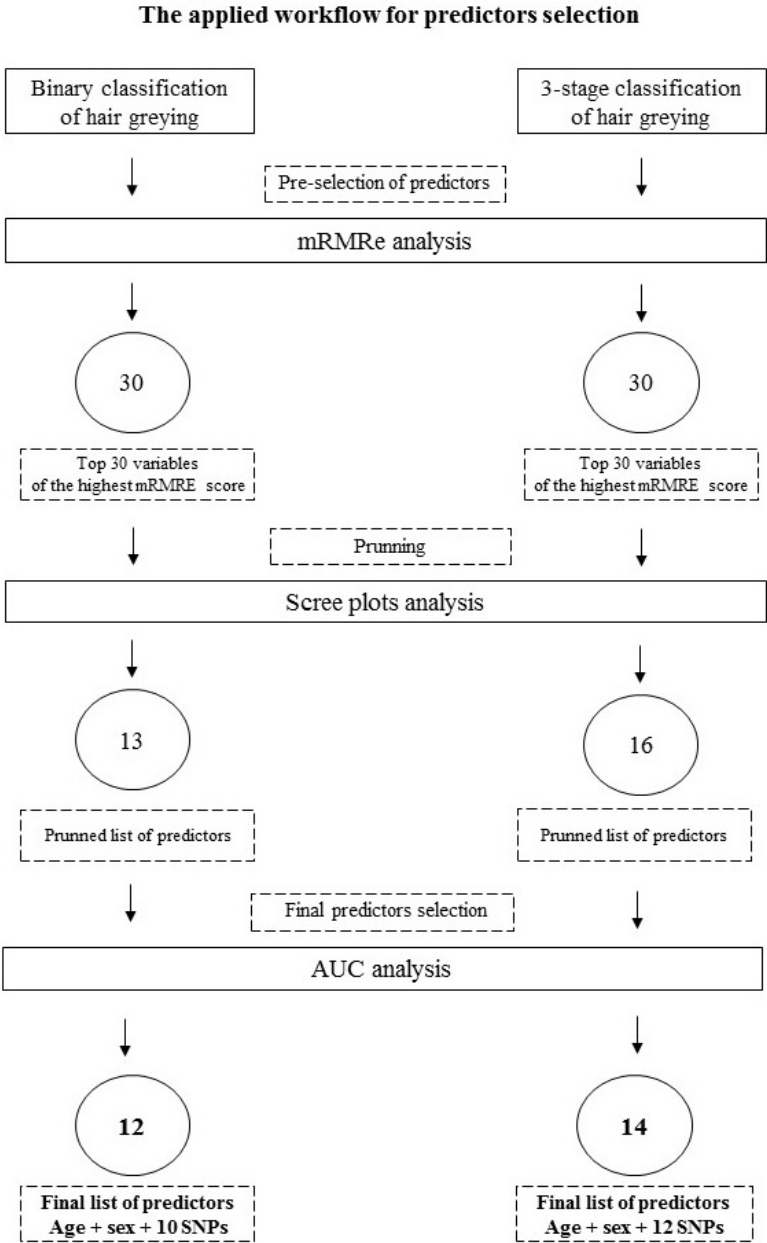
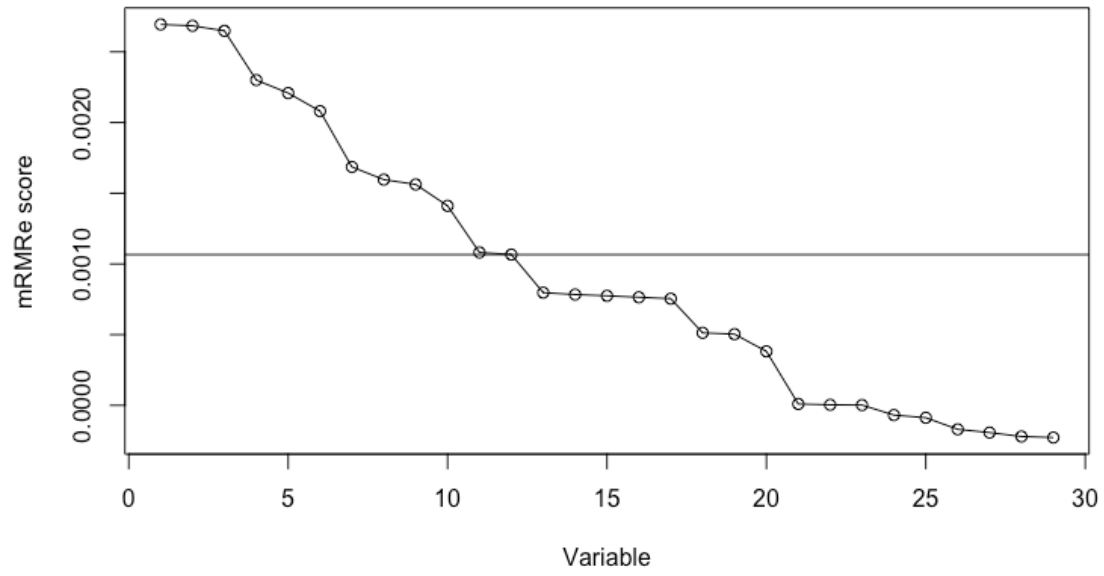


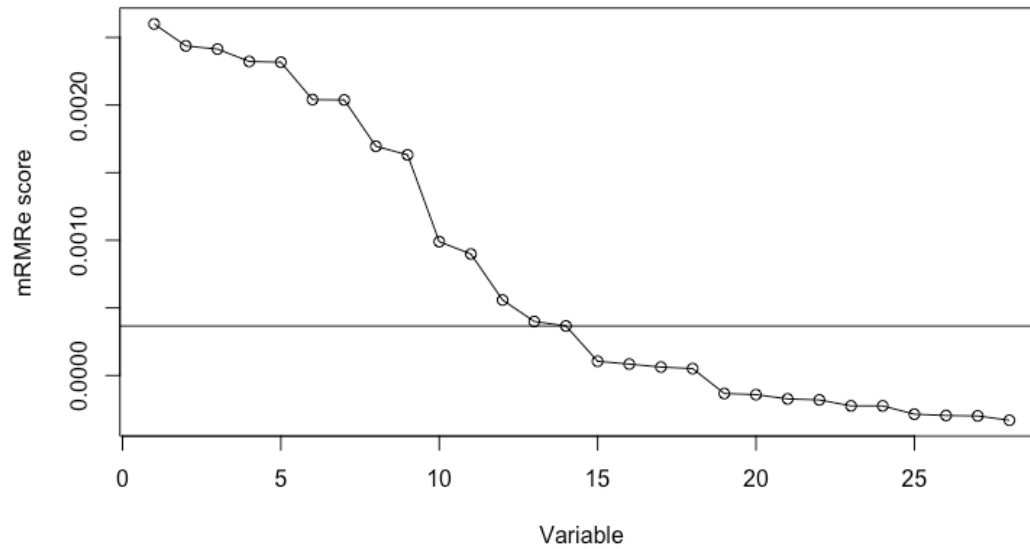
Supplementary Fig. 1 The applied workflow for the final selection of predictors for head hair greying



A

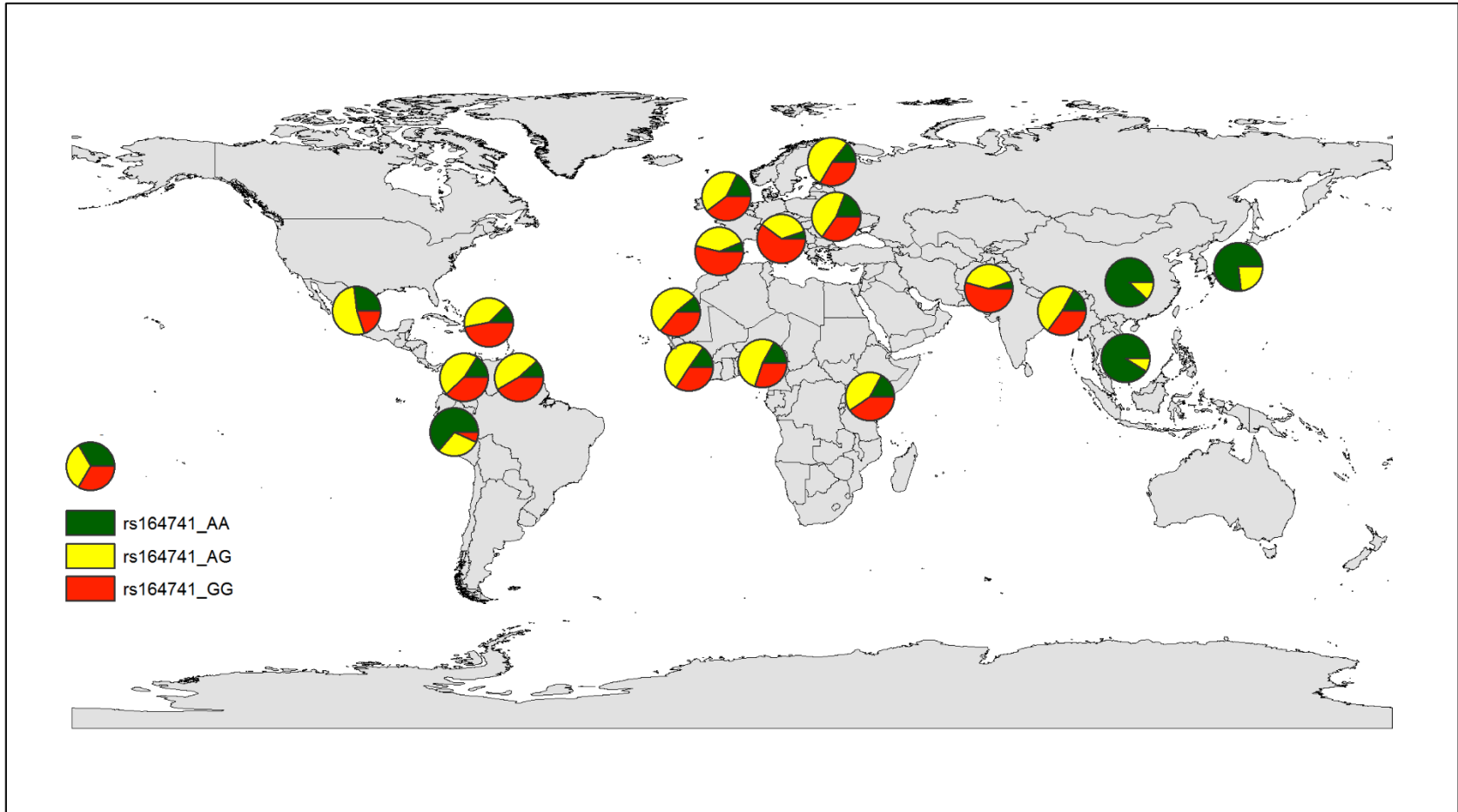


B

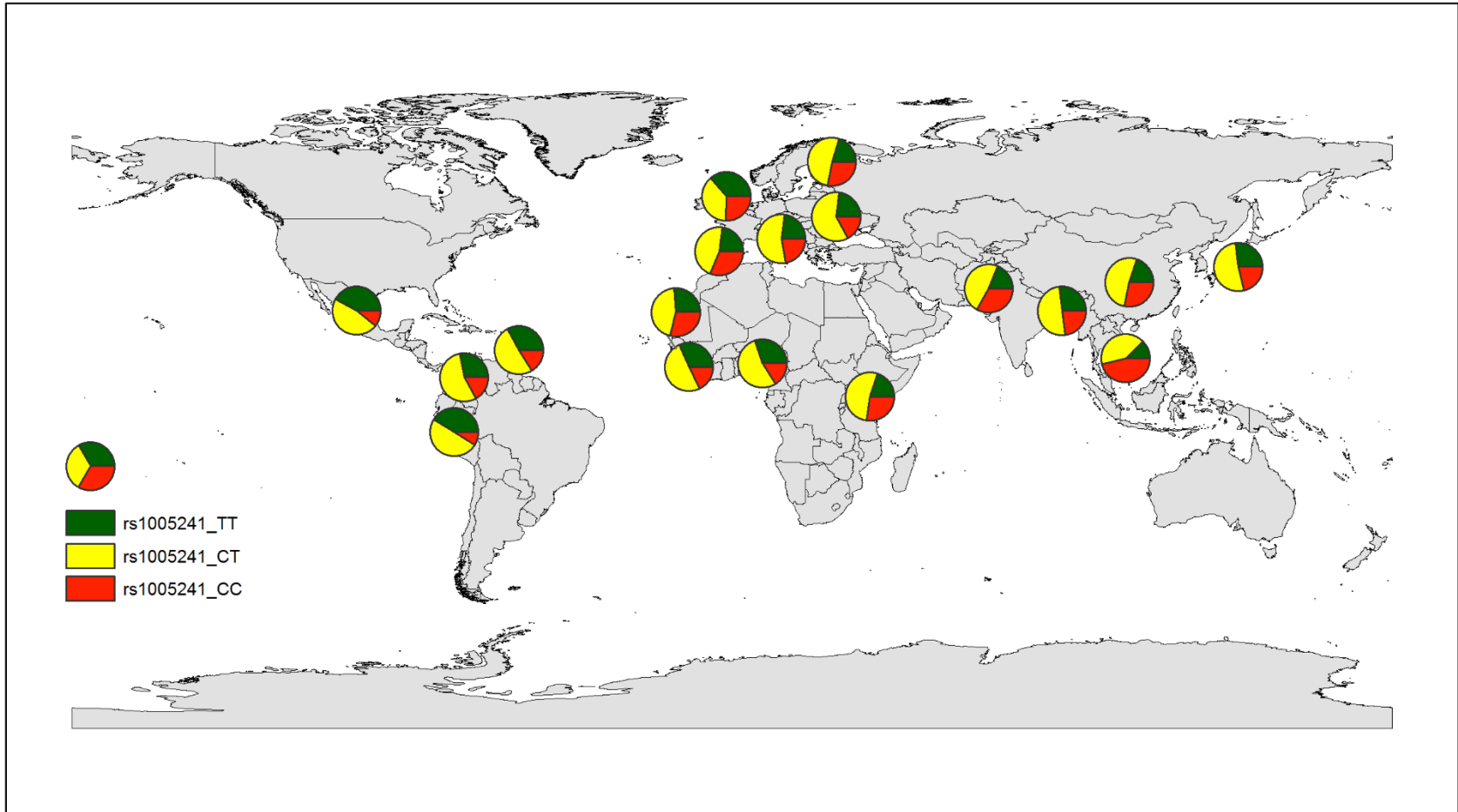


Supplementary Fig. 2 Scree plots generated for the top predictors selected with mRMRe method for **A** binary hair greying classification and **B** 3-stage hair greying classification. The mRMRe score values were plotted against their rank in the selected set of predictors. The suggestive cutoff point is indicated by the black horizontal line. In order to increase the transparency of the graphs and to improve determination of the cut-off point age (for binary hair greying classification) and age + sex (for 3-stage classification) were excluded when plotting graphs because of their significantly higher mRMRe scores. The order of the remaining predictors is in accordance with Supplementary Table 6.

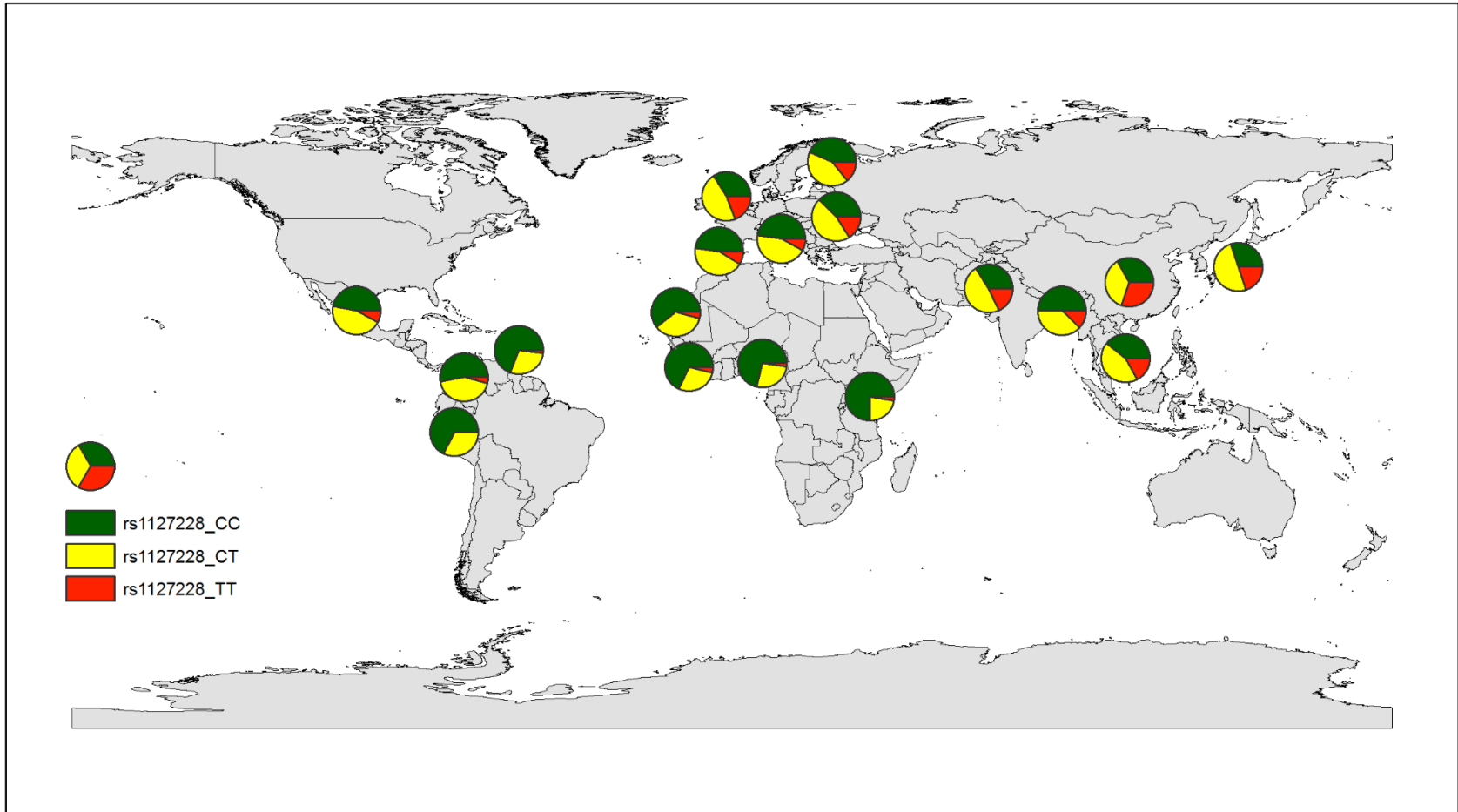
A



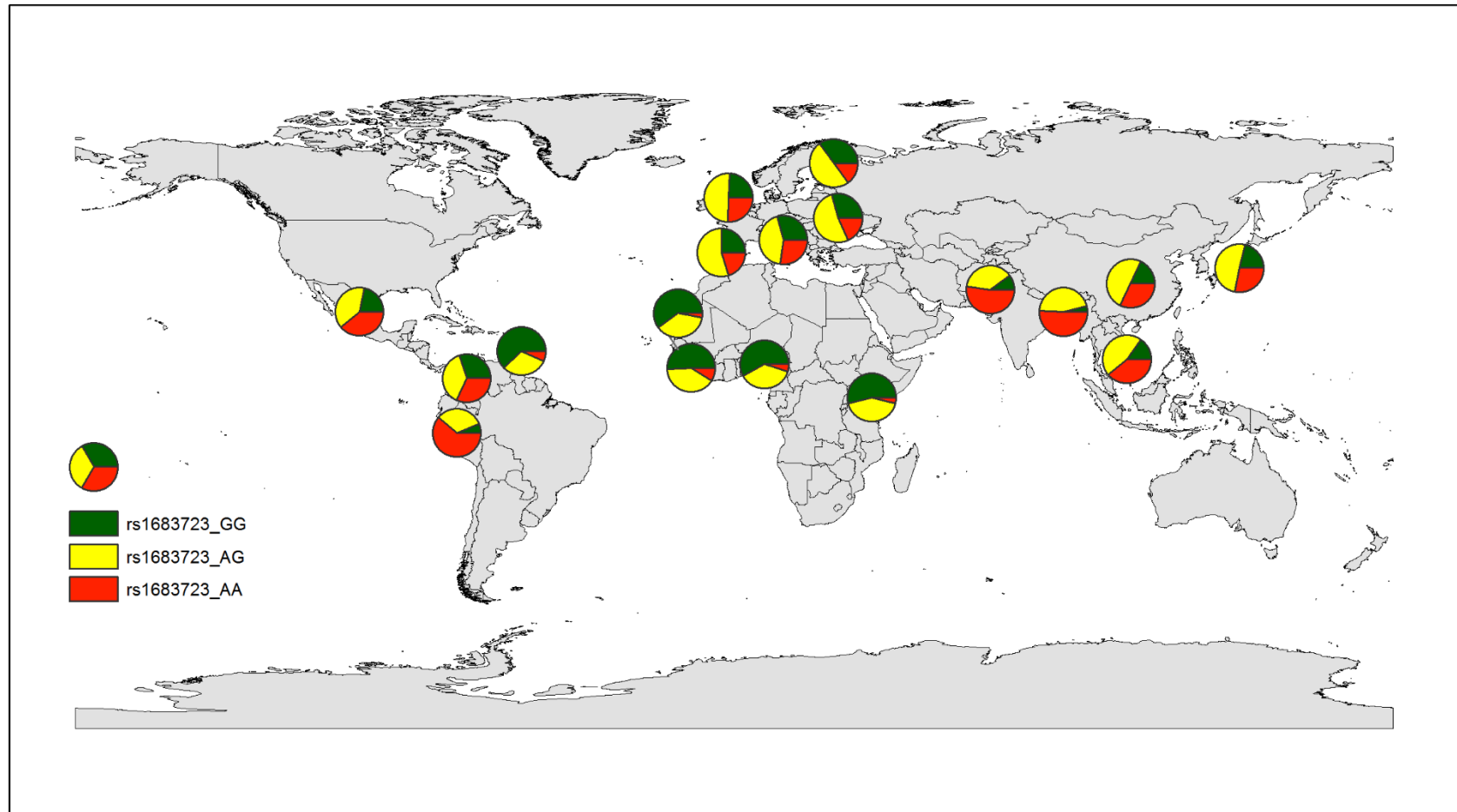
B



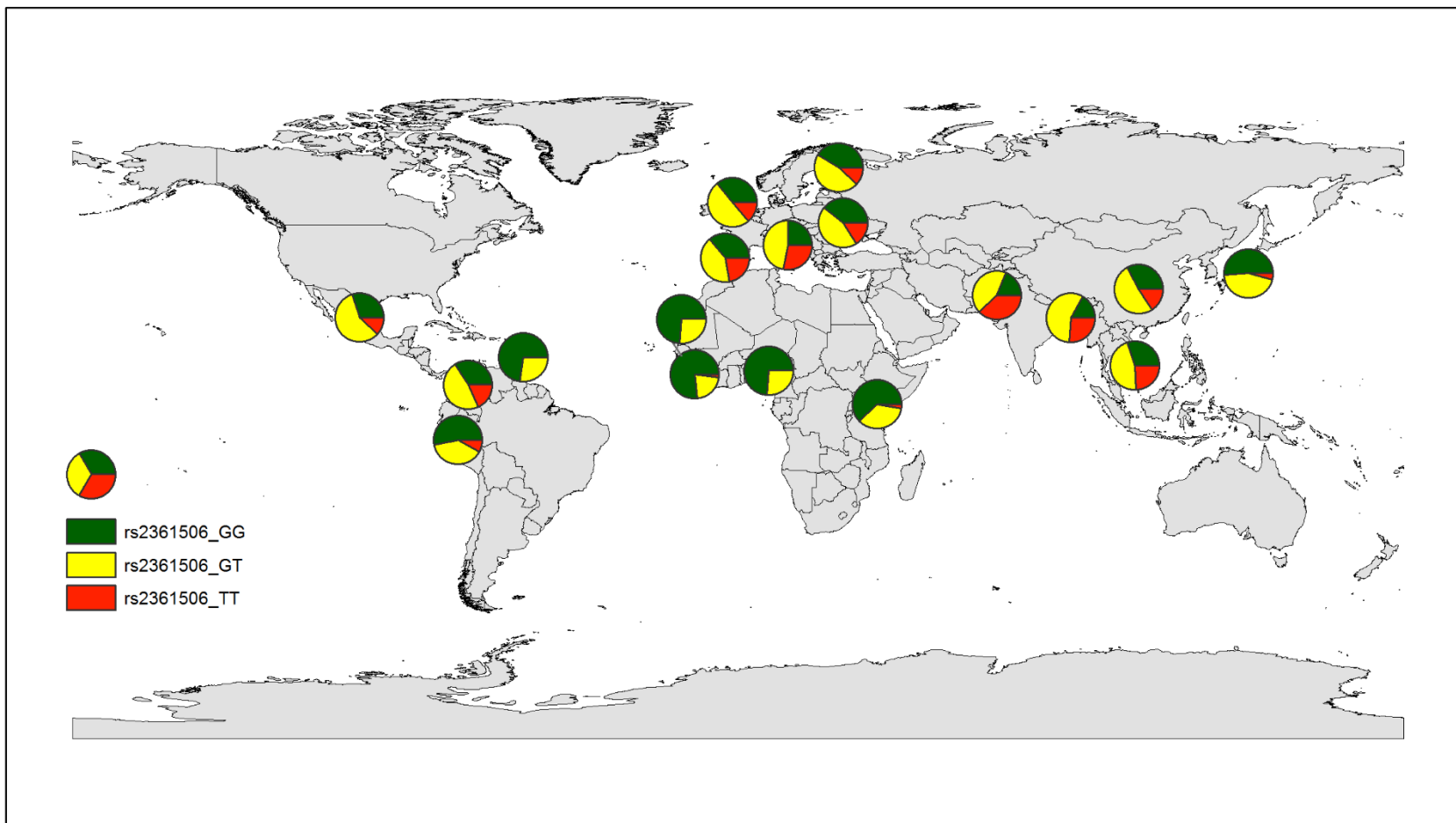
C



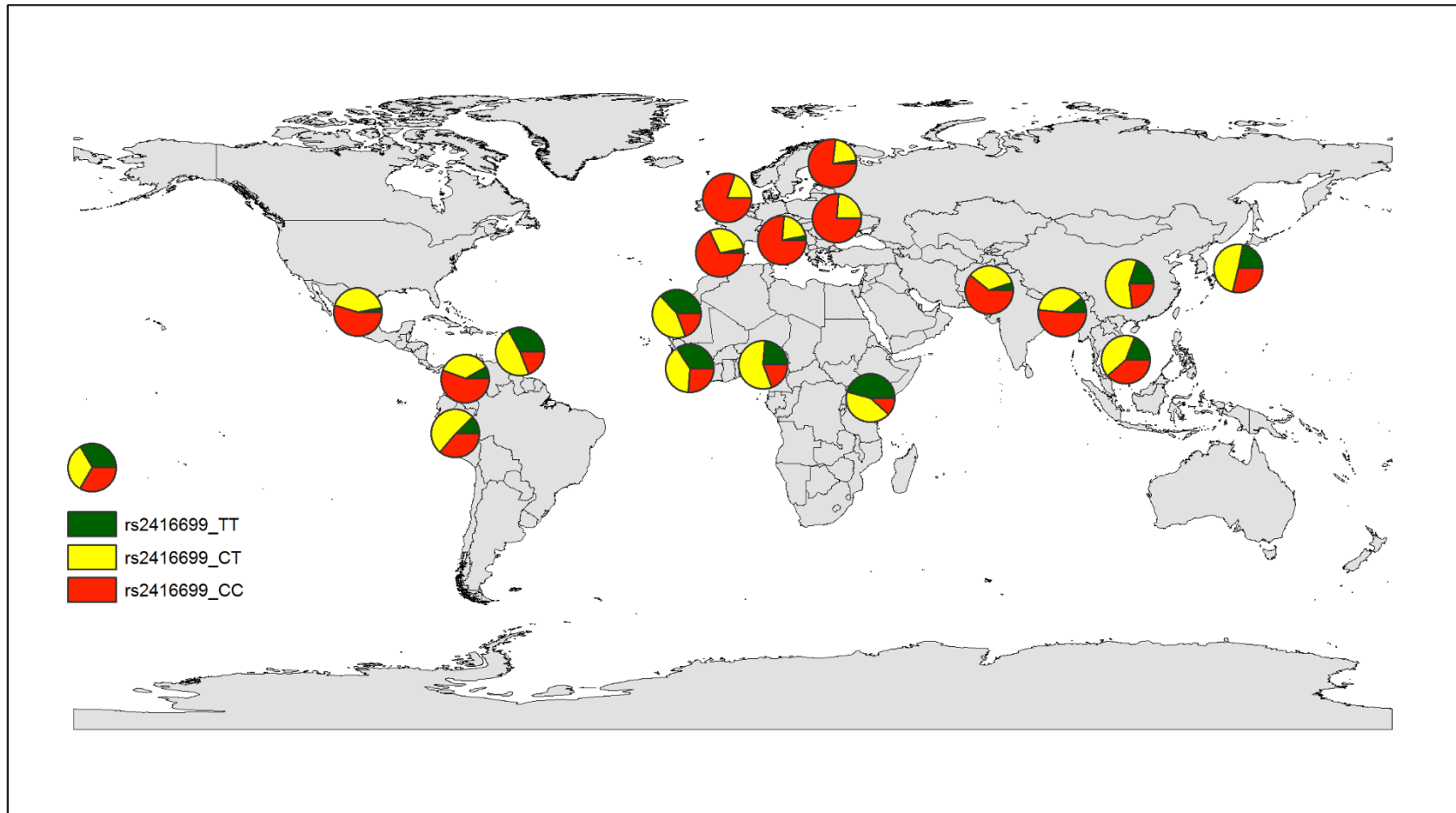
D



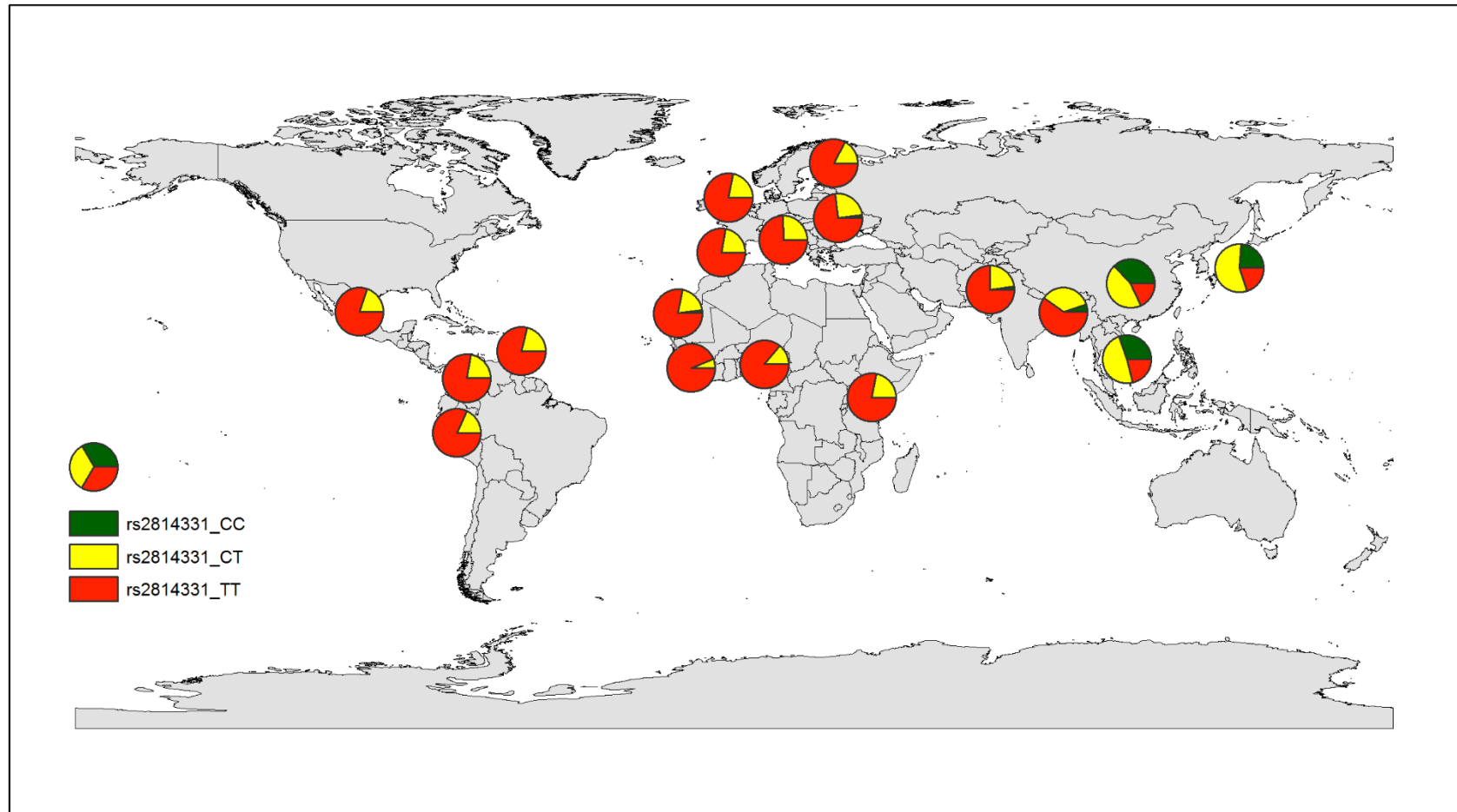
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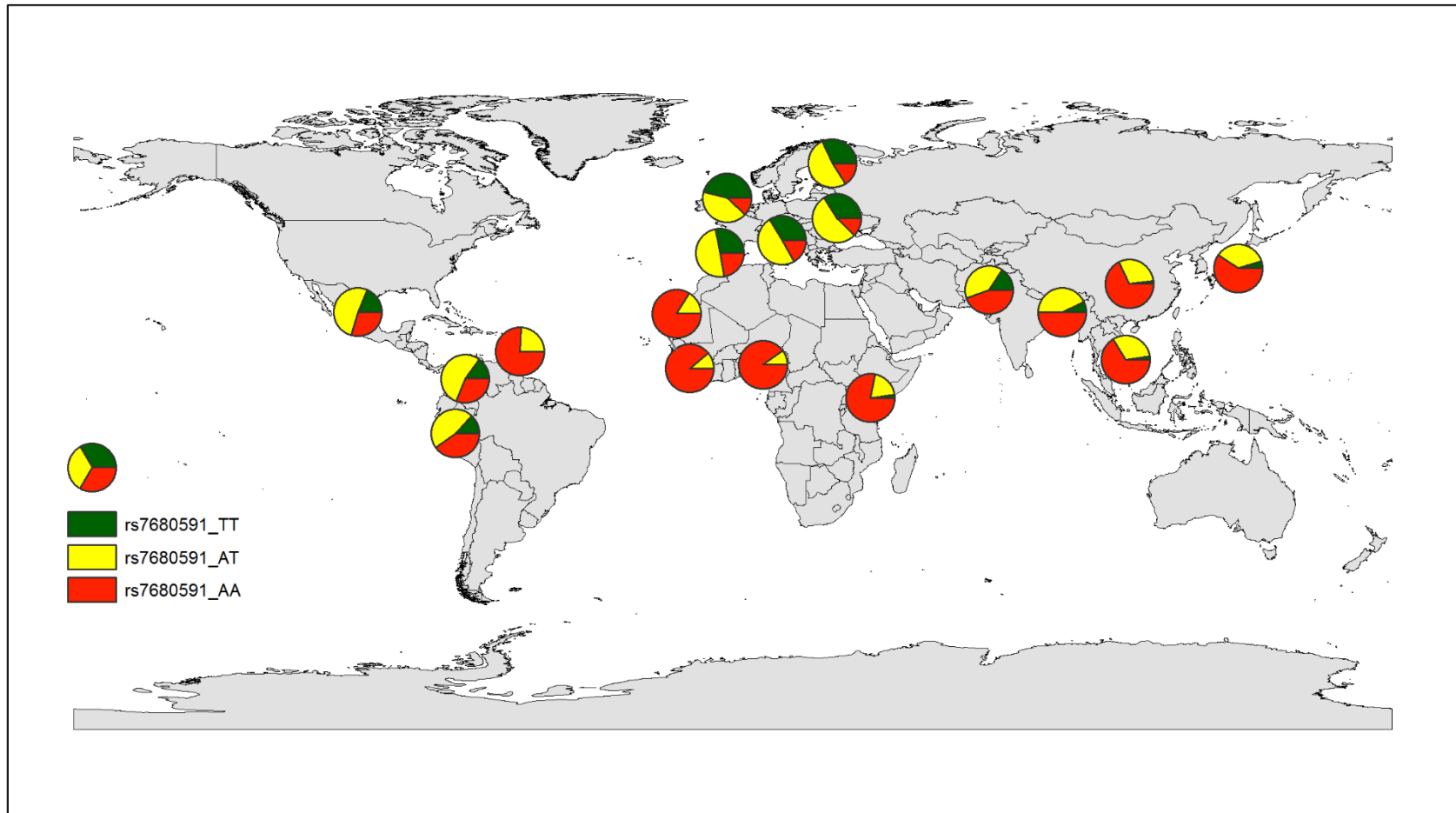
F



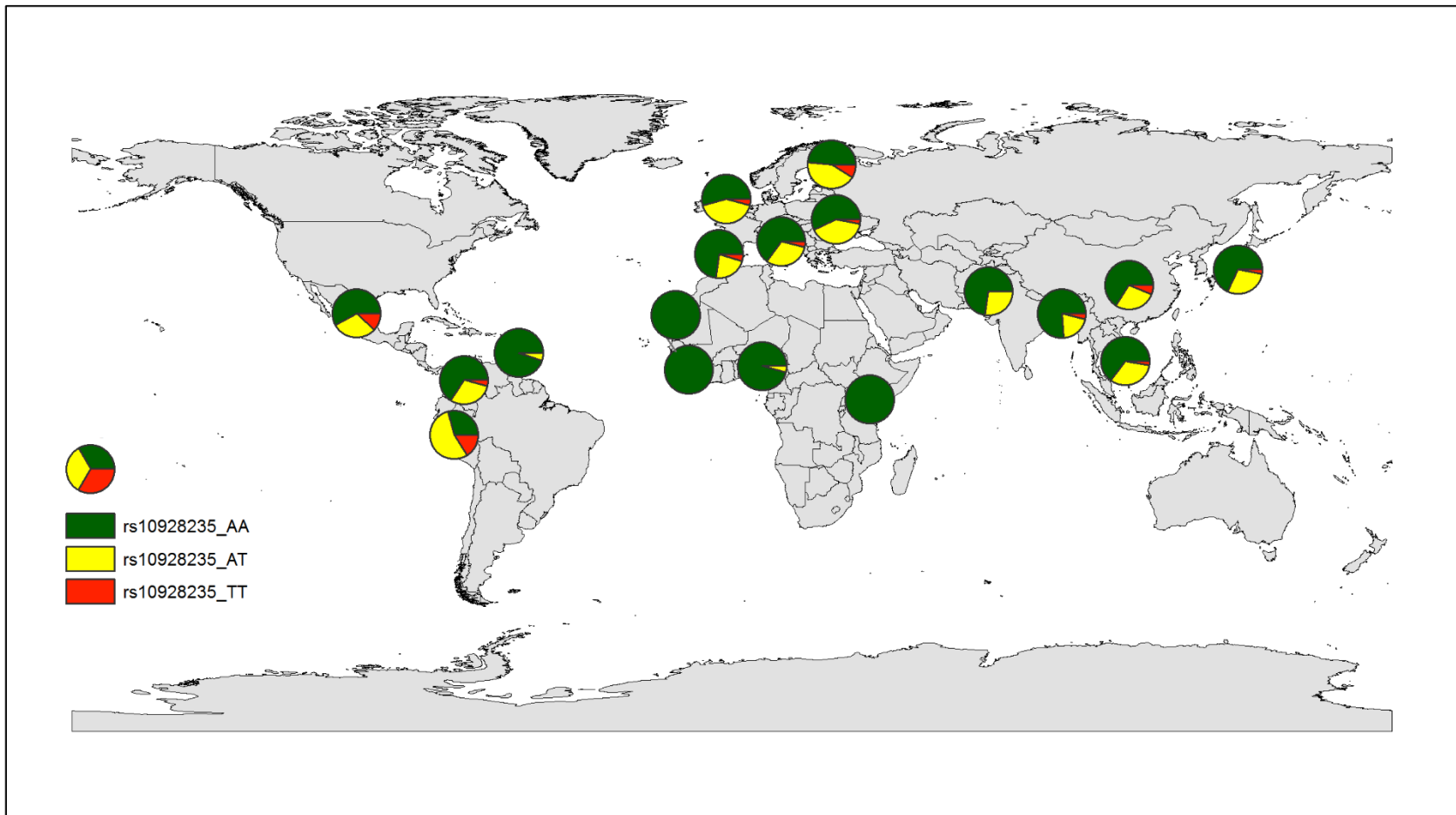
G



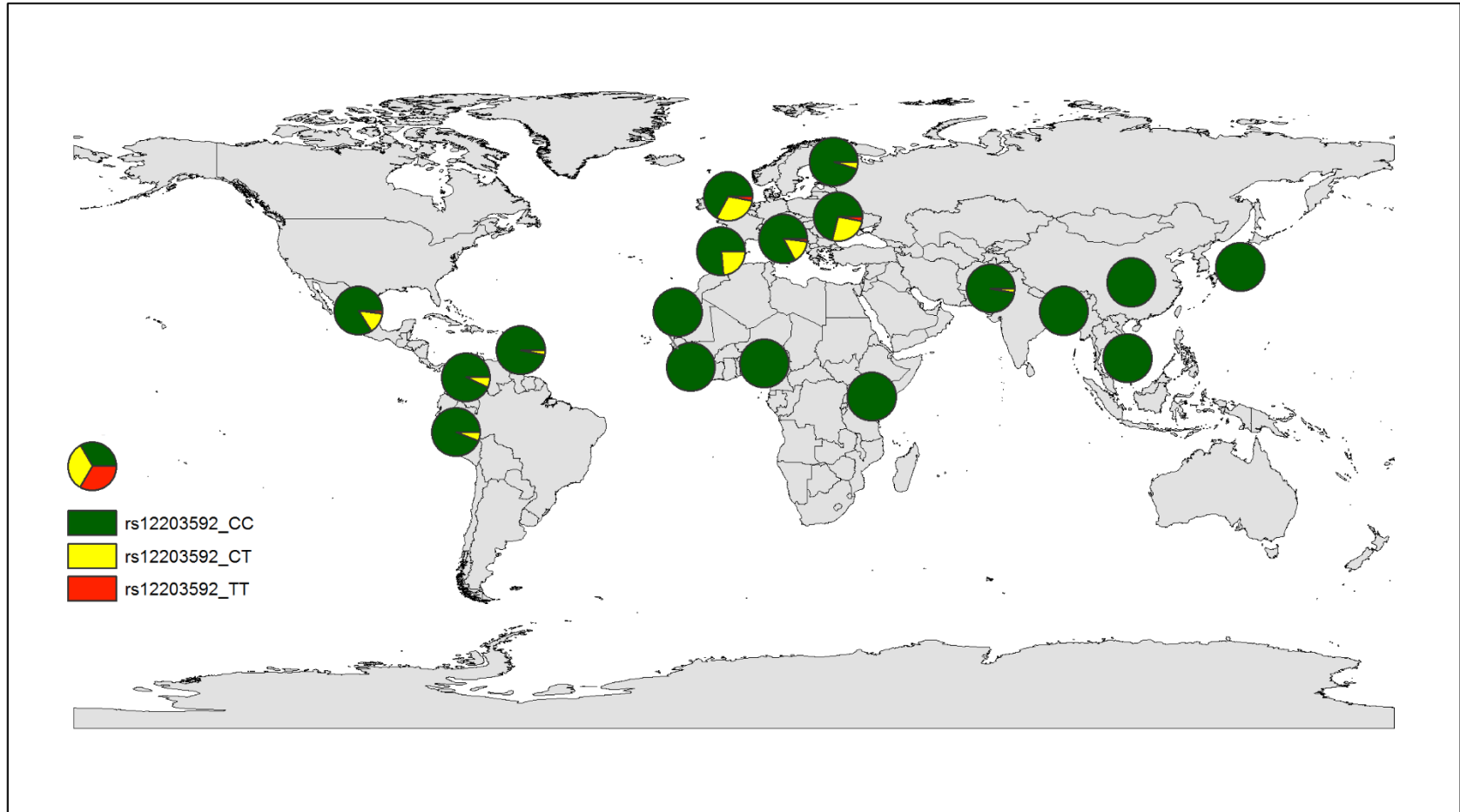
H



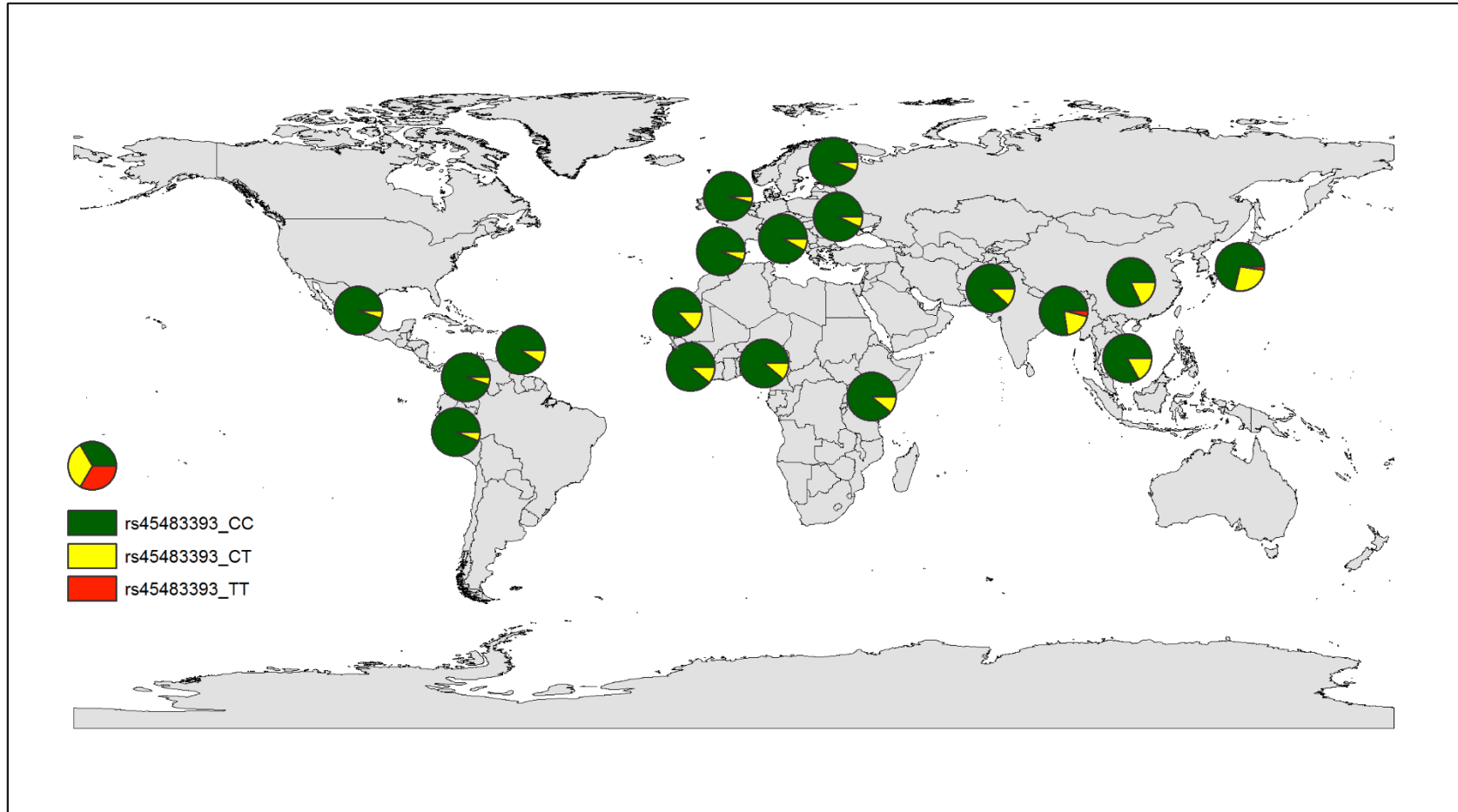
I



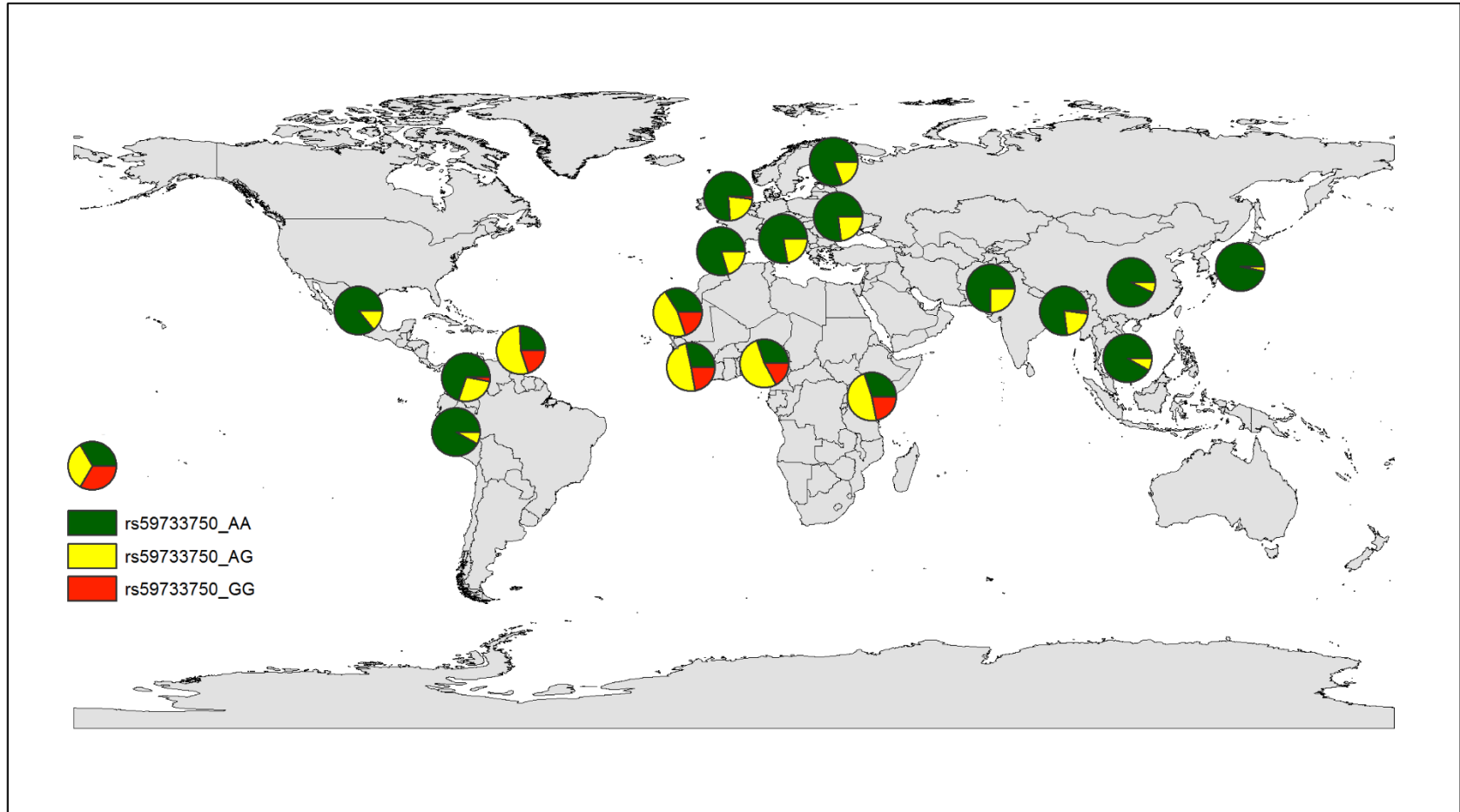
J



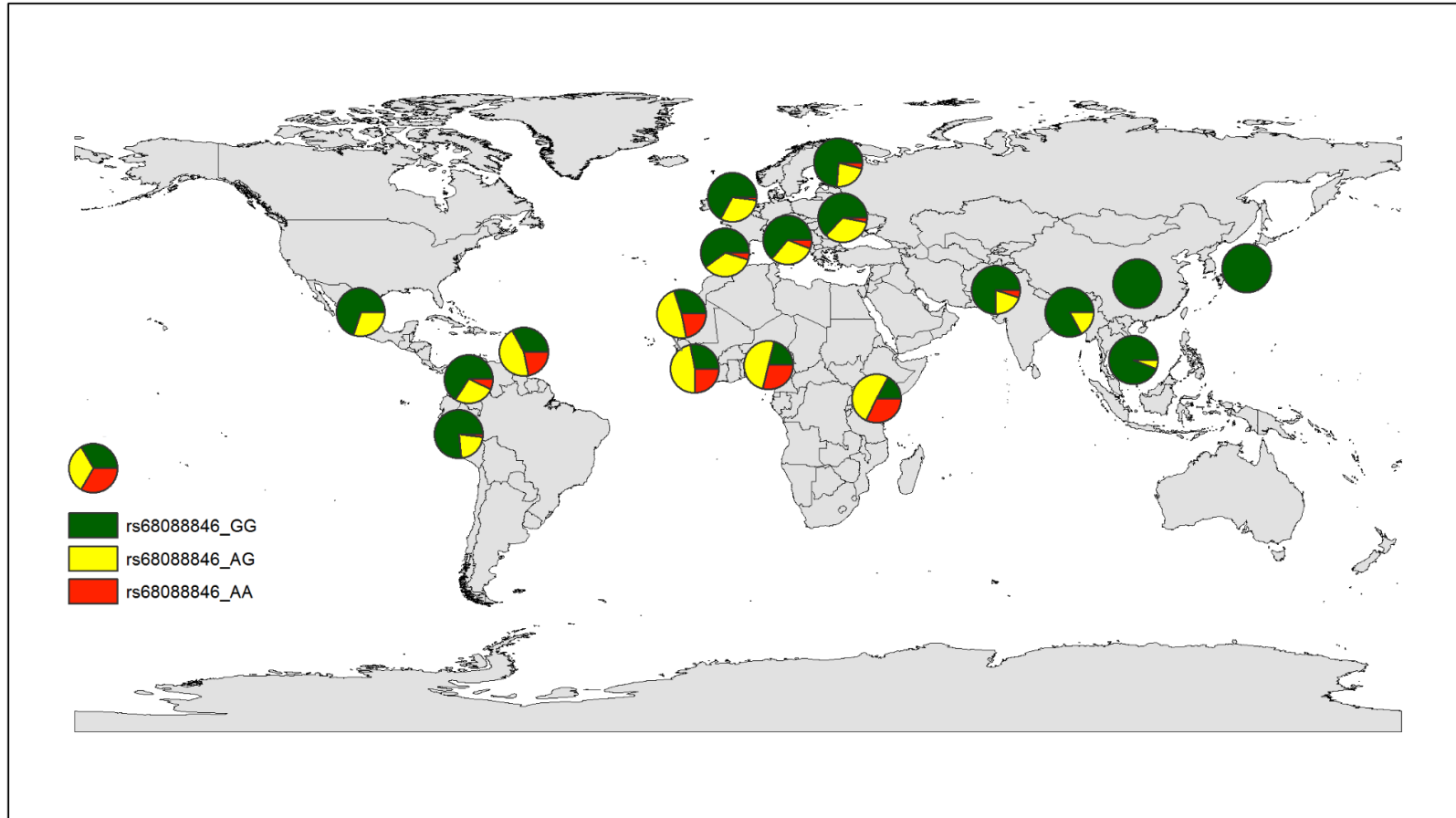
K



L

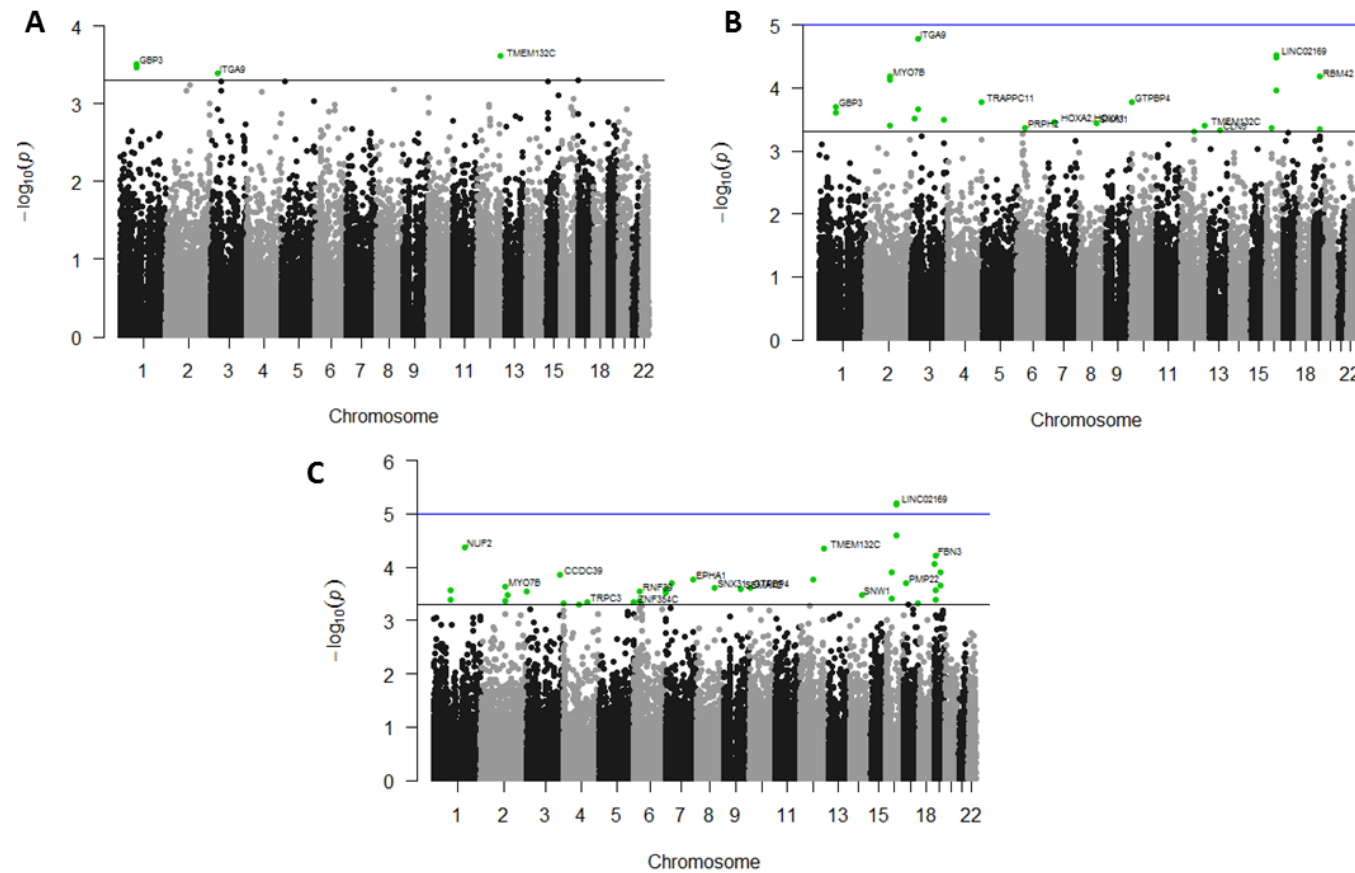


M



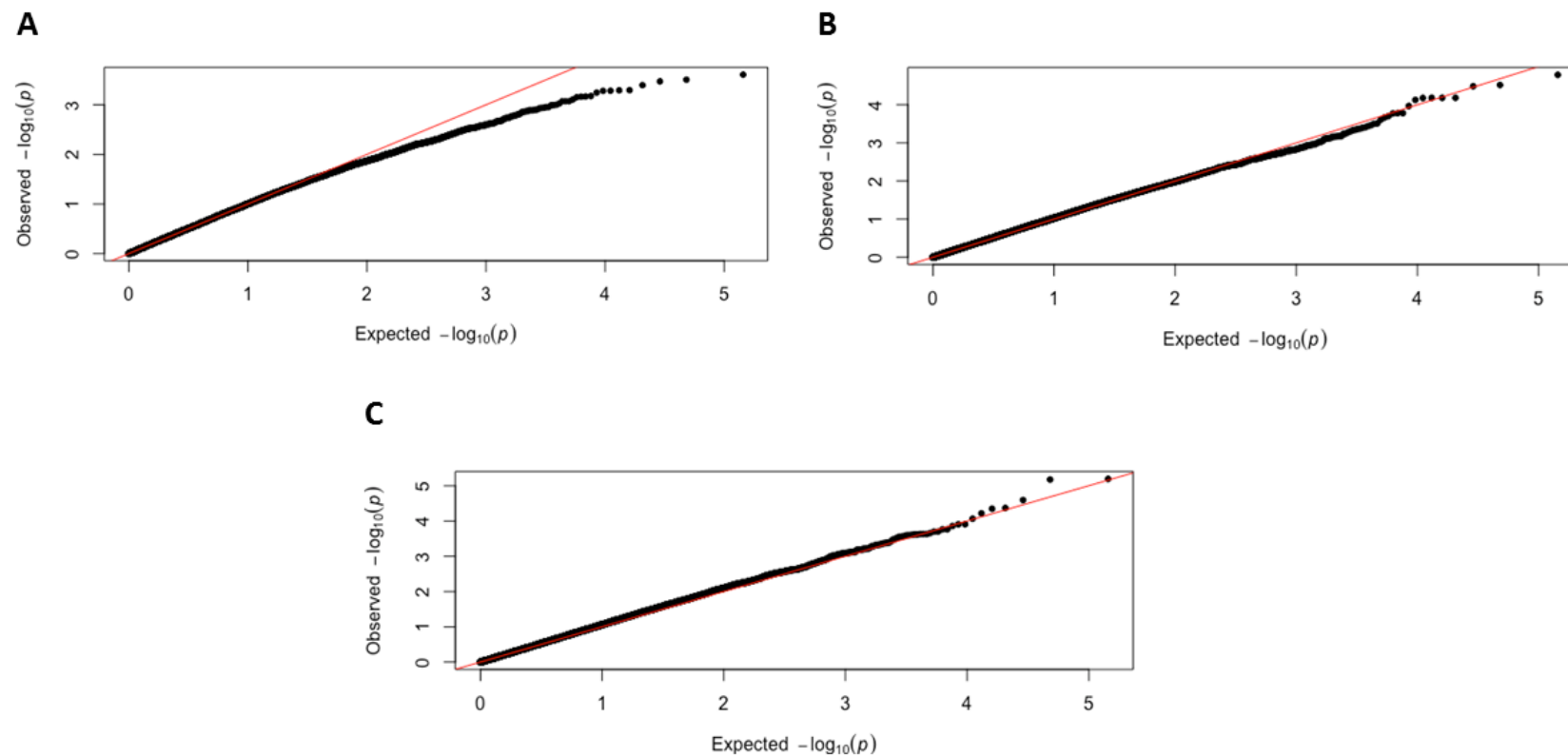
Supplementary Fig. 3 Global allele frequency distribution for 13 SNPs included in hair greying prediction models (**A** rs164741; **B** rs1005241; **C** rs1127228; **D** rs1683723; **E** rs2361506; **F** rs2416699; **G** rs2814331; **H** rs7680591; **I** rs10928235; **J** rs12203592; **K** rs45483393; **L**

rs59733750; **M** rs68088846). Allele frequencies for the selected SNPs were plotted on the world map using data from “The 1000 Genomes Project” (http://grch37.ensembl.org/Homo_sapiens/Info/Index) and ArcMap 10.7 under ArcGIS Desktop software (Esri, Redlands, California).



Supplementary Fig. 4 Manhattan plot of three EWAS analyses conducted in a 149 sample set for human head hair greying defined as A greying vs. no greying (BLR analysis); B no greying vs. mild greying vs. severe greying (MLR3 analysis); C 6-stage hair greying classification (MLR6 analysis). The $-\log_{10}(P)$ -values were plotted for each SNP under study according to its chromosomal position (GRCh38). The suggestive

significance threshold ($P\text{-value} = 5 \times 10^{-4}$) is indicated as a black horizontal line and SNPs that reached the suggestive significance threshold are marked with green.



Supplementary Fig. 5 Q-Q plots of three EWAS analyses conducted in a 149 sample set for human head hair greying defined as A greying vs. no greying (BLR analysis); B no greying vs. mild greying vs. severe greying (MLR3 analysis); C 6-stage hair greying classification (MLR6 analysis).

Supplementary Table 1 Characteristics of the study population including discovery and replication/prediction modelling cohorts

Cohort	Hair greying category							Total
	Cat. 1	Cat. 2	Cat. 3	Cat. 4	Cat. 5	Cat. 6	Cat. Grey ^a	
<i>Discovery cohort (N = 149)</i>								
N [%]	89 [59.7]	33 [22.1]	14 [9.4]	10 [6.7]	2 [1.4]	1 [0.7]	-	149 [100.0]
Male [%]	43 [48.3]	18 [54.5]	9 [64.3]	10 [100.0]	2 [100.0]	1 [100.0]	-	83 [55.7]
Mean age ± SD	25.5±6.0	37.1±7.5	40.0±6.7	44.2±3.9	50.0±0.0	55	-	31.2±9.6
<i>Replication and prediction modelling cohort (N = 849)</i>								
N [%]	518 [61.0]	177 [20.8]	76 [9.0]	45 [5.3]	5 [0.6]	2 [0.2]	26 [3.1]	849 [100.0]
Male [%]	322 [62.2]	147 [83.1]	65 [85.5]	41 [9.1]	5 [100.0]	0 [0.0]	10 [38.5]	590 [69.5]
Mean age ± SD	26.1±6.5	35.0±7.5	37.9±6.7	41.8±5.0	46.4±7.4	50.0±17.0	38.6±5.9	30.4±8.7
<i>Total cohort (N = 998)</i>								
N [%]	607 [60.8]	210 [21.1]	90 [9.0]	55 [5.5]	7 [0.7]	3 [0.3]	26 [2.6]	998 [100.0]
Male [%]	365 [60.1]	165 [78.6]	74 [82.2]	51 [92.7]	7 [100.0]	1 [33.3]	10 [38.5]	673 [67.4]
Mean age ± SD	26.0±6.5	35.3±7.2	38.3±6.7	42.2±4.9	47.4±6.3	51.7±12.3	38.6±5.9	30.5±8.8

^afor 26 samples only binary classification of greying vs. no greying was available

Supplementary Table 2 LD analysis conducted for exome-wide selected SNPs

SNP_ID_1	Chr position GRCh38	SNP_ID_2	Chr position GRCh38	r ²	SNP included in replication analysis
rs58719465	2:127609784	rs13422424	2:127624233	0.742	rs13422424
rs77159371	2:127620267	rs13422424	2:127624233	0.742	rs13422424
rs61744148	2:127621988	rs13422424	2:127624233	0.742	rs13422424
rs2507940	3:37494493	rs267561	3:37533460	0.801	rs2507940
rs17261971	2:127608697	rs58719465	2:127609784	0.808	rs13422424
rs17261971	2:127608697	rs77159371	2:127620267	0.808	rs13422424
rs17261971	2:127608697	rs61744148	2:127621988	0.808	rs13422424
rs73728107	6:30071046	rs11758516	6:30075709	0.867	rs11758516
rs72502509	6:30001413	rs11758516	6:30075709	0.881	rs11758516
rs34940876	16:27226713	rs1127228	16:27226789	0.983	rs1127228
rs36170987	7:259884	rs36139924	7:259915	0.986	rs36139924
rs58719465	2:127609784	rs77159371	2:127620267	1.000	rs13422424
rs58719465	2:127609784	rs61744148	2:127621988	1.000	rs13422424
rs77159371	2:127620267	rs61744148	2:127621988	1.000	rs13422424
rs17164384	4:1167692	rs6836335	4:1171960	1.000	rs6836335
rs72502509	6:30001413	rs73728107	6:30071046	1.000	rs11758516
rs2306408	10:1007010	rs2306406	10:1015922	1.000	rs2306406
rs72811791	16:54245728	rs16953255	16:54245775	1.000	rs72811791
rs72811791	16:54245728	rs72811792	16:54245781	1.000	rs72811791
rs16953255	16:54245775	rs72811792	16:54245781	1.000	rs72811791
rs72993508	19:8141675	rs72993510	19:8141684	1.000	rs56243829
rs72993508	19:8141675	rs56243829	19:8147279	1.000	rs56243829
rs72993510	19:8141684	rs56243829	19:8147279	1.000	rs56243829
rs4656076	1:89013171	rs3795543	1:89014075	1.000	rs4656076

Supplementary Table 3 A selection of exome-wide identified SNPs (P -value $< 5 \times 10^{-4}$) associated with hair greying in a discovery cohort of 149 individuals from Poland

No.	SNP_ID	Chr position GRCh38	Gene/Locus	Discovery cohort (N = 149)							
				MA	fMA	BLR	MLR3		MLR6		
							beta	P-value*	beta	P-value*	beta
1	rs4656076	1:89013171	GBP3	C	0.245	2.031	3.115×10 ⁻⁴	1.520	1.983×10 ⁻⁴	1.350	2.658×10 ⁻⁴
2	rs2999852	1:163339512	NUF2	C	0.057	2.214	0.014	2.134	0.002	2.499	4.262×10 ⁻⁵
3	rs13422424	2:127624233	MYO7B	T	0.151	2.147	5.668×10 ⁻⁴	1.940	7.452×10 ⁻⁵	1.500	4.231×10 ⁻⁴
4	rs79386904	2:141015954	LRP1B	G	0.054	2.274	0.015	1.926	0.004	2.209	3.311×10 ⁻⁴
5	rs59733750	2:240780193	KIF1A	G	0.144	-1.782	0.013	-1.787	0.002	-1.861	2.798×10 ⁻⁴
6	rs74393830	3:23134423	RPL24P7	G	0.081	1.220	0.059	1.992	3.096×10 ⁻⁴	1.496	6.113×10 ⁻⁴
7	rs2507940	3:37494493	ITGA9	C	0.443	2.066	4.009×10 ⁻⁴	2.014	1.642×10 ⁻⁵	1.058	0.001
8	rs6836335	4:1171960	SPON2	C	0.107	0.972	0.093	1.441	0.004	1.605	4.817×10 ⁻⁴
9	rs13131900	4:82580733	AC067942.2	G	0.151	2.601	7.018×10 ⁻⁴	1.583	0.001	1.427	4.945×10 ⁻⁴
10	rs1396082	4:121951564	TRPC3	G	0.487	0.400	0.286	0.969	0.005	1.082	4.491×10 ⁻⁴
11	rs62358032	4:183693964	TRAPPC11	C	0.084	2.414	0.002	2.252	1.689×10 ⁻⁴	1.663	7.619×10 ⁻⁴
12	rs35780223	5:179083069	ZNF354C	T	0.067	2.237	0.012	1.602	0.011	1.803	4.638×10 ⁻⁴
13	rs11758516	6:30075709	RNF39	C	0.057	2.509	0.002	2.222	5.434x10 ⁻⁴	2.119	2.860×10 ⁻⁴
14	rs7764439	6:42722017	PRPH2	A	0.456	0.627	0.092	1.175	4.246×10 ⁻⁴	1.039	5.319×10 ⁻⁴
15	rs36139924	7:259915	FAM20C	G	0.450	0.608	0.136	1.140	0.002	1.151	2.520×10 ⁻⁴
16	rs10951154	7:27095695	HOXA2;HOXA1	C	0.148	1.332	0.012	1.635	3.447×10 ⁻⁴	1.518	2.000×10 ⁻⁴
17	rs62472724	7:143391804	EPHA1	T	0.138	1.879	0.004	1.736	6.867×10 ⁻⁴	1.744	1.714×10 ⁻⁴
18	rs2248609	8:100596691	SNX31	C	0.289	1.597	6.645×10 ⁻⁴	1.378	3.641×10 ⁻⁴	1.254	2.463×10 ⁻⁴
19	rs45483393	9:89378809	SEMA4D	T	0.057	1.526	0.059	1.698	0.007	1.996	2.513×10 ⁻⁴
20	rs2306406	10:1015922	GTPBP4	G	0.154	2.139	0.001	1.734	1.664×10 ⁻⁴	1.459	2.402×10 ⁻⁴
21	rs2228654	12:68871798	CPM	A	0.423	1.535	0.002	1.202	6.777×10 ⁻⁴	1.153	1.717×10 ⁻⁴
22	rs17120917	12:69796628	RAB3IP	C	0.218	1.609	0.002	1.465	4.918×10 ⁻⁴	1.054	0.005
23	rs1683723	12:128415460	TMEM132C	A	0.399	-1.993	2.462×10 ⁻⁴	-1.397	3.916×10 ⁻⁴	-1.422	4.462×10 ⁻⁵
24	rs1800209	13:77000848	FBXL3; CLN5	G	0.054	2.917	0.001	2.496	4.615×10 ⁻⁴	2.146	7.492×10 ⁻⁴
25	rs17752628	14:77732443	SNW1	C	0.054	3.534	0.007	1.905	0.016	2.307	3.362×10 ⁻⁴
26	rs1127228	16:27226789	NSMCE1	T	0.362	-1.360	0.005	-1.452	4.312×10 ⁻⁴	-1.404	1.227×10 ⁻⁴
27	rs72811791	16:54245728	LINC02169	T	0.097	2.338	0.001	2.471	3.035×10 ⁻⁵	2.268	6.380×10 ⁻⁶

28	rs1804193	17:15230689	<i>PMP22</i>	T	0.144	-1.737	0.013	-2.087	6.956×10 ⁻⁴	-1.865	1.991×10⁻⁴
29	rs1043149	17:76081716	<i>EXOC7; ZACN</i>	T	0.161	-1.718	0.012	-1.948	0.002	-1.881	4.648×10⁻⁴
30	rs778982	19:5866574	<i>FUT5</i>	C	0.329	1.291	0.014	1.261	0.003	1.586	8.576×10⁻⁵
31	rs56243829	19: 8147279	<i>FBN3</i>	T	0.087	1.870	0.012	2.107	6.919×10 ⁻⁴	2.211	6.025×10⁻⁵
32	rs79338830	19: 35503484	<i>DMKN</i>	G	0.071	1.806	0.019	2.249	5.799×10 ⁻⁴	2.107	2.190×10⁻⁴
33	rs2285416	19:35637393	<i>RBM42</i>	A	0.158	1.559	0.006	1.978	6.654×10⁻⁵	1.591	1.240×10⁻⁴
34	rs547483	19:36950463	<i>ZNF568</i>	C	0.299	1.504	0.002	1.254	4.552×10⁻⁴	0.958	0.001

Significant results are marked with bold.

BLR, binomial logistic regression; MLR3, multinomial ordinal logistic regression for 3 hair greying categories; MLR6, multinomial ordinal logistic regression for 6 hair greying categories; MA, minor allele; fMA, frequency of minor allele.

*Results adjusted for age and sex

Supplementary Table 4 Replication analysis of EWAS results in a replication cohort of 849 Polish individuals

No.	SNP_ID	Chr position GRCh38	Gene/Locus	Replication cohort (N = 849)							
				MA	fMA	BLR	MLR3		MLR6		
							beta	P-value ^a	beta	P-value ^a	beta
1	rs4656076	1:89013171	GBP3	C	0.222	0.055	0.727	0.059	0.691	0.040	0.778
2	rs2999852	1:163339512	NUF2	C	0.051	0.097	0.728	0.104	0.675	0.187	0.423
3	rs13422424	2:127624233	MYO7B	T	0.178	0.047	0.775	-0.028	0.853	-0.076	0.598
4	rs79386904	2:141015954	LRP1B	G	0.044	-0.568	0.068	-0.493	0.103	-0.372	0.205
5	rs59733750	2:240780193	KIF1A	G	0.163	-0.484	0.007	-0.541	0.002	-0.569	5.473×10 ⁻⁴
6	rs74393830	3:23134423	RPL24P7	G	0.091	-0.076	0.732	-0.138	0.510	-0.197	0.323
7	rs2507940	3:37494493	ITGA9	C	0.522	0.004	0.978	0.010	0.933	-0.015	0.896
8	rs6836335	4:1171960	SPON2	C	0.137	-0.014	0.942	-0.018	0.916	0.005	0.977
9	rs13131900	4:82580733	AC067942.2	G	0.141	0.079	0.665	0.097	0.570	0.152	0.348
10	rs34306906 ^b	4:121944043	TRPC3	C	0.490	0.011	0.930	-0.051	0.681	-0.060	0.610
11	rs62358032	4:183693964	TRAPPC11	C	0.116	-0.074	0.719	0.080	0.666	0.146	0.402
12	rs35780223	5:179083069	ZNF354C	T	0.058	0.047	0.864	0.183	0.483	0.174	0.479
13	rs11758516	6:30075709	RNF39	C	0.043	-0.433	0.165	-0.507	0.116	-0.352	0.255
14	rs7764439	6:42722017	PRPH2	A	0.456	-0.061	0.645	0.009	0.940	-0.012	0.917
15	rs36139924	7:259915	FAM20C	G	0.462	-0.116	0.369	-0.073	0.543	0.012	0.914
16	rs10951154	7:27095695	HOXA2;HOXA1	C	0.159	0.092	0.602	-0.013	0.938	0.021	0.896
17	rs62472724	7:143391804	EPHA1	T	0.164	-0.085	0.631	-0.157	0.355	-0.163	0.314
18	rs2248609	8:100596691	SNX31	C	0.303	-0.215	0.125	-0.196	0.136	-0.161	0.196
19	rs45483393	9:89378809	SEMA4D	T	0.035	0.510	0.139	0.530	0.075	0.497	0.076
20	rs2306406	10:1015922	GTPBP4	G	0.204	0.054	0.732	0.027	0.858	0.050	0.727
21	rs2228654	12:68871798	CPM	A	0.437	0.190	0.163	0.101	0.426	0.092	0.443
22	rs17120917	12:69796628	RAB3IP	C	0.247	-0.124	0.410	-0.176	0.214	-0.162	0.228
23	rs1683723	12:128415460	TMEM132C	A	0.433	0.080	0.533	0.135	0.267	0.158	0.168
24	rs1800209	13:77000848	FBXL3; CLN5	G	0.078	-0.359	0.150	-0.377	0.112	-0.304	0.183
25	rs17752628	14:77732443	SNW1	C	0.067	0.227	0.383	0.216	0.365	0.174	0.437
26	rs1127228	16:27226789	NSMCE1	T	0.347	-0.241	0.079	-0.314	0.015	-0.283	0.022
27	rs72811791	16:54245728	LINC02169	T	0.099	0.048	0.818	0.069	0.727	0.076	0.687
28	rs1804193	17:15230689	PMP22	T	0.118	0.236	0.234	0.184	0.318	0.130	0.454

29	rs1043149	17:76081716	<i>EXOC7; ZACN</i>	T	0.173	-0.117	0.486	-0.154	0.336	-0.080	0.602
30	rs778982	19:5866574	<i>FUT5</i>	C	0.254	-0.040	0.788	-0.070	0.615	-0.113	0.397
31	rs72993531 ^b	19:8147640	<i>FBN3</i>	T	0.115	0.035	0.862	-0.034	0.863	-0.045	0.811
32	rs77995042 ^b	19:35508296	<i>DMKN</i>	T	0.056	0.088	0.745	-0.027	0.913	-0.045	0.847
33	rs2285416	19:35637393	<i>RBM42</i>	A	0.127	0.093	0.631	-0.013	0.942	-0.029	0.863
34	rs547483	19:36950463	<i>ZNF568</i>	C	0.318	0.017	0.904	0.131	0.326	0.052	0.681

Significant results are marked with bold.

BLR, binomial logistic regression; MLR3, multinomial ordinal logistic regression for 3 hair greying categories; MLR6, multinomial ordinal logistic regression for 6 hair greying categories; MA, minor allele; fMA, frequency of minor allele.

^aResults adjusted for age and sex

^bDue to technical difficulties three SNPs: *TRPC3* rs1396082, *FBN3* rs56243829 and *DMKN* rs79338830 were replaced by different SNPs in LD (*TRPC3* rs34306906, *FBN3* rs72993531 and *DMKN* rs77995042)

Supplementary Table 5 Results of association testing for 336 literature-based selected candidate SNPs for hair greying associated previously with hair colour/pigmentation, hair loss, hair shape and hair thickness

No.	SNP_ID	Chr position GRCh38	Gene	fMA	BLR		MLR3		MLR6		Trait association	References
					beta	P-value*	beta	P-value*	beta	P-value*		
1	rs80293268	1:8147519	ERRFII; SLC45A1	C 0.08	-0.483	0.048	-0.390	0.090	-0.366	0.093	Hair shape	[1,2]
2	rs6658216	1:10501547	PEX14	C 0.30	-0.083	0.554	-0.002	0.988	0.037	0.766	Hair shape	[1,2]
3	rs10864459	1:10503552	PEX14	A 0.31	-0.076	0.584	-0.007	0.959	0.032	0.794	Hair shape	[1]
4	rs2847344	1:10504618	PEX14	G 0.32	-0.093	0.499	-0.022	0.866	0.012	0.923	Hair shape	[1]
5	rs12565727	1:10973025	C1orf127	G 0.22	-0.297	0.064	-0.222	0.141	-0.224	0.119	Hair loss	[3-5]
6	rs11203346	1:17274327	PADI3	G 0.16	-0.085	0.627	-0.096	0.550	-0.059	0.695	Hair shape	[1,2]
7	rs11585118	1:17279279	PADI3	A 0.15	-0.098	0.581	-0.112	0.497	-0.077	0.620	Hair shape	[6]
8	rs9803789	1:25141755	lp36.11	G 0.35	-0.100	0.450	-0.011	0.931	-0.024	0.839	Hair loss	[7]
9	rs16827770	1:40918052	CITED4	G 0.30	0.216	0.133	0.118	0.386	0.134	0.302	Hair loss	[8]
10	rs17371253	1:47489755	FOXD2	T 0.43	0.005	0.970	-0.125	0.305	-0.141	0.222	Hair loss	[9]
11	rs10888690	1:50494849	FAF1	C 0.30	0.017	0.902	0.006	0.961	-0.075	0.539	Hair loss	[8]
12	rs10874518	1:101806756	OLFM3	C 0.35	-0.123	0.381	0.009	0.946	0.037	0.762	Pigmentation	[10]
13	rs111668293	1:118896200	TBX15; WARS2	- 0.16	-0.130	0.470	-0.087	0.601	-0.024	0.878	Hair loss	[7]
14	rs17185996	1:119066109	WARS2	C 0.18	-0.168	0.310	-0.277	0.077	-0.270	0.069	Hair loss	[9]
15	rs11204897	1:151836590	LOC100132111	G 0.11	-0.039	0.839	-0.014	0.937	-0.020	0.906	Hair shape	[1-2]
16	rs75203436	1:151869882	1q21.3	G 0.06	0.075	0.787	-0.015	0.953	0.003	0.991	Hair shape	[1-2]
17	rs55883933	1:151916971	1q21.3	C 0.22	0.108	0.474	0.005	0.974	0.048	0.724	Hair shape	[1-2]
18	rs10788819	1:151922617	LOC105373470	T 0.21	0.130	0.399	0.025	0.865	0.074	0.593	Hair shape	[1,6,11]
19	rs114410520	1:152000133	LOC105371441	C 0.02	0.438	0.372	0.264	0.547	0.287	0.481	Hair shape	[1-2]
20	rs3007671	1:152026871	NBPF18P; S100A11	T 0.30	0.065	0.641	0.030	0.821	0.132	0.288	Hair shape	[1,6,11]
21	rs151069963	1:152031765	1q21.3	C 0.01	0.891	0.081	0.863	0.077	0.841	0.066	Hair shape	[1-2]
22	rs3007681	1:152046881	LOC101927949	C 0.50	0.023	0.854	0.010	0.931	-0.039	0.733	Hair shape	[1-2]
23	rs12130862	1:152054539	near TCHH	T 0.25	0.205	0.157	0.141	0.295	0.241	0.059	Hair shape	[1,6,11,12]
24	rs17646946	1:152090291	TCHHL1	A 0.25	0.183	0.204	0.115	0.393	0.201	0.115	Hair shape	[1,2,12]
25	rs11204925	1:152100644	1q21.3	G 0.30	0.119	0.395	0.180	0.175	0.131	0.298	Hair shape	[1-2]
26	rs1131471	1:152107513	TCHH	G 0.43	-0.247	0.058	-0.237	0.052	-0.279	0.016	Hair shape	[1-2]
27	rs11803731	1:152110849	TCHH	T 0.25	0.186	0.200	0.129	0.341	0.212	0.096	Hair shape	[1,6,11,12]

28	rs72696935	1:152113475	<i>TCHH</i>	G 0.04	0.083	0.794	0.020	0.944	0.034	0.901	Hair shape	[1-2]
29	rs36010924	1:152116368	<i>PUDPP2; TCHH</i>	G 0.25	0.186	0.200	0.129	0.341	0.212	0.096	Hair loss	[8]
30	rs140371183	1:152125952	1q21.3	G 0.01	0.295	0.668	0.148	0.818	0.096	0.872	Hair shape	[1-2]
31	rs3001978	1:152153991	<i>RPTN</i>	C 0.43	-0.247	0.058	-0.237	0.052	-0.279	0.016	Hair shape	[1,6,11,13]
32	rs4845418	1:152163754	<i>near TCHH</i>	C 0.20	0.149	0.341	0.089	0.539	0.182	0.183	Hair shape	[1,6,11,12]
33	rs10788826	1:152189259	1q21.3	C 0.30	-0.119	0.405	-0.123	0.363	-0.128	0.321	Hair shape	[1-2]
34	rs74868796	1:152218575	<i>HRNR</i>	A 0.02	-0.290	0.420	-0.028	0.933	0.130	0.668	Hair shape	[1-2]
35	rs61816764	1:152336495	<i>FLG-AS1</i>	T 0.04	-0.550	0.096	-0.514	0.116	-0.511	0.105	Hair shape	[1-2]
36	rs2050631	1:152340121	<i>FLG-AS1</i>	G 0.35	0.067	0.611	0.053	0.668	0.063	0.590	Hair shape	[1-2]
37	rs2146114	1:152418145	1q21.3	C 0.14	-0.078	0.676	-0.001	0.995	-0.013	0.939	Hair shape	[1-2]
38	rs12116760	1:152465407	1q21.3	C 0.38	-0.087	0.519	-0.081	0.517	-0.117	0.323	Hair shape	[1-2]
39	rs12123907	1:152495275	1q21.3	A 0.33	0.015	0.917	0.134	0.308	0.157	0.209	Hair shape	[1-2]
40	rs4845779	1:152506700	<i>CRNN; LCE5A</i>	T 0.25	-0.192	0.197	-0.203	0.149	-0.199	0.135	Hair shape	[1-2]
41	rs499697	1:152520678	<i>CRCT1; near LCE3E</i>	G 0.24	-0.201	0.185	-0.215	0.136	-0.203	0.137	Hair shape	[1,6,11]
42	rs115813648	1:152949110	<i>LINC01527</i>	C 0.00	0.555	0.472	0.414	0.578	0.485	0.475	Hair shape	[1-2]
43	rs10919382	1:170392023	<i>GORAB</i>	G 0.33	-0.003	0.980	-0.104	0.423	-0.070	0.573	Hair loss	[7]
44	rs2206310	1:170803635	<i>PRRX1; MROH9</i>	G 0.35	0.042	0.755	-0.017	0.890	0.038	0.749	Hair loss	[9]
45	rs78448052	1:203996272	<i>SOX13</i>	T 0.02	0.311	0.486	0.119	0.779	0.034	0.931	Hair loss	[8]
46	rs3002288	1:212953223	<i>VASH2</i>	A 0.45	0.098	0.469	0.087	0.487	0.055	0.640	Pigmentation	[14]
47	rs4846480	1:218425127	<i>TGFB2</i>	T 0.25	-0.044	0.764	-0.085	0.535	-0.059	0.649	Hair shape	[15]
48	rs3768056	1:235744525	<i>LYST</i>	G 0.22	0.153	0.323	0.096	0.500	0.099	0.463	Pigmentation	[16]
49	rs12997617	2:6413568	2p25.2	T 0.14	0.073	0.688	0.202	0.229	0.175	0.271	Hair loss	[9]
50	rs6752754	2:6429434	<i>ESPN</i>	G 0.15	-0.006	0.972	0.160	0.337	0.157	0.322	Hair loss	[8]
51	rs7586898	2:15821475	<i>DDX1; RNU5E-7P</i>	G 0.17	0.274	0.101	0.174	0.261	0.087	0.555	Hair shape	[11]
52	rs844193	2:30403557	2p23.1	T 0.20	0.000	0.999	0.058	0.703	0.075	0.604	Hair loss	[8]
53	rs13021718	2:31956355	<i>MEMO1</i>	A 0.13	-0.214	0.269	-0.098	0.591	0.023	0.896	Hair loss	[7]
54	rs6732426	2:43360365	<i>THADA</i>	T 0.49	-0.032	0.810	0.039	0.755	0.000	0.998	Hair shape	[11]
55	rs17035085	2:46378148	<i>EPAS1</i>	G 0.01	-0.170	0.745	-0.401	0.446	-0.500	0.320	Hair shape	[11]
56	rs12464462	2:60409281	2p16.1	G 0.42	-0.111	0.394	-0.167	0.176	-0.101	0.390	Hair loss	[8]
57	rs9989836	2:70115595	2p13.3	A 0.31	-0.261	0.063	-0.220	0.096	-0.204	0.105	Hair shape	[1-2]
58	rs2706768	2:70229454	<i>TIA1</i>	T 0.39	-0.101	0.433	-0.058	0.630	-0.042	0.713	Hair loss	[8]
59	rs12997742	2:70559466	<i>TGFA</i>	C 0.40	0.120	0.360	0.055	0.649	0.085	0.455	Hair shape	[1-2]
60	rs205611	2:74744954	2p13.1	G 0.18	-0.051	0.762	-0.026	0.873	-0.036	0.815	Pigmentation	[10]
61	rs3827760	2:108897145	<i>EDAR</i>	G 0.01	-0.754	0.221	-0.293	0.606	-0.277	0.624	Hair shape	[17-19]

62	rs365060	2:108959280	<i>EDAR</i>	G 0.07	-0.051	0.838	0.038	0.868	0.111	0.610	Hair thickness	[20]
63	rs10928235	2:144920547	<i>TEX41</i>	T 0.24	0.253	0.080	0.264	0.049	0.177	0.165	Hair loss	[8]
64	rs13405699	2:173740905	<i>CDCA7</i>	A 0.03	-0.044	0.908	0.007	0.984	0.119	0.717	Hair loss	[8]
65	rs71421546	2:176127129	<i>HOXD-AS2;HOXD3</i>	A 0.04	-0.660	0.050	-0.687	0.037	-0.580	0.064	Hair loss	[8]
66	rs881921	2:176831781	<i>HNRNPA3</i>	G 0.44	-0.178	0.163	-0.124	0.304	-0.099	0.385	Hair loss	[8]
67	rs692243	2:218830764	<i>PRKAG3</i>	C 0.18	-0.203	0.230	-0.228	0.151	-0.125	0.403	Hair shape	[1-2]
68	rs10193725	2:218861775	<i>WNT6</i>	C 0.17	-0.096	0.561	-0.120	0.440	-0.009	0.954	Hair loss	[4,5,21]
69	rs74333950	2:218881570	<i>WNT10A</i>	G 0.12	-0.334	0.116	-0.310	0.121	-0.214	0.257	Hair shape	[1-2]
70	rs7349332	2:218891661	<i>WNT10A</i>	T 0.11	-0.386	0.071	-0.345	0.087	-0.255	0.179	Hair loss/shape	[1,2,6,11,12,21]
71	rs77157375	2:218915189	<i>LINC01494</i>	A 0.02	-0.427	0.380	-0.728	0.136	-0.440	0.353	Hair shape	[1-2]
72	rs4672907	2:218956447	<i>LOC391485</i>	A 0.15	-0.388	0.033	-0.187	0.271	-0.177	0.275	Hair shape	[1,6,11]
73	rs2218065	2:222169363	2q36.1	A 0.35	0.076	0.572	-0.010	0.939	-0.015	0.896	Hair thickness	[20]
74	rs77177529	2:222205957	<i>PAX3</i>	T 0.08	-0.038	0.868	-0.152	0.490	-0.208	0.330	Hair loss	[7,8]
75	rs6742078	2:233763993	<i>UGT1A</i>	T 0.36	0.092	0.507	-0.065	0.610	0.002	0.986	Pigmentation	[22]
76	rs79693451	2:238387832	<i>TRAF3IP1</i>	G 0.07	-0.179	0.494	0.024	0.922	0.032	0.894	Pigmentation	[10]
77	rs9287638	2:238785990	2q37.3	A 0.33	0.189	0.160	0.117	0.356	0.123	0.304	Hair loss	[3,4,5]
78	rs11684254	2:238787252	<i>TWIST2</i>	G 0.34	0.188	0.155	0.140	0.262	0.145	0.219	Hair loss	[7,8]
79	rs9751918	2:238827171	2q37.3	G 0.21	0.200	0.224	0.166	0.276	0.181	0.207	Hair loss	[3,5]
80	rs9846246	3:107705243	<i>BBX</i>	G 0.48	0.125	0.325	0.016	0.895	-0.026	0.819	Hair loss	[8]
81	rs9850626	3:126349936	<i>KLF15</i>	G 0.21	-0.252	0.116	-0.160	0.291	-0.173	0.230	Hair loss	[9]
82	rs35892873	3:126350105	<i>KLF15</i>	T 0.28	0.257	0.069	0.146	0.264	0.112	0.365	Hair loss	[8]
83	rs75937217	3:138957929	<i>FOXL2</i>	C 0.00	1.675	0.091	1.309	0.142	1.320	0.096	Hair thickness	[20]
84	rs7642536	3:139313491	<i>MRPS22</i>	C 0.15	-0.254	0.165	-0.266	0.130	-0.255	0.131	Hair loss	[7]
85	rs11714208	3:141576208	<i>RASA2; ALPL</i>	G 0.34	0.067	0.633	-0.050	0.706	-0.026	0.835	Hair loss	[8]
86	rs7648585	3:151921977	<i>AADACL2; ASI</i>	G 0.38	0.158	0.234	0.048	0.700	0.075	0.523	Hair loss	[5,21]
87	rs4679955	3:151935580	<i>SUCNR1</i>	T 0.41	0.087	0.505	0.002	0.989	0.019	0.866	Hair loss/shape	[4,5,12,21]
88	rs16863765	3:151956689	<i>AADAC</i>	A 0.33	0.064	0.642	0.067	0.601	0.048	0.692	Hair loss	[8]
89	rs55854644	3:185508704	<i>LIPH</i>	T 0.30	0.062	0.668	0.084	0.536	0.094	0.462	Hair shape	[23]
90	rs505569	3:185518327	<i>LIPH</i>	G 0.45	0.097	0.454	0.130	0.287	0.119	0.304	Hair shape	[23]
91	rs551936	3:185545679	<i>LIPH</i>	C 0.17	-0.038	0.827	-0.062	0.697	-0.109	0.469	Hair shape	[23]
92	rs4864809	4:53645746	<i>LNXI</i>	A 0.35	0.135	0.324	0.102	0.429	0.059	0.633	Hair thickness	[20]
93	rs436034	4:78334882	<i>FRAS1</i>	T 0.25	0.084	0.563	0.171	0.214	0.150	0.252	Hair shape	[1,11]
94	rs1268789	4:78359539	<i>FRAS1</i>	T 0.31	0.014	0.918	0.052	0.688	0.060	0.626	Hair shape	[1,2,11-13]

95	rs7680591	4:80276795	FGF5	A 0.42	-0.340	0.011	-0.376	0.003	-0.347	0.004	Hair loss	[7]
96	rs142756290	4:104952656	<i>CXXC4; TET2</i>	C 0.06	0.134	0.616	0.217	0.370	0.049	0.831	Hair loss	[9]
97	rs12509636	4:105089276	<i>TET2</i>	T 0.39	-0.005	0.970	-0.003	0.982	-0.065	0.599	Hair loss	[8]
98	rs76067940	4:107131838	<i>DKK2</i>	T 0.03	-0.216	0.527	-0.387	0.257	-0.397	0.221	Hair loss	[8]
99	rs17316633	4:109904478	<i>EGF</i>	A 0.25	0.067	0.658	-0.044	0.759	0.004	0.975	Hair shape	[11]
100	rs724818	4:120705958	<i>PRDM5</i>	A 0.02	-0.520	0.243	-0.521	0.231	-0.371	0.376	Hair thickness	[20]
101	rs4864363	4:136770595	4q28.3	G 0.14	-0.076	0.678	-0.124	0.472	-0.155	0.349	Hair shape	[20]
102	rs6840361	4:162816969	<i>NAF1</i>	G 0.05	0.162	0.583	-0.044	0.879	-0.185	0.502	Hair shape	[11]
103	rs17053607	4:167868421	<i>ANXA10</i>	A 0.03	0.127	0.696	0.109	0.725	0.188	0.525	Hair loss	[9]
104	rs13140875	4:167936311	<i>ANXA10</i>	C 0.11	-0.181	0.377	-0.316	0.104	-0.148	0.414	Pigmentation	[10]
105	rs12520016	5:6767199	<i>LOC102724943</i>	G 0.05	-0.282	0.342	-0.379	0.185	-0.265	0.337	Pigmentation	[14]
106	rs16891982	5:33951588	<i>SLC45A2</i>	C 0.04	-0.094	0.780	-0.131	0.690	-0.131	0.680	Pigmentation	[24-28]
107	rs28777	5:33958854	<i>SLC45A2</i>	C 0.03	-0.075	0.829	-0.120	0.731	-0.110	0.741	Pigmentation	[25,29]
108	rs26722	5:33963765	<i>SLC45A2</i>	T 0.02	-0.141	0.732	0.119	0.760	0.126	0.735	Pigmentation	[24,25,29,30]
109	rs183671	5:33964105	<i>SLC45A2</i>	T 0.04	-0.018	0.959	0.083	0.802	0.109	0.728	Pigmentation	[24,31]
110	rs13289	5:33986304	<i>SLC45A2</i>	C 0.43	0.216	0.109	0.146	0.248	0.162	0.177	Pigmentation	[32,33]
111	rs7702331	5:73255307	5q13.2	G 0.42	-0.036	0.776	0.061	0.611	0.068	0.551	Hair thickness	[20]
112	rs141577316	5:74129813	<i>ARHGEF28; ENC1</i>	T 0.01	0.230	0.632	0.254	0.580	0.248	0.566	Hair loss	[9]
113	rs335145	5:123108890	<i>PRDM6</i>	G 0.34	0.056	0.681	0.043	0.736	0.033	0.782	Hair loss	[8]
114	rs929626	5:158883623	EBF1	G 0.45	0.210	0.109	0.291	0.020	0.275	0.022	Hair loss	[4,5,21]
115	rs1081073	5:158954504	EBF1	A 0.48	0.201	0.118	0.285	0.020	0.271	0.021	Hair loss	[5,21]
116	rs62389424	6:422631	IRF4	A 0.07	0.206	0.418	0.402	0.084	0.519	0.017	Pigmentation	[34]
117	rs4959270	6:457748	<i>EXOC2</i>	A 0.44	0.118	0.380	0.173	0.169	0.216	0.070	Pigmentation	[25,29]
118	rs1540771	6:466033	SEC5L1; IRF4	T 0.45	0.183	0.171	0.216	0.085	0.269	0.024	Pigmentation	[25,29,35]
119	rs12197419	6:1708803	<i>GMDS</i>	C 0.24	-0.042	0.781	-0.067	0.641	-0.082	0.546	Hair thickness	[20]
120	rs4959410	6:6803205	6p25.1	T 0.37	-0.007	0.957	0.022	0.856	0.013	0.906	Hair loss	[5]
121	rs9348805	6:9334286	<i>OFCC1; SLC35B3</i>	G 0.40	0.004	0.974	0.045	0.717	0.030	0.799	Hair loss	[7]
122	rs1556547	6:10270144	<i>near OFCC1</i>	G 0.49	-0.181	0.164	-0.147	0.228	-0.166	0.151	Hair shape	[6]
123	rs7762265	6:21836604	<i>SOX4; NBAT1</i>	A 0.25	0.060	0.690	-0.011	0.941	-0.006	0.964	Hair loss	[9]
124	rs6901317	6:105588276	<i>PREP</i>	T 0.31	0.100	0.468	0.131	0.313	0.111	0.365	Hair thickness	[20]
125	rs12214131	6:105760046	6q21	A 0.32	0.046	0.741	0.034	0.798	-0.013	0.917	Hair loss	[8]
126	rs9388490	6:126383649	<i>CENPW</i>	T 0.43	-0.135	0.306	-0.094	0.451	-0.089	0.454	Hair loss	[7]
127	rs138345544	6:136204874	<i>RP1-143G15.4</i>	A 0.00	-0.113	0.930	0.096	0.929	0.318	0.726	Hair shape	[11]
128	rs9691699	7:493715	<i>PDGFA</i>	G 0.46	-0.002	0.989	0.026	0.829	0.025	0.819	Hair loss	[7,8]

129	rs2110015	7:17773115	SNXI3	C 0.39	-0.322	0.021	-0.260	0.040	-0.286	0.017	Pigmentation	[36]
130	rs2073963	7:18838251	HDAC9	G 0.38	-0.179	0.164	-0.161	0.186	-0.204	0.079	Hair loss	[3-5]
131	rs756853	7:18850377	HDAC9	G 0.40	-0.141	0.269	-0.114	0.343	-0.170	0.141	Hair loss	[4,37]
132	rs6461387	7:18858682	HDAC9	A 0.39	-0.118	0.363	-0.093	0.444	-0.113	0.326	Hair loss	[4,9]
133	rs58788673	7:46864701	EPS15P1	CA 0.24	0.186	0.215	0.060	0.672	0.078	0.562	Hair loss	[8]
134	rs11766798	7:55056626	EGFR	A 0.26	0.147	0.314	0.194	0.155	0.095	0.468	Hair shape	[15]
135	rs939963	7:69122810	RNU6; AUTS2	G 0.45	-0.083	0.516	-0.070	0.556	-0.090	0.425	Hair loss	[7,8]
136	rs6945541	7:69146973	7q11.22	C 0.43	-0.137	0.296	-0.107	0.386	-0.124	0.291	Hair loss	[3-5,7]
137	rs10235789	7:84027484	SEMA3A	C 0.48	0.086	0.513	0.077	0.535	0.072	0.540	Pigmentation	[10]
138	rs2373391	7:88819986	ZNF804B	A 0.24	-0.049	0.753	-0.048	0.743	-0.072	0.601	Pigmentation	[38]
139	rs382270	7:102079556	CUX1	G 0.44	-0.068	0.614	-0.035	0.781	0.039	0.743	Hair shape	[15]
140	rs73199888	7:110116961	EIF3IP1	C 0.25	-0.003	0.983	0.004	0.977	0.033	0.804	Hair shape	[20]
141	rs117717824	7:114349147	FOXP2	T 0.01	1.219	0.124	1.180	0.058	0.929	0.109	Hair thickness	[20]
142	rs9719620	7:131309621	MKLN1	T 0.49	0.107	0.396	0.051	0.669	0.076	0.498	Hair loss	[8]
143	rs1454292	8:5068943	PAICSP4; RSL24DIP7	C 0.47	0.127	0.322	0.088	0.460	0.103	0.366	Hair shape	[11]
144	rs2047198	8:107950399	RSPO2	C 0.42	0.045	0.727	0.098	0.415	0.107	0.352	Hair loss	[7,8]
145	rs79206101	8:108133327	near RSPO2	T 0.00	0.590	0.521	0.451	0.542	0.903	0.173	Hair loss	[7]
146	rs9297550	8:116023559	LINC00536	G 0.36	0.048	0.723	0.089	0.488	0.105	0.382	Hair loss	[8]
147	rs7866411	9:2475084	LOC101930053	G 0.32	0.187	0.182	0.245	0.058	0.164	0.178	Pigmentation	[36]
148	rs12236890	9:3157137	9p24.2	C 0.45	-0.001	0.997	0.054	0.644	0.124	0.266	Hair thickness	[20]
149	rs1408799	9:12672097	TYRP1	T 0.31	-0.186	0.192	-0.144	0.281	-0.170	0.181	Pigmentation	[14,39-41]
150	rs683	9:12709305	TYRP1	C 0.35	-0.110	0.423	-0.102	0.434	-0.189	0.126	Pigmentation	[29,42]
151	rs10756819	9:16858086	BNC2	G 0.40	-0.051	0.708	-0.070	0.582	-0.077	0.521	Pigmentation	[22]
152	rs2153271	9:16864523	BNC2	C 0.47	-0.224	0.091	-0.224	0.067	-0.181	0.118	Pigmentation	[6,43]
153	rs12350739	9:16885019	BNC2	G 0.48	-0.131	0.326	-0.165	0.180	-0.124	0.288	Pigmentation	[44,45]
154	rs12686549	9:106867783	ZNF462	G 0.06	0.212	0.444	0.229	0.371	0.150	0.530	Hair loss	[8]
155	rs2416699	9:119434462	BRINP1	T 0.16	-0.369	0.036	-0.363	0.030	-0.275	0.083	Hair loss	[9]
156	rs62578126	9:126613059	LMX1B	T 0.31	0.035	0.803	0.058	0.658	0.003	0.981	Hair thickness	[20]
157	rs2784081	9:136897439	TRAF2	C 0.21	-0.015	0.922	-0.074	0.621	-0.040	0.776	Hair shape	[46]
158	rs4881147	10:3300582	PFKP; PITRM1	T 0.25	0.126	0.387	0.095	0.484	0.124	0.333	Hair shape	[20]
159	rs2489250	10:8232904	10p14	C 0.47	0.310	0.019	0.315	0.010	0.274	0.019	Hair shape	[1-2]
160	rs17143387	10:8272081	GATA3	G 0.15	0.349	0.049	0.247	0.128	0.176	0.254	Hair shape	[20]
161	rs1999874	10:8311138	GATA3	A 0.39	0.097	0.465	0.122	0.329	0.094	0.427	Hair shape	[1-2]
162	rs2807691	10:61157638	RHOBTB1	A 0.44	0.158	0.217	0.162	0.173	0.152	0.180	Hair loss	[8]

163	rs11593840	10:76436854	<i>LRMDA</i>	G 0.43	0.092	0.491	0.098	0.433	0.123	0.307	Hair loss	[8]
164	rs2814331	10:86233584	<i>GRID1</i>	C 0.07	0.483	0.056	0.479	0.032	0.448	0.032	Hair loss	[20]
165	rs4752566	10:121508117	<i>FGFR2</i>	T 0.47	-0.176	0.193	-0.070	0.579	-0.034	0.775	Hair shape	[15]
166	rs3781452	10:124666560	<i>FAM53B</i>	C 0.38	0.100	0.466	0.117	0.352	0.162	0.174	Hair loss	[7]
167	rs2219783	11:27389751	<i>LGR4</i>	G 0.06	0.003	0.991	-0.073	0.756	-0.250	0.272	Hair shape	[1-2]
168	rs78321654	11:27431772	<i>LGR4</i>	A 0.02	0.559	0.193	0.499	0.206	0.302	0.426	Hair loss	[7]
169	rs79811440	11:27432205	<i>LGR4</i>	C 0.02	0.533	0.211	0.478	0.223	0.285	0.450	Hair loss	[8]
170	rs11037975	11:44389312	<i>ALX4</i>	G 0.29	-0.097	0.494	-0.027	0.839	-0.020	0.871	Hair loss	[8]
171	rs35264875	11:69078931	<i>TPCN2</i>	T 0.24	-0.077	0.629	-0.198	0.186	-0.104	0.462	Pigmentation	[39]
172	rs3829241	11:69087895	<i>TPCN2</i>	A 0.38	-0.138	0.313	0.010	0.937	0.055	0.651	Pigmentation	[33,47]
173	rs72930659	11:69105375	<i>TPCN2</i>	T 0.19	-0.194	0.253	-0.237	0.140	-0.152	0.321	Pigmentation	[34]
174	rs10831496	11:88824823	<i>GRM5</i>	G 0.34	0.122	0.372	0.100	0.422	0.068	0.566	Pigmentation	[48,49]
175	rs1042602	11:89178528	<i>TYR</i>	A 0.30	0.037	0.788	-0.046	0.721	0.070	0.563	Pigmentation	[24,35]
176	rs1847134	11:89272085	<i>TYR</i>	C 0.28	0.049	0.735	0.092	0.497	0.080	0.537	Pigmentation	[6]
177	rs1393350	11:89277878	<i>TYR</i>	A 0.24	0.095	0.541	0.121	0.403	0.098	0.475	Pigmentation	[6,27,29,35,50]
178	rs1126809	11:89284793	<i>TYR</i>	A 0.25	0.099	0.519	0.100	0.478	0.098	0.466	Pigmentation	[14]
179	rs4936890	11:124044035	11q24.2	A 0.47	-0.307	0.039	-0.335	0.017	-0.249	0.060	Pigmentation	[51]
180	rs9668810	12:26273487	<i>SSPN</i>	T 0.24	0.168	0.275	0.238	0.097	0.251	0.063	Hair loss	[4,5,7]
181	rs7975017	12:26275860	<i>SSPN</i>	T 0.19	0.091	0.580	0.155	0.314	0.178	0.219	Hair loss	[5,21]
182	rs10843026	12:27940679	<i>KLHL42; PTHLH</i>	A 0.03	-0.256	0.521	-0.213	0.561	-0.173	0.619	Hair loss	[9]
183	rs7976269	12:29081094	<i>FAR2</i>	A 0.31	0.013	0.939	0.011	0.940	-0.011	0.938	Hair loss	[8]
184	rs12311316	12:52401803	<i>KRT82</i>	A 0.18	-0.157	0.339	-0.105	0.508	-0.050	0.743	Hair shape	[1]
185	rs585583	12:52535586	<i>KRT71</i>	T 0.36	0.125	0.350	0.116	0.358	0.128	0.285	Hair shape	[52]
186	rs17662023	12:52540565	<i>KRT71</i>	A 0.49	0.116	0.357	0.242	0.043	0.224	0.049	Hair shape	[52]
187	rs10783518	12:52544713	<i>KRT71</i>	C 0.49	0.117	0.352	0.241	0.045	0.228	0.045	Hair shape	[52]
188	rs17730088	12:52552552	<i>KRT71</i>	G 0.42	0.181	0.164	0.265	0.032	0.244	0.037	Hair shape	[52]
189	rs3912631	12:52569069	<i>KRT74</i>	C 0.29	0.006	0.966	0.017	0.899	0.005	0.967	Hair shape	[53]
190	rs670741	12:52571389	<i>KRT74</i>	T 0.27	-0.072	0.618	-0.038	0.778	-0.021	0.873	Hair shape	[53]
191	rs673449	12:52571977	<i>KRT74</i>	C 0.27	-0.072	0.624	-0.033	0.811	-0.019	0.881	Hair shape	[53]
192	rs11170678	12:53760390	<i>HOX13</i>	G 0.32	-0.117	0.380	-0.067	0.596	-0.052	0.659	Hair shape	[1-2]
193	rs10777129	12:88567936	<i>KITLG</i>	A 0.06	-0.481	0.084	-0.241	0.349	-0.324	0.193	Pigmentation	[54]
194	rs12821256	12:88934558	<i>KITLG</i>	C 0.09	-0.023	0.922	0.171	0.419	0.204	0.309	Pigmentation	[14,34,35]
195	rs9568036	13:48397800	<i>P2RY5</i>	G 0.44	0.059	0.649	0.025	0.835	0.059	0.607	Hair shape	[55]
196	rs198607	13:48405031	<i>P2RY5</i>	C 0.29	-0.183	0.199	-0.170	0.209	-0.121	0.350	Hair shape	[55]

197	rs2227311	13:48412896	P2RY5	G 0.13	0.438	0.023	0.377	0.035	0.411	0.015	Hair shape	[55]
198	rs9535032	13:48438129	P2RY5	G 0.31	-0.143	0.308	-0.153	0.247	-0.136	0.282	Hair shape	[55]
199	rs975739	13:77807011	EDNRB	G 0.40	-0.147	0.268	-0.133	0.282	-0.055	0.641	Pigmentation	[14]
200	rs3782974	13:94440642	DCT	T 0.13	-0.027	0.883	-0.073	0.674	-0.085	0.608	Pigmentation	[51,52]
201	rs417054	14:30078929	PRKDI	A 0.19	-0.270	0.109	-0.225	0.150	-0.230	0.118	Hair loss	[8]
202	rs8017455	14:81109110	TSHR	C 0.22	0.048	0.759	-0.007	0.959	-0.036	0.798	Hair shape	[11]
203	rs4900109	14:92297047	SLC32A4	T 0.42	-0.067	0.614	0.013	0.916	-0.005	0.966	Pigmentation	[10]
204	rs12896399	14:92307319	SLC24A4	T 0.41	-0.083	0.532	-0.001	0.992	-0.021	0.858	Pigmentation	[6,14,27,35,40]
205	rs4904868	14:92314657	14q32.12	T 0.48	0.146	0.275	0.021	0.864	0.031	0.793	Pigmentation	[6,29,57]
206	rs8014907	14:92333660	SLC24A4	T 0.17	-0.053	0.766	-0.048	0.775	-0.024	0.882	Pigmentation	[34]
207	rs2402130	14:92334859	SLC24A4	G 0.17	-0.073	0.681	-0.068	0.683	-0.041	0.799	Pigmentation	[29,42]
208	rs17128291	14:92416482	SLC24A4	G 0.15	0.032	0.859	-0.019	0.909	-0.071	0.655	Pigmentation	[31,51]
209	rs3742377	14:99699891	CYP46A1	A 0.16	0.175	0.288	0.016	0.918	0.042	0.775	Hair shape	[20]
210	rs142826872	15:24167222	PWRN2	T 0.02	0.462	0.322	0.368	0.395	0.334	0.408	Hair shape	[11]
211	rs4906800	15:25875535	MIR4715	A 0.06	-0.366	0.166	-0.186	0.466	-0.268	0.275	Hair loss	[9]
212	rs1545397	15:27942626	OCA2	T 0.08	0.015	0.949	-0.081	0.718	0.010	0.963	Pigmentation	[51,58,59]
213	rs7173419	15:27951675	OCA2	T 0.24	0.330	0.029	0.265	0.056	0.290	0.027	Pigmentation	[14]
214	rs74653330	15:27983407	OCA2	T 0.01	-0.786	0.298	-1.063	0.223	-1.130	0.188	Pigmentation	[47]
215	rs121918166	15:27985101	OCA2	T 0.00	-9.942	0.985	-18.835	-	-18.841	-	Pigmentation	[47]
216	rs1800407	15:27985172	OCA2	T 0.06	0.676	0.015	0.530	0.034	0.472	0.044	Pigmentation	[27,28,30,40,41,50,60,61,62]
217	rs1800401	15:28014907	OCA2	A 0.03	-0.006	0.987	-0.089	0.780	-0.076	0.806	Pigmentation	[60]
218	rs12441727	15:28026629	OCA2	A 0.12	-0.234	0.260	-0.219	0.264	-0.291	0.119	Pigmentation	[27]
219	rs4778232	15:28036619	OCA2	T 0.21	-0.058	0.722	-0.018	0.906	-0.066	0.651	Pigmentation	[30,63]
220	rs1448485	15:28037595	OCA2	T 0.13	-0.139	0.491	-0.140	0.463	-0.188	0.302	Pigmentation	[51]
221	rs1448484	15:28038295	OCA2	G 0.00	0.063	0.957	0.024	0.982	0.375	0.694	Pigmentation	[27,60,63]
222	rs16950821	15:28038361	OCA2	A 0.11	-0.206	0.326	-0.216	0.273	-0.253	0.175	Pigmentation	[29]
223	rs8024968	15:28038543	OCA2	T 0.11	-0.206	0.326	-0.216	0.273	-0.253	0.175	Pigmentation	[30,63]
224	rs1470608	15:28042975	OCA2	T 0.13	-0.115	0.557	-0.127	0.496	-0.169	0.343	Pigmentation	[6,54]
225	rs1375164	15:28046666	OCA2	T 0.20	-0.032	0.844	-0.010	0.947	-0.041	0.777	Pigmentation	[30,56,60]
226	rs7174027	15:28083619	OCA2	A 0.11	-0.006	0.977	-0.011	0.952	-0.079	0.664	Pigmentation	[25,29,54,57]
227	rs4778138	15:28090674	OCA2	G 0.15	0.090	0.617	0.044	0.795	0.010	0.951	Pigmentation	[6,29,30,60,63]
228	rs4778241	15:28093567	OCA2	A 0.19	0.160	0.337	0.136	0.382	0.043	0.771	Pigmentation	[25,29,60,61-63]
229	rs7495174	15:28099092	OCA2	G 0.05	0.522	0.083	0.535	0.050	0.439	0.096	Pigmentation	[25,34,57,61,63]

230	rs1129038	15:28111713	<i>HERC2</i>	C 0.18	0.238	0.185	0.252	0.132	0.207	0.195	Pigmentation	[30,47,54,61,62]
231	rs12913832	15:28120472	<i>HERC2</i>	A 0.18	0.247	0.169	0.247	0.140	0.207	0.195	Pigmentation	[6,14,25,27,29,45,47,51,61,62,64]
232	rs7183877	15:28120587	<i>HERC2</i>	A 0.06	0.197	0.492	0.156	0.541	0.115	0.634	Pigmentation	[16,30,54,61,62]
233	rs11636232	15:28141480	<i>HERC2</i>	T 0.42	-0.013	0.922	-0.036	0.774	-0.043	0.718	Pigmentation	[25,30,54]
234	rs2238289	15:28208069	<i>HERC2</i>	G 0.10	0.415	0.063	0.416	0.039	0.312	0.103	Pigmentation	[54]
235	rs8182028	15:28222789	<i>HERC2</i>	C 0.04	0.626	0.057	0.734	0.015	0.609	0.036	Pigmentation	[27,51]
236	rs6497292	15:28251049	<i>HERC2</i>	G 0.04	0.642	0.050	0.734	0.014	0.589	0.040	Pigmentation	[63]
237	rs16950941	15:28257598	<i>HERC2</i>	A 0.04	0.626	0.057	0.734	0.015	0.609	0.036	Pigmentation	[63]
238	rs79097182	15:28266851	<i>HERC2</i>	T 0.04	0.567	0.075	0.681	0.020	0.566	0.046	Pigmentation	[34]
239	rs916977	15:28268218	<i>HERC2</i>	T 0.13	0.302	0.126	0.289	0.113	0.224	0.200	Pigmentation	[30,63]
240	rs1667394	15:28285036	<i>HERC2</i>	C 0.13	0.313	0.112	0.341	0.060	0.270	0.119	Pigmentation	[30,35,61,63]
241	rs12592730	15:28285213	<i>HERC2</i>	A 0.04	0.626	0.057	0.734	0.015	0.609	0.036	Pigmentation	[57,63]
242	rs4424881	15:28969513	<i>APBA2</i>	T 0.13	0.045	0.823	-0.015	0.937	-0.017	0.922	Pigmentation	[49,65]
243	rs2924567	15:47976289	<i>SLC24A5</i>	T 0.33	-0.083	0.561	-0.022	0.869	-0.033	0.788	Pigmentation	[24,31]
244	rs1834640	15:48099968	<i>SLC24A5</i>	G 0.01	-1.724	0.050	-1.597	0.065	-1.361	0.106	Pigmentation	[24]
245	rs1426654	15:48134287	<i>SLC24A5</i>	G 0.01	-1.533	0.088	-1.509	0.088	-1.249	0.146	Pigmentation	[24,33,42,51]
246	rs7173477	15:57258766	<i>TCF12</i>	C 0.18	0.143	0.403	-0.031	0.844	-0.068	0.652	Hair loss	[9]
247	rs17270216	15:60544595	<i>RORA</i>	G 0.23	0.069	0.640	0.061	0.660	0.066	0.611	Hair loss	[9]
248	rs11630290	15:63623587	<i>HERC1</i>	T 0.23	-0.140	0.357	-0.126	0.374	-0.140	0.296	Pigmentation	[10]
249	rs12902958	15:69747915	<i>DRAIC</i>	A 0.09	0.099	0.665	0.189	0.381	0.150	0.462	Hair loss	[8]
250	rs8033595	15:90540121	<i>CRTC3; IQGAP1</i>	G 0.43	-0.204	0.120	-0.100	0.421	-0.063	0.598	Hair loss	[8]
251	rs11150606	16:31087690	<i>PRSS53</i>	C 0.03	-0.250	0.497	-0.249	0.487	-0.321	0.357	Hair shape	[20]
252	rs12597422	16:53853826	<i>FTO</i>	G 0.25	-0.176	0.234	-0.175	0.207	-0.130	0.323	Hair thickness	[20]
253	rs2353688	16:86329448	16q24.1	C 0.01	-1.462	0.019	-1.386	0.022	-1.470	0.013	Pigmentation	[34]
254	rs3114908	16:89317317	<i>ANKRD11</i>	T 0.29	0.091	0.529	0.024	0.857	-0.067	0.601	Pigmentation	[51,66]
255	rs164741	16:89625890	<i>DPEPI</i>	A 0.25	0.428	0.004	0.364	0.007	0.260	0.041	Pigmentation	[25,48,51]
256	rs12931267	16:89752324	<i>FANCA</i>	G 0.03	0.367	0.319	0.345	0.302	0.258	0.416	Pigmentation	[6,31,57]
257	rs1805005	16:89919436	<i>MC1R</i>	T 0.07	0.003	0.990	-0.112	0.650	-0.115	0.618	Pigmentation	[24,29,31,42,47,67]
258	rs1805006	16:89919510	<i>MC1R</i>	A 0.00	-0.961	0.477	-1.092	0.413	-1.181	0.357	Pigmentation	[24,47,67]
259	rs2228479	16:89919532	<i>MC1R</i>	A 0.11	-0.372	0.092	-0.352	0.088	-0.345	0.077	Pigmentation	[24,29,31,42,54]
260	rs11547464	16:89919683	<i>MC1R</i>	A 0.00	-14.249	0.978	-23.159		-23.717		Pigmentation	[6,29,47]

261	rs1805007	16:89919709	MC1R	T 0.03	0.628	0.090	0.543	0.100	0.424	0.177	Pigmentation	[6,14,24,29,31,35,42,45,47,54,67]
262	rs1110400	16:89919722	MC1R	C 0.02	-0.538	0.333	-0.407	0.432	-0.497	0.328	Pigmentation	[24,29,31,47]
263	rs1805008	16:89919736	MC1R	T 0.08	-0.108	0.663	-0.137	0.564	-0.250	0.268	Pigmentation	[24,29,31,35,42,47,54]
264	rs885479	16:89919746	MC1R	A 0.04	0.174	0.621	0.293	0.361	0.223	0.460	Pigmentation	[24,29,54]
265	rs1805009	16:89920138	MC1R	C 0.00	0.714	0.700	0.254	0.874	1.050	0.415	Pigmentation	[6,24,29,31,67]
266	rs8049897	16:89957794	DEF8	A 0.12	-0.230	0.273	-0.284	0.145	-0.296	0.108	Pigmentation	[6,25,48,51]
267	rs8051733	16:89957798	DEF8	G 0.29	-0.158	0.270	-0.192	0.147	-0.256	0.041	Pigmentation	[51,68]
268	rs4268748	16:89960104	DEF8	C 0.26	-0.123	0.413	-0.189	0.174	-0.246	0.062	Pigmentation	[31,51,68]
269	rs11076649	16:89992928	AFG3L1P	G 0.12	-0.166	0.419	-0.233	0.220	-0.214	0.235	Pigmentation	[51]
270	rs333113	17:4497061	SPNS2	C 0.24	-0.031	0.837	-0.043	0.760	-0.164	0.226	Pigmentation	[51]
271	rs72809171	17:12553762	LINC00670	A 0.04	0.161	0.600	-0.016	0.956	0.218	0.416	Hair loss	[8]
272	rs143290289	17:41060725	KRTAP2-3	A 0.09	-0.044	0.833	-0.134	0.503	-0.028	0.883	Hair shape	[1-2]
273	rs12373124	17:45846853	IMP5	C 0.16	0.118	0.504	0.143	0.378	0.231	0.129	Hair loss	[4,5,21]
274	rs112385572	17:45988806	MAPT	G 0.16	0.125	0.482	0.149	0.362	0.237	0.121	Hair loss	[7,8]
275	rs538628	17:46709947	ARL17A	C 0.14	0.059	0.751	0.079	0.646	0.190	0.237	Hair loss	[7]
276	rs17833789	17:57153267	MSI2	A 0.48	0.177	0.179	0.113	0.359	0.107	0.356	Hair loss	[8]
277	rs79806428	17:66282767	APOH;PRKCA	T 0.06	-0.332	0.251	-0.317	0.252	-0.246	0.346	Hair loss	[9]
278	rs9894429	17:81629785	NPLOC4	T 0.43	-0.005	0.970	-0.075	0.551	-0.068	0.566	Pigmentation	[16,69]
279	rs29073	18:9971793	APCDD1	C 0.41	-0.163	0.200	-0.254	0.035	-0.254	0.028	Hair loss	[8]
280	rs4800451	18:23136841	CABLES1; MIR4741	C 0.28	0.121	0.399	0.063	0.639	0.087	0.499	Hair shape	[20]
281	rs10502861	18:45220183	SLC14A2	T 0.27	0.102	0.481	0.055	0.684	0.006	0.965	Hair loss	[3-5]
282	rs7226979	18:63257737	BCL2	C 0.48	0.025	0.845	0.041	0.736	0.027	0.814	Hair loss	[8]
283	rs17318596	19:41431190	B3GNT8	A 0.39	-0.168	0.211	-0.104	0.408	-0.141	0.240	Hair loss	[9]
284	rs4380312	20:2258361	TGM3	T 0.04	0.139	0.685	0.195	0.533	0.200	0.501	Hair shape	[1]
285	rs6132532	20:2334897	TGM3	G 0.02	-0.028	0.951	0.026	0.952	0.064	0.875	Hair shape	[15]
286	rs261360	20:5057128	RPS21P7; TMEM230	A 0.44	-0.166	0.201	-0.238	0.051	-0.177	0.123	Hair shape	[11]
287	rs733626	20:17704704	BANF2	G 0.17	0.084	0.610	0.115	0.456	0.117	0.416	Hair loss	[9]
288	rs2424371	20:21458745	NKX2	G 0.19	-0.014	0.933	-0.075	0.622	-0.112	0.436	Hair loss	[9]
289	rs2180439	20:21872462	20p11.22	C 0.43	-0.026	0.836	-0.080	0.505	-0.007	0.950	Hair loss	[4,37,70]
290	rs1998076	20:21899407	20p11.22	A 0.43	-0.034	0.787	-0.088	0.467	-0.013	0.906	Hair loss	[4,70]
291	rs4544515	20:21904673	20p11.22	C 0.44	0.004	0.972	-0.040	0.738	0.009	0.937	Hair loss	[7]

292	rs201593	20:22053181	<i>LOC100270679</i>	G 0.45	-0.094	0.458	-0.110	0.363	-0.065	0.574	Hair loss	[7]
293	rs6047844	20:22056937	<i>LINC01432</i>	C 0.45	-0.094	0.458	-0.110	0.363	-0.065	0.574	Hair loss	[3-5]
294	rs913063	20:22061780	<i>LINC01432</i>	C 0.46	-0.111	0.384	-0.118	0.332	-0.071	0.545	Hair loss	[4]
295	rs1160312	20:22069865	<i>LINC01432</i>	G 0.46	-0.111	0.384	-0.118	0.332	-0.071	0.545	Hair loss	[4,71]
296	rs6113491	20:22076777	20p11.22	C 0.46	-0.092	0.469	-0.100	0.412	-0.057	0.628	Hair loss	[4]
297	rs804520	20:22138503	20p11.22	A 0.44	-0.085	0.502	-0.110	0.366	-0.086	0.459	Hair loss	[3,5]
298	rs6113548	20:22156201	20p11.22	C 0.37	-0.092	0.484	-0.143	0.253	-0.109	0.359	Hair loss	[7]
299	rs6059655	20:34077942	<i>RALY</i>	A 0.04	0.016	0.964	-0.038	0.904	-0.168	0.574	Pigmentation	[31,72]
300	rs4911414	20:34141638	<i>ASIP</i>	T 0.33	0.050	0.724	0.101	0.431	0.096	0.426	Pigmentation	[14,31]
301	rs1015362	20:34150806	<i>ASIP</i>	T 0.31	0.001	0.996	0.088	0.505	0.102	0.412	Pigmentation	[39,41,48]
302	rs6119471	20:34197406	<i>ASIP</i>	G 0.00	-15.815	0.980	-24.509		-24.443		Pigmentation	[73]
303	rs2424984	20:34262569	<i>ASIP</i>	C 0.14	-0.022	0.905	0.062	0.719	0.014	0.932	Pigmentation	[42]
304	rs6058017	20:34269192	<i>ASIP</i>	G 0.14	-0.022	0.905	0.062	0.719	0.014	0.932	Pigmentation	[24,29,42,41,48]
305	rs2378249	20:34630286	<i>ASIP</i>	G 0.14	0.018	0.925	0.027	0.876	-0.047	0.777	Pigmentation	[29]
306	rs4911442	20:34767243	<i>NCOA6</i>	G 0.08	-0.086	0.720	-0.030	0.891	-0.066	0.746	Pigmentation	[6,43,74]
307	rs1885120	20:34989186	<i>MYH7B</i>	C 0.04	-0.135	0.700	-0.055	0.858	-0.147	0.609	Pigmentation	[31,51,66]
308	rs6072223	20:40992207	<i>MAFB; TOPI</i>	A 0.19	-0.133	0.429	-0.104	0.507	-0.055	0.711	Hair loss	[9]
309	rs17265513	20:41203988	<i>ZHX3</i>	C 0.22	-0.027	0.857	-0.033	0.816	-0.021	0.876	Hair loss	[8]
310	rs985546	20:56859627	<i>TFAP2C</i>	C 0.18	0.013	0.939	0.002	0.991	0.002	0.991	Hair loss	[8]
311	rs310642	20:63530645	<i>PTK6</i>	C 0.04	-0.595	0.091	-0.726	0.035	-0.662	0.042	Hair shape	[1-2]
312	rs68088846	21:34835870	<i>RUNXI</i>	A 0.20	0.311	0.049	0.240	0.101	0.224	0.110	Hair loss	[8]
313	rs7277820	21:37208008	<i>DSCR9</i>	G 0.48	0.015	0.905	0.109	0.359	0.110	0.332	Pigmentation	[16]
314	rs2256843	21:44754576	21q22.3	T 0.38	-0.224	0.091	-0.155	0.206	-0.191	0.103	Hair loss	[8]
315	rs5934505	X:8945785	<i>FAM9B</i>	C 0.21	0.092	0.442	0.050	0.647	0.038	0.717	Hair loss	[8]
316	rs147829649	X:57979046	Xp11.21	G 0.04	-0.101	0.691	-0.162	0.505	-0.199	0.383	Hair loss	[7]
317	rs6624142	X:65185289	<i>ZC4H2</i>	C 0.28	0.049	0.655	-0.003	0.976	-0.051	0.590	Hair loss	[7]
318	rs147154263	X:65863405	<i>VSIG4</i>	T 0.03	-0.306	0.261	-0.336	0.224	-0.316	0.232	Hair loss	[7]
319	rs145867342	X:66322114	<i>HEPH; VSIG4</i>	T 0.07	0.110	0.557	-0.027	0.880	-0.066	0.690	Hair loss	[7]
320	rs73221556	X:66713443	<i>EDA2R; HEPH</i>	A 0.15	-0.004	0.976	-0.057	0.645	-0.111	0.337	Hair loss	[7]
321	rs1041668	X:66866114	Xq12	G 0.14	-0.035	0.798	-0.077	0.538	-0.135	0.248	Hair loss	[4,75]
322	rs471205	X:67018475	Xq12	T 0.23	-0.035	0.758	-0.081	0.445	-0.123	0.220	Hair loss	[3]
323	rs1511061	X:67096282	Xq12	C 0.15	0.001	0.995	-0.066	0.589	-0.132	0.251	Hair loss	[3,5]
324	rs17216820	X:67117703	Xq12	T 0.08	-0.282	0.138	-0.262	0.152	-0.211	0.235	Hair loss	[7]
325	rs5919324	X:67210798	Xq12	G 0.15	0.022	0.868	-0.048	0.693	-0.116	0.310	Hair loss	[4,76]

326	rs6625150	X:67229126	Xq12	A 0.17	0.054	0.668	-0.018	0.880	-0.102	0.353	Hair loss	[4]
327	rs6625163	X:67291142	Xq12	G 0.19	0.018	0.881	-0.070	0.533	-0.135	0.202	Hair loss	[4,71]
328	rs2497938	X:67343176	Xq12	C 0.18	0.031	0.802	-0.059	0.601	-0.124	0.247	Hair loss	[4,5,75]
329	rs962458	X:67526122	Xq12	G 0.08	-0.122	0.504	-0.207	0.220	-0.179	0.247	Hair loss	[4]
330	rs12007229	X:67528513	Xq12	A 0.09	0.157	0.359	0.082	0.601	-0.025	0.864	Hair loss	[4]
331	rs6152	X:67545785	AR	A 0.17	0.027	0.831	-0.059	0.616	-0.107	0.333	Hair loss	[4,75,77]
332	rs5919427	X:67783742	OPHN1	C 0.19	0.103	0.369	0.043	0.683	-0.015	0.879	Hair loss	[7]
333	rs148652266	X:67919221	Xq13.1	A 0.03	0.059	0.837	-0.001	0.996	-0.178	0.448	Hair loss	[7]
334	rs7061504	X:68143959	OPHN1	G 0.09	0.265	0.112	0.262	0.081	0.157	0.272	Hair loss	[7]
335	rs140488081	X:68276160	OPHN1	T 0.03	-0.441	0.124	-0.475	0.096	-0.452	0.105	Hair loss	[7]
336	rs4829906	X:137873245	ZIC3	A 0.35	-0.126	0.218	-0.111	0.244	-0.106	0.238	Hair loss	[9]

Significant results are marked with bold.

BLR, binomial logistic regression; MLR3, multinomial ordinal logistic regression for 3 hair greying categories; MLR6, multinomial ordinal logistic regression for 6 hair greying categories; MA, minor allele; fMA, frequency of minor allele.

*Results adjusted for age and sex (in case of pigmentation-linked SNPs adjustment for hair colour was also applied)

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Supplementary Table 6 The results of mRMRe analysis for binary and 3-stage hair greying classification conducted in a 849-sample cohort

Rank	mRMRe analysis							
	Binary hair greying classification (greying vs. no greying)				3-stage hair greying classification (no greying vs. mild greying vs. severe greying)			
	SNP_ID	Chr position GRCh38	Gene/Locus	mRMRe Score	SNP_ID	Chr position GRCh38	Gene/Locus	mRMRe Score
1	Age	-	-	0.2429273	Age	-	-	0.2555938
2	rs59733750	2:240780193	<i>KIF1A</i>	0.0026937	Sex	-	-	0.0071533
3	Sex	-	-	0.0026841	rs7680591	4:80276795	<i>FGF5</i>	0.0026000
4	rs68088846	21:34835870	<i>RUNX1</i>	0.0026483	rs59733750	2:240780193	<i>KIF1A</i>	0.0024376
5	rs1005241	22:47291868	<i>TBC1D22A</i>	0.0023004	rs10928235	2:144920547	<i>TEX41</i>	0.0024138
6	rs7680591	4:80276795	<i>FGF5</i>	0.0022084	rs68088846	21:34835870	<i>RUNX1</i>	0.0023223
7	rs2361506	2:233830694	<i>MROH2A</i>	0.0020803	rs2361506	2:233830694	<i>MROH2A</i>	0.0023167
8	rs12203592	6:396321	<i>IRF4</i>	0.0016857	rs45483393	9:89378809	<i>SEMA4D</i>	0.0020403
9	rs45483393	9:89378809	<i>SEMA4D</i>	0.0015962	rs12203592	6:396321	<i>IRF4</i>	0.0020377
10	rs2416699	9:119434462	<i>BRINP1</i>	0.0015622	rs1005241	22:47291868	<i>TBC1D22A</i>	0.0016952
11	rs164741	16:89625890	<i>DPEP1</i>	0.0014107	rs2416699	9:119434462	<i>BRINP1</i>	0.0016313
12	rs1683723	12:128415460	<i>TMEM132C</i>	0.0010814	rs2814331	10:86233584	<i>GRID1</i>	0.0009898
13	rs17143387	10:8272081	<i>GATA3</i>	0.0010660	rs164741	16:89625890	<i>DPEP1</i>	0.0008983
14	rs1131471	1:152107513	<i>TCHH</i>	0.0007969	rs1127228	16:27226789	<i>NSMCE1</i>	0.0005584
15	rs1081073	5:158954504	<i>EBF1</i>	0.0007834	rs17143387	10:8272081	<i>GATA3</i>	0.0003995
16	rs2814331	10:86233584	<i>GRID1</i>	0.0007746	rs29073	18:9971793	<i>APCDD1</i>	0.0003662
17	rs62472724	7:143391804	<i>EPHA1</i>	0.0007642	rs1912702	11:79462038	<i>MIR708;TENM4</i>	0.0001052
18	rs2999852	1:163339512	<i>NUF2</i>	0.0007541	rs11621135	14:71192892	<i>PCNX</i>	0.0000844
19	rs1800209	13:77000848	<i>CLN5</i>	0.0005128	rs2306406	10:1015922	<i>GTPBP4</i>	0.0000623
20	rs310642	20:63530645	<i>PTK6</i>	0.0005033	rs34306906	4:121944043	<i>TRPC3</i>	0.0000511
21	rs4672907	2:218956447	<i>LOC391485</i>	0.0003816	rs36139924	7:259915	<i>FAM20C</i>	-0.0001330
22	rs71421546	2:176127129	<i>HOXD-AS2,HOXD3</i>	0.0000096	rs4656076	1:89013171	<i>GBP3</i>	-0.0001416
23	rs35780223	5:179083069	<i>ZNF354C</i>	0.0000036	rs10951154	7:27095695	<i>HOXA2</i>	-0.0001731
24	rs2227311	13:48412896	<i>P2RY5</i>	0.0000018	rs72811791	16:54245728	<i>LINC02169</i>	-0.0001805
25	rs1127228	16:27226789	<i>NSMCE1</i>	-0.0000688	rs13131900	4:82580733	<i>AC067942.2</i>	-0.0002247
26	rs1912702	11:79462038	<i>MIR708;TENM4</i>	-0.0000877	rs7009516	8:24351334	<i>ADAM28</i>	-0.0002249

27	rs10951154	7:27095695	<i>HOXA2</i>	-0.0001697	rs77995042	19:35508296	<i>DMKN</i>	-0.0002859
28	rs17752628	14:77732443	<i>SNW1</i>	-0.0001928	rs2379206	X:7077274	<i>HDHD1</i>	-0.0002955
29	rs2379206	X:7077274	<i>HDHD1</i>	-0.0002205	rs74393830	3:23134423	<i>RPL24P7</i>	-0.0002990
30	rs29073	18:9971793	<i>APCDD1</i>	-0.0002279	rs2507940	3:37494493	<i>ITGA9</i>	-0.0003308

Exome-wide candidate and literature-based selected SNPs were considered in analyses. The top 30 variants with the highest mRMRe score were extracted and pruned based on scree plots analysis. Variables marked with bold were included in the pruned list of predictors.

Supplementary Table 7 (The genotype-phenotype dataset generated with whole-exome sequencing) and **Supplementary Table 8** (The genotype-phenotype dataset generated with targeted next-generation sequencing) are in separate Excel files.