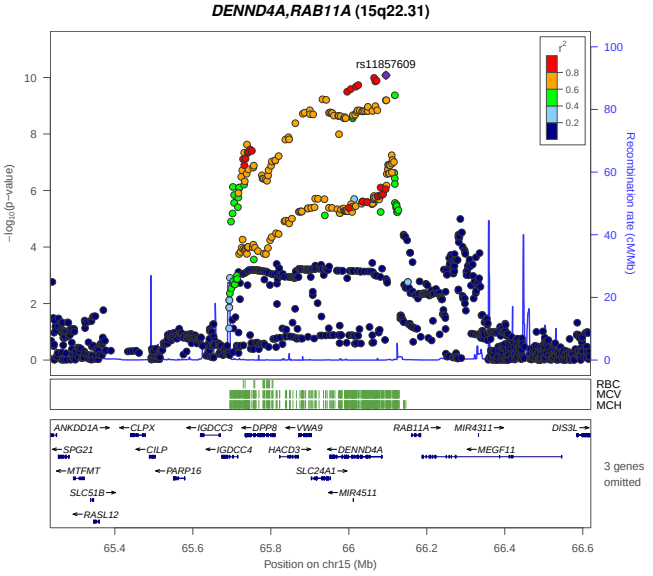

MIR3141,MIR1303 (5q33.2)
rs11167699
MCV
MCH
Position on chr5 (Mb)
GMPR (6p22.3)
rs7752579
WBC
Neutro
MCV
MCH
Position on chr6 (Mb)
HFE (6p22.2)
rs1799945
UA
MCV
MCH
27 genes omitted
Position on chr6 (Mb)
HBS1L,MYB (6q23.3)
rs7776054
HbA1c
AST
WBC
Eosino
RBC
Hb
Ht
MCV
MCH
Plt
Position on chr6 (Mb)
GNAT3,CD36 (7q21.11)
rs139761834
HDL_C
AST
Plt
Position on chr7 (Mb)
TFR2 (7q22.1)
rs4548095
RBC
Ht
MCV
MCH
21 genes omitted
Position on chr7 (Mb)
Recombination rate (cM/Mb)

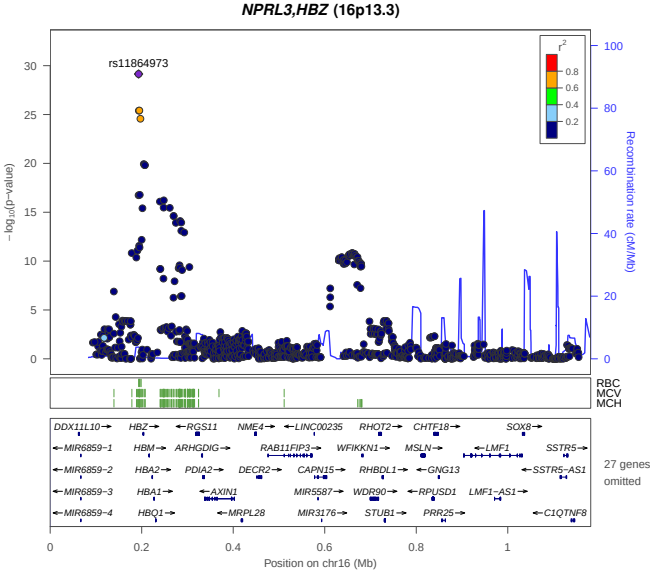

SLC25A37,NKX3-1 (8p21.2)
rs2942216
BUN
sCr
eGFR
MCH
2 genes omitted
Position on chr8 (Mb)
SLC20A2 (8p11.21)
rs1901282
MCV
Position on chr8 (Mb)
ABO (9q34.2)
rs8176749
TC
LDL−C
NAP
BUN
ALP
APTT
CK
LDH
Mono
RBC
Hb
Ht
MCV
MCH
11 genes omitted
Position on chr9 (Mb)
BET1L,RIC8A (11p15.5)
rs11245998
HbA1c
ALP
RBC
MCV
8 genes omitted
Position on chr11 (Mb)
APOA5 (11q23.3)
rs651821
TC
HDL−C
LDL−C
TG
Ht
MCV
Plt
5 genes omitted
Position on chr11 (Mb)
HSPA8,CLMP (11q24.1)
rs7933208
Position on chr11 (Mb)
Recombination rate (cM/Mb)

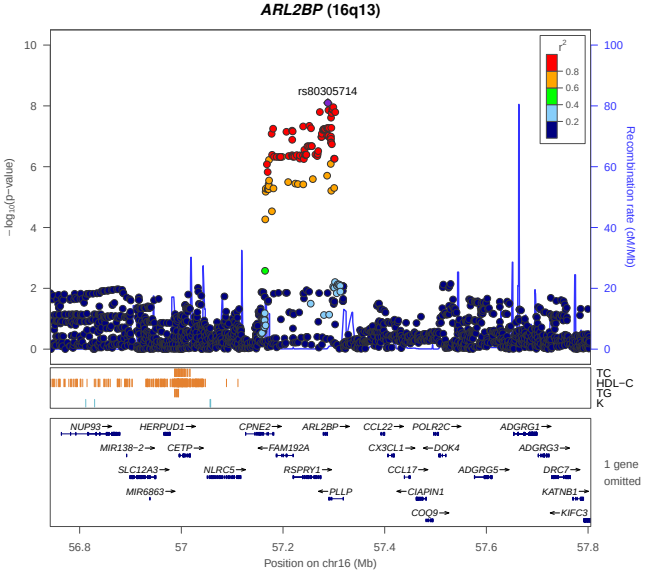

PTPN6 (12p13.31)
rs113837888
−log10(p-value)
Recombination rate (cM/Mb)
APTT
CK
LDH
20 genes omitted
Position on chr12 (Mb)

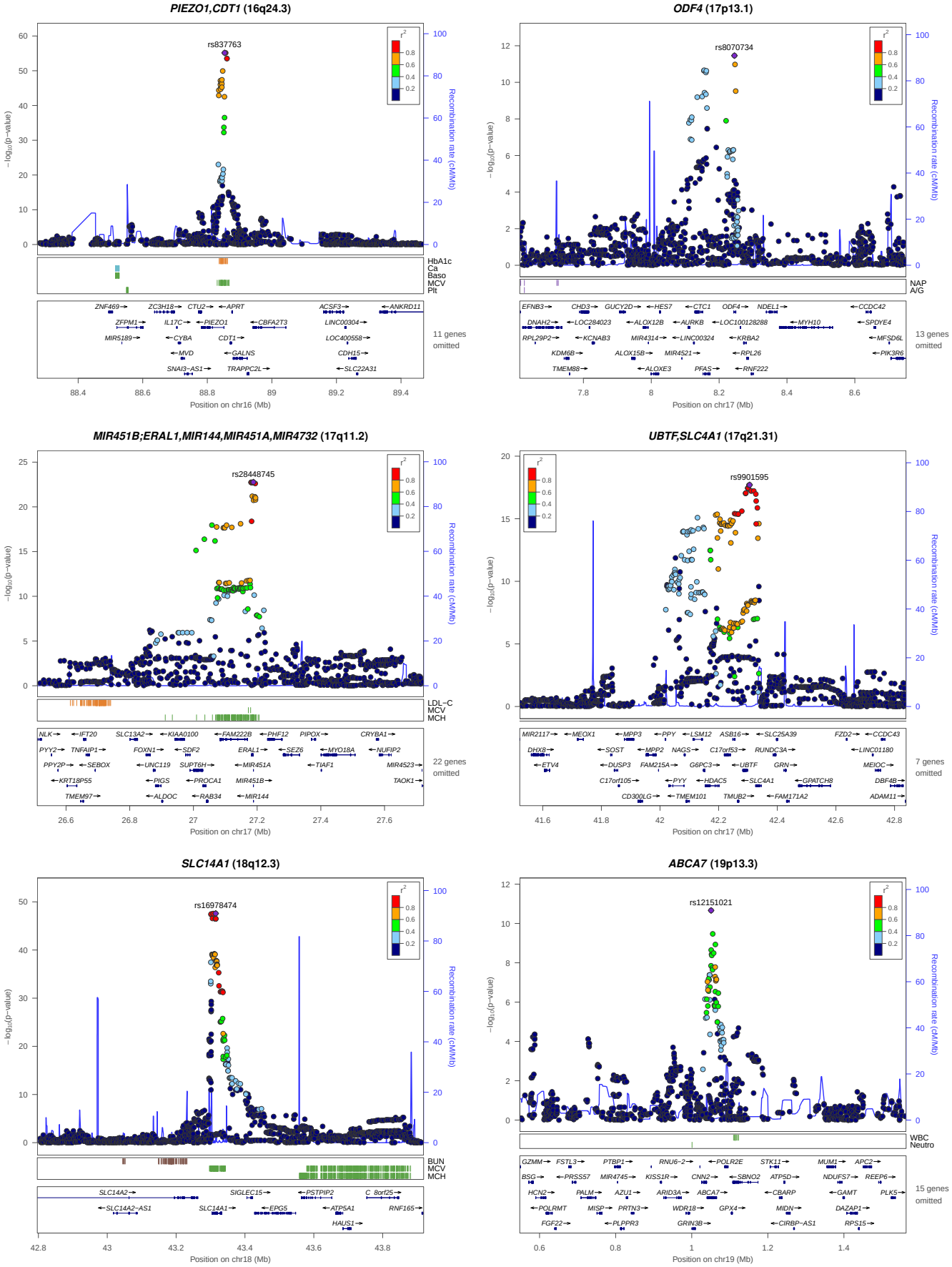

CUX2 (12q24.12)
rs79105258
−log10(p-value)
Recombination rate (cM/Mb)
HDL−C
LDL−C
BS
TP
BUN
sCr
eGFR
UA
Na
Cl
AST
ALT
GGT
APTT
WBC
Neutro
RBC
MCV
MCH
Plt
SBP
DBP
MAP
PP
16 genes omitted
Position on chr12 (Mb)

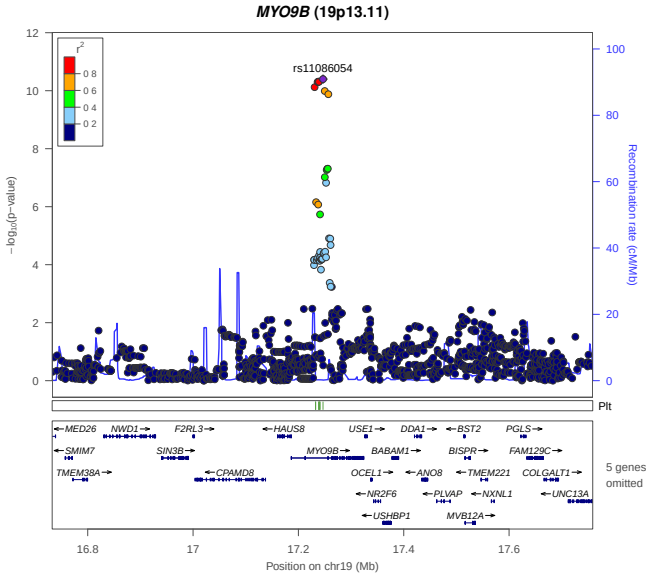

CHURC1-FNTB,FNTB,MAX (14q23.3)
rs7158239
−log10(p-value)
Recombination rate (cM/Mb)
1 gene omitted
Position on chr14 (Mb)

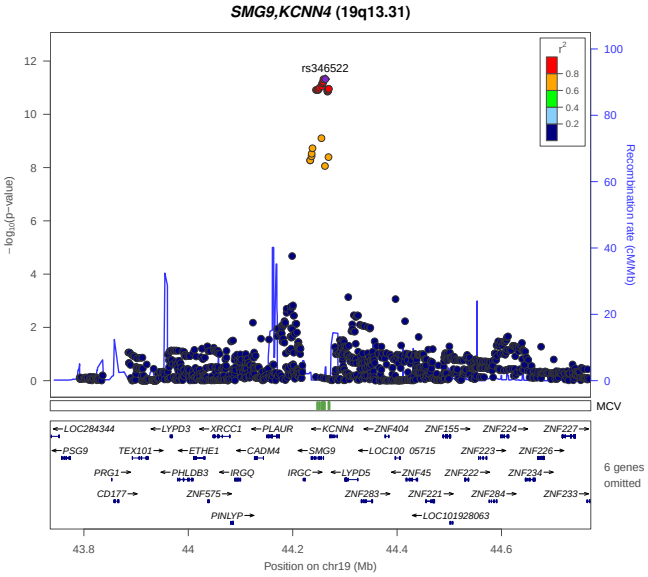

DENND4A,RAB11A (15q22.31)
rs11857609
−log10(p-value)
Recombination rate (cM/Mb)
RBC
MCV
MCH
3 genes omitted
Position on chr15 (Mb)

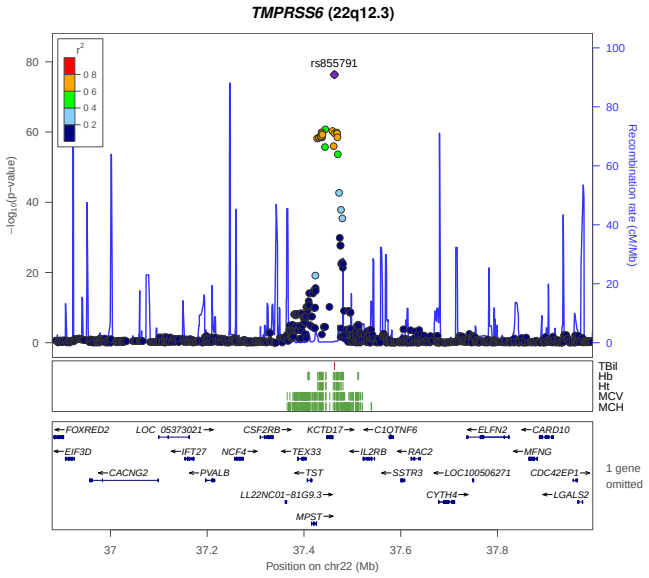

NPRL3,HBZ (16p13.3)
rs11864973
−log10(p-value)
Recombination rate (cM/Mb)
RBC
MCV
MCH
27 genes omitted
Position on chr16 (Mb)


ARL2BP (16q13)
rs80305714
−log10(p-value)
Recombination rate (cM/Mb)
TC
HDL−C
TG
K
1 gene omitted
Position on chr16 (Mb)

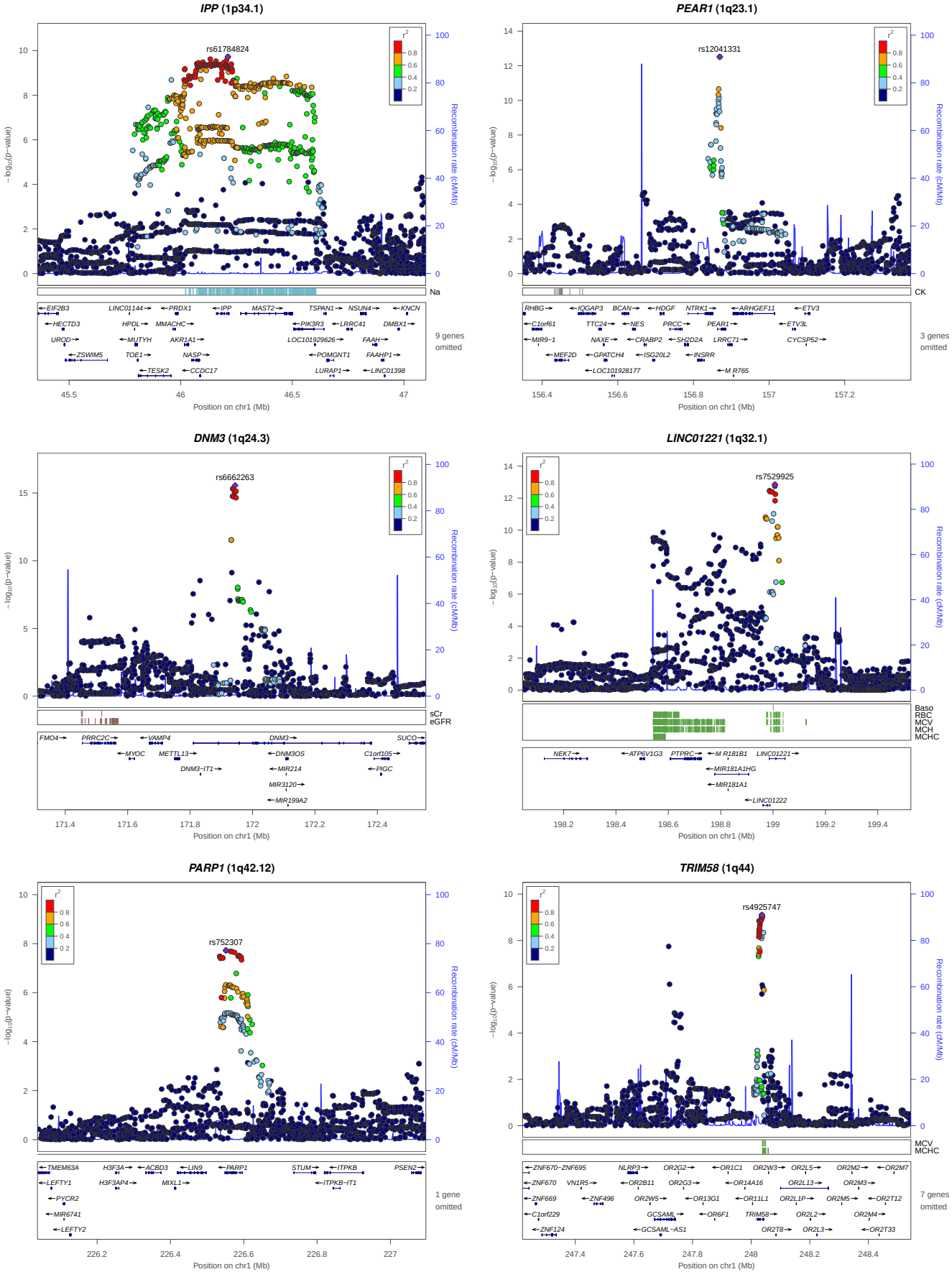

PIEZO1,CDT1 (16q24.3)
rs837763
HbA1c
Ca
Baso
MCV
Plt
11 genes omitted
Position on chr16 (Mb)
ODF4 (17p13.1)
rs8070734
NAP
A/G
13 genes omitted
Position on chr17 (Mb)
MIR451B;ERAL1,MIR144,MIR451A,MIR4732 (17q11.2)
rs28448745
LDL−C
MCV
MCH
22 genes omitted
Position on chr17 (Mb)
UBTF,SLC4A1 (17q21.31)
rs9901595
7 genes omitted
Position on chr17 (Mb)
SLC14A1 (18q12.3)
rs16978474
BUN
MCV
MCH
Position on chr18 (Mb)
ABCA7 (19p13.3)
rs12151021
WBC
Neutro
15 genes omitted
Position on chr19 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

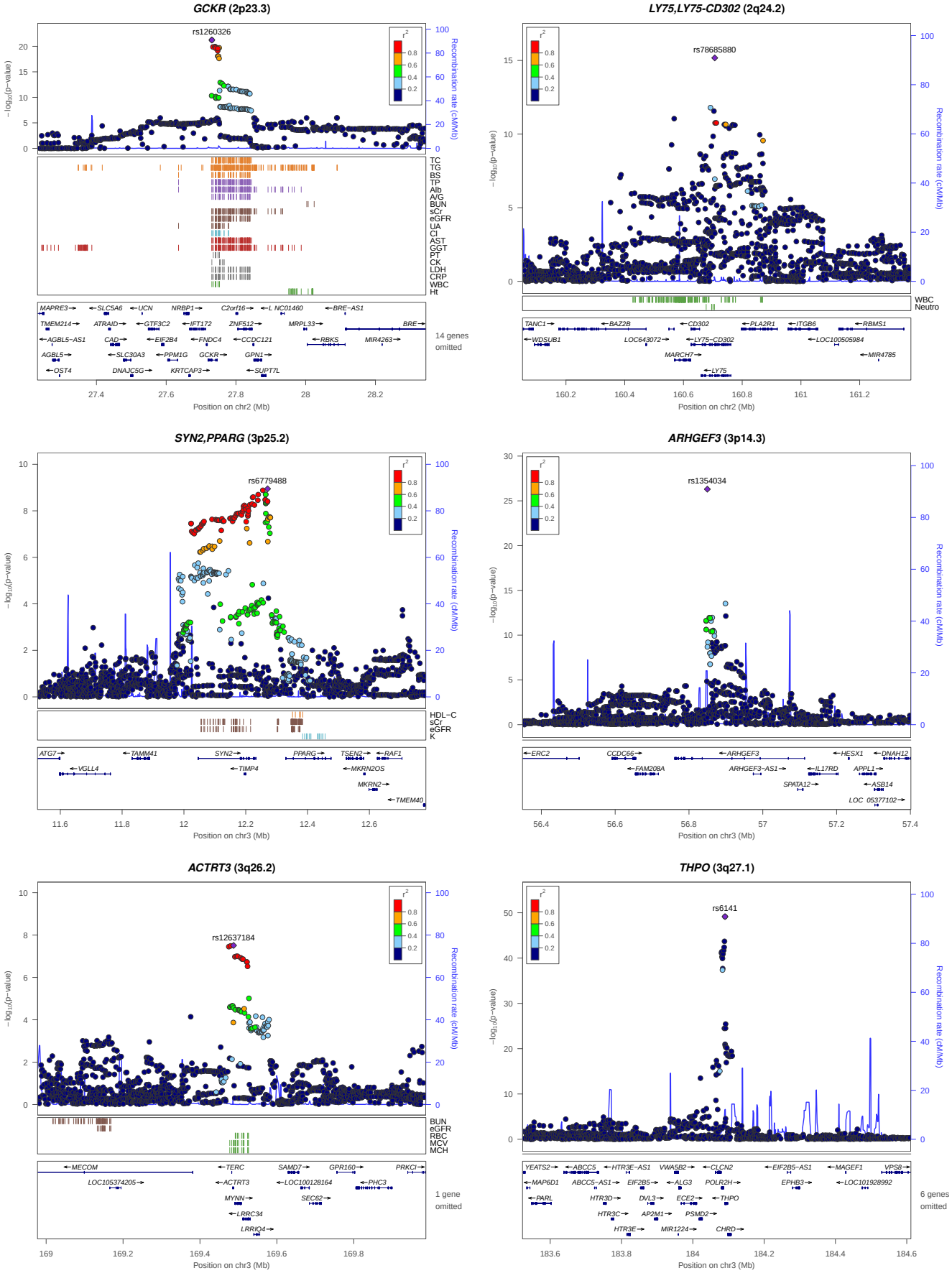

MYO9B (19p13.11)
rs11086054
Recombination rate (cM/Mb)
Plt
5 genes omitted
Position on chr19 (Mb)

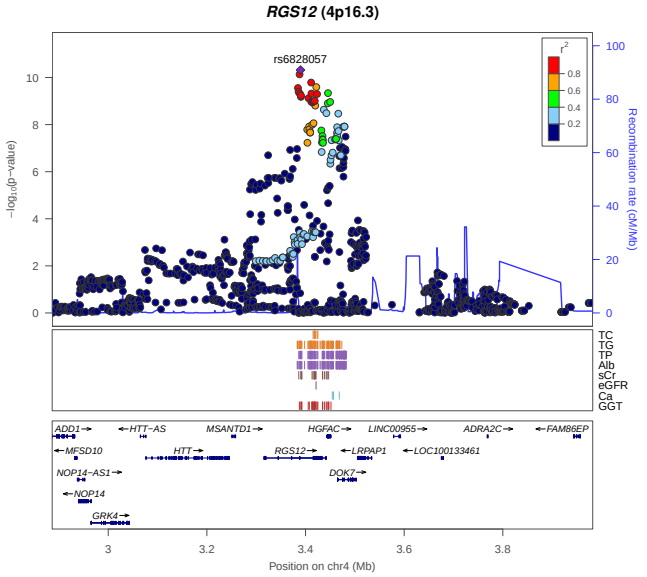

SMG9,KCNN4 (19q13.31)
rs346522
Recombination rate (cM/Mb)
MCV
6 genes omitted
Position on chr19 (Mb)

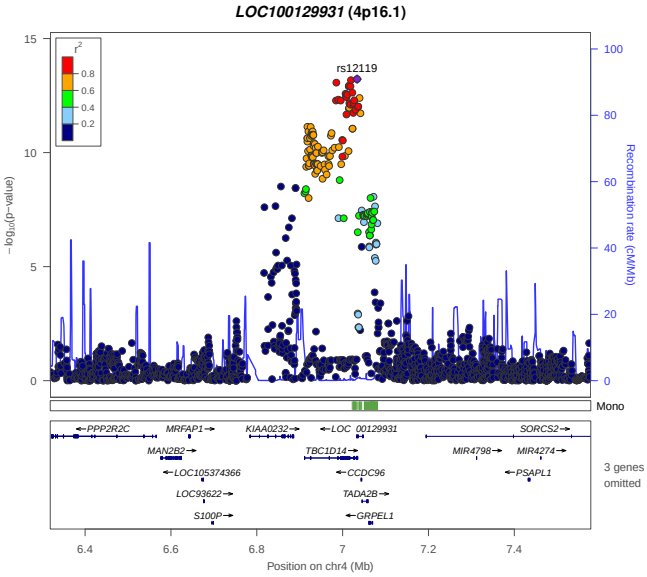

TMPRSS6 (22q12.3)
rs855791
Recombination rate (cM/Mb)
TBil
Hb
Ht
MCV
MCH
1 gene omitted
Position on chr22 (Mb)

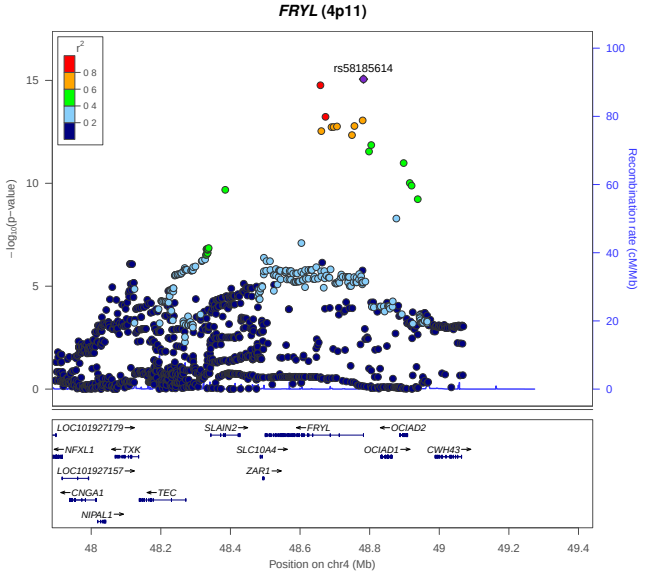
2.44 Plt (n = 108,208)

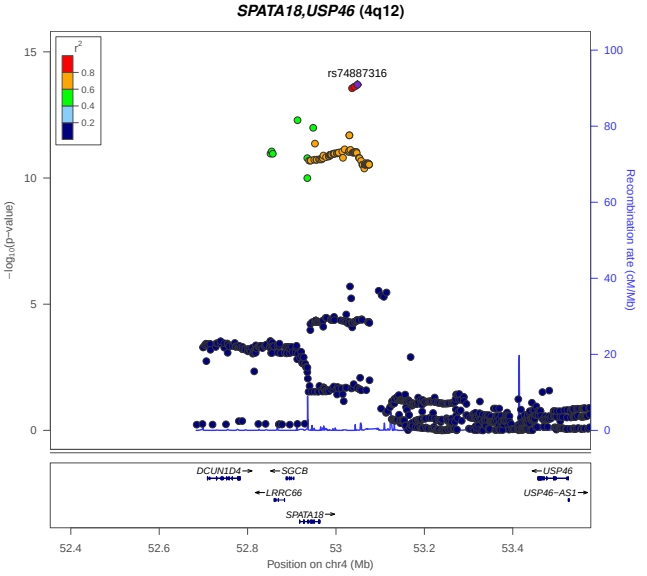


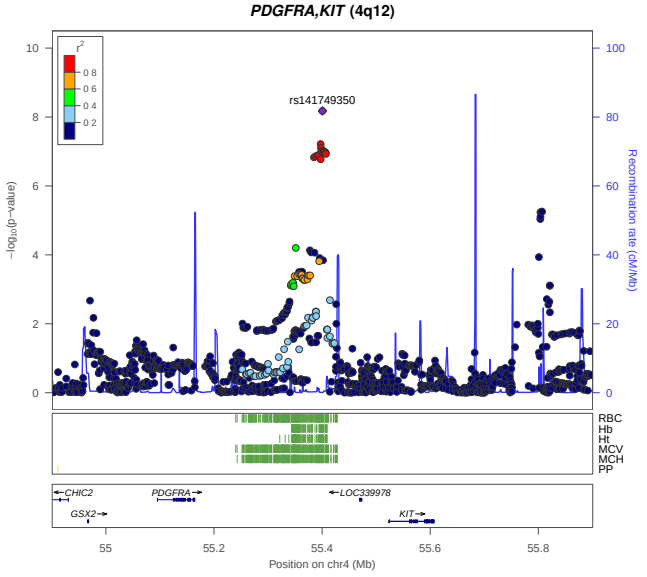

GCKR (2p23.3)
rs1260326
TC
TG
BS
TP
Alb
A/G
BUN
sCr
eGFR
UA
CI
AST
GGT
PT
CK
LDH
CRP
WBC
Ht
14 genes omitted
Position on chr2 (Mb)
LY75,LY75-CD302 (2q24.2)
rs78685880
WBC
Neutro
Position on chr2 (Mb)
SYN2,PPARG (3p25.2)
rs6779488
HDL−C
sCr
eGFR
K
Position on chr3 (Mb)
ARHGEF3 (3p14.3)
rs1354034
Position on chr3 (Mb)
ACTRT3 (3q26.2)
rs12637184
BUN
eGFR
RBC
MCV
MCH
1 gene omitted
Position on chr3 (Mb)
THPO (3q27.1)
rs6141
6 genes omitted
Position on chr3 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

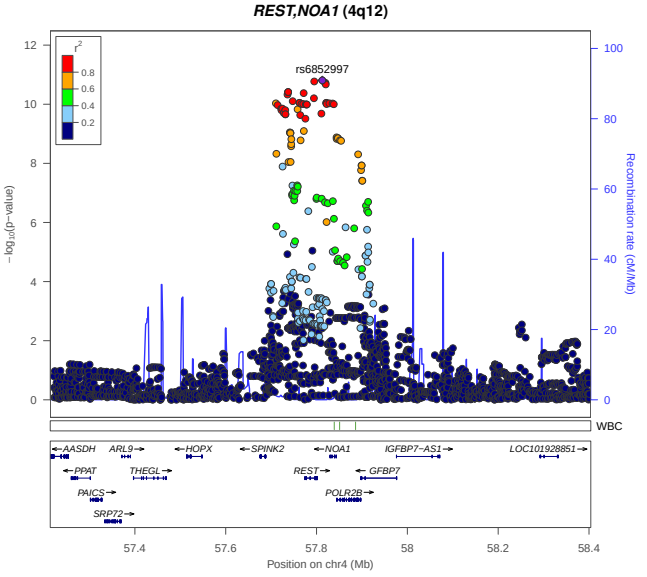

RGS12 (4p16.3)
rs6828057
−log10(p-value)
Recombination rate (cM/Mb)
r2
0.8
0.6
0.4
0.2
TC
TG
TP
Alb
sCr
eGFR
Ca
GGT
ADD1→
←HTT-AS
MSANTD1→
HGFAC→
LINC00955→
ADRA2C→
←FAM86EP
←MFSD10
HTT→
RGS12→
←LRPAP1
←LOC100133461
NOP14-AS1→
DOK7→
←NOP14
GRK4→
Position on chr4 (Mb)

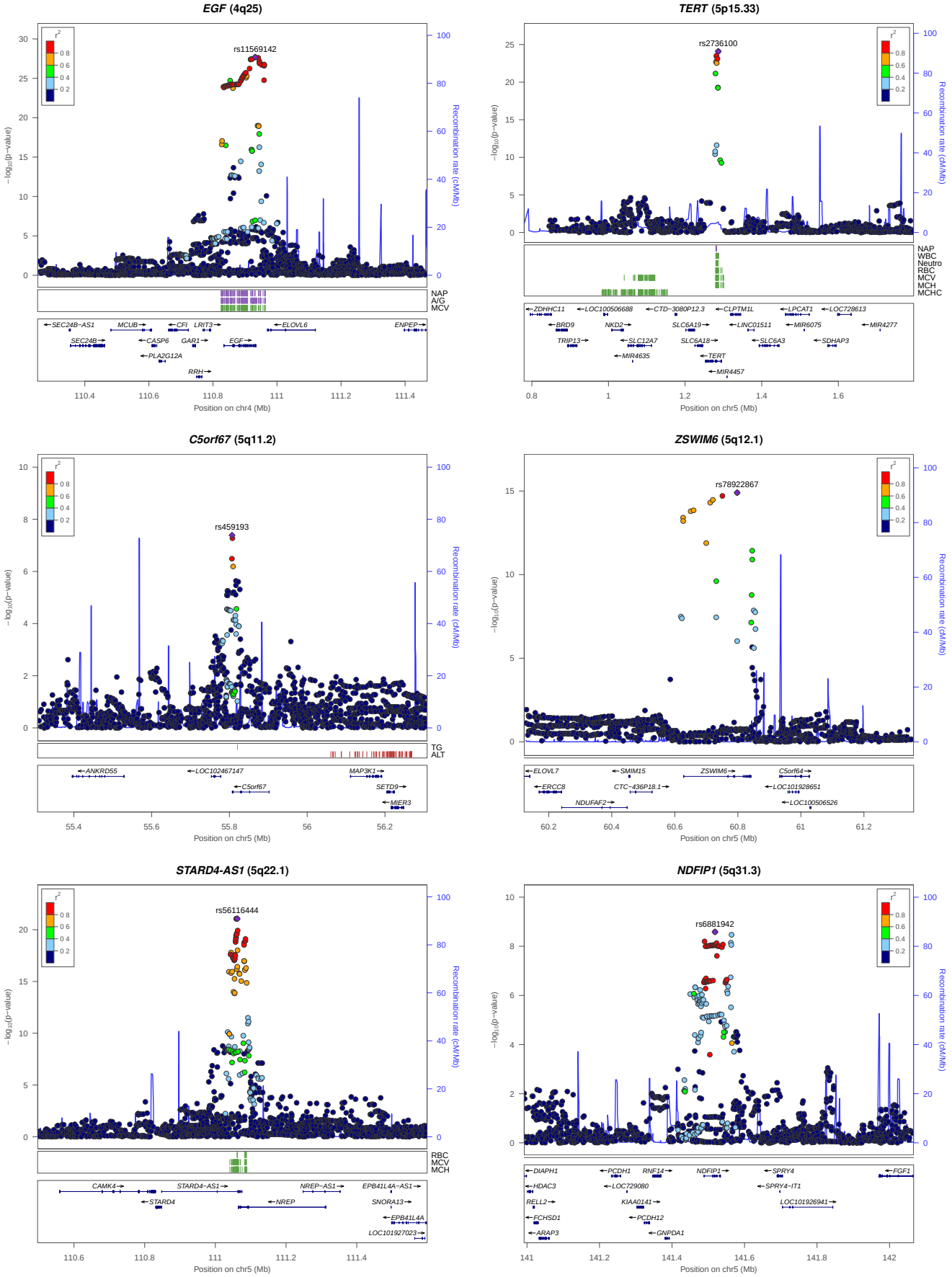

LOC100129931 (4p16.1)
rs12119
−log10(p-value)
Recombination rate (cM/Mb)
r2
0.8
0.6
0.4
0.2
Mono
←PPP2R2C
MRFAP1→
KIAA0232→
←LOC 00129931
SORCS2→
MAN2B2→
TBC1D14→
MIR4798→
MIR4274→
←LOC105374366
←CCDC96
←PSAPL1
LOC93622→
TADA2B→
S100P→
←GRPEL1
3 genes omitted
Position on chr4 (Mb)

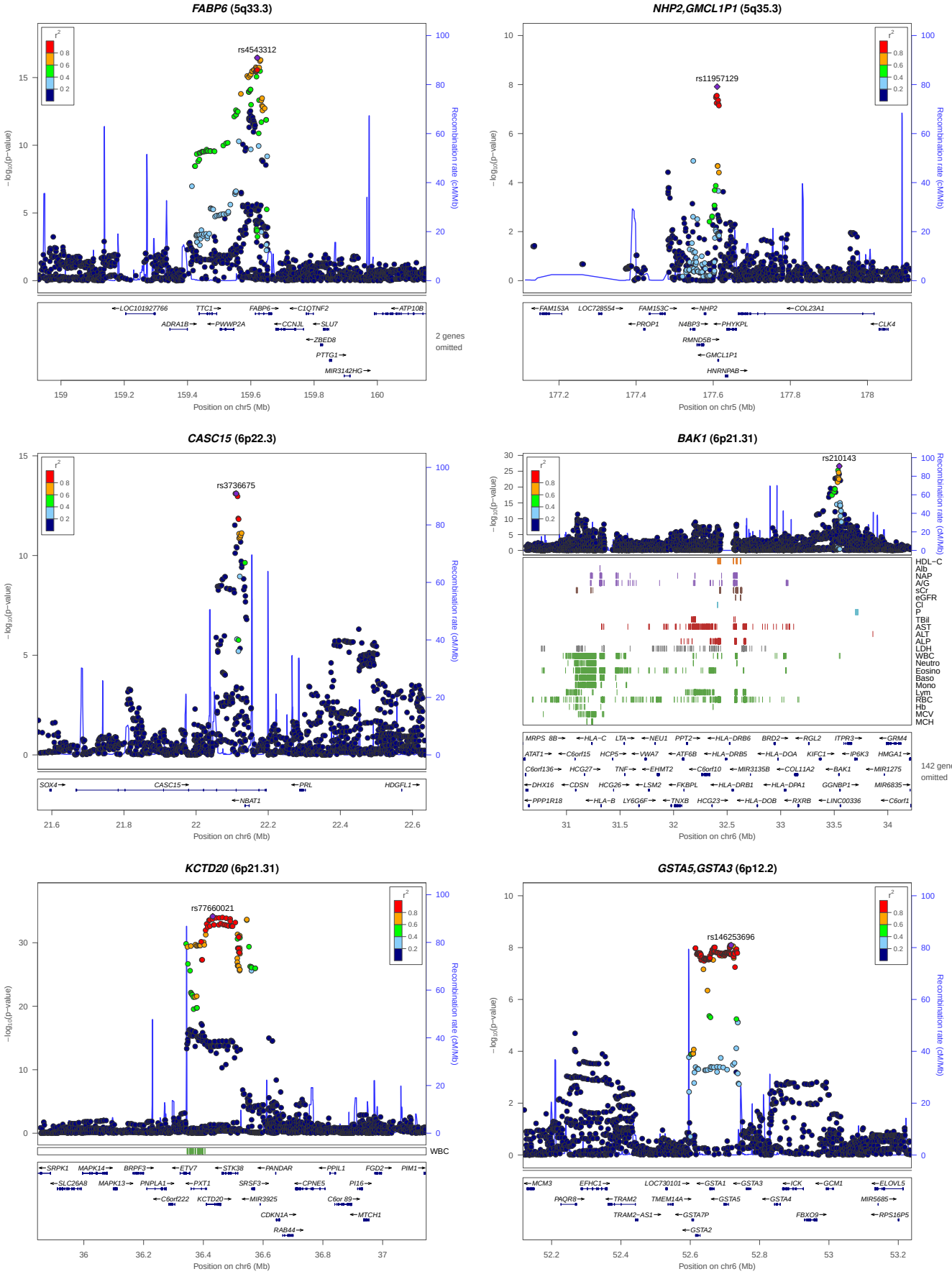

FRYL (4p11)
rs58185614
−log10(p-value)
Recombination rate (cM/Mb)
r2
0.8
0.6
0.4
0.2
LOC101927179→
SLAIN2→
←FRYL
←OCIAD2
←NFXL1
←TXK
SLC10A4→
OCIAD1→
CWH43→
LOC101927157→
ZAR1→
←CNGA1
←TEC
NIPAL1→
Position on chr4 (Mb)

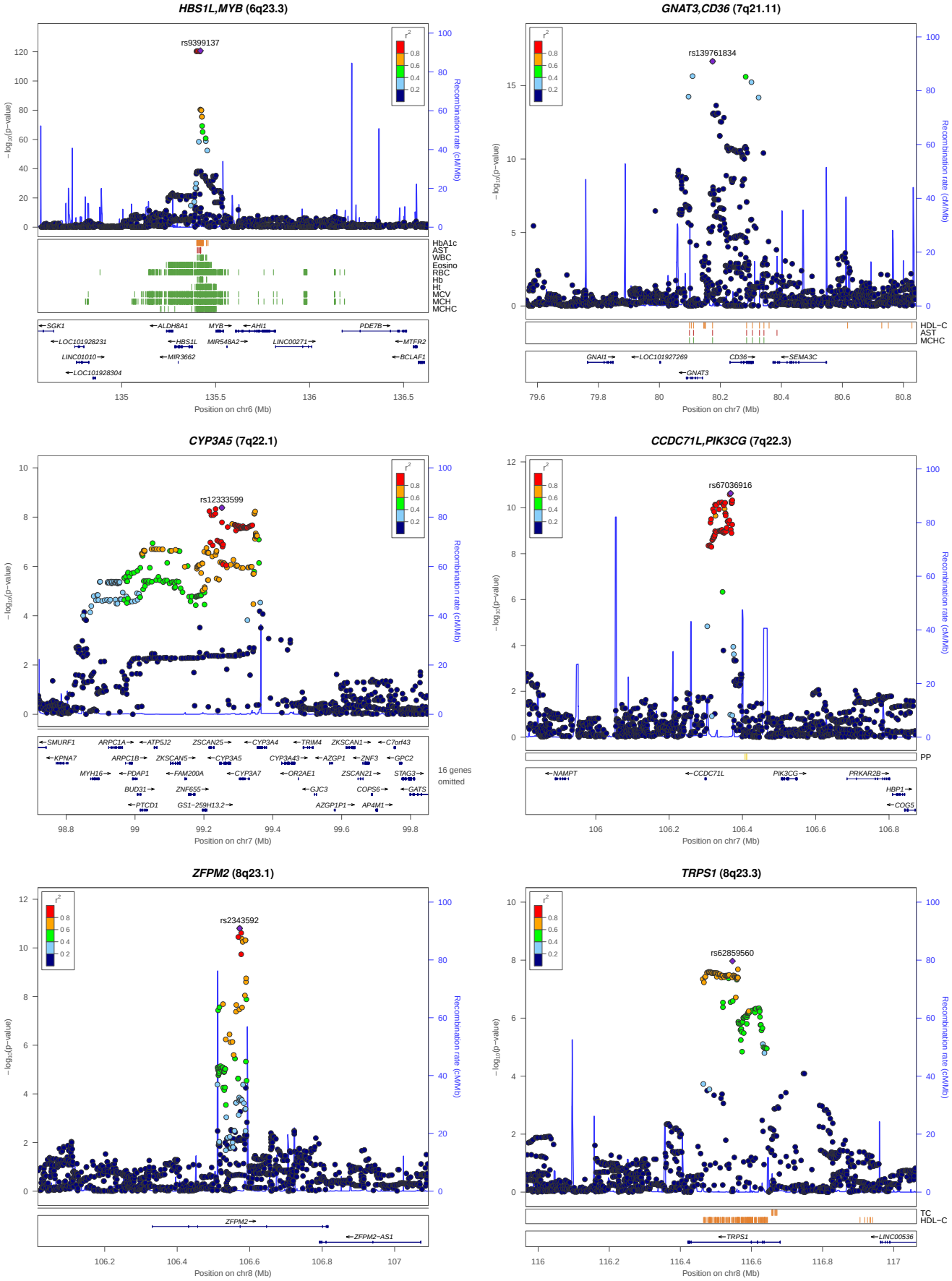

SPATA18,USP46 (4q12)
rs74887316
−log10(p-value)
Recombination rate (cM/Mb)
r2
0.8
0.6
0.4
0.2
DCUN1D4→
←SGCB
←USP46
←LRRC66
USP46-AS1→
SPATA18→
Position on chr4 (Mb)


PDGFRA,KIT (4q12)
rs141749350
−log10(p-value)
Recombination rate (cM/Mb)
r2
0.8
0.6
0.4
0.2
RBC
Hb
Ht
MCV
MCH
PP
←CHIC2
PDGFRA→
←LOC339978
GSX2→
←KIT
Position on chr4 (Mb)

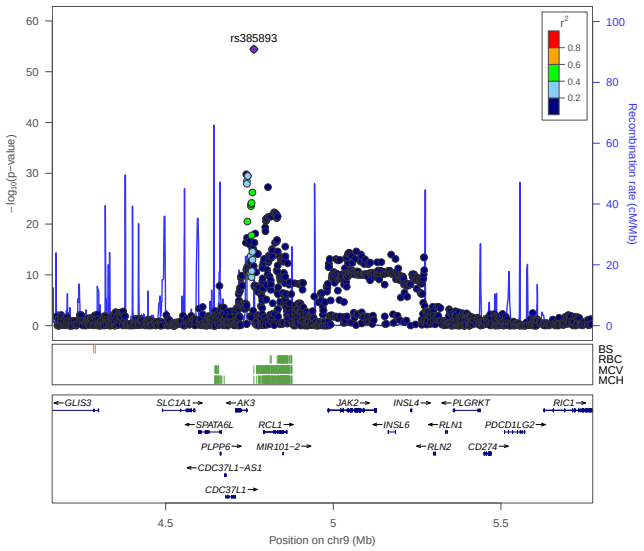

REST,NOA1 (4q12)
rs6852997
−log10(p-value)
Recombination rate (cM/Mb)
r2
0.8
0.6
0.4
0.2
WBC
←AASDH
ARL9→
←HOPX
←SPINK2
←NOA1
IGFBP7-AS1→
LOC101928851→
←PPAT
THEGL→
REST→
←GFBP7
PAICS→
POLR2B→
SRP72→
Position on chr4 (Mb)


EGF (4q25)
rs11569142
NAP
A/G
MCV
SEC24B-AS1
MCUB
CFI
LRIT3
ELOVL6
ENPEP
SEC24B
CASP6
GAR1
EGF
PLA2G12A
RRH
Position on chr4 (Mb)
TERT (5p15.33)
rs2736100
NAP
WBC
Neutro
RBC
MCV
MCH
MCHC
ZDHHC11
LOC100506688
CTD-3080P12.3
CLPTM1L
LPCAT1
LOC728613
BRD9
NKD2
SLC6A19
LINC01511
MIR6075
MIR4277
TRIP13
SLC12A7
SLC6A18
SLC6A3
SDHAP3
MIR4635
TERT
MIR4457
Position on chr5 (Mb)
C5orf67 (5q11.2)
rs459193
TG
ALT
ANKRD55
LOC102467147
MAP3K1
C5orf67
SETD9
MIER3
Position on chr5 (Mb)
ZSWIM6 (5q12.1)
rs78922867
ELOVL7
SMIM15
ZSWIM6
C5orf64
ERCC8
CTC-436P18.1
LOC101928651
NDUFAF2
LOC100506526
Position on chr5 (Mb)
STARD4-AS1 (5q22.1)
rs56116444
RBC
MCV
MCH
CAMK4
STARD4-AS1
NREP-AS1
EPB41L4A-AS1
STARD4
NREP
SNORA13
EPB41L4A
LOC101927023
Position on chr5 (Mb)
NDFIP1 (5q31.3)
rs6881942
DIAPH1
PCDH1
RNF14
NDFIP1
SPRY4
FGF1
HDAC3
LOC729080
SPRY4-IT1
RELL2
KIAA0141
LOC101926941
FCHSD1
PCDH12
ARAP3
GNPDA1
Position on chr5 (Mb)
−log10(p-value)
Recombination rate (cM/Mb)
r2

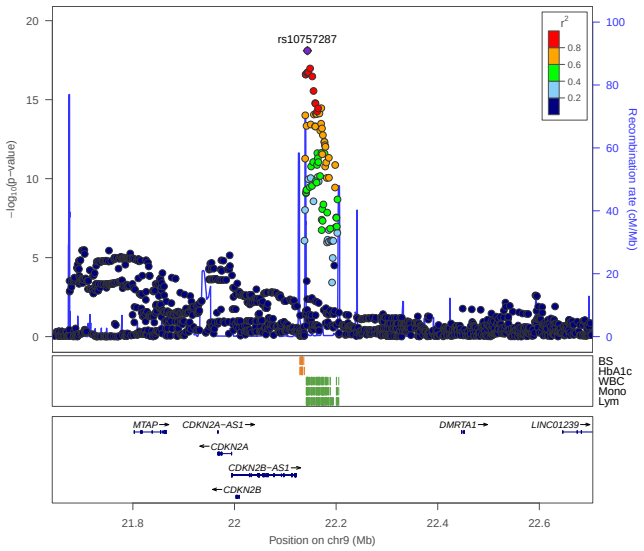

FABP6 (5q33.3)
rs4543312
2 genes omitted
Position on chr5 (Mb)
NHP2,GMCL1P1 (5q35.3)
rs11957129
Position on chr5 (Mb)
CASC15 (6p22.3)
rs3736675
Position on chr6 (Mb)
BAK1 (6p21.31)
rs210143
HDL-C
Alb
NAP
A/G
sCr
eGFR
Cl
P
TBil
AST
ALT
ALP
LDH
WBC
Neutro
Eosino
Baso
Mono
Lym
RBC
Hb
MCV
MCH
142 genes omitted
Position on chr6 (Mb)
KCTD20 (6p21.31)
rs77660021
WBC
Position on chr6 (Mb)
GSTA5,GSTA3 (6p12.2)
rs146253696
Position on chr6 (Mb)
Recombination rate (cM/Mb)


HBS1L,MYB (6q23.3)
rs9399137
HbA1c
AST
WBC
Eosino
RBC
Hb
Ht
MCV
MCH
MCHC
Position on chr6 (Mb)
GNAT3,CD36 (7q21.11)
rs139761834
HDL−C
AST
MCHC
Position on chr7 (Mb)
CYP3A5 (7q22.1)
rs12333599
16 genes omitted
Position on chr7 (Mb)
CCDC71L,PIK3CG (7q22.3)
rs67036916
PP
Position on chr7 (Mb)
ZFPM2 (8q23.1)
rs2343592
Position on chr8 (Mb)
TRPS1 (8q23.3)
rs62859560
TC
HDL−C
Position on chr8 (Mb)
Recombination rate (cM/Mb)

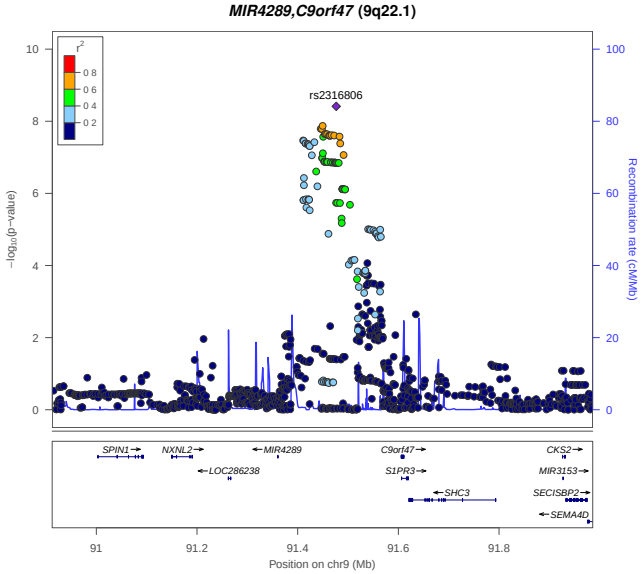
AK3,RCL1 **(9p24.1)**



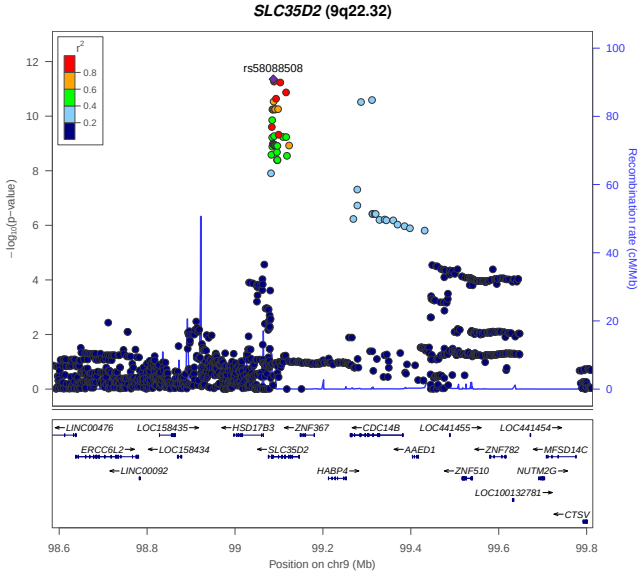
CDKN2B-AS1,DMRTA1 **(9p21.3)**



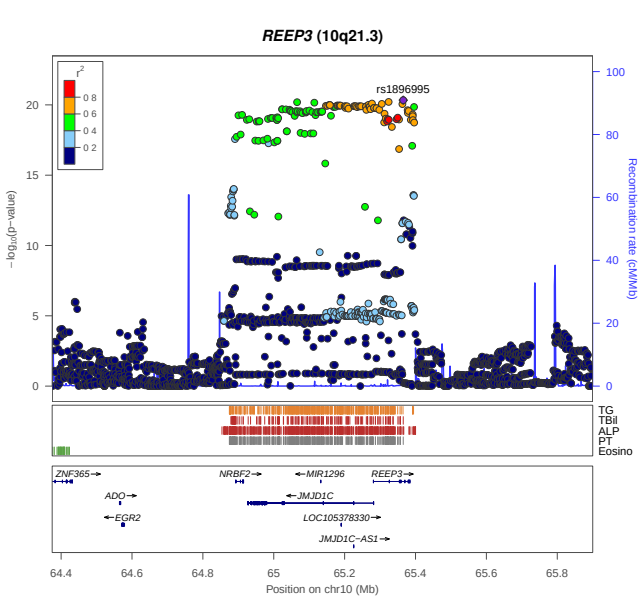
MIR4289,C9orf47 **(9q22.1)**



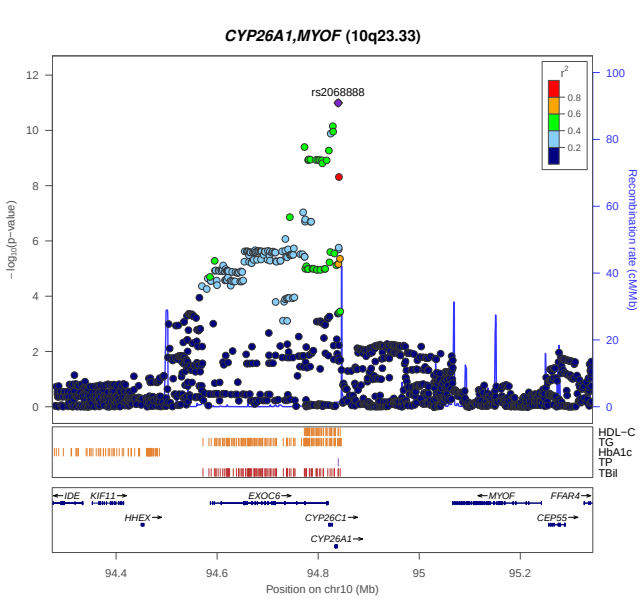
SLC35D2 **(9q22.32)**

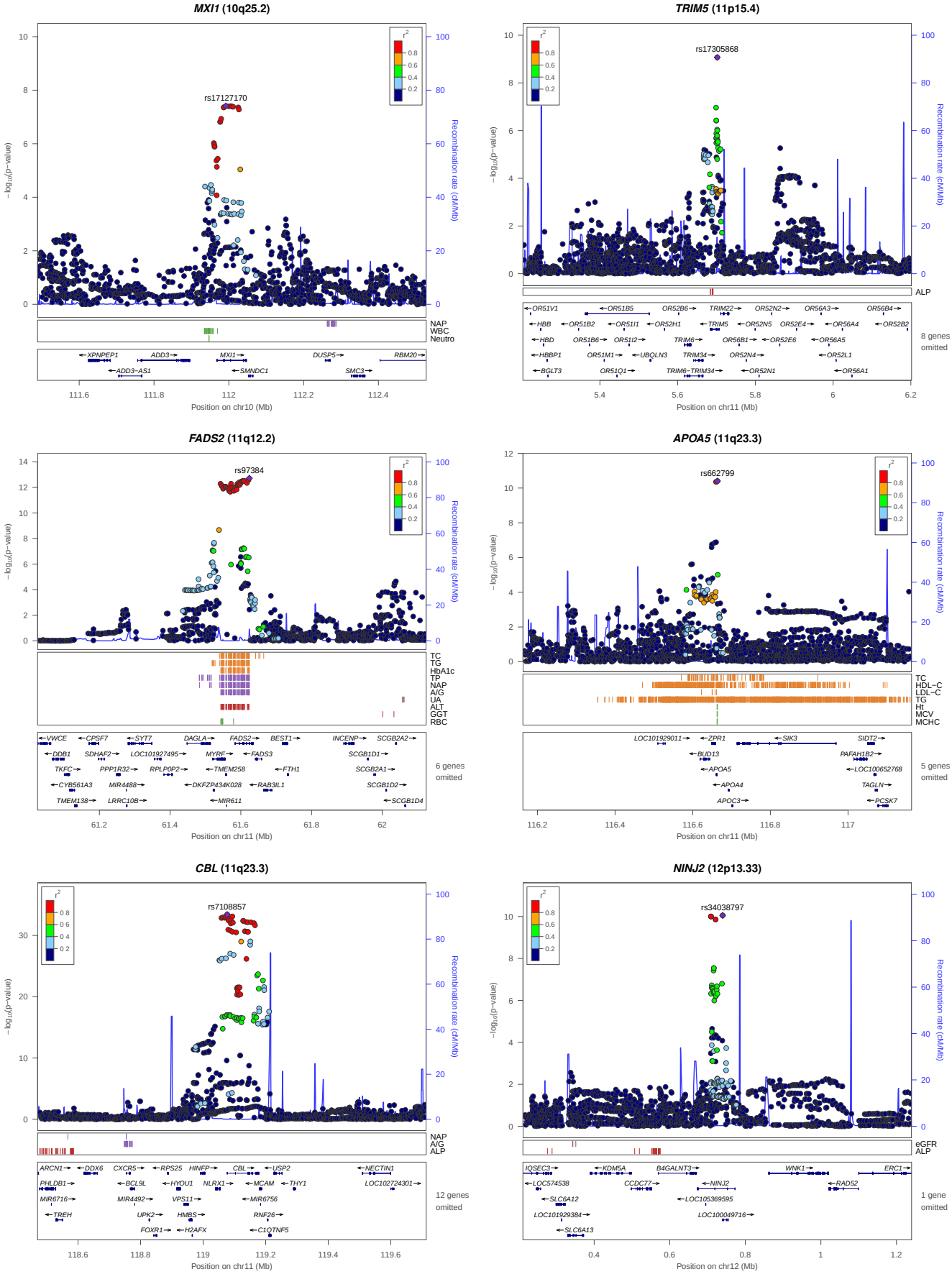


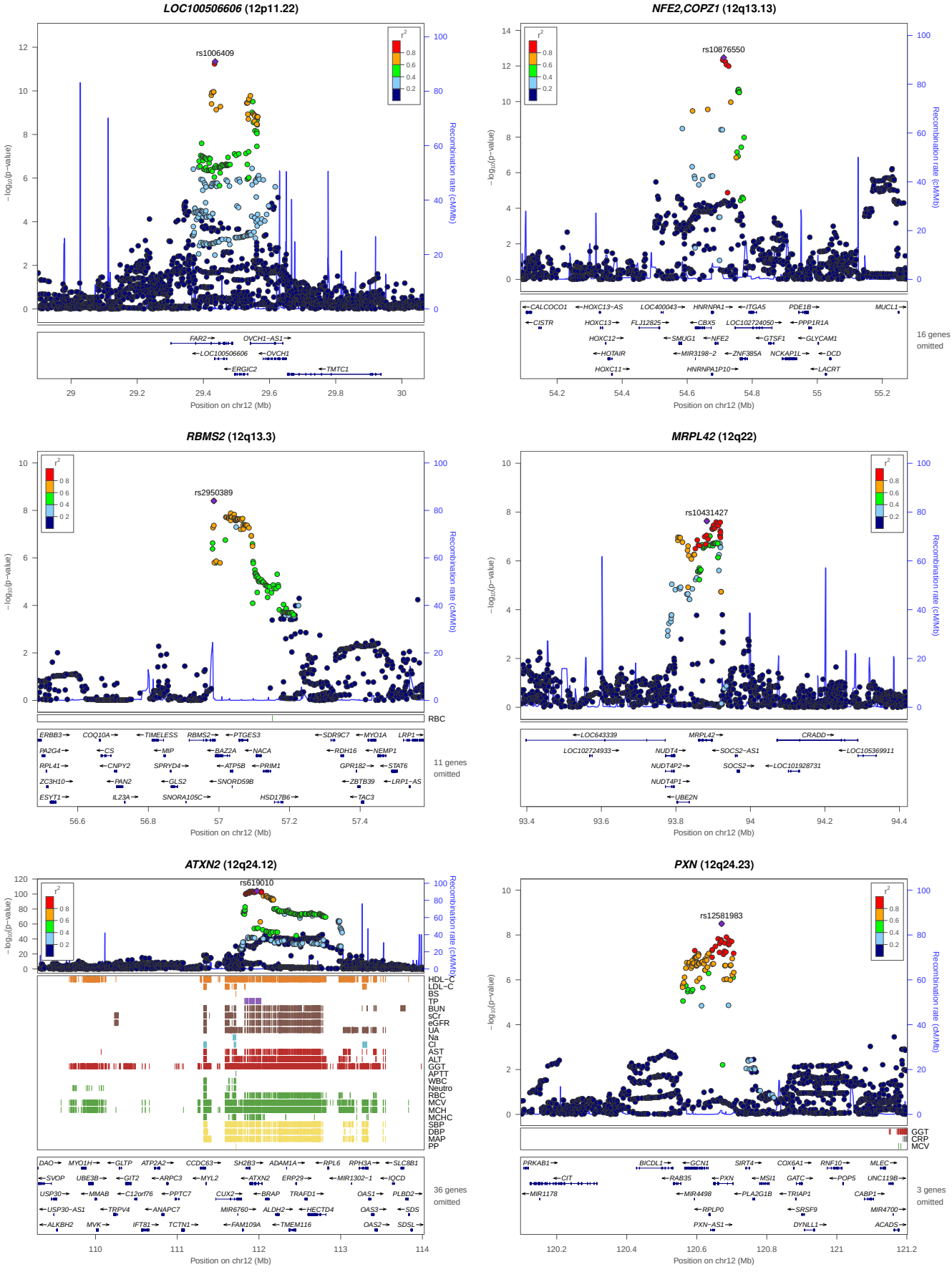
REEP3 **(10q21.3)**

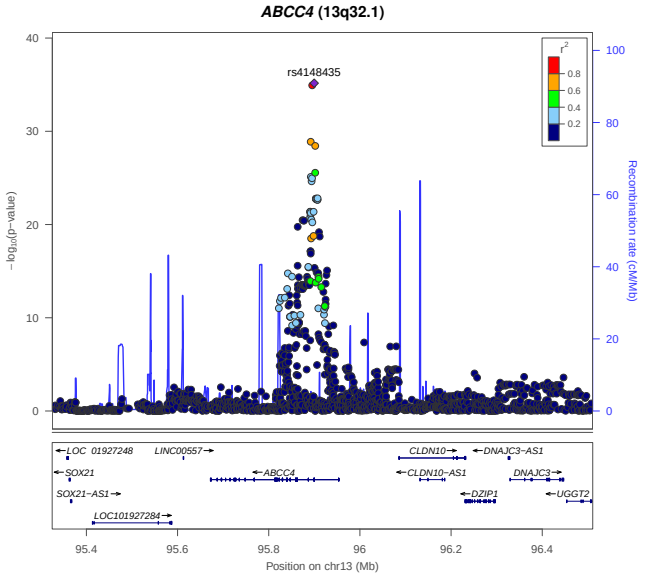


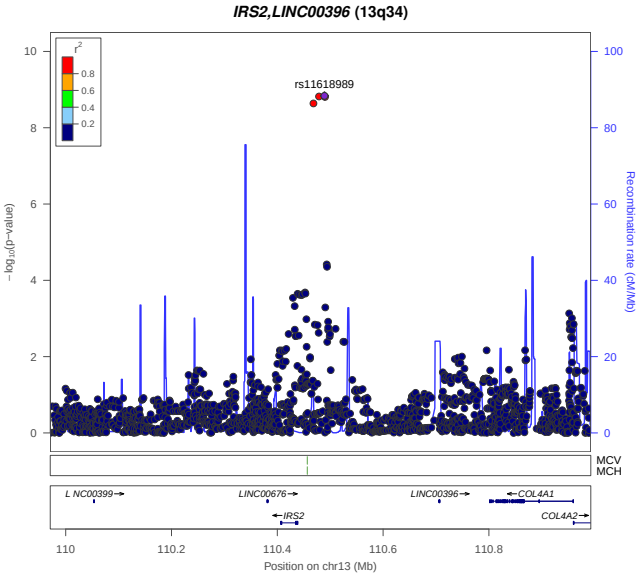
CYP26A1,MYOF **(10q23.33)**

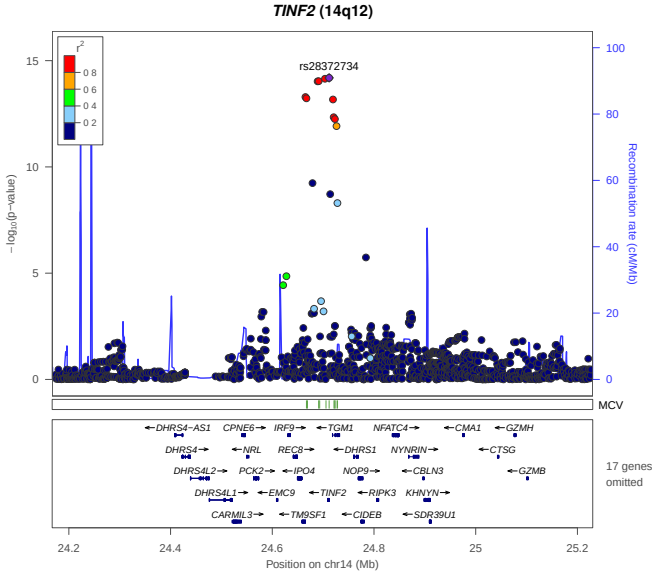


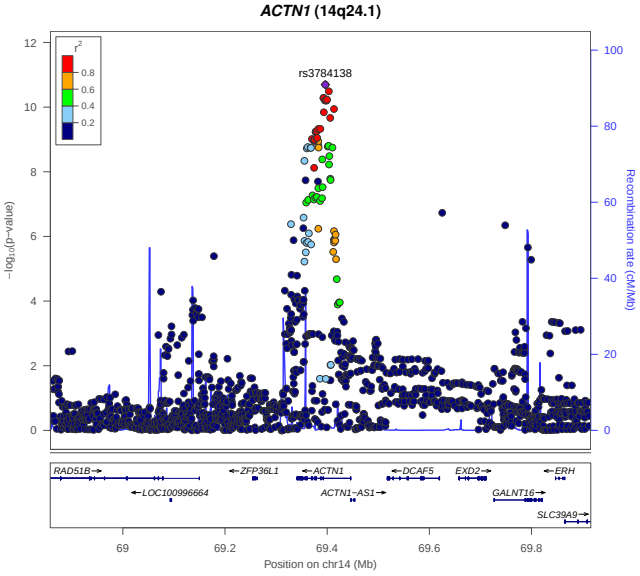

MXI1 (10q25.2)
rs17127170
NAP
WBC
Neutro
Position on chr10 (Mb)
TRIM5 (11p15.4)
rs17305868
ALP
8 genes omitted
Position on chr11 (Mb)
FADS2 (11q12.2)
rs97384
TC
TG
HbA1c
TP
NAP
A/G
UA
ALT
GGT
RBC
6 genes omitted
Position on chr11 (Mb)
APOA5 (11q23.3)
rs662799
TC
HDL−C
LDL−C
TG
Ht
MCV
MCHC
5 genes omitted
Position on chr11 (Mb)
CBL (11q23.3)
rs7108857
NAP
A/G
ALP
12 genes omitted
Position on chr11 (Mb)
NINJ2 (12p13.33)
rs34038797
eGFR
ALP
1 gene omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

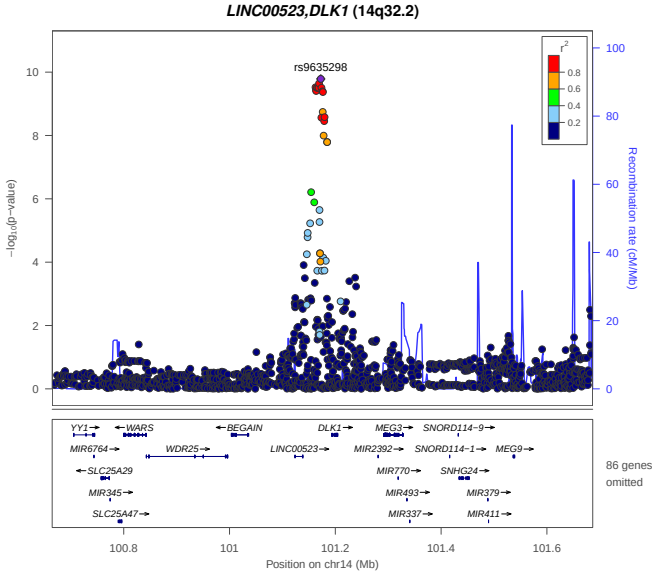

LOC100506606 (12p11.22)
rs1006409
NFE2,COPZ1 (12q13.13)
rs10876550
16 genes omitted
RBMS2 (12q13.3)
rs2950389
11 genes omitted
MRPL42 (12q22)
rs10431427
ATXN2 (12q24.12)
rs619010
36 genes omitted
PXN (12q24.23)
rs12581983
3 genes omitted
−log10(p-value)
Recombination rate (cM/Mb)
Position on chr12 (Mb)

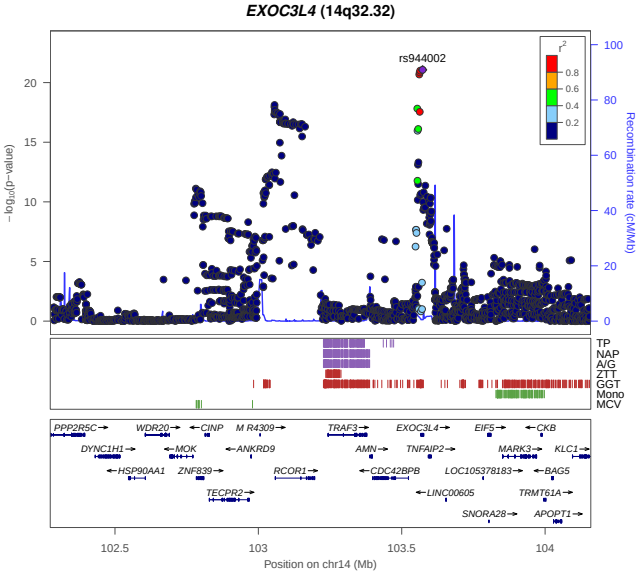

ABCC4 (13q32.1)
rs4148435
Position on chr13 (Mb)
Recombination rate (cM/Mb)

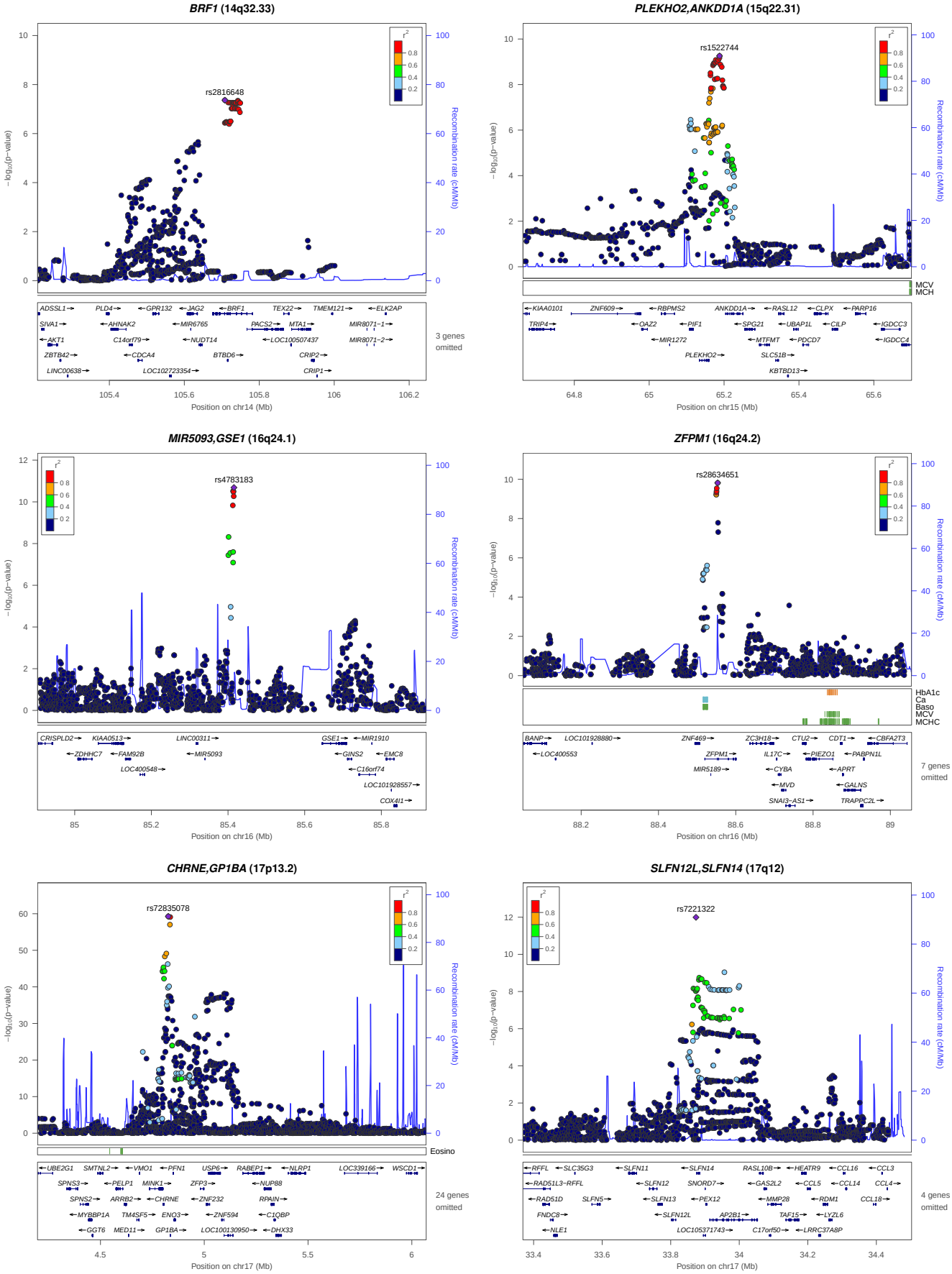

IRS2,LINC00396 (13q34)
rs11618989
MCV
MCH
Position on chr13 (Mb)
Recombination rate (cM/Mb)

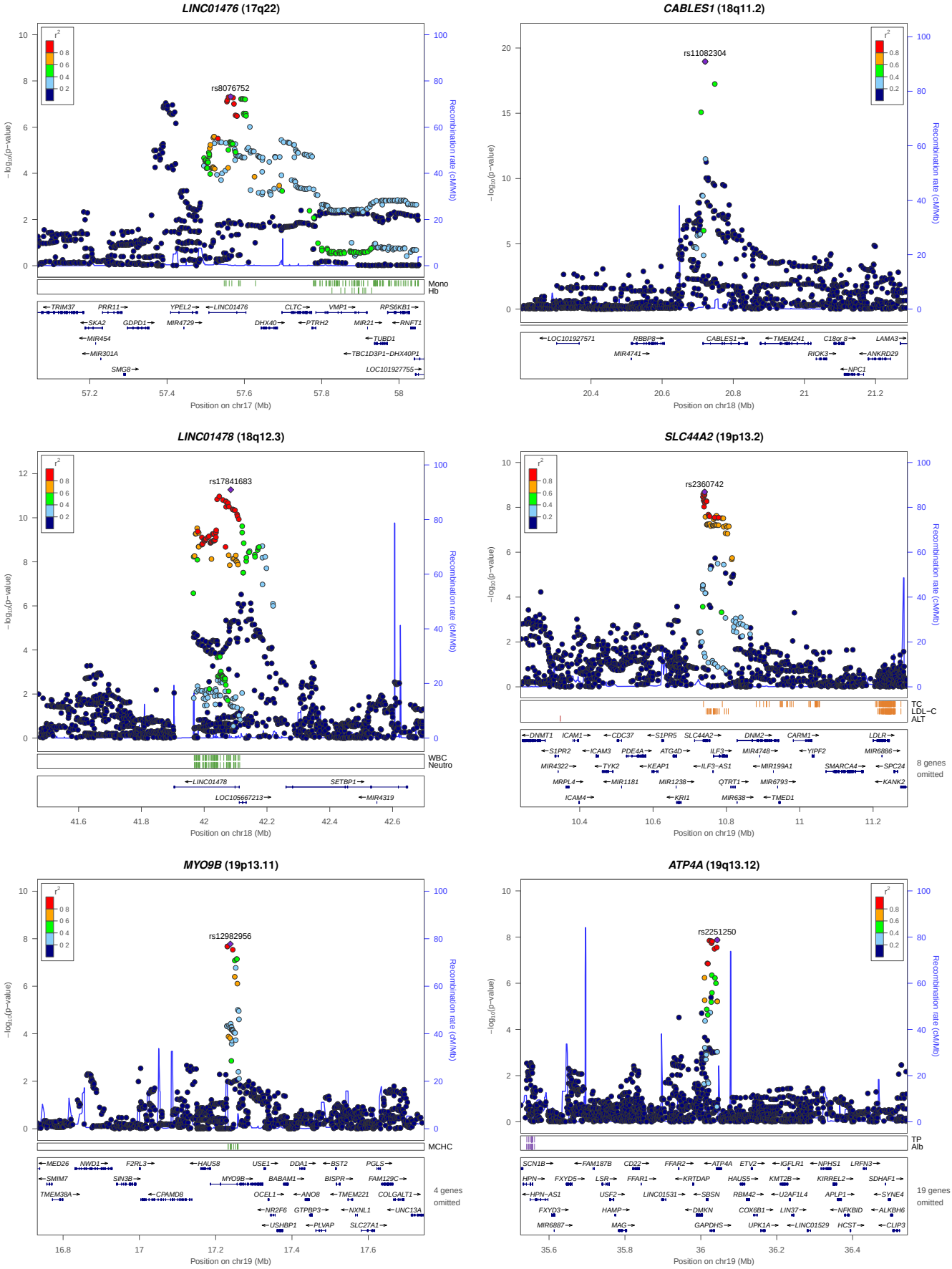

TINF2 (14q12)
rs28372734
MCV
17 genes omitted
Position on chr14 (Mb)
Recombination rate (cM/Mb)

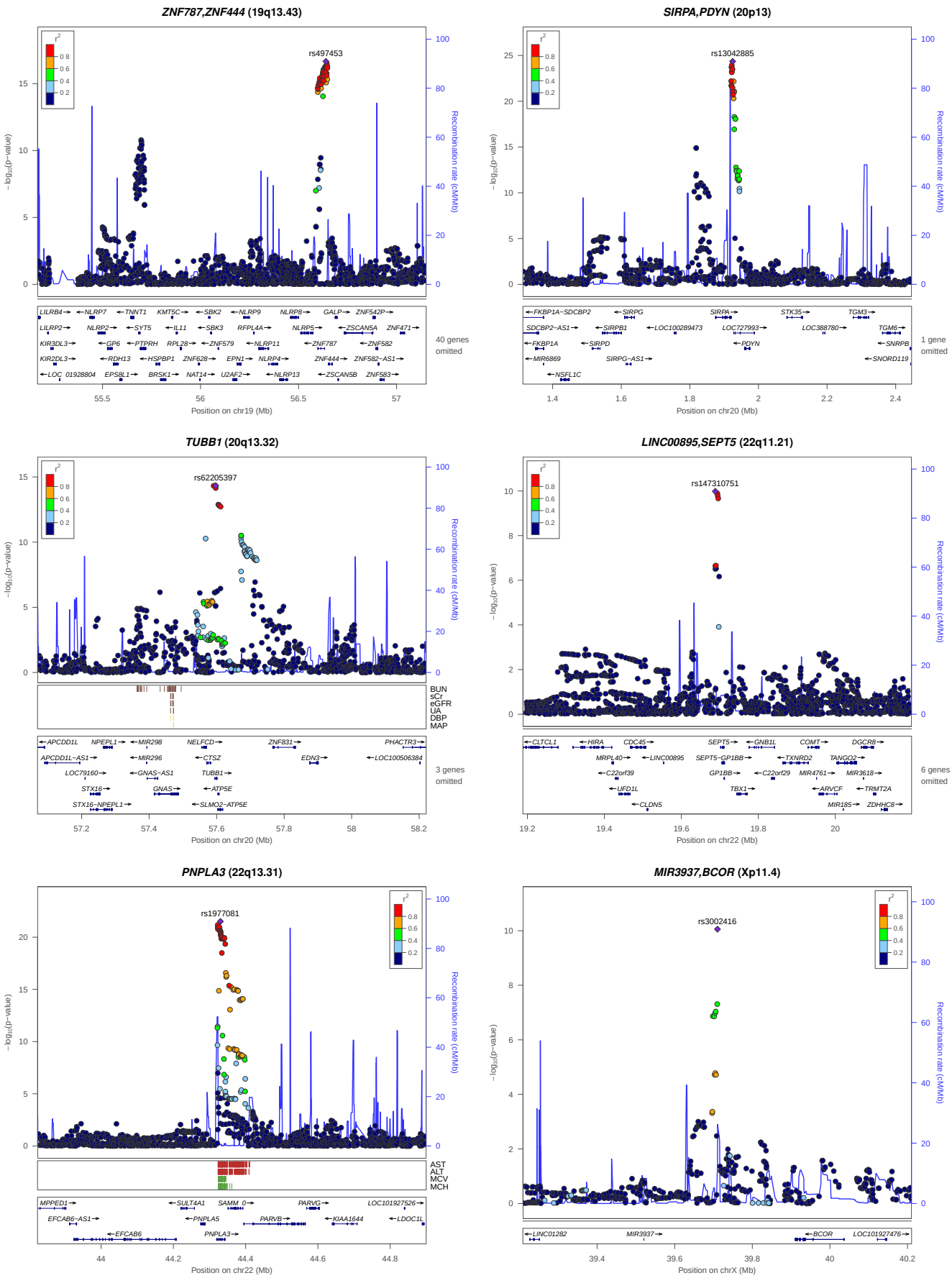

ACTN1 (14q24.1)
rs3784138
Position on chr14 (Mb)
Recombination rate (cM/Mb)


LINC00523,DLK1 (14q32.2)
rs9635298
86 genes omitted
Position on chr14 (Mb)
Recombination rate (cM/Mb)

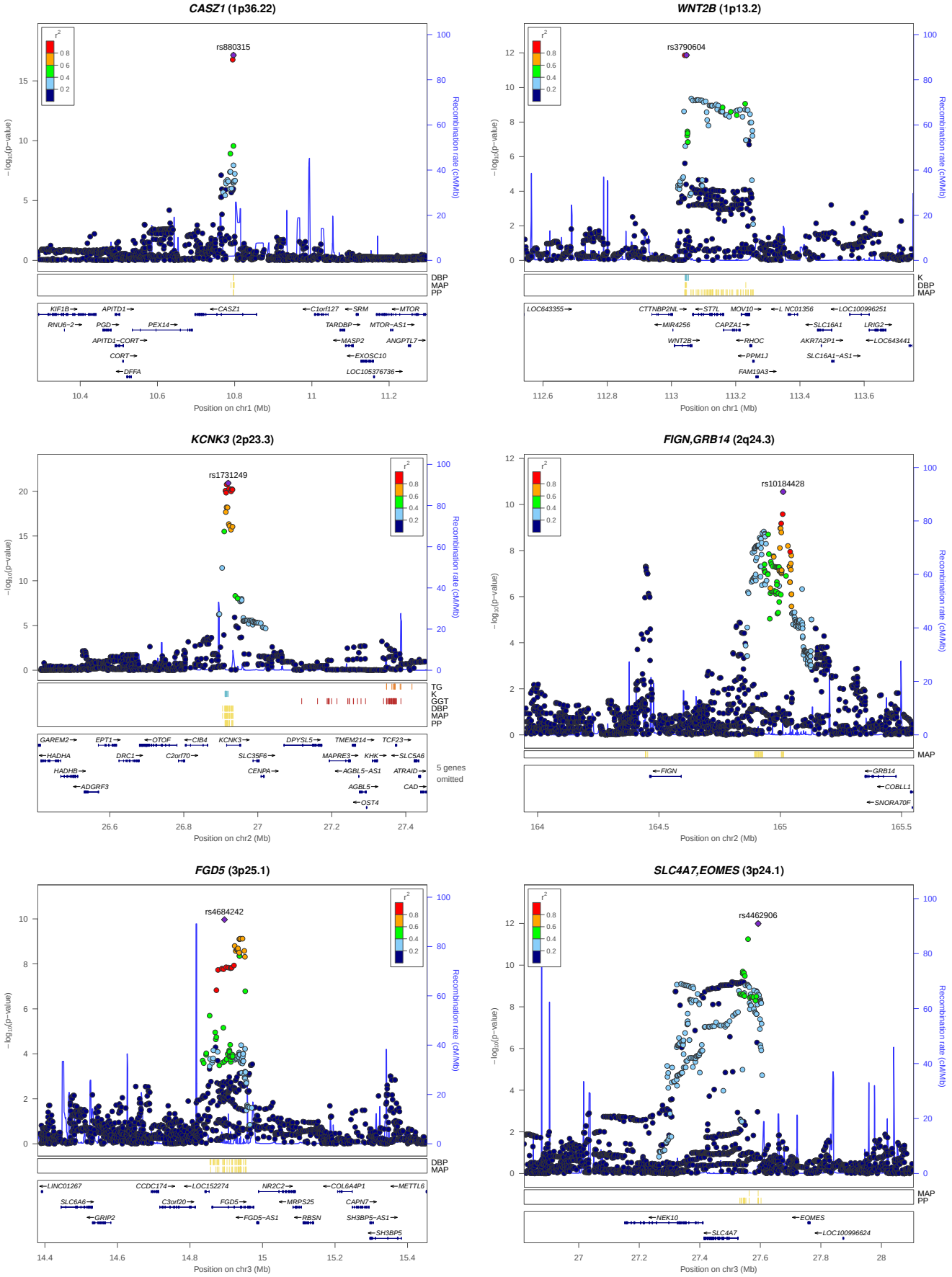

EXOC3L4 (14q32.32)
rs944002
TP
NAP
A/G
ZTT
GGT
Mono
MCV
Position on chr14 (Mb)
Recombination rate (cM/Mb)

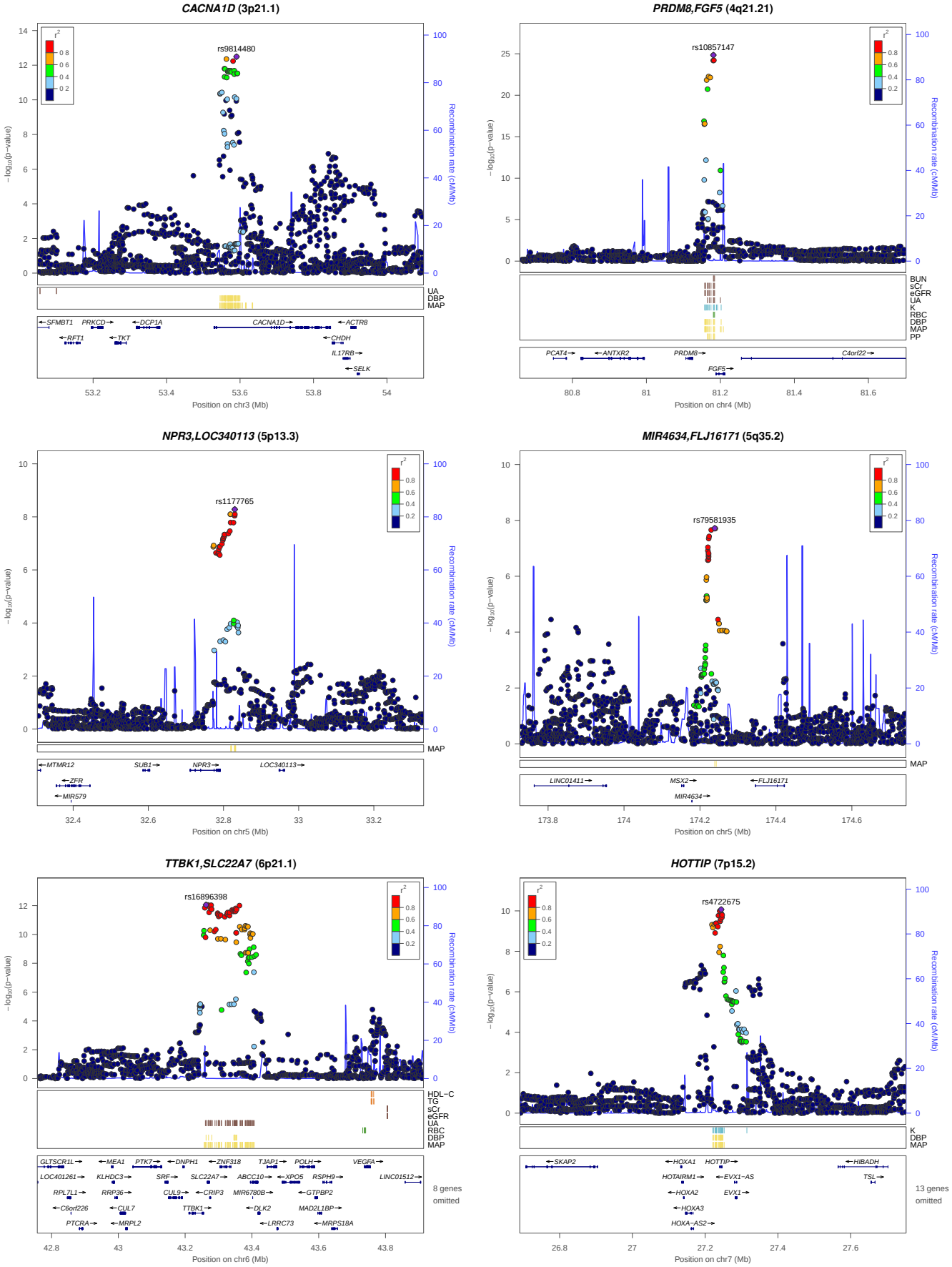

BRF1 (14q32.33)
rs2816648
3 genes omitted
Position on chr14 (Mb)
PLEKHO2,ANKDD1A (15q22.31)
rs1522744
MCV
MCH
Position on chr15 (Mb)
MIR5093,GSE1 (16q24.1)
rs4783183
Position on chr16 (Mb)
ZFPM1 (16q24.2)
rs28634651
HbA1c
Ca
Baso
MCV
MCHC
7 genes omitted
Position on chr16 (Mb)
CHRNE,GP1BA (17p13.2)
rs72835078
Eosino
24 genes omitted
Position on chr17 (Mb)
SLFN12L,SLFN14 (17q12)
rs7221322
4 genes omitted
Position on chr17 (Mb)
−log10(p−value)
Recombination rate (cM/Mb)

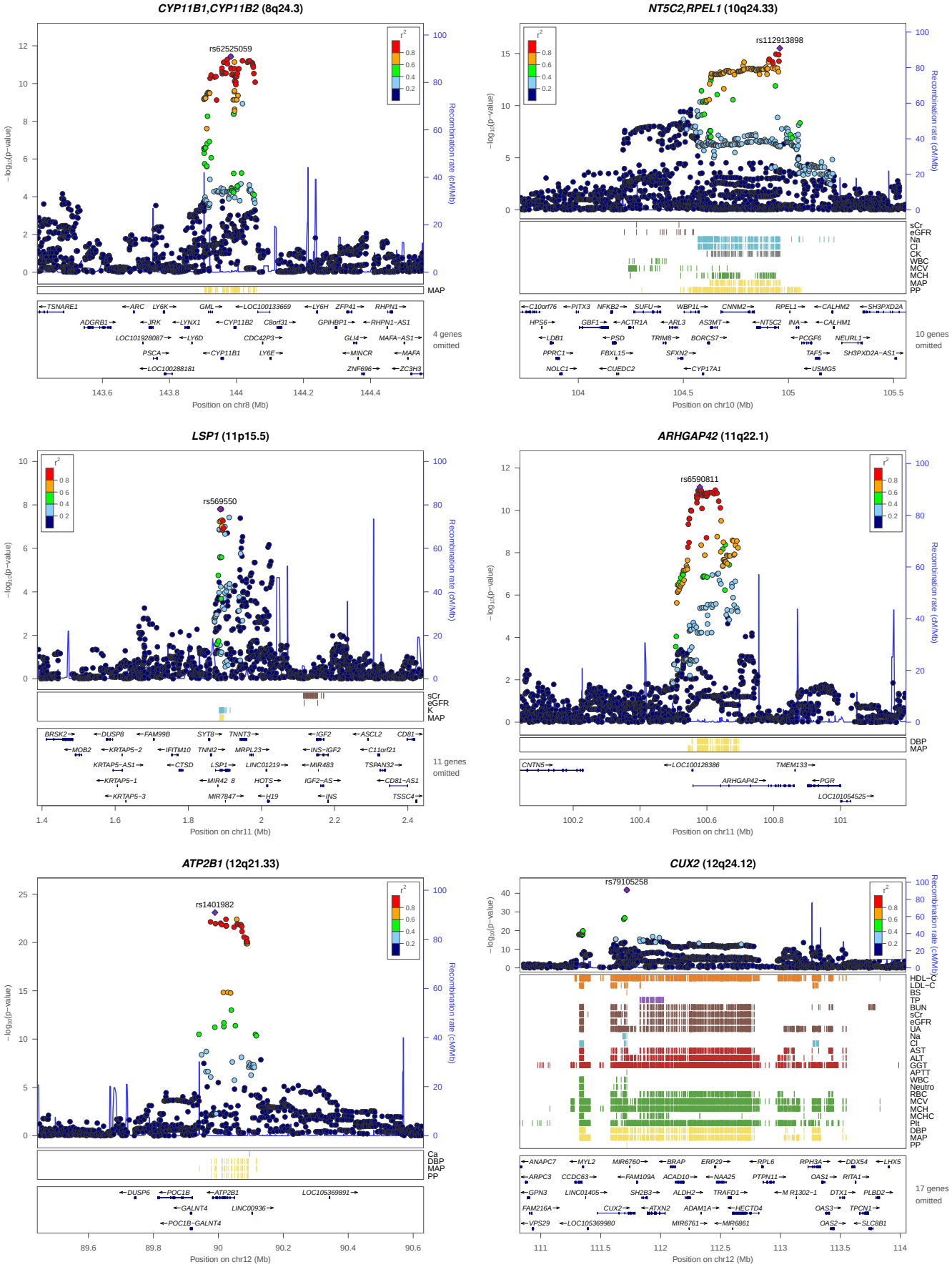

LINC01476 (17q22)
rs8076752
Mono
Hb
Position on chr17 (Mb)
CABLES1 (18q11.2)
rs11082304
Position on chr18 (Mb)
LINC01478 (18q12.3)
rs17841683
WBC
Neutro
Position on chr18 (Mb)
SLC44A2 (19p13.2)
rs2360742
TC
LDL−C
ALT
8 genes
omitted
Position on chr19 (Mb)
MYO9B (19p13.11)
rs12982956
MCHC
4 genes
omitted
Position on chr19 (Mb)
ATP4A (19q13.12)
rs2251250
TP
Alb
19 genes
omitted
Position on chr19 (Mb)
Recombination rate (cM/Mb)


ZNF787,ZNF444 (19q13.43)
rs497453
40 genes omitted
Position on chr19 (Mb)
SIRPA,PDYN (20p13)
rs13042885
1 gene omitted
Position on chr20 (Mb)
TUBB1 (20q13.32)
rs62205397
BUN
sCr
eGFR
UA
DBP
MAP
3 genes omitted
Position on chr20 (Mb)
LINC00895,SEPT5 (22q11.21)
rs147310751
6 genes omitted
Position on chr22 (Mb)
PNPLA3 (22q13.31)
rs1977081
AST
ALT
MCV
MCH
Position on chr22 (Mb)
MIR3937,BCOR (Xp11.4)
rs3002416
Position on chrX (Mb)
Recombination rate (cM/Mb)
−log10(p-value)

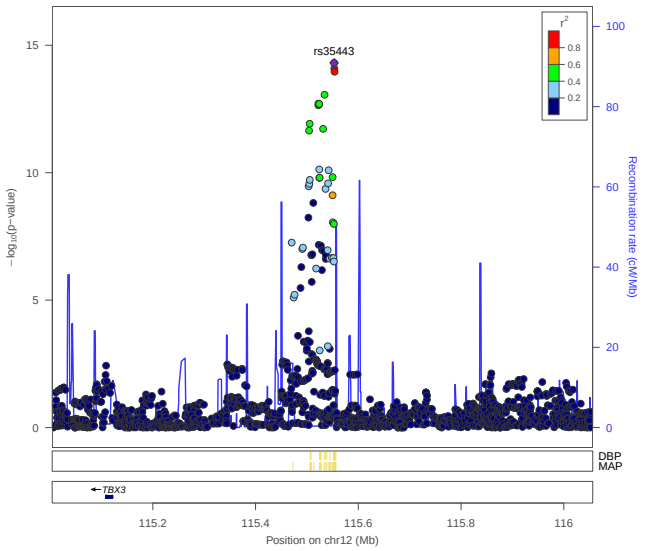
2.45 SBP (n = 136,597)



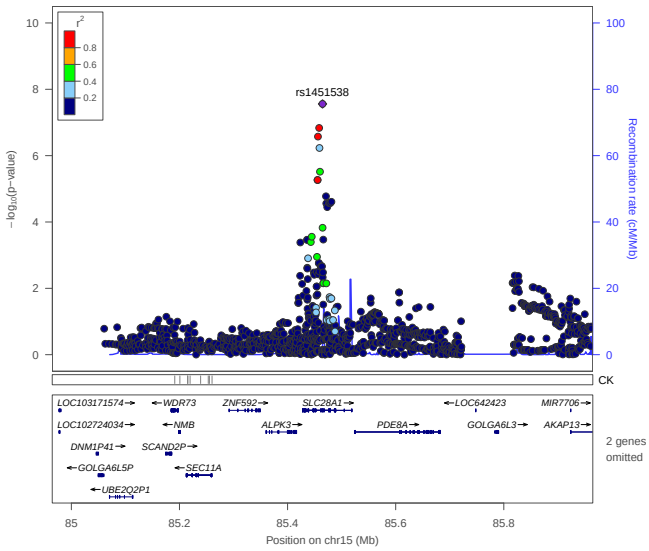

CACNA1D (3p21.1)
rs9814480
PRDM8,FGF5 (4q21.21)
rs10857147
NPR3,LOC340113 (5p13.3)
rs1177765
MIR4634,FLJ16171 (5q35.2)
rs79581935
TTBK1,SLC22A7 (6p21.1)
rs16896398
HOTTIP (7p15.2)
rs4722675
Recombination rate (cM/Mb)
Position on chr3 (Mb)
Position on chr4 (Mb)
Position on chr5 (Mb)
Position on chr6 (Mb)
Position on chr7 (Mb)
8 genes omitted
13 genes omitted


CYP11B1,CYP11B2 (8q24.3)
rs62525059
4 genes omitted
Position on chr8 (Mb)
NT5C2,RPEL1 (10q24.33)
rs112913898
10 genes omitted
Position on chr10 (Mb)
LSP1 (11p15.5)
rs569550
11 genes omitted
Position on chr11 (Mb)
ARHGAP42 (11q22.1)
rs6590811
Position on chr11 (Mb)
ATP2B1 (12q21.33)
rs1401982
Position on chr12 (Mb)
CUX2 (12q24.12)
rs79105258
17 genes omitted
Position on chr12 (Mb)
Recombination rate (cM/Mb)

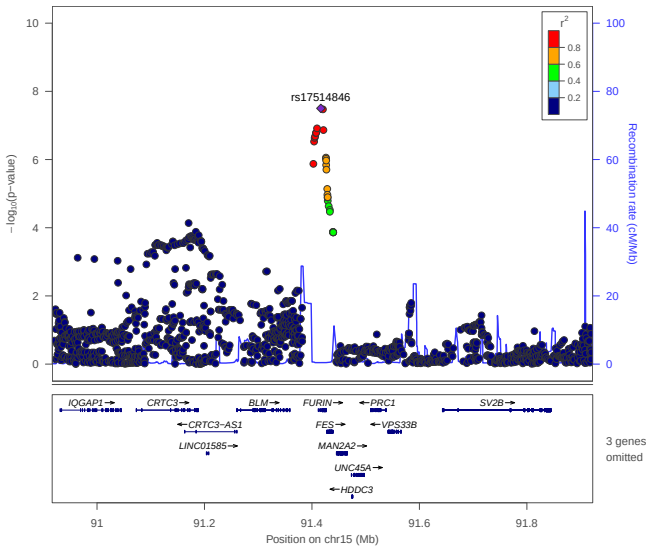
TBX3,MED13L **(12q24.21)**



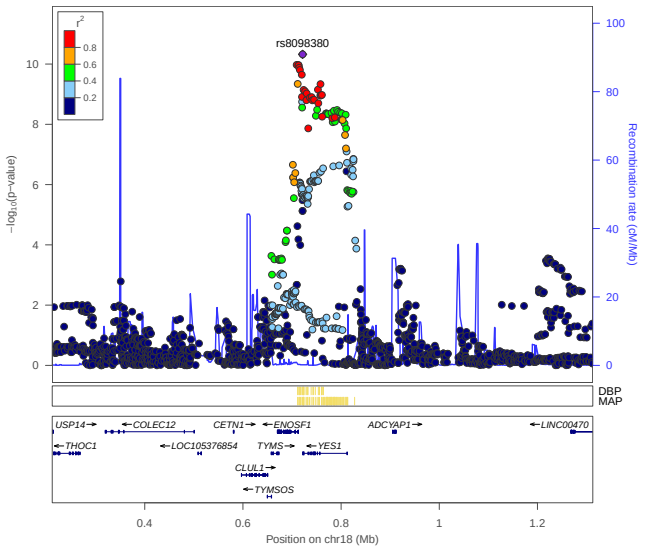
SLC28A1 **(15q25.3)**



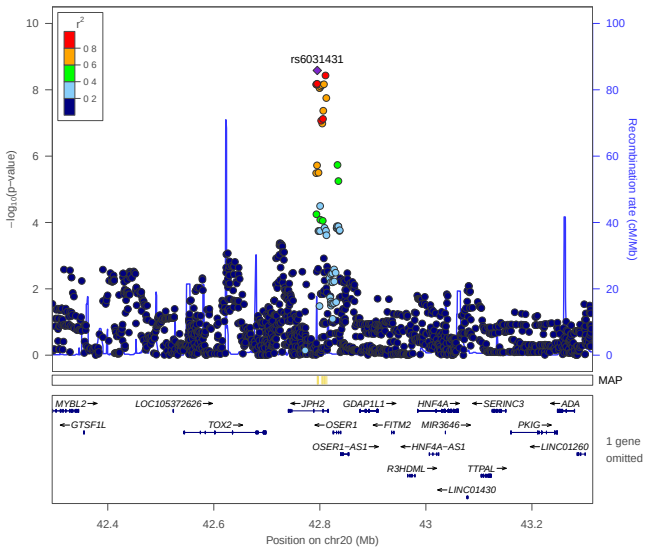
FURIN **(15q26.1)**



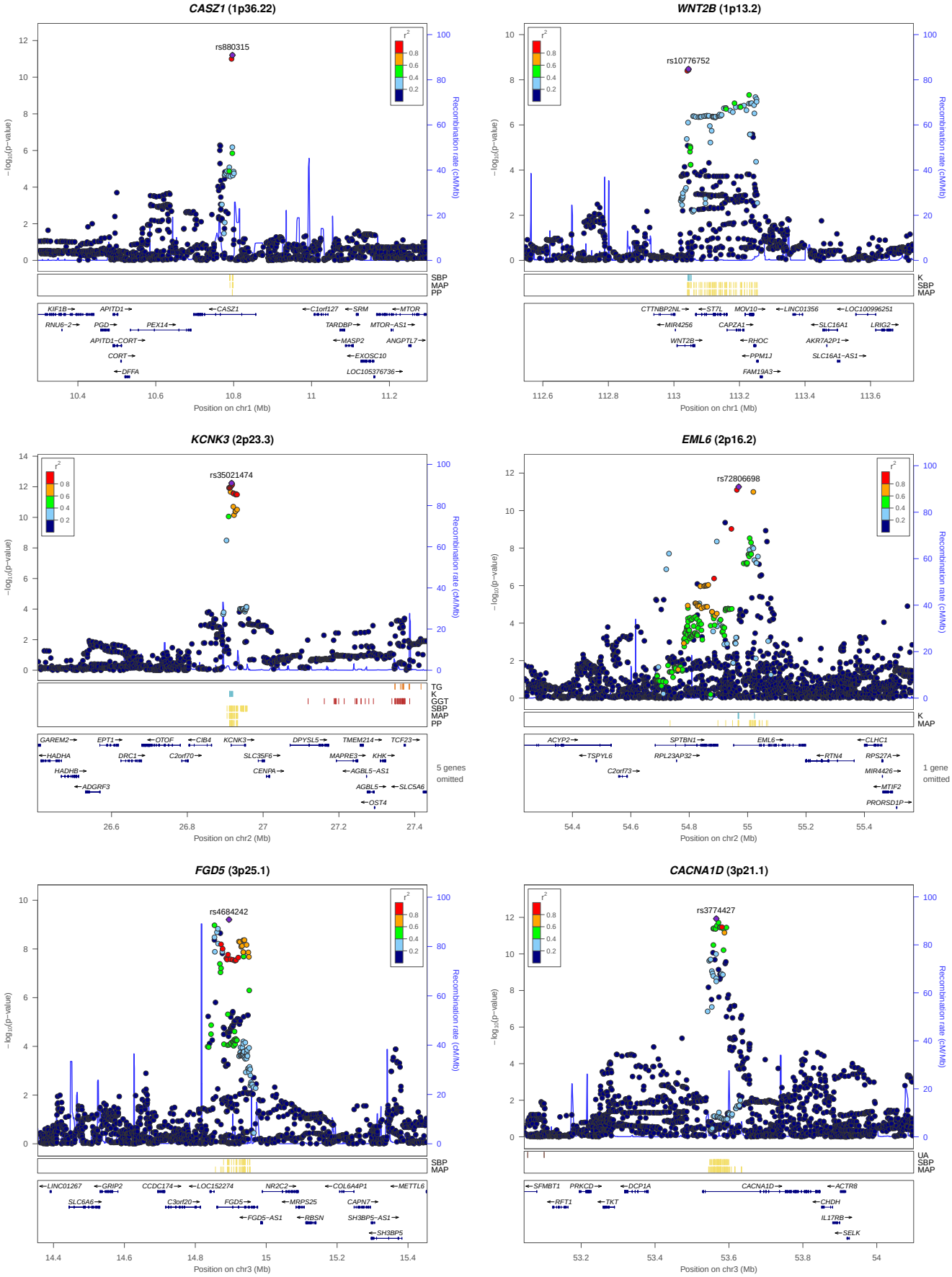
YES1 **(18p11.32)**

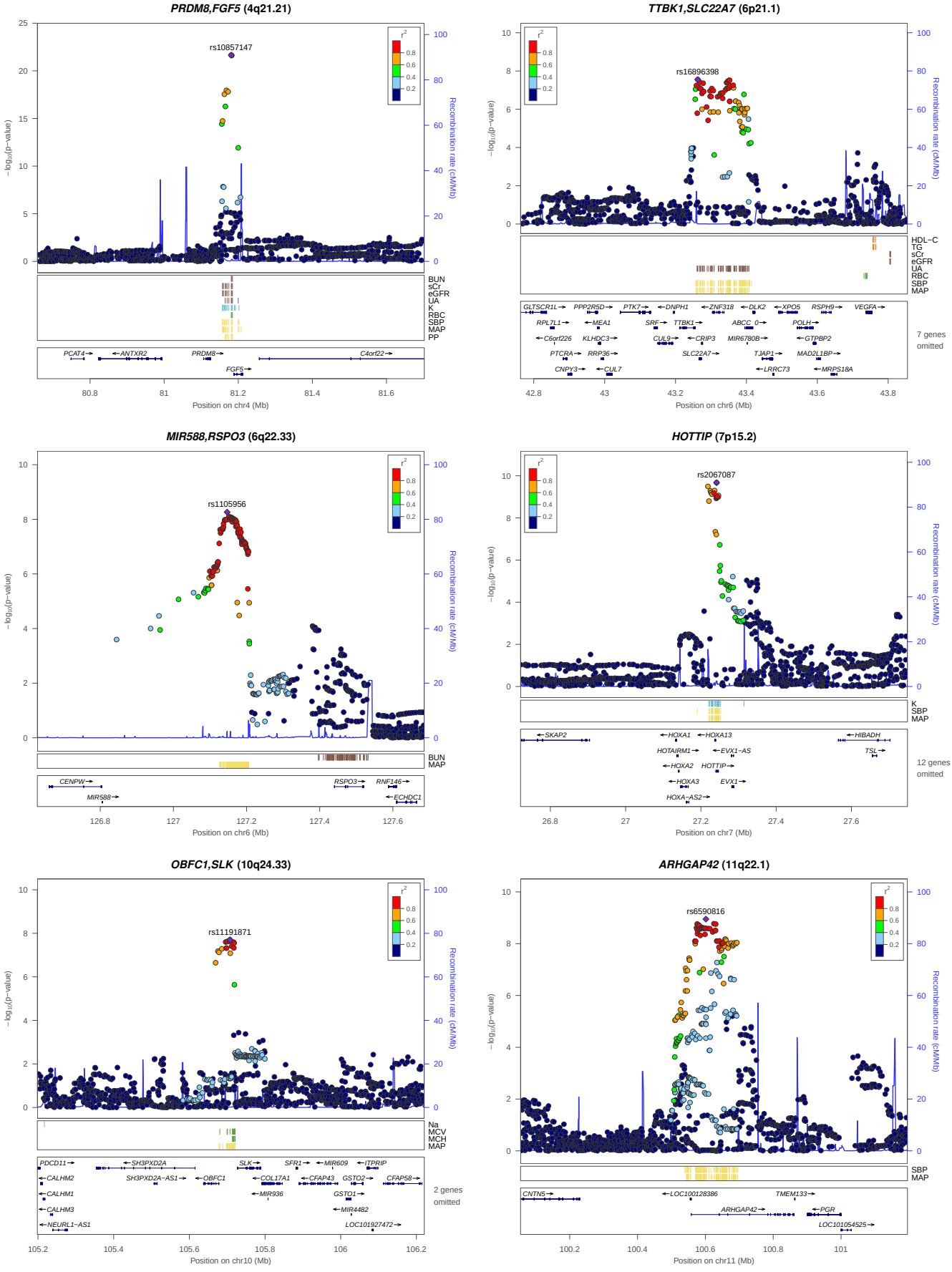


JPH2 **(20q13.12)**

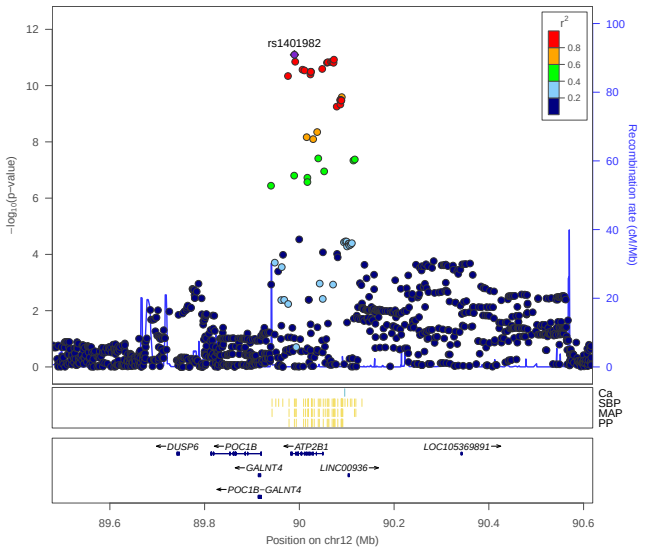


2.46 DBP (n = 136,615)

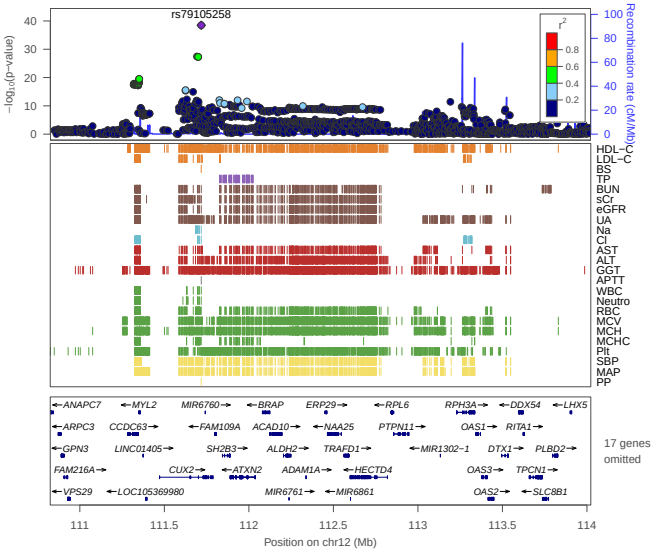



PRDM8,FGF5 (4q21.21)
rs10857147
TTBK1,SLC22A7 (6p21.1)
rs16896398
MIR588,RSPO3 (6q22.33)
rs1105956
HOTTIP (7p15.2)
rs2067087
OBFC1,SLK (10q24.33)
rs11191871
ARHGAP42 (11q22.1)
rs6590816
Recombination rate (cM/Mb)
Position on chr4 (Mb)
Position on chr6 (Mb)
Position on chr10 (Mb)
Position on chr7 (Mb)
Position on chr11 (Mb)
7 genes omitted
12 genes omitted
2 genes omitted

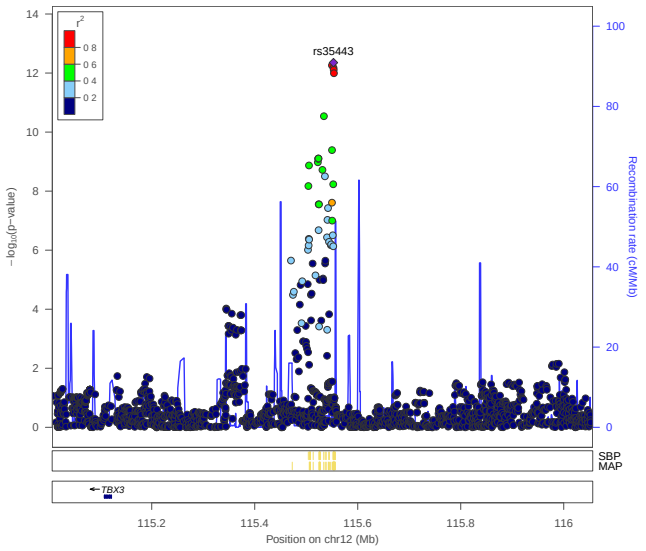
ATP2B1 **(12q21.33)**



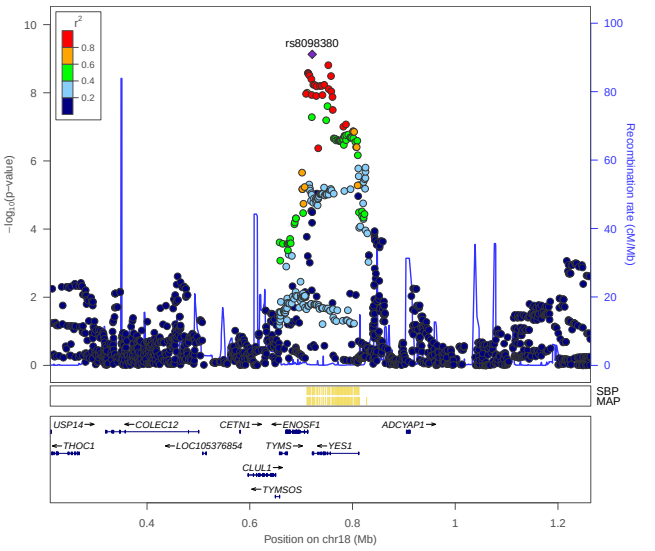
CUX2 **(12q24.12)**



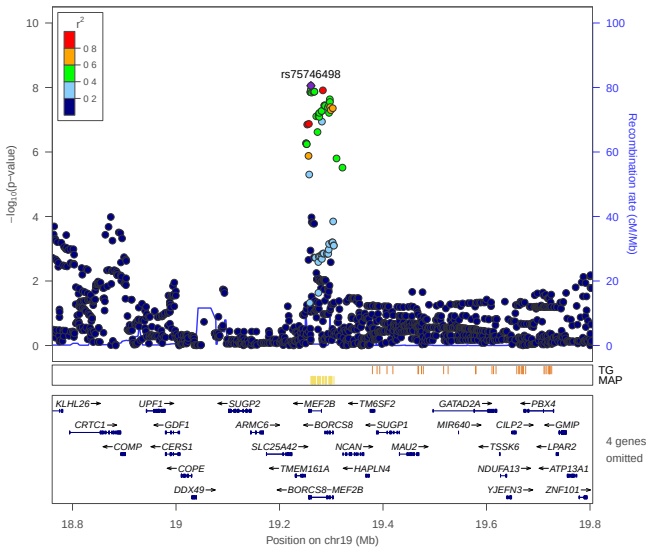
TBX3,MED13L **(12q24.21)**



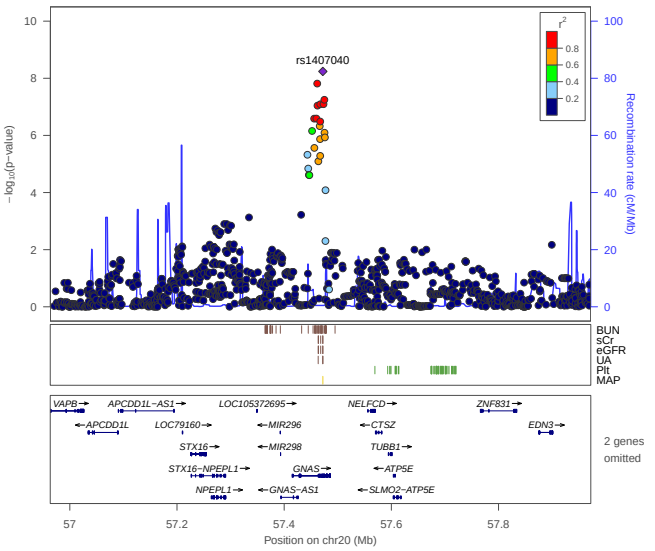
YES1 **(18p11.32)**



MEF2B,MEF2BNB-MEF2B **(19p13.11)**

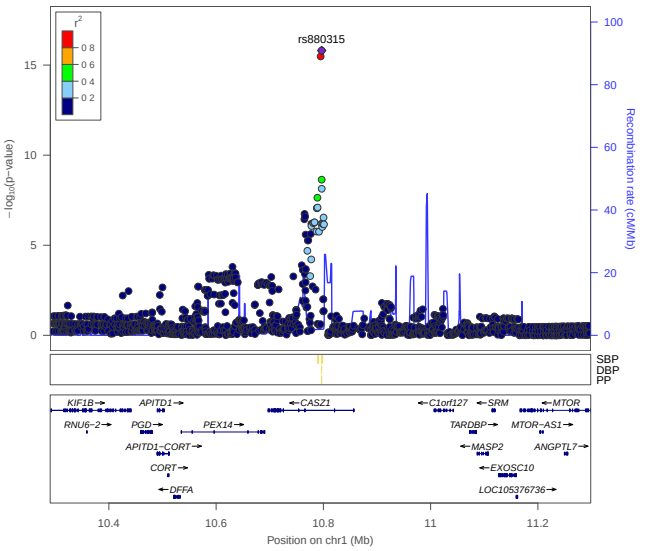


GNAS **(20q13.32)**

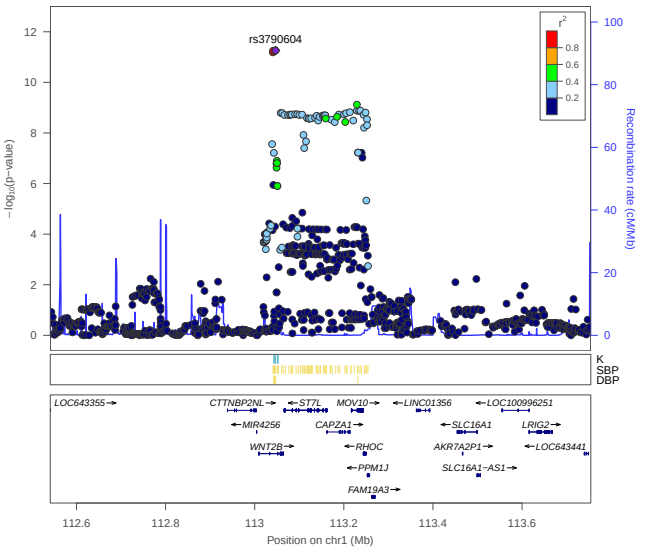


2.47 MAP (n = 136,482)

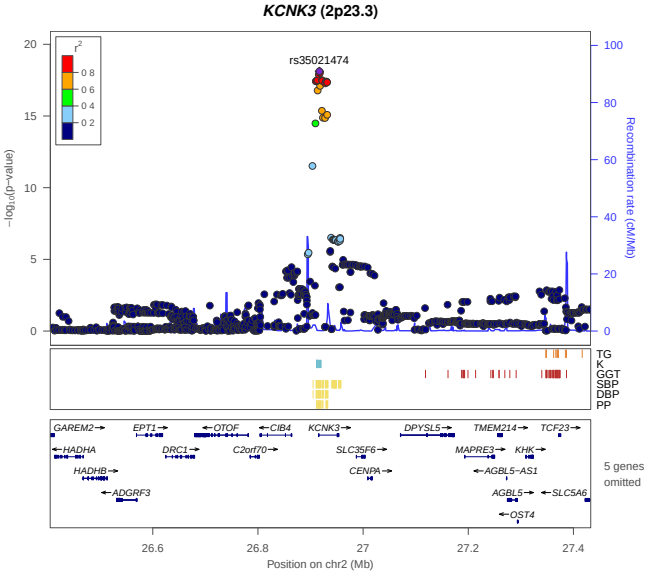
CASZ1 **(1p36.22)**



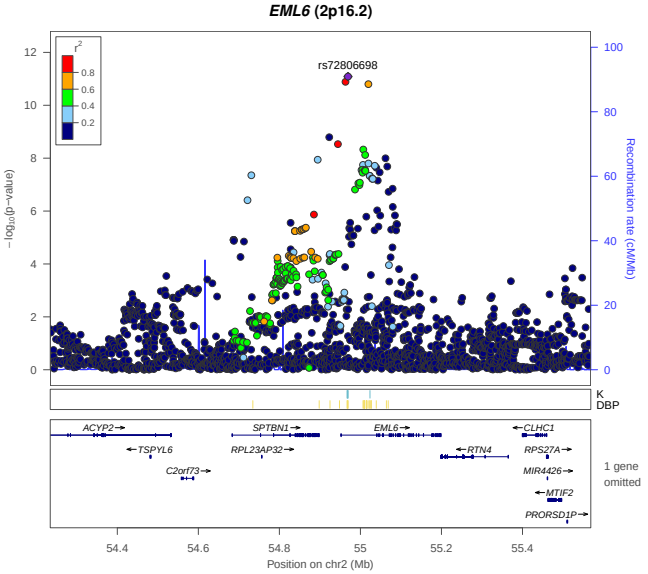
WNT2B **(1p13.2)**



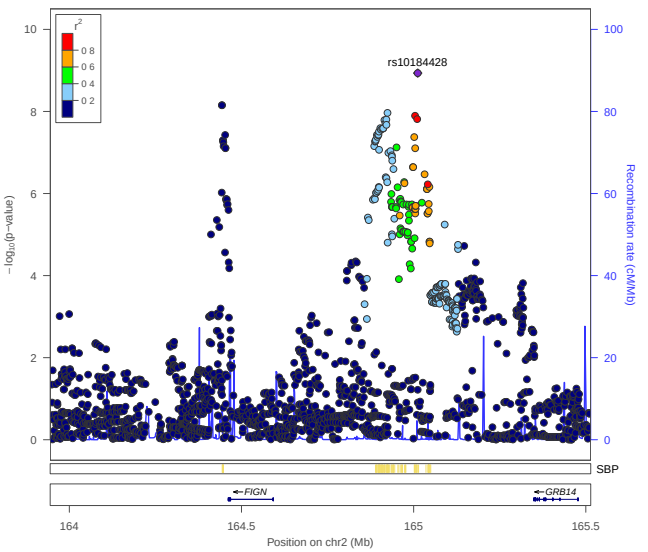
KCNK3 **(2p23.3)**



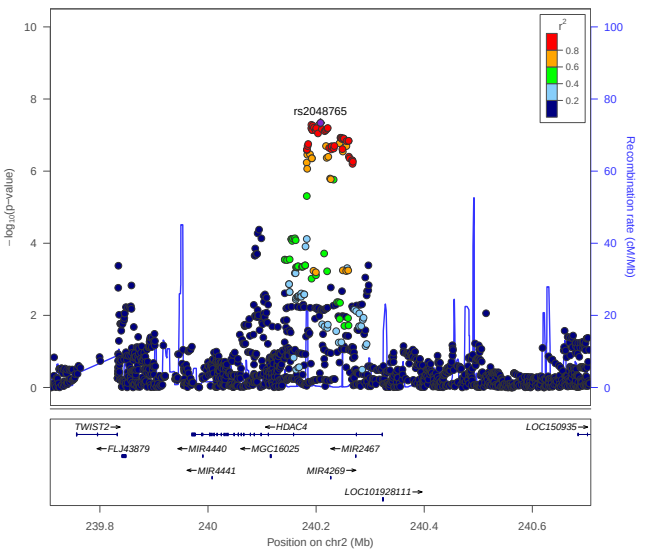
EML6 **(2p16.2)**

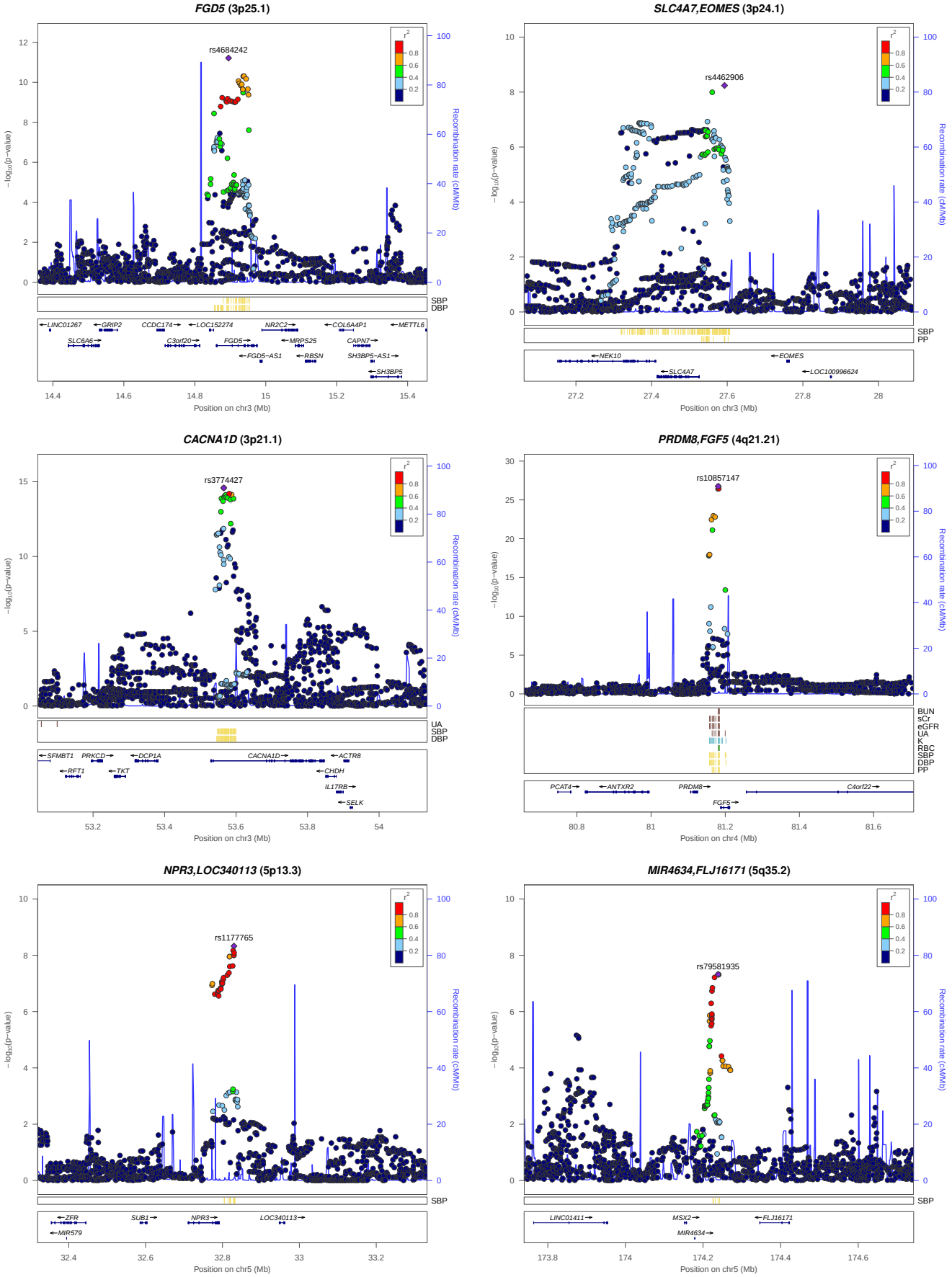


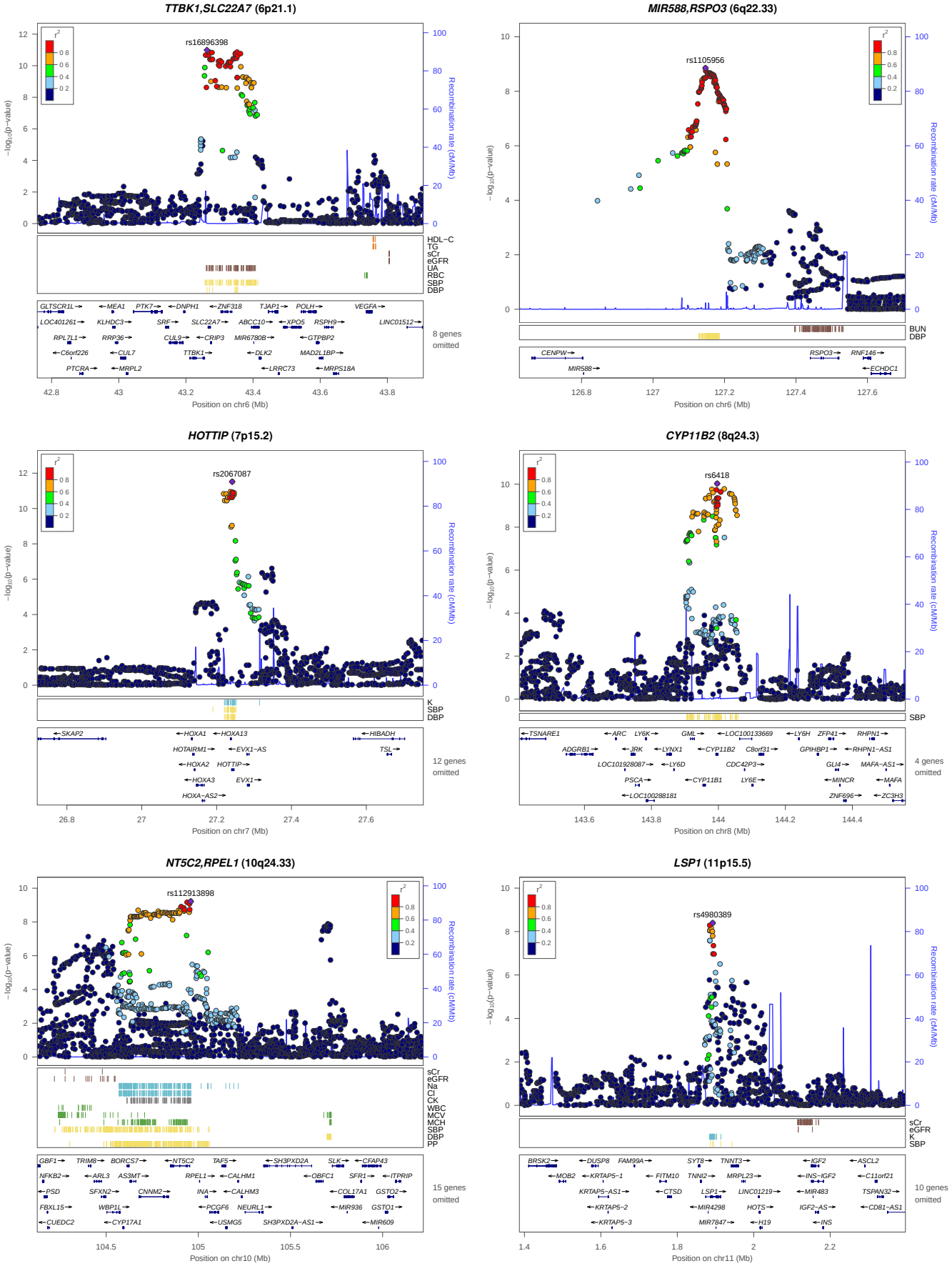
FIGN,GRB14 **(2q24.3)**

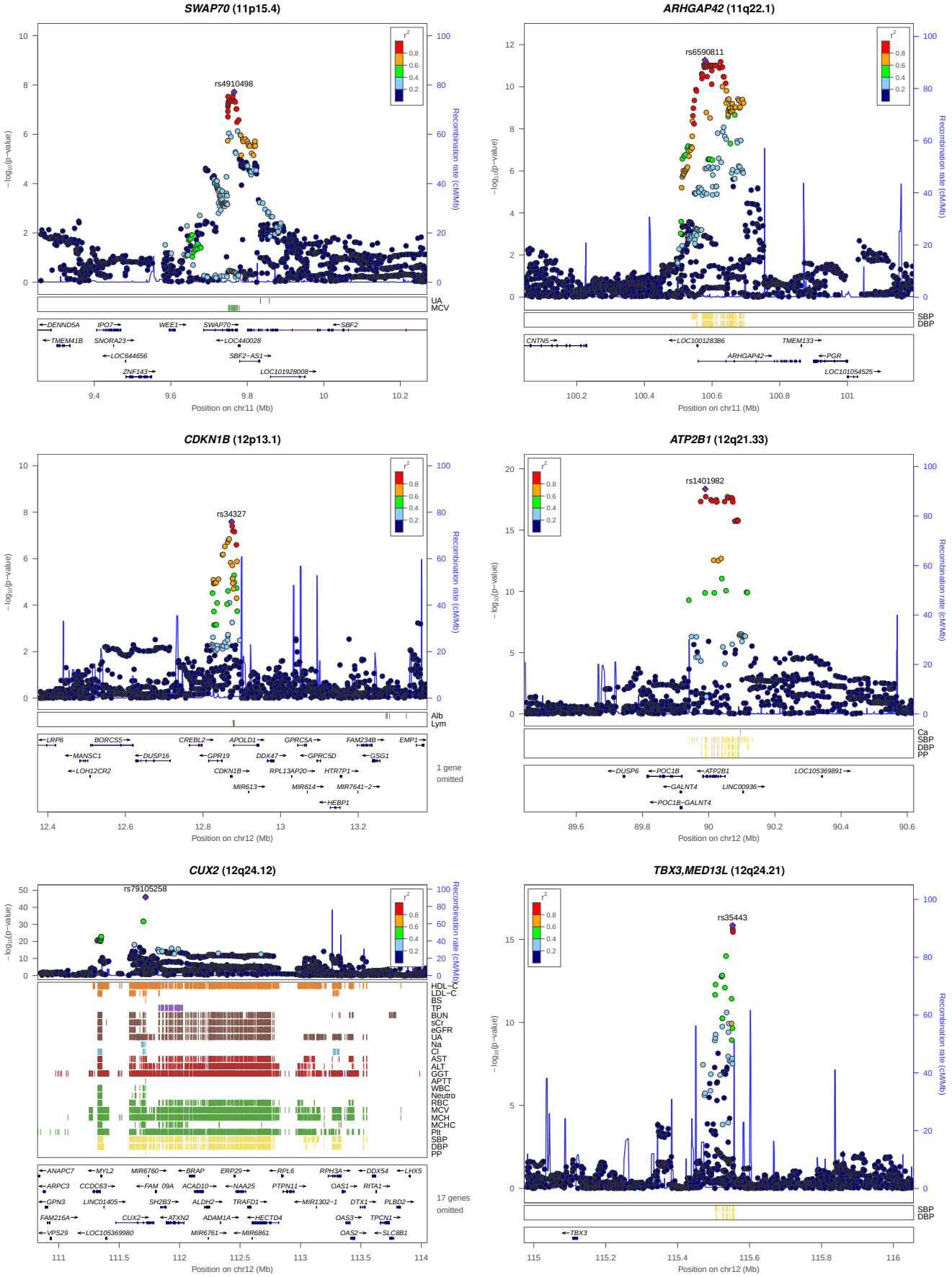


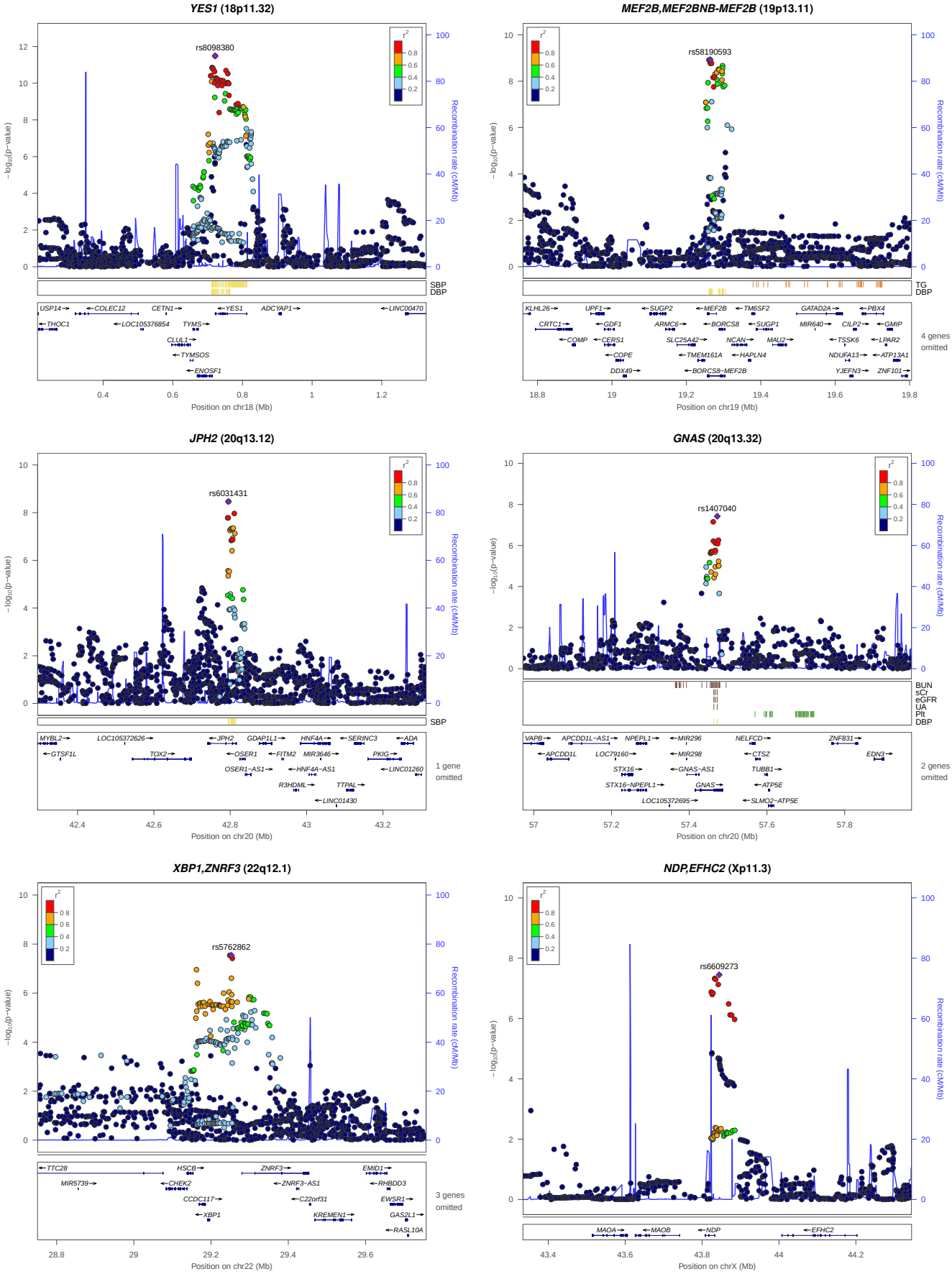
HDAC4 **(2q37.3)**



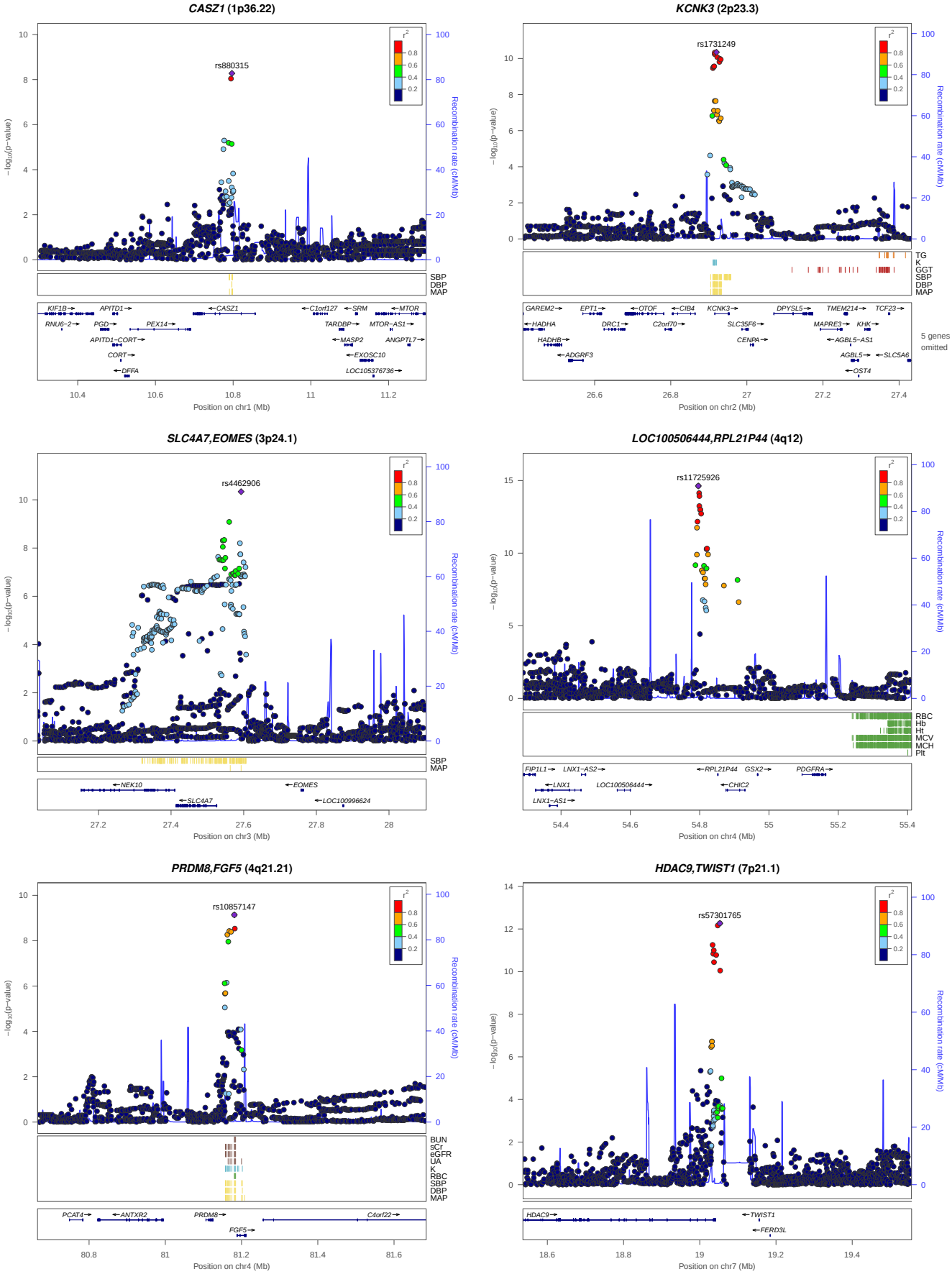

FGD5 (3p25.1)
rs4684242
SLC4A7,EOMES (3p24.1)
rs4462906
CACNA1D (3p21.1)
rs3774427
PRDM8,FGF5 (4q21.21)
rs10857147
NPR3,LOC340113 (5p13.3)
rs1177765
MIR4634,FLJ16171 (5q35.2)
rs79581935
Position on chr3 (Mb)
Position on chr4 (Mb)
Position on chr5 (Mb)
Recombination rate (cM/Mb)

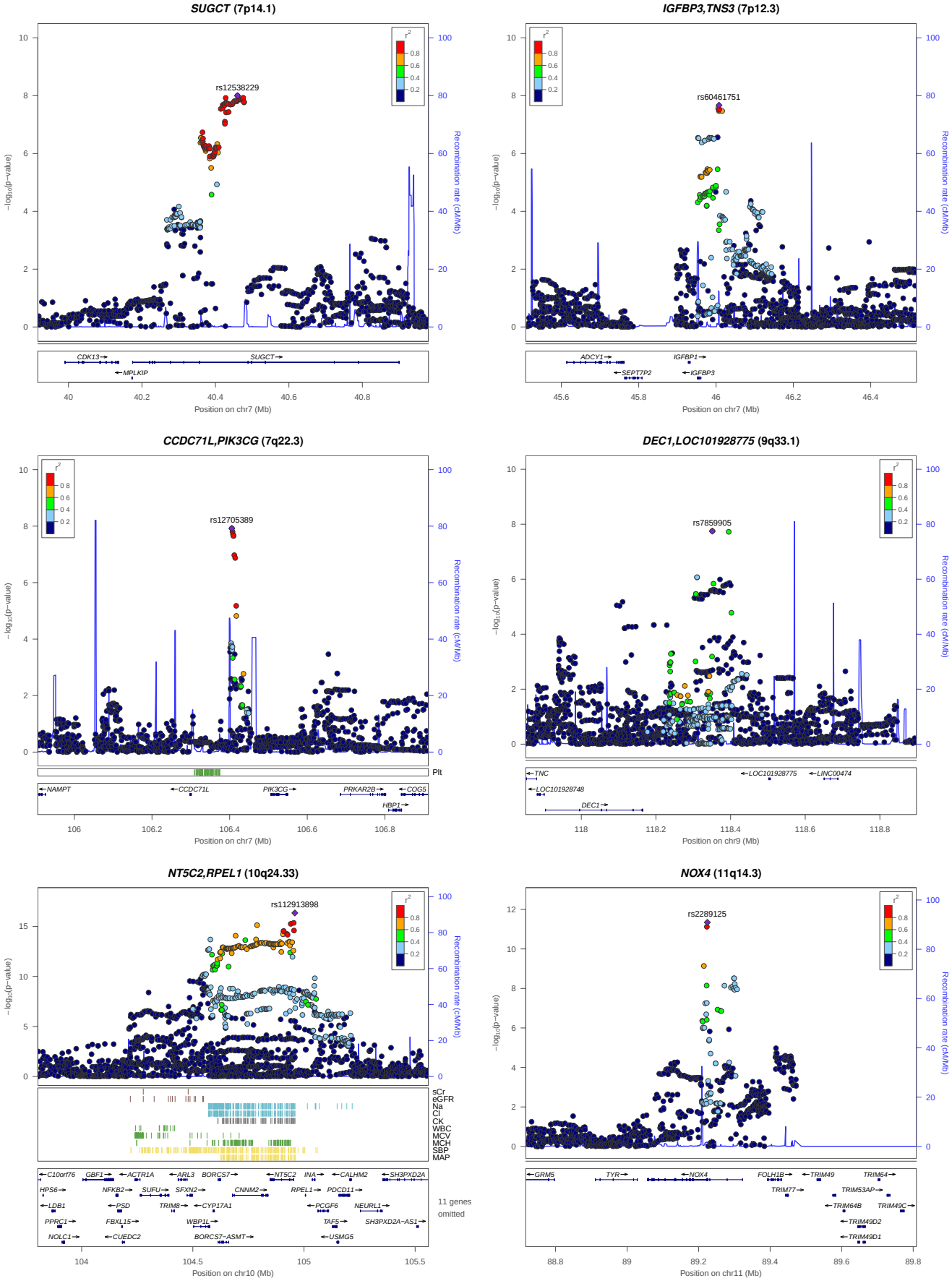

TTBK1,SLC22A7 (6p21.1)
rs16896398
HDL
TG
sCr
eGFR
UA
RBC
SBP
DBP
8 genes omitted
Position on chr6 (Mb)
MIR588,RSPO3 (6q22.33)
rs1105956
BUN
DBP
Position on chr6 (Mb)
HOTTIP (7p15.2)
rs2067087
K
SBP
DBP
12 genes omitted
Position on chr7 (Mb)
CYP11B2 (8q24.3)
rs6418
SBP
4 genes omitted
Position on chr8 (Mb)
NT5C2,RPEL1 (10q24.33)
rs112913898
sCr
eGFR
Na
Cl
CK
WBC
MCV
MCH
SBP
DBP
PP
15 genes omitted
Position on chr10 (Mb)
LSP1 (11p15.5)
rs4980389
sCr
eGFR
K
SBP
10 genes omitted
Position on chr11 (Mb)
Recombination rate (cM/Mb)


SWAP70 (11p15.4)
rs4910498
ARHGAP42 (11q22.1)
rs6590811
CDKN1B (12p13.1)
rs34327
1 gene omitted
ATP2B1 (12q21.33)
rs1401982
CUX2 (12q24.12)
rs79105258
17 genes omitted
TBX3,MED13L (12q24.21)
rs35443
Position on chr11 (Mb)
Position on chr12 (Mb)
Recombination rate (cM/Mb)

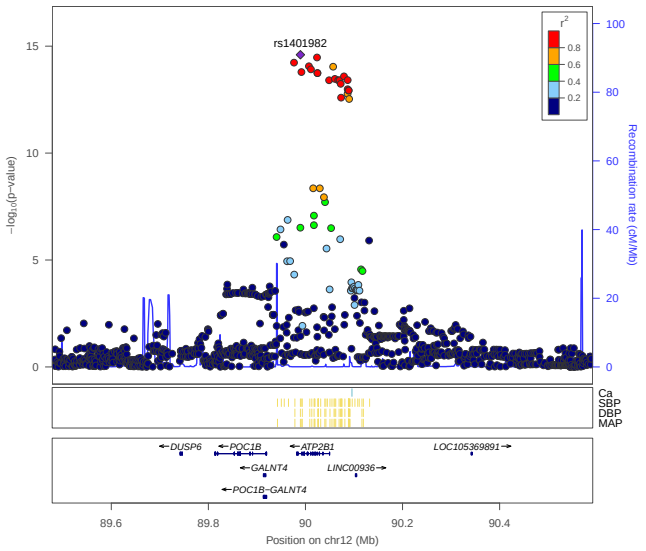

YES1 (18p11.32)
rs8098380
MEF2B,MEF2BNB-MEF2B (19p13.11)
rs58190593
JPH2 (20q13.12)
rs6031431
GNAS (20q13.32)
rs1407040
XBP1,ZNRF3 (22q12.1)
rs5762862
NDP,EFHC2 (Xp11.3)
rs6609273
−log10(p-value)
Recombination rate (cM/Mb)
r2
SBP
DBP
TG
BUN
sCr
eGFR
UA
Plt
4 genes omitted
1 gene omitted
2 genes omitted
3 genes omitted
Position on chr18 (Mb)
Position on chr19 (Mb)
Position on chr20 (Mb)
Position on chr22 (Mb)
Position on chrX (Mb)

2.48 PP (n = 136,249)

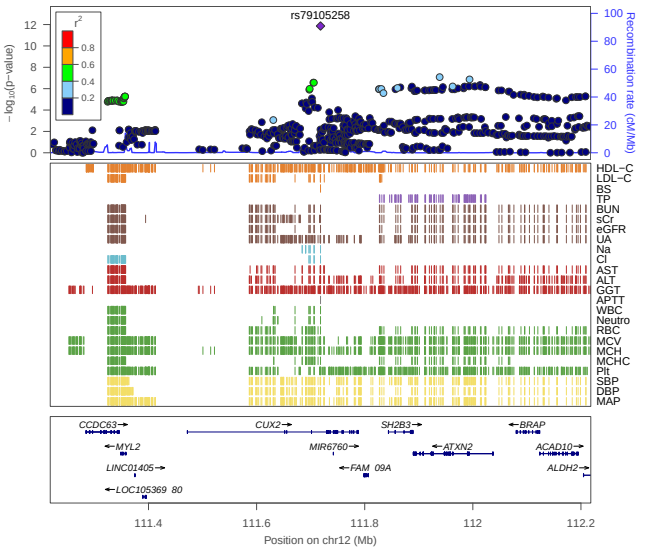



SUGCT (7p14.1)
rs12538229
CDK13
SUGCT
MPLKIP
Position on chr7 (Mb)
IGFBP3,TNS3 (7p12.3)
rs60461751
ADCY1
IGFBP1
SEPT7P2
IGFBP3
Position on chr7 (Mb)
CCDC71L,PIK3CG (7q22.3)
rs12705389
NAMPT
CCDC71L
PIK3CG
PRKAR2B
COG5
HBP1
Plt
Position on chr7 (Mb)
DEC1,LOC101928775 (9q33.1)
rs7859905
TNC
LOC101928775
LINC00474
LOC101928748
DEC1
Position on chr9 (Mb)
NT5C2,RPEL1 (10q24.33)
rs112913898
sCr
eGFR
Na
Cl
CK
WBC
MCV
MCH
SBP
MAP
11 genes omitted
Position on chr10 (Mb)
NOX4 (11q14.3)
rs2289125
GRM5
TYR
NOX4
FOLH1B
TRIM49
TRIM64
TRIM77
TRIM53AP
TRIM64B
TRIM49C
TRIM49D2
TRIM49D1
Position on chr11 (Mb)
Recombination rate (cM/Mb)

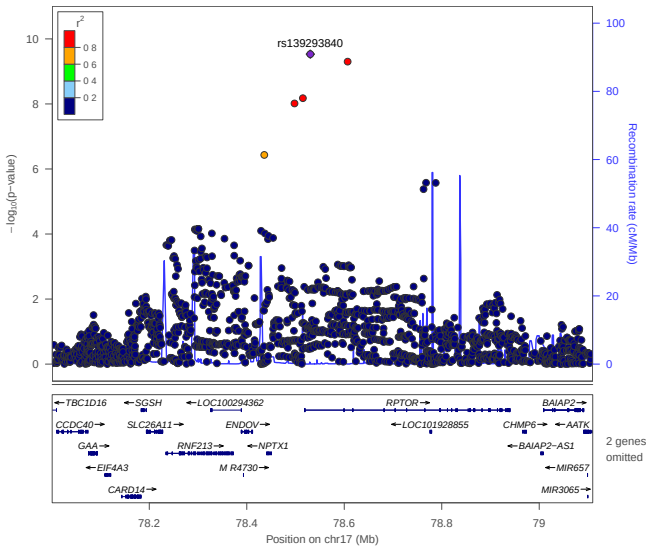
***ATP2B1* (12q21.33)**



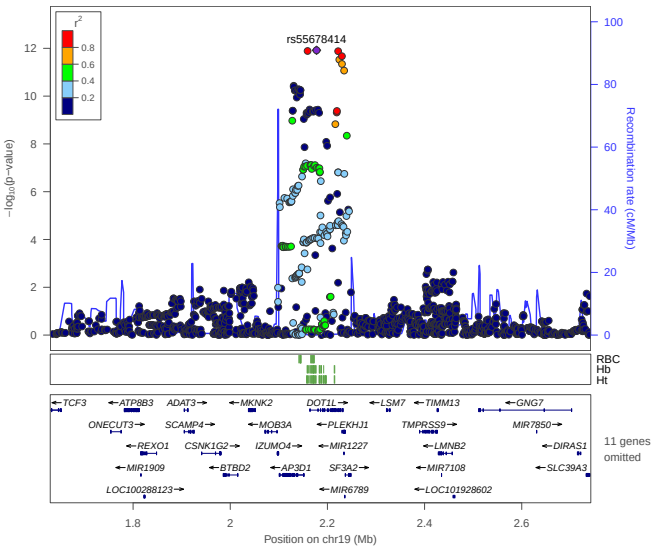
***CUX2* (12q24.12)**



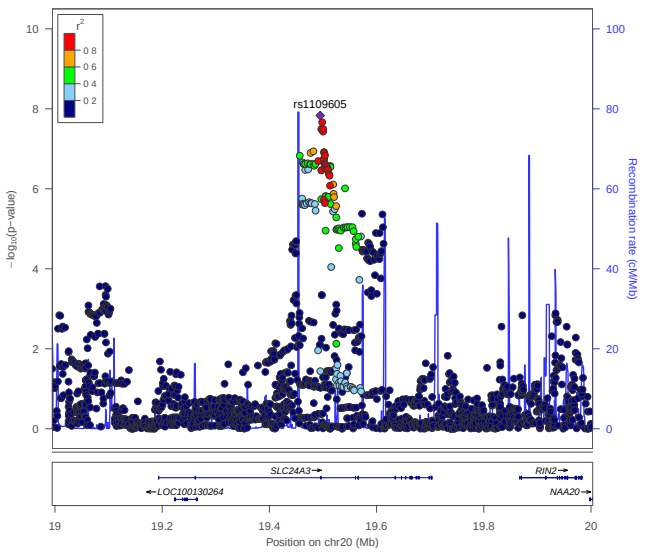
***RPTOR* (17q25.3)**



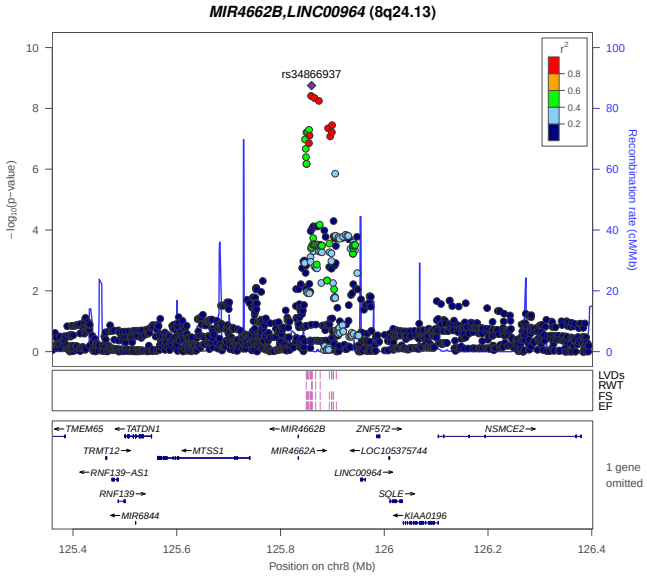
***DOT1L* (19p13.3)**

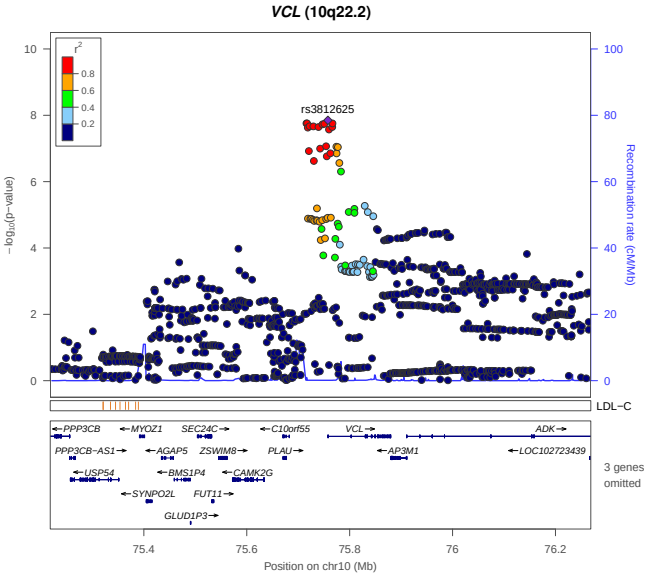


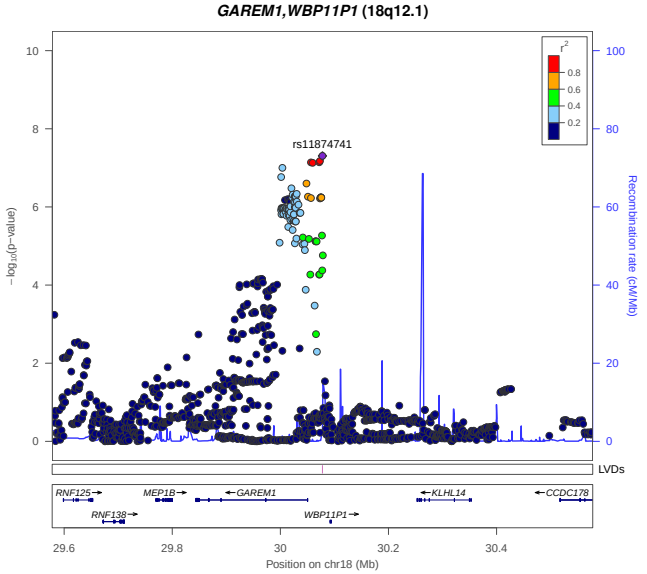
***SLC24A3* (20p11.23)**



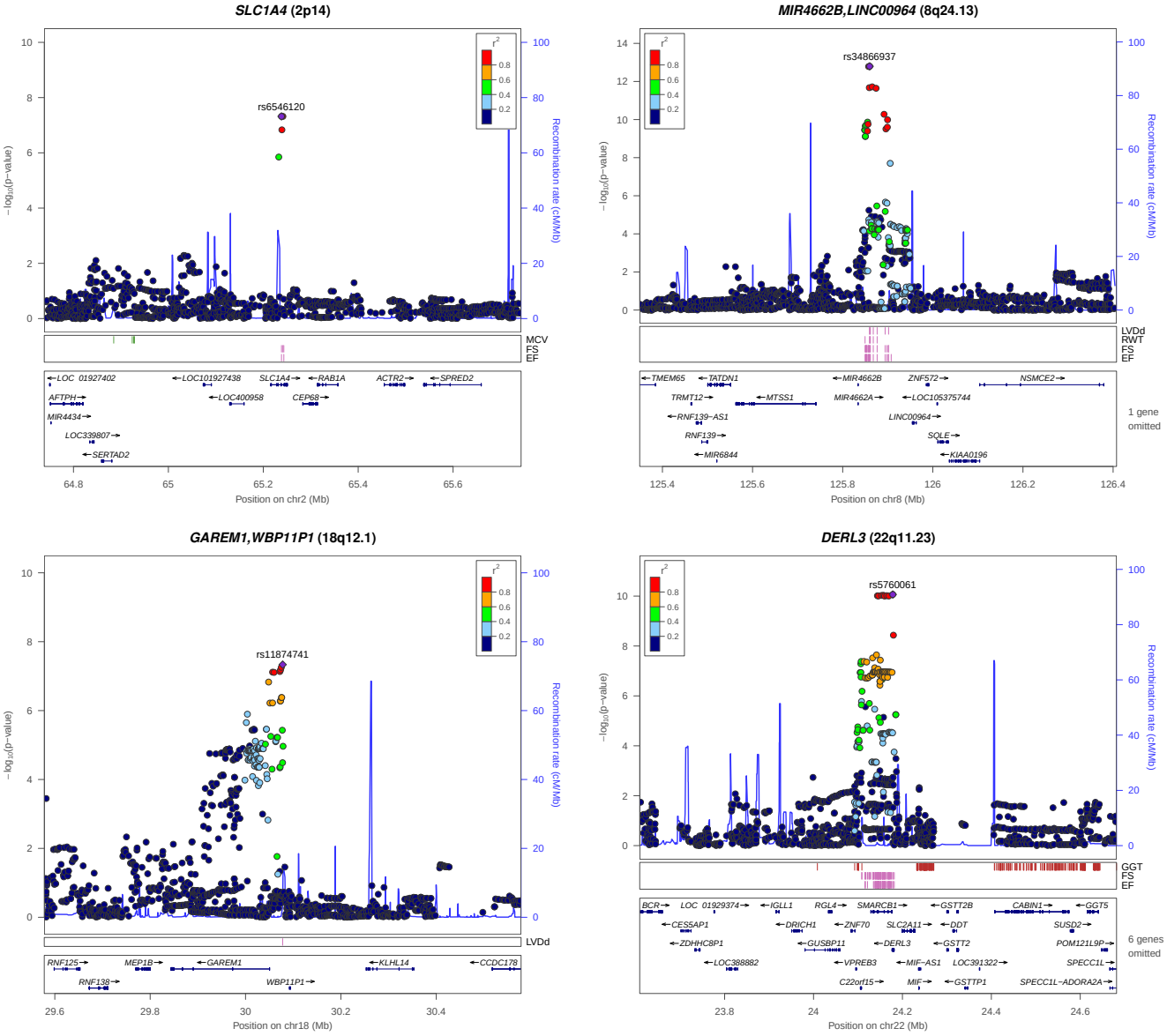
2.49 LVDd (n = 19,676)



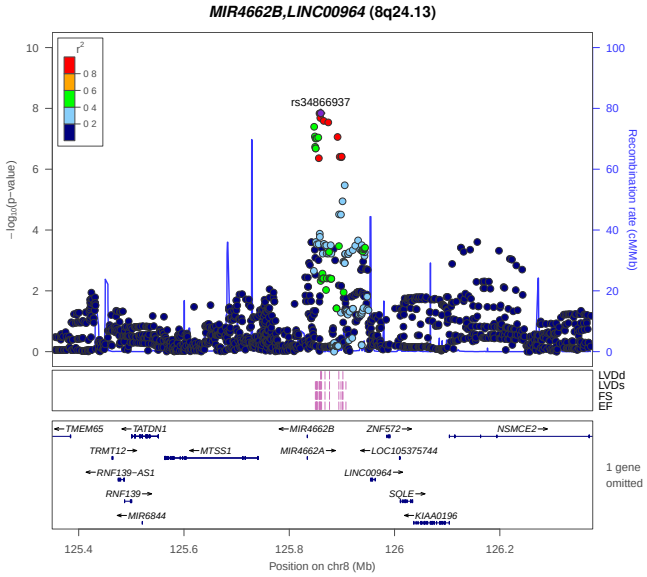




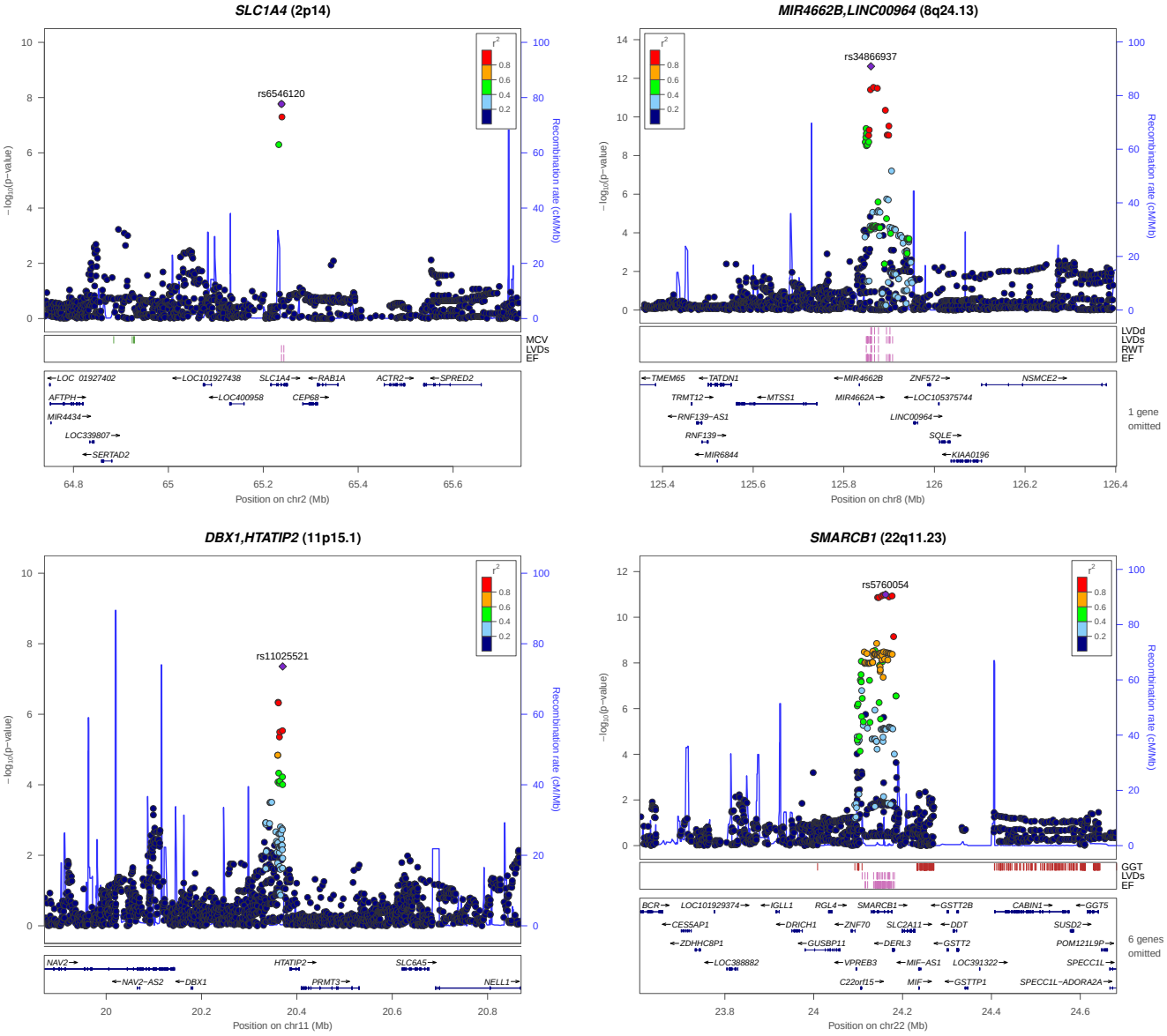
2.50 LVDs (n = 19,586)



2.51 RWT (n = 19,311)



2.52 FS (n = 19,580)



2.53 EF (n = 19,516)

