

Appendix

Appendix A

i) Ethic Approval Form



جامعة ملايا
جامعة ملايا

17 Ramadhan 1429H
17 September 2008

No. Rujukan:- HU-61/12/1-1

Prof. Zahurin Mohamed
Jabatan Farmakologi
Pusat Perubatan universiti Malaya

Puan,

Surat PEMAKLUMAN KEPUTUSAN PERMOHONAN MENJALANKAN PROJEK PENYELIDIKAN
N. Molecular Analysis Of Genes Predisposing To Obesity In Malaysian Subjects
Protocol No:-
MEC Ref. No: 672.23

Dengan hormatnya saya merujuk kepada perkara di atas.

Bersama-sama ini dilampirkan surat pemakluman keputusan Jawatankuasa Etika Perubatan yang bermesyuarat pada 27 Ogos 2008 untuk makluman dan tindakan puan selanjutnya.

Sekian, terima kasih.

Yang benar

A handwritten signature in black ink.

Norehan Ahmad
S. Jusaha
Jawatankuasa Etika Perubatan
Pusat Perubatan Universiti Malaya

s.k Ketua
 Jabatan Farmakologi

Jawatankuasa Etika Perubatan
PUSAT PERUBATAN UNIVERSITI MALAYA
(University Malaya Medical Centre)
LEMBAH PANTAI, 59100 KUALA LUMPUR, MALAYSIA
Telefon: : 603-79494422
 : samb, 2138 & 3209(pejabat am)
NO.Fax: : 603-79545682
Laman Web : www.ummc.edu.my
E-mail : izanie@ummc.edu.my





**JAWATANKUASA ETIKA PERUBATAN
PUSAT PERUBATAN UNIVERSITI MALAYA**

ALAMAT: LEMBAH PANTAI, 59100 KUALA LUMPUR, MALAYSIA
TELEFON: 03-79494422 FAKSIMILI: 03-79545682

NAME OF ETHICS COMMITTEE/IRB: Medical Ethics Committee, University Malaya Medical Centre	ETHICS COMMITTEE/IRB REFERENCE NUMBER: 672.23
ADDRESS: LEMBAH PANTAI 59100 KUALA LUMPUR	
PROTOCOL NO:	
TITLE: Molecular Analysis Of Genes Predisposing To Obesity In Malaysian Subject	
PRINCIPAL INVESTIGATOR: Prof. Zahurin Mohamed	SPONSOR: Research University Grant
TELEPHONE:	KOMTEL:

The following item [✓] have been received and reviewed in connection with the above study to be conducted by the above investigator.

- | | |
|--|---------------------|
| Borang Permohonan Penyelidikan | Ver date: 25 Jul 08 |
| [✓] Study Protocol | Ver date: |
| [] Investigator Brochure | Ver date: |
| [✓] Patient Information Sheet | Ver date: |
| [✓] Consent Form | Ver date: |
| [] Questionnaire | |
| [] Investigator(s) CV's (if applicable) | |

and have been [✓]

- [✓] Approved
[] Conditionally approved (identify item and specify modification below or in accompanying letter)
[] Rejected (identify item and specify reasons below or in accompanying letter)

Comments:

*Investigator is required to follow instructions, guidelines and requirements of the Medical Ethics Committee.
Investigator is required to report any protocol deviations/violations through the Clinical Investigation Centre and provide annual/closure reports to the Medical Ethics Committee.*

Date of approval: 27th OGOS 2008

s.k Ketua
 Jabatan Farmakologi

Timbalan Dekan (Penyelidikan)
Fakulti Perubatan, Universiti Malaya

Setiausaha
Jawatankuasa Penyelidikan Pusat Perubatan
Fakulti Perubatan, Universiti Malaya

.....
PROF. LOOI LAI MENG
Chairman
Medical Ethics Committee

ii) Consent Form

UNIVERSITY MALAYA MEDICAL CENTRE

CONSENT BY PATIENT FOR CLINICAL RESEARCH

I Identity Card No.....
(Name of Patient)

of
(Address)

hereby agree to take part in the clinical research (clinical study/questionnaire study/drug trial) specified below:

Title of Study:

MOLECULAR ANALYSIS OF GENES PREDISPOSING TO OBESITY IN MALAYSIAN SUBJECTS.....

the nature and purpose of which has been explained to me by Dr.
(Name & Designation of Doctor)

..... and interpreted by
(Name & Designation of Interpreter)

..... to the best of his/her ability in language/dialect.

I have been told about the nature of the clinical research in terms of methodology, possible adverse effects and complications (as per patient information sheet). After knowing and understanding all the possible advantages and disadvantages of this clinical research, I voluntarily consent of my own free will to participate in the clinical research specified above.

I understand that I can withdraw from this clinical research at any time without assigning any reason whatsoever and in such a situation shall not be denied the benefits of usual treatment by the attending doctors.

Date: Signature or Thumbprint
(Patient)

IN THE PRESENCE OF

Name)
)
Identity Card No.) Signature
) (Witness for Signature of Patient)
Designation)

I confirm that I have explained to the patient the nature and purpose of the above-mentioned clinical research.

Date Signature
(Attending Doctor)

CONSENT BY PATIENT
FOR
CLINICAL RESEARCH

R.N.
Name
Sex
Age

Unit

FPU-DOF-BK-012-05-R01

iii) Patient Information Sheet

PATIENT INFORMATION SHEET

Please read the following information carefully, do not hesitate to discuss any questions you may have with your Doctor.

Study Title

Molecular analysis of genes predisposing to obesity in Malaysian subjects

Introduction

Obesity is a chronic disorder that can increases the risk of developing many metabolic disorders. According to the World Health Organization (WHO), obesity is one of the top five global health risk factor. Study on the influence of genetics on obesity is still new in Malaysia and yet to be carried out. The multi-ethnic population in Malaysia with different genetic background may yield interesting facts for the development of the pharmacogenomics of obesity in Malaysia.

What is the purpose of this study?

1. To determine whether any association exist between various single nucleotide polymorphisms (SNPs) with the predisposition to obesity in the Malaysian Malay population
2. To determine whether allele and/or genotype frequencies of the candidate genes differ among the different obese and non-obese groups

3. To identify the haplotypes and Linkage Disequilibrium pattern between the obese and non-obese groups
4. To compare the levels of biomarkers between the obese and non-obese participants
5. To investigate whether any association exist between single nucleotide polymorphisms (SNPs) with obesity biomarkers

What are the procedures to be followed?

There will be two groups of subjects in this study –a group of healthy subjects without obesity and another who has a confirmed diagnosis of obesity. Buccal swab will be collected and DNA (genetic material) will be extracted and the genetic polymorphisms will be detected. We will then compare the data between both groups to see if there are any significant differences. Buccals swabs and blood samples will be collected and stored at -80°C for analysis. Genotyping of SNPs and analysis of biomarkers levels will be performed.

Who should not enter the study?

Those who are suffering from chronic disease or cancer and those who have mix marriage for three generation in the family.

What will be benefits of the study:

(a) to you as the subject?

You should be able to contribute to the rapidly expanding scientific research field of Pharmacogenomics of obesity. This hopefully can help to improve treatment to

patients with obesity with the data obtained from this study in future.

(b) to the investigator?

We would be able to gain important details for the pharmacogenomics of obesity. We also hope to get DNA Profiling of obese patients. This may help in better targeting of drugs

What are the possible drawbacks?

Results could be not significant.

Can I refuse to take part in the study?

Yes. Participation is absolutely voluntary, so you can refuse to participate at any point of this study.

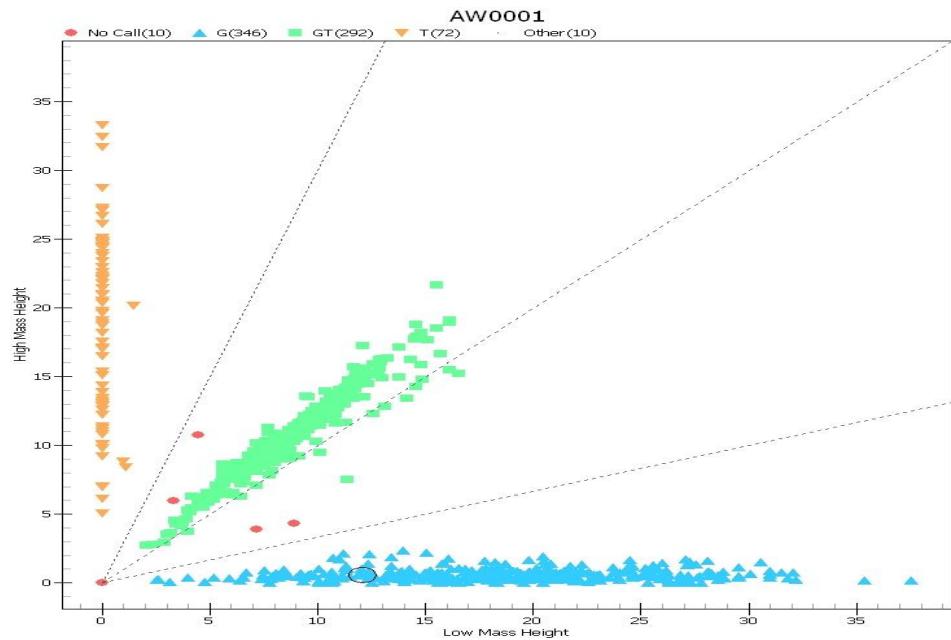
Who should I contact if I have additional questions during the course of the study?

You can contact Prof.Zahurin Mohamed from Department of Pharmacology, Faculty of Medicine (Tel:03-79675725).

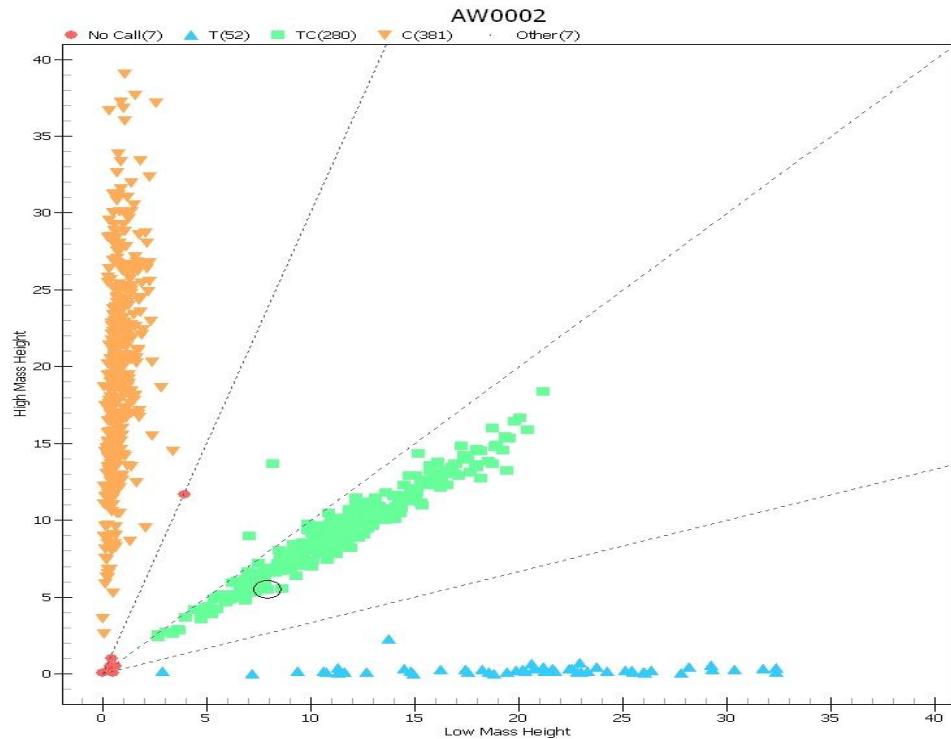
Appendix B: Cluster Plots for SNPs

a) Cluster Plots for SNPs using MALDI-TOF

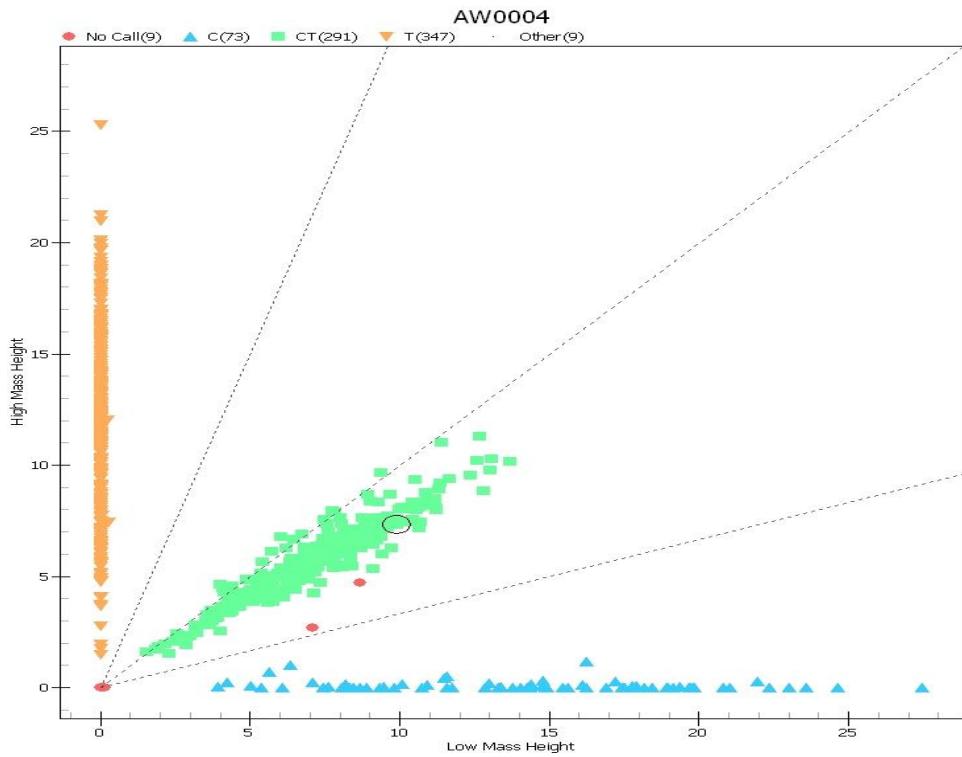
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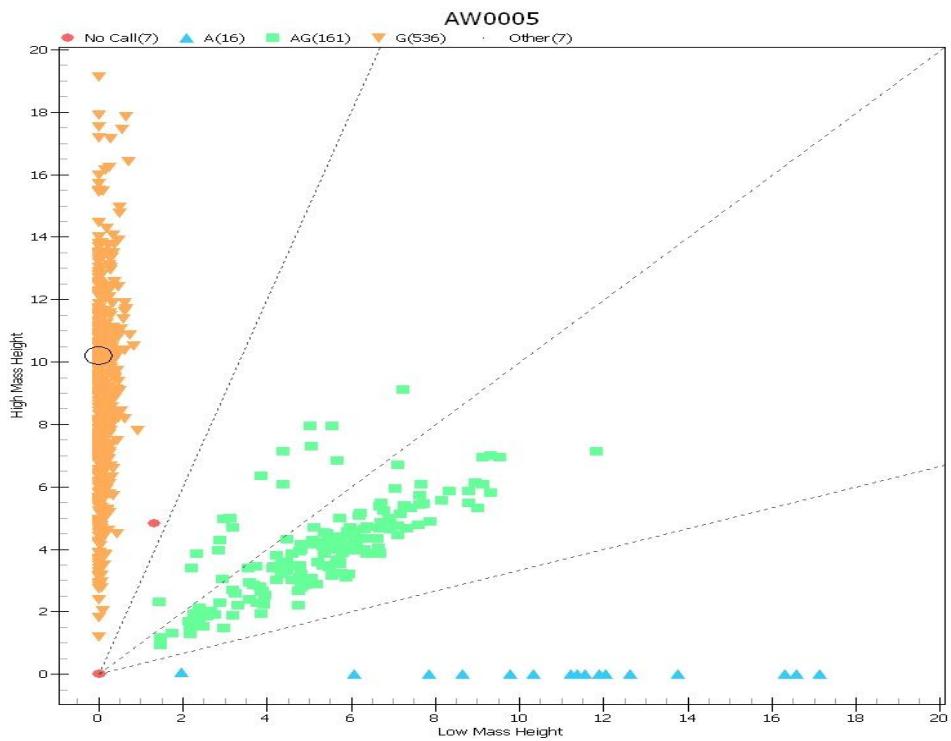
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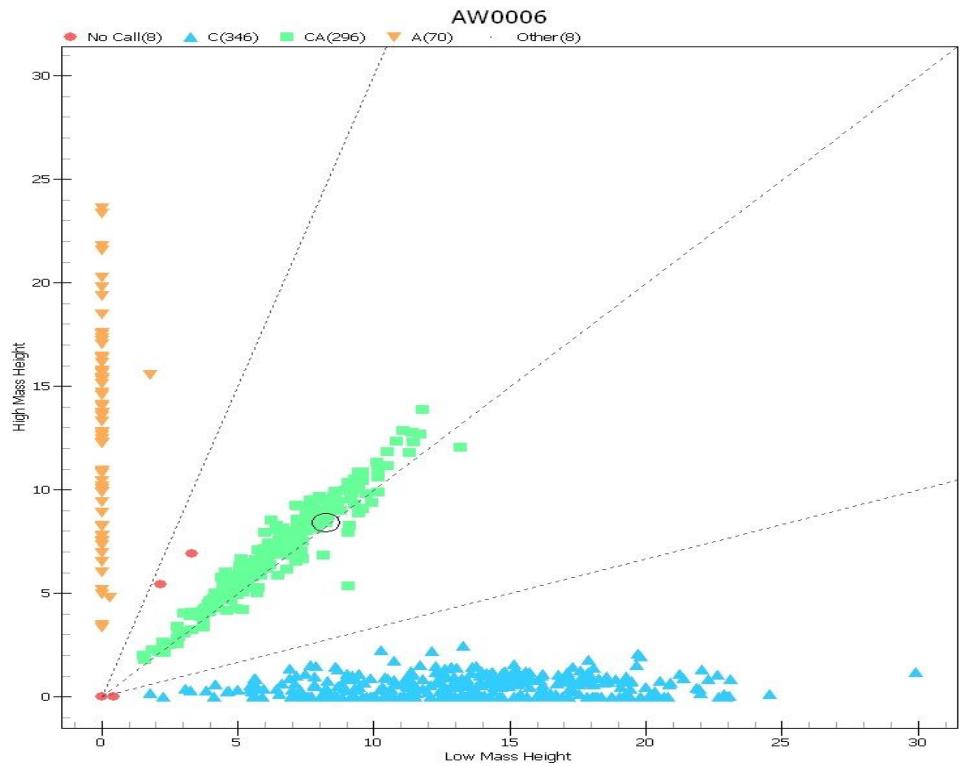
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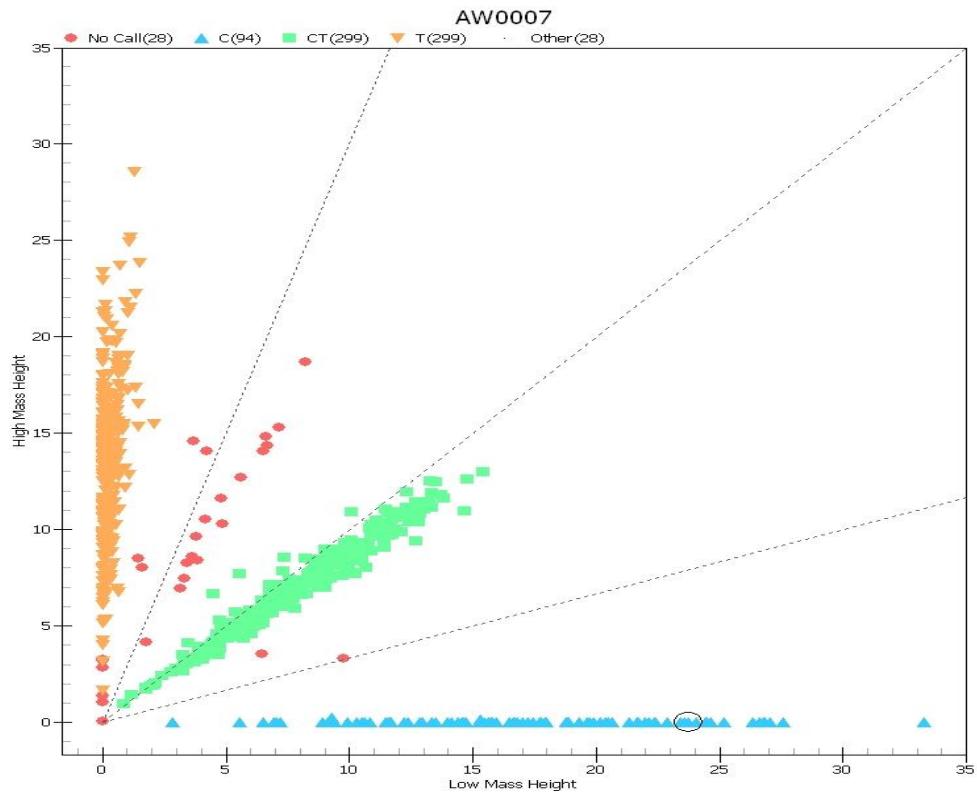
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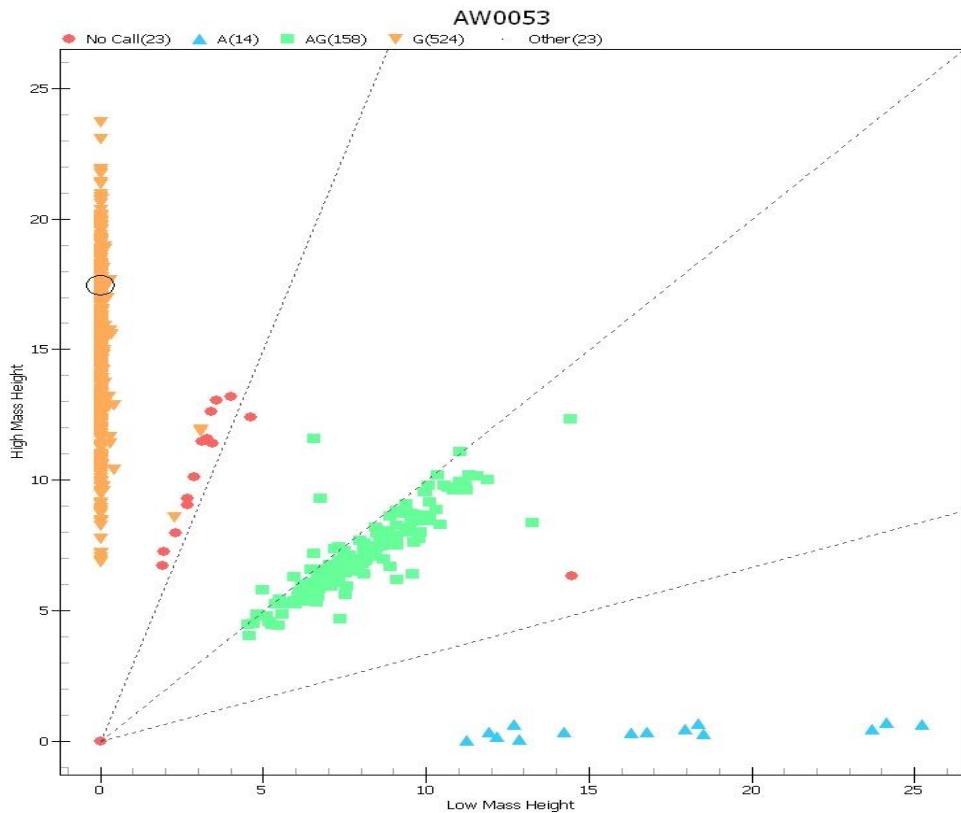
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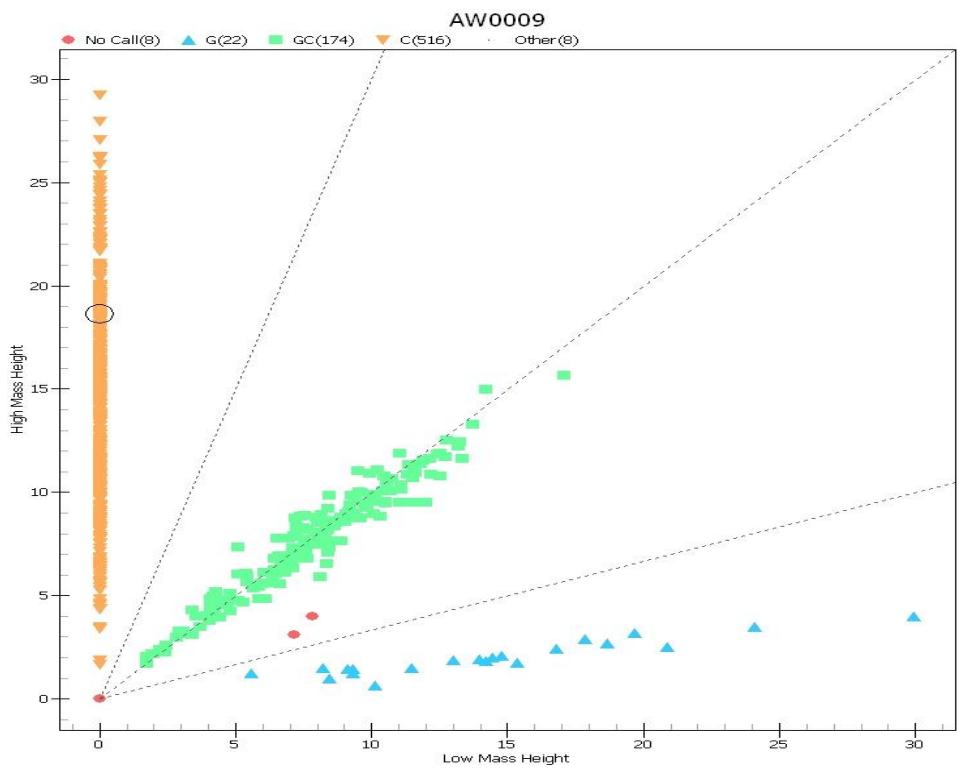
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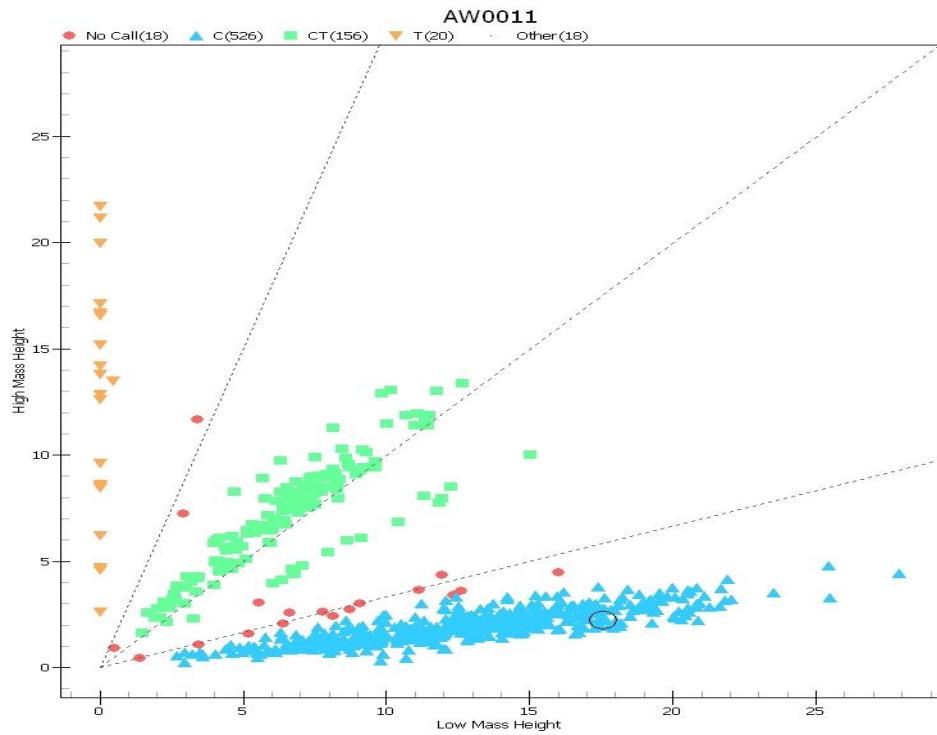
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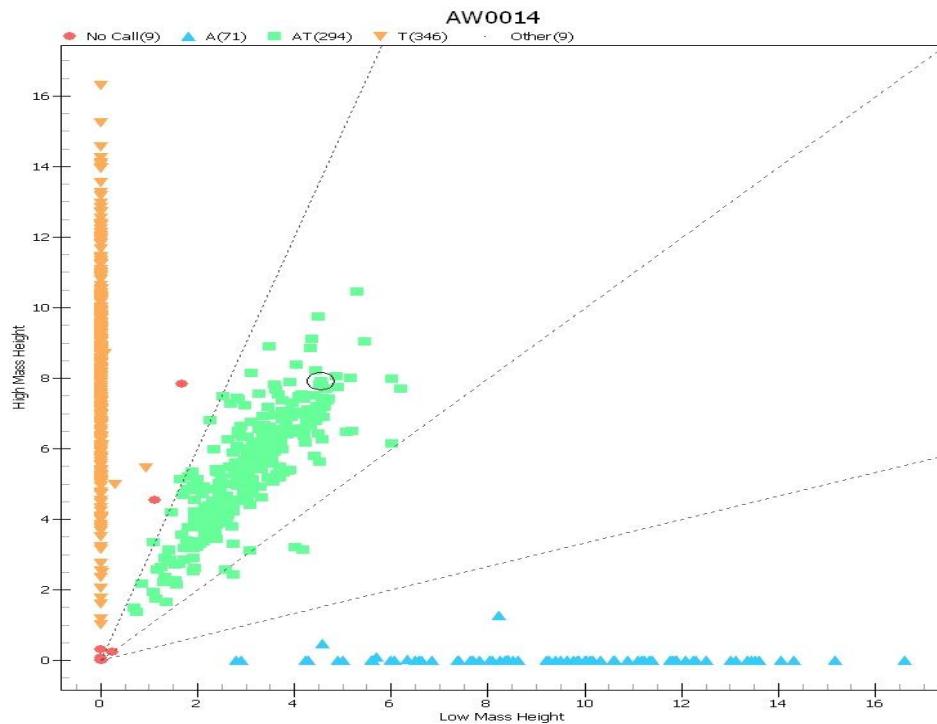
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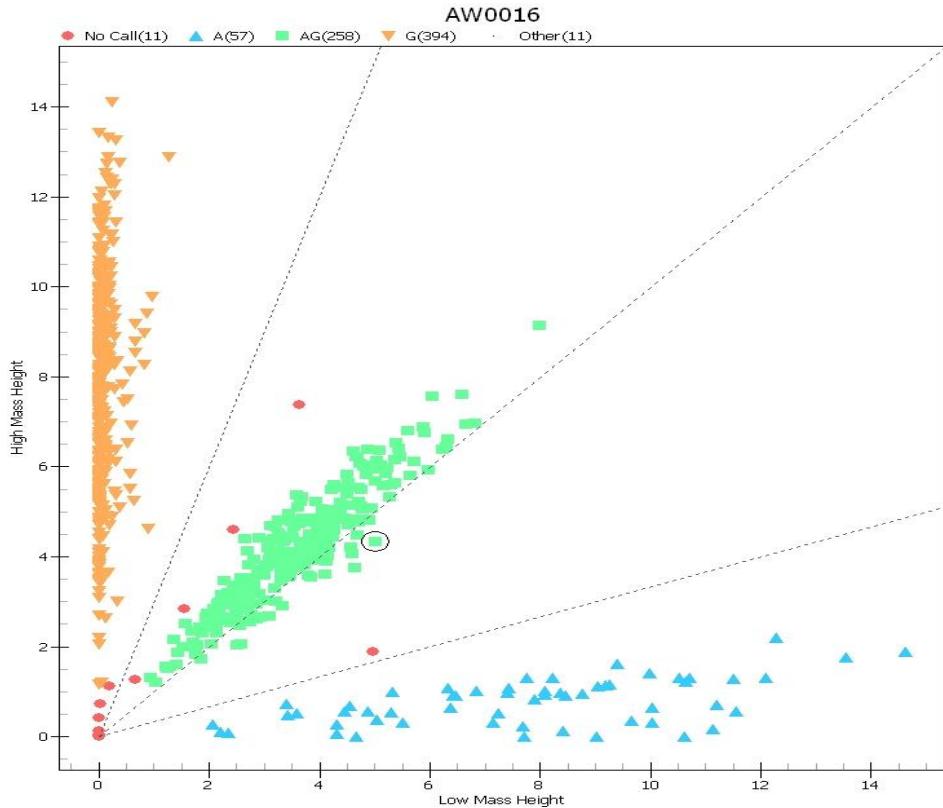
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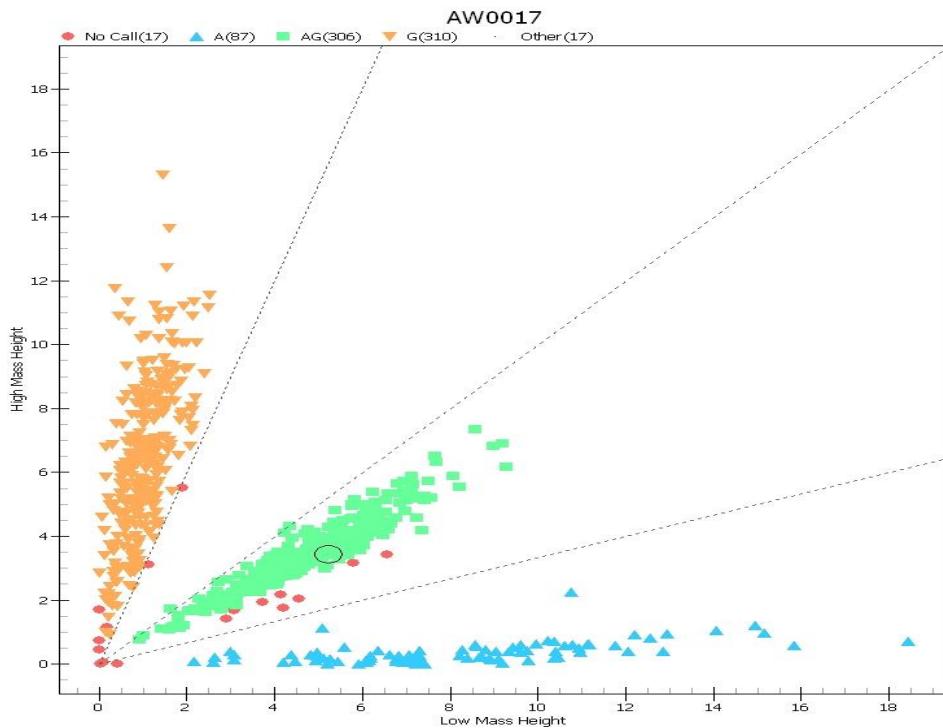
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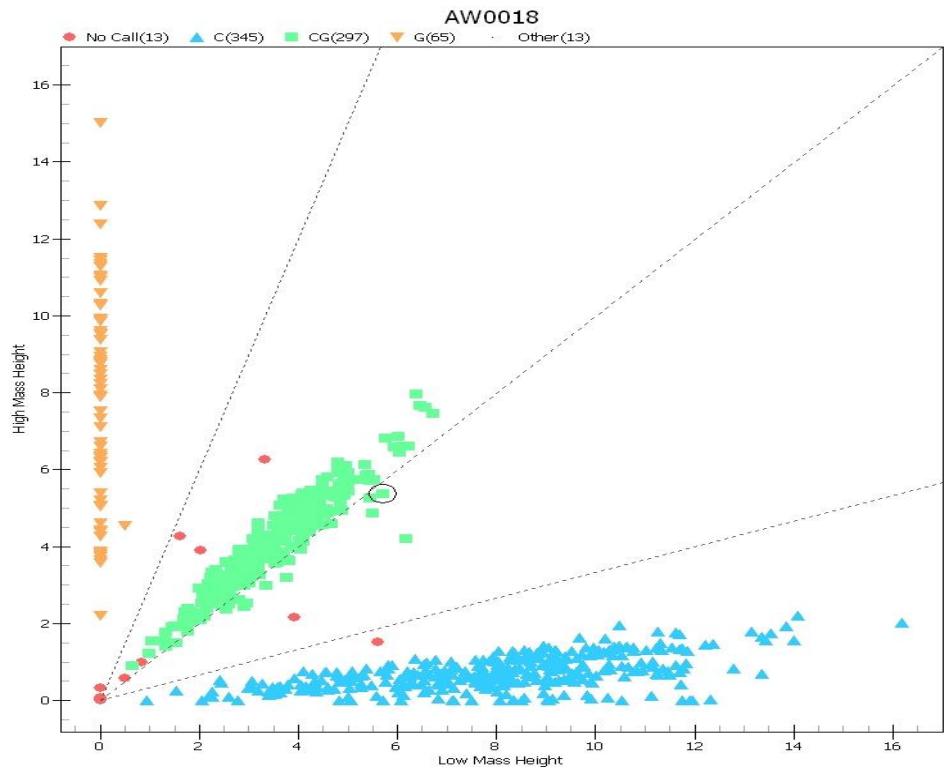
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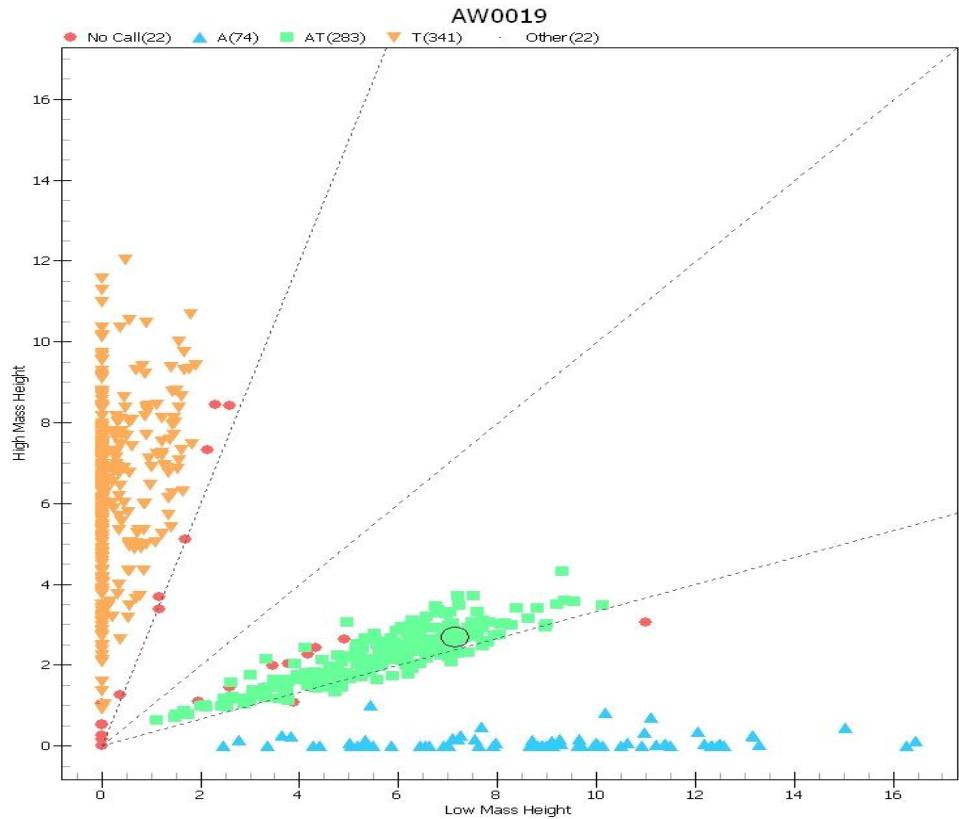
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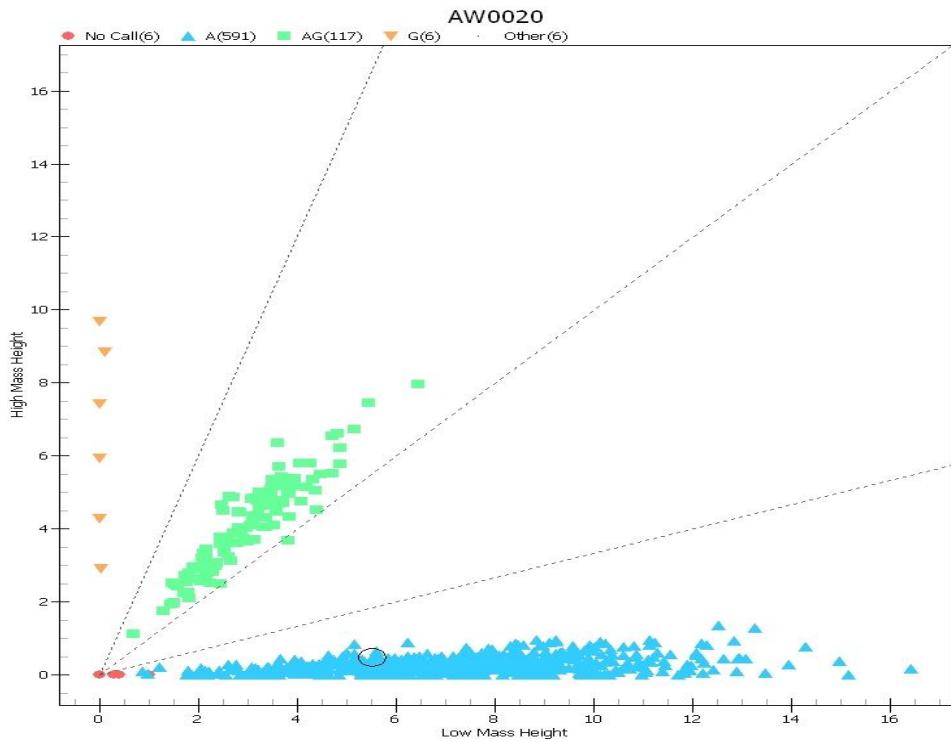
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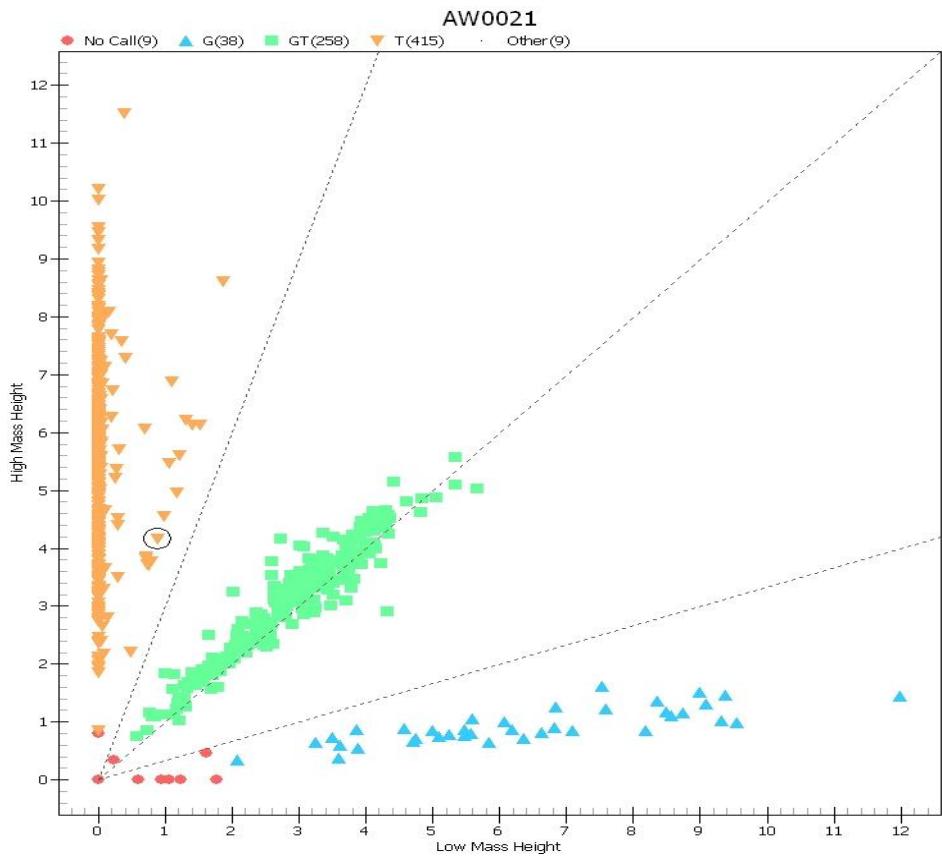
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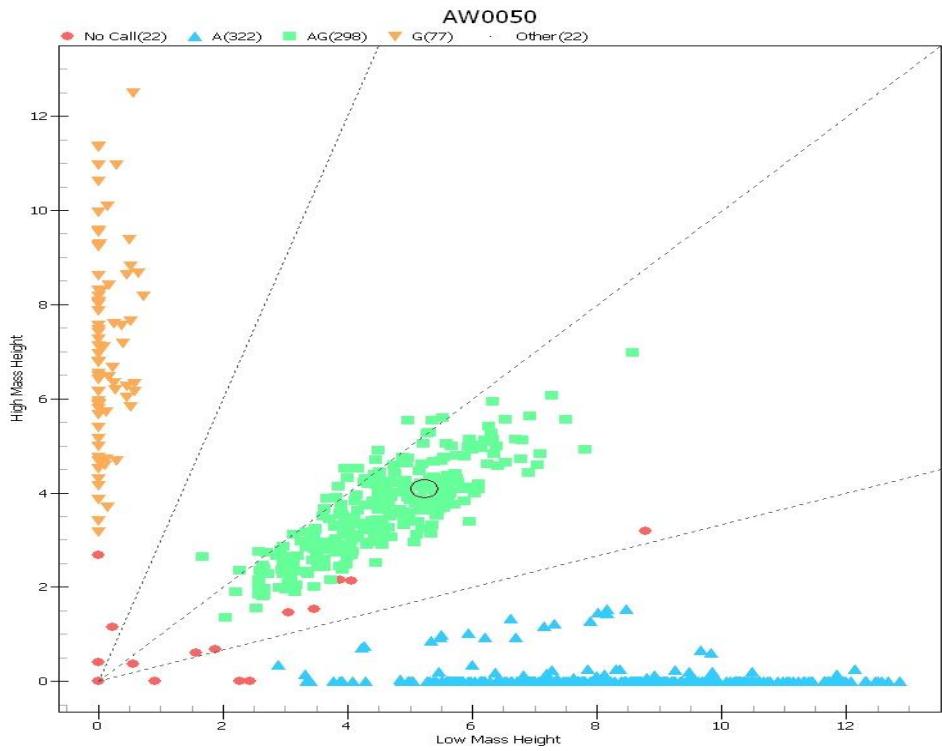
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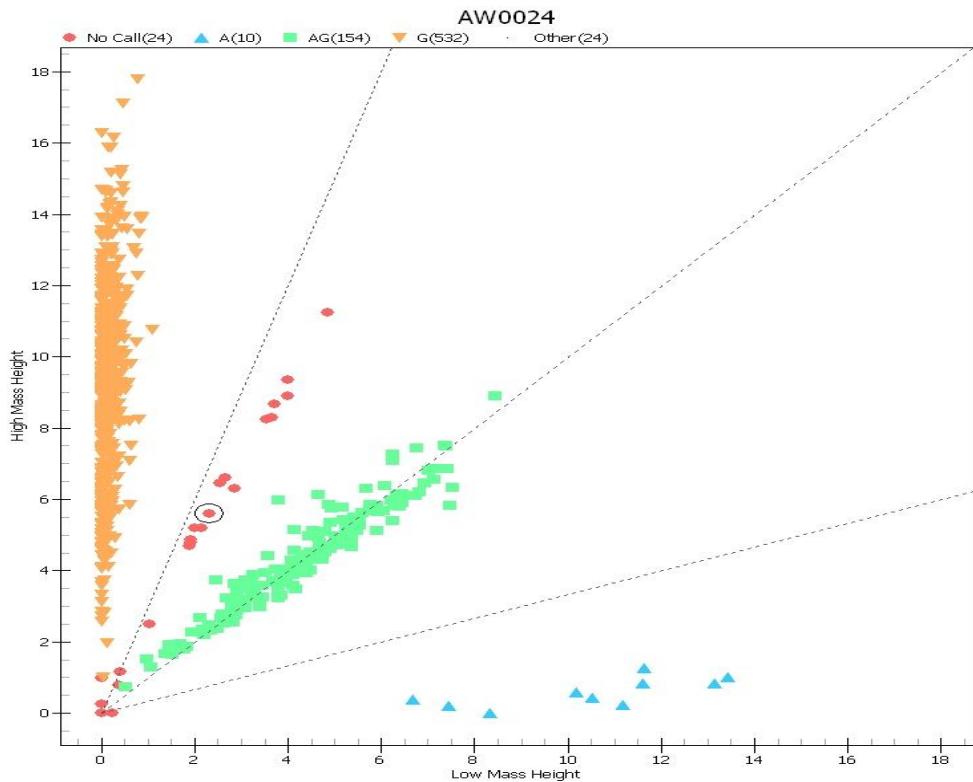
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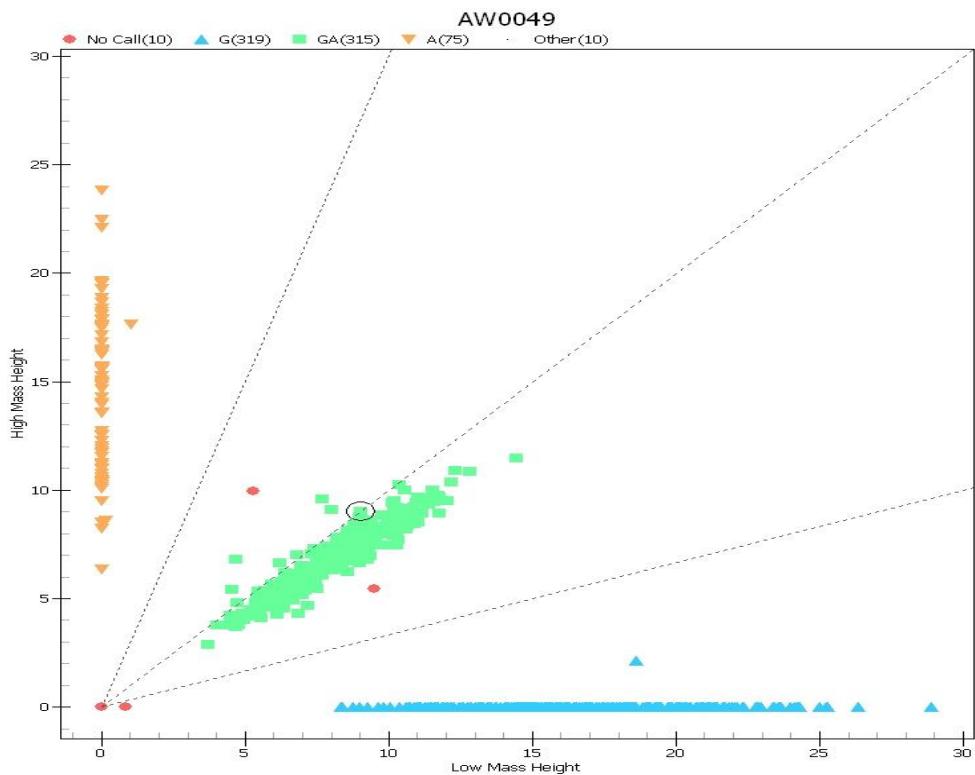
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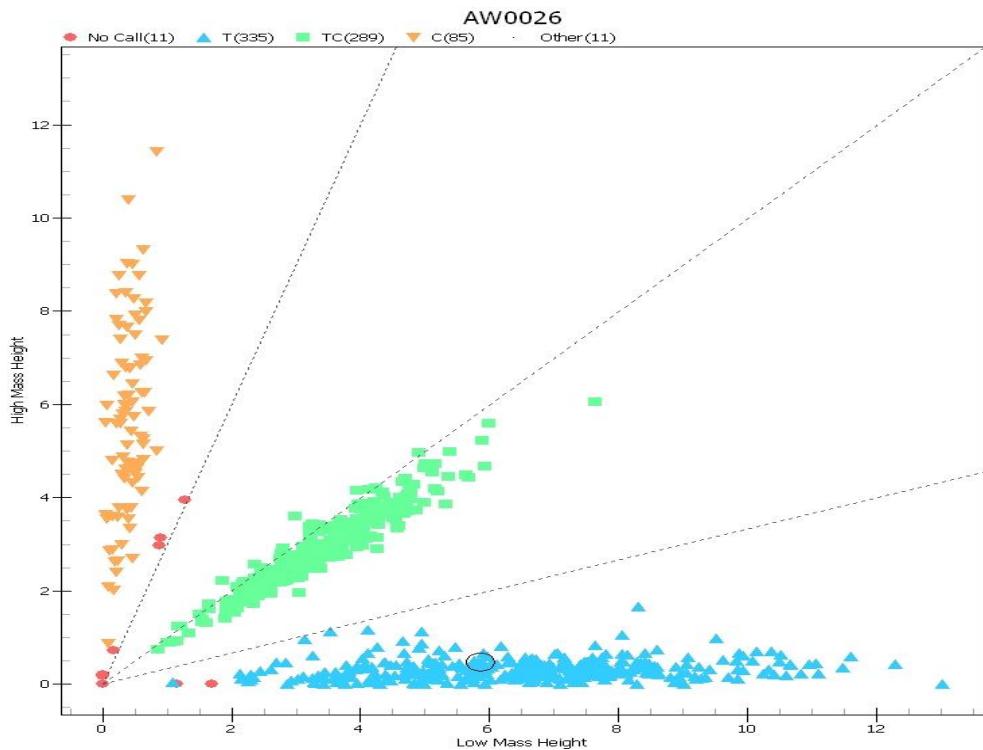
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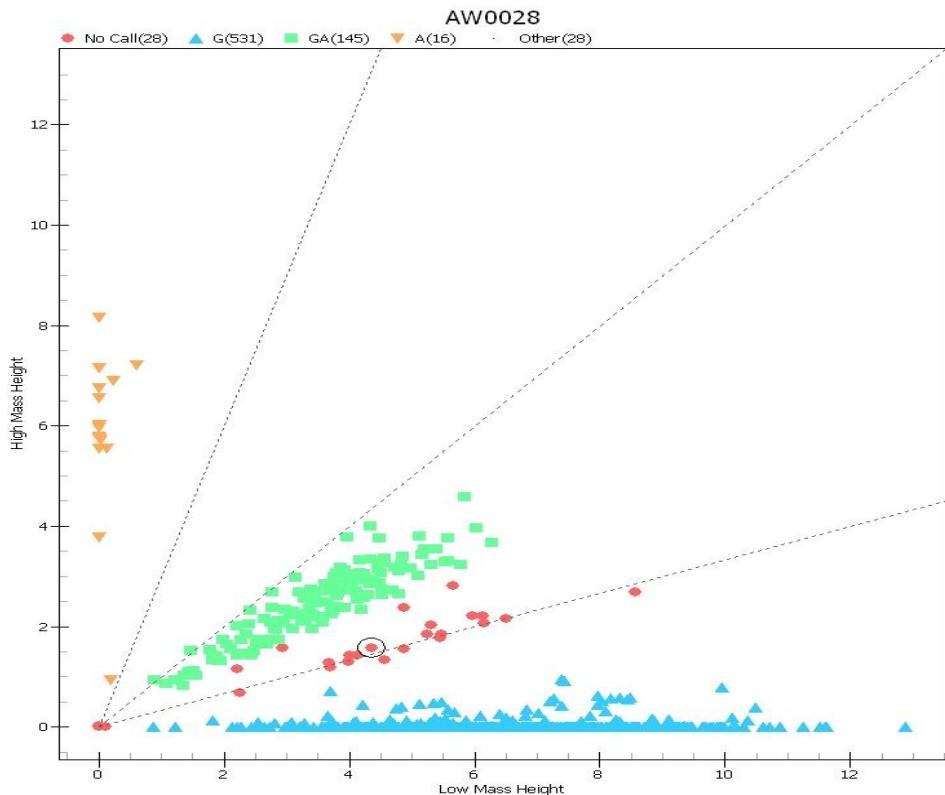
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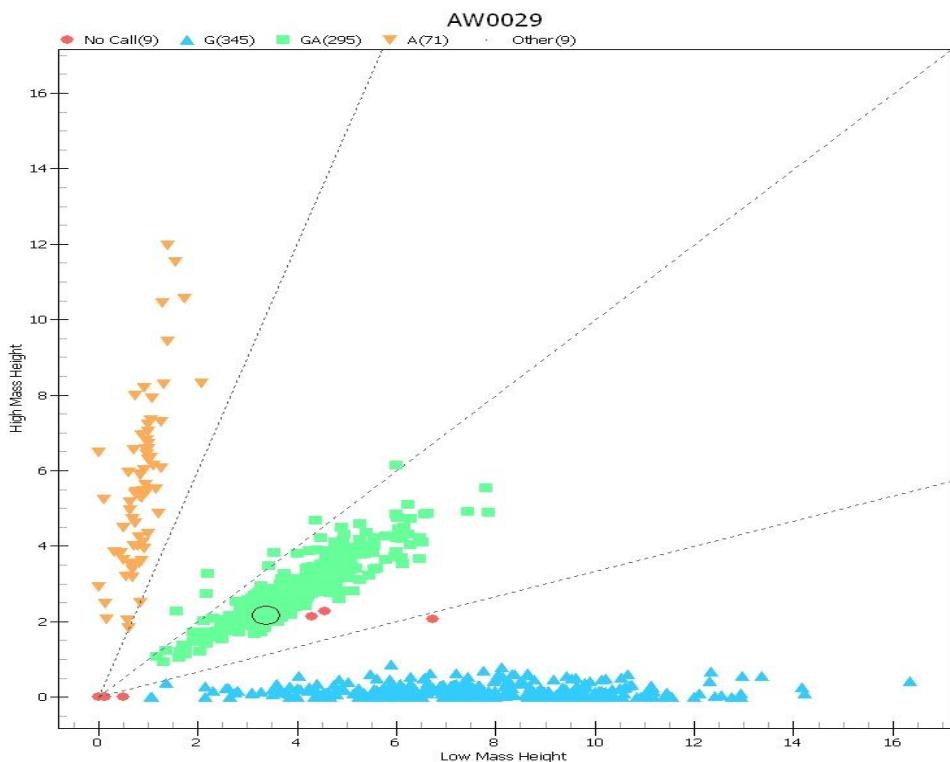
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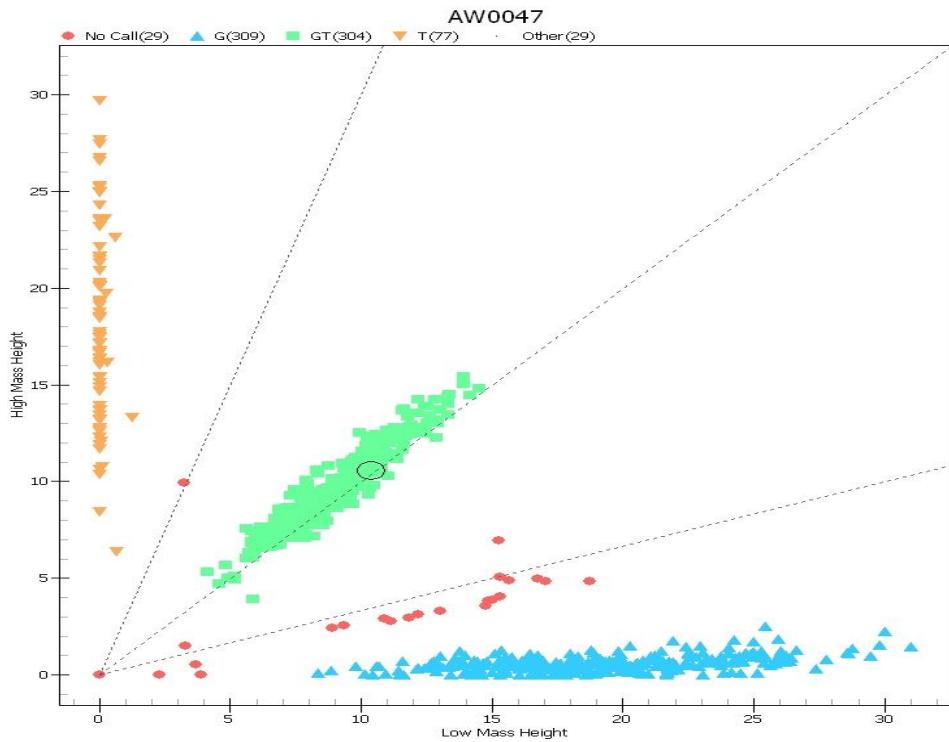
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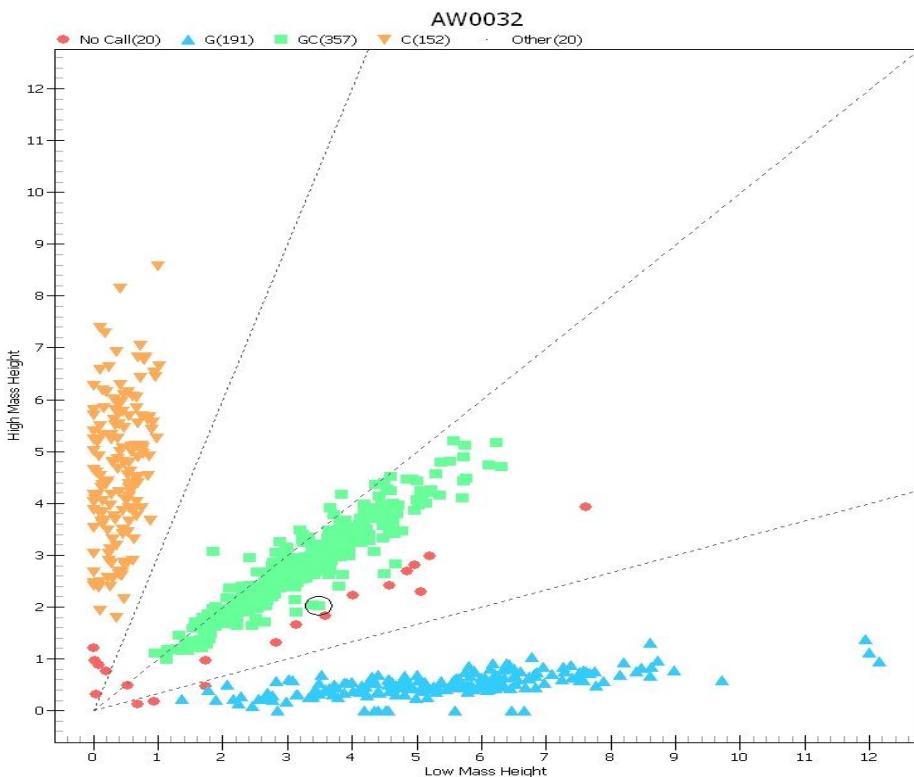
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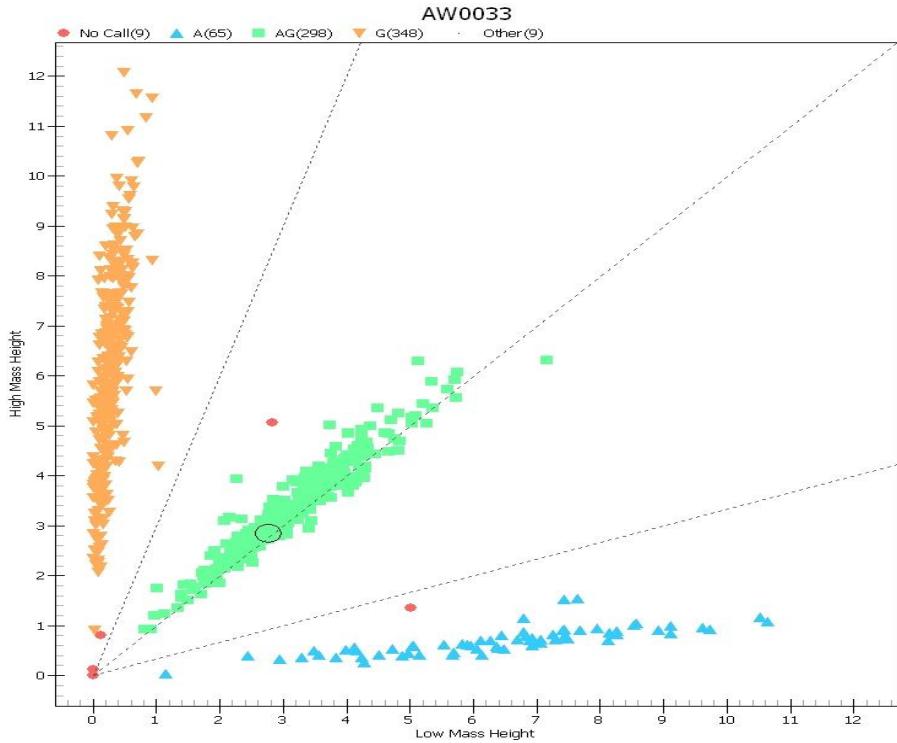
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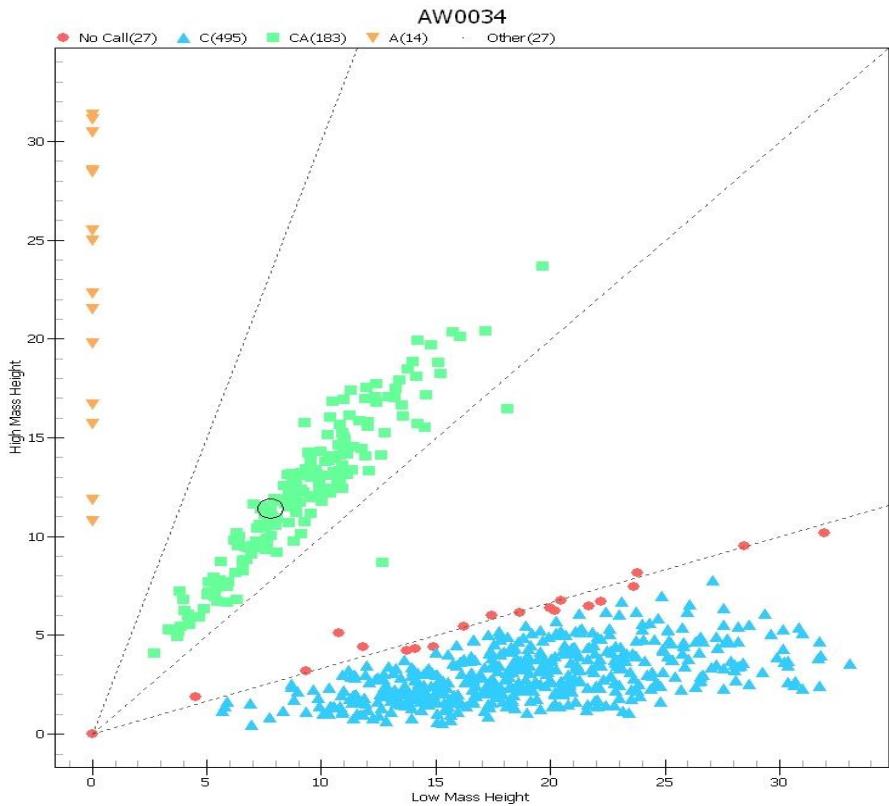
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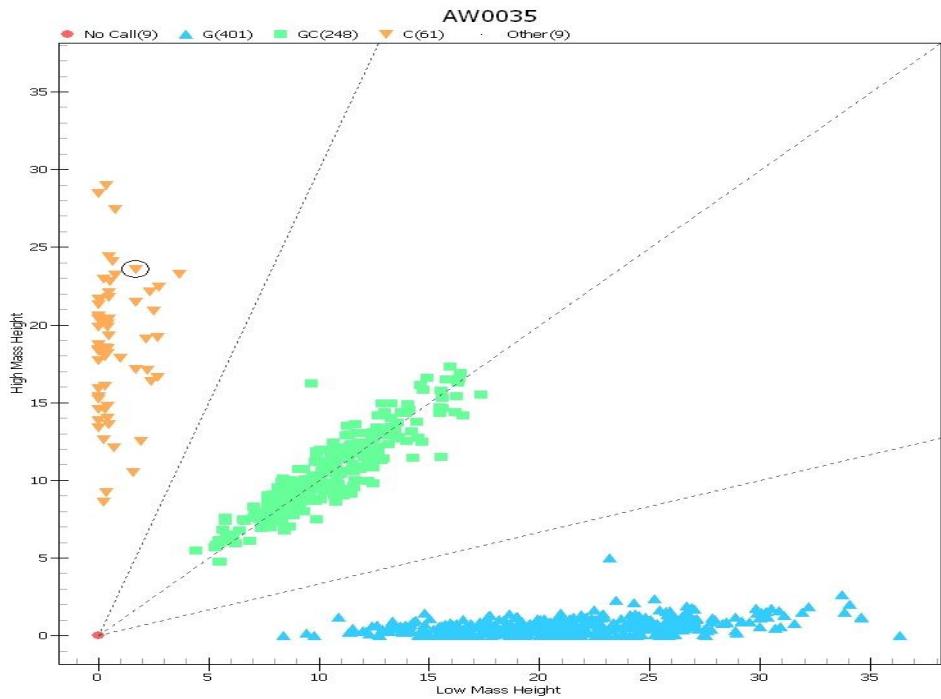
25. FTO rs17817288



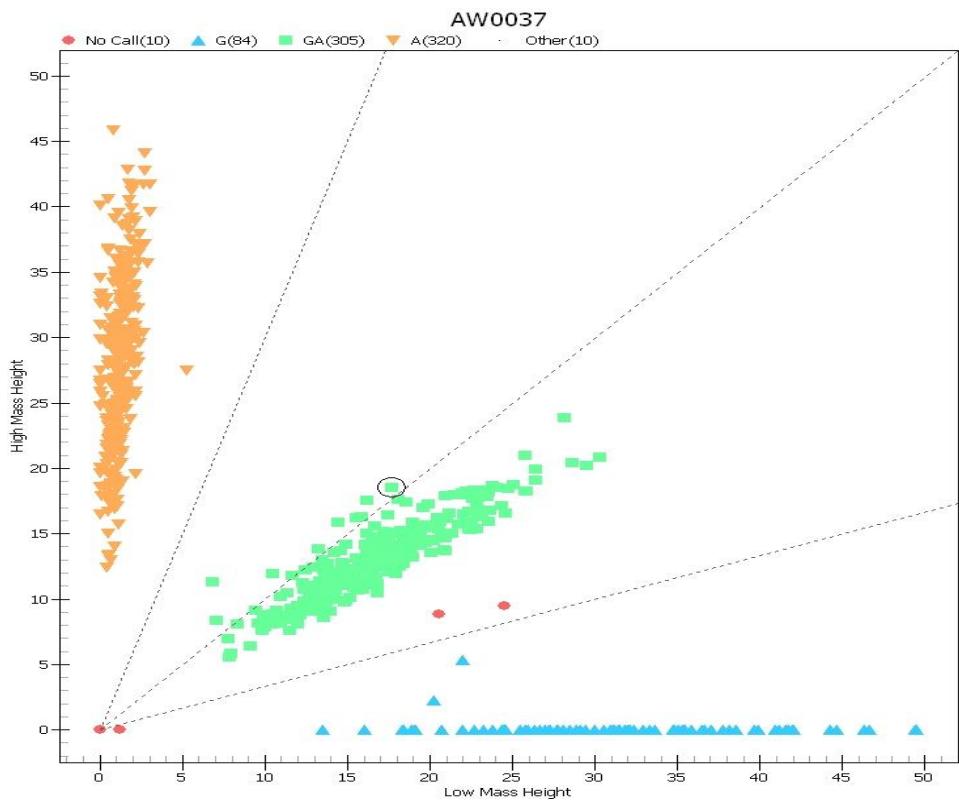
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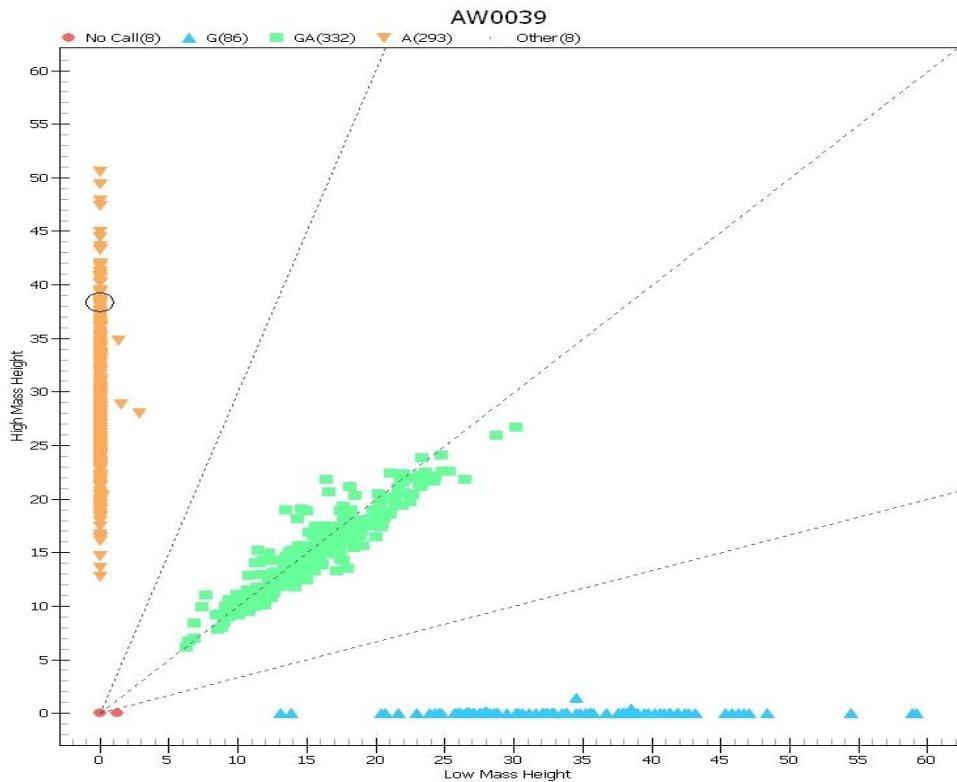
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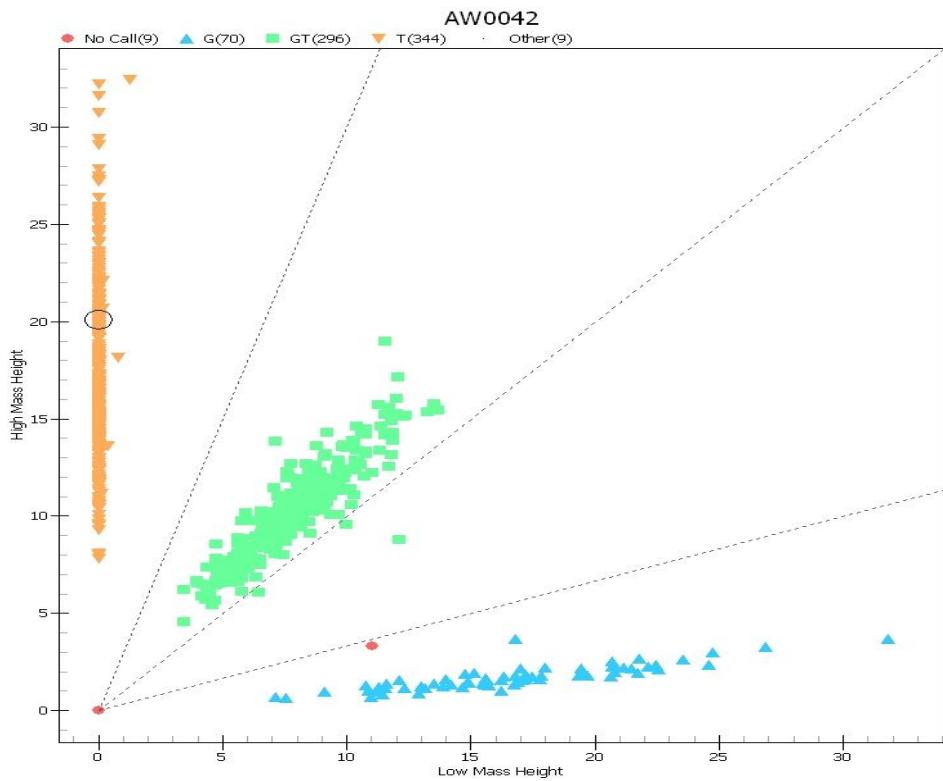
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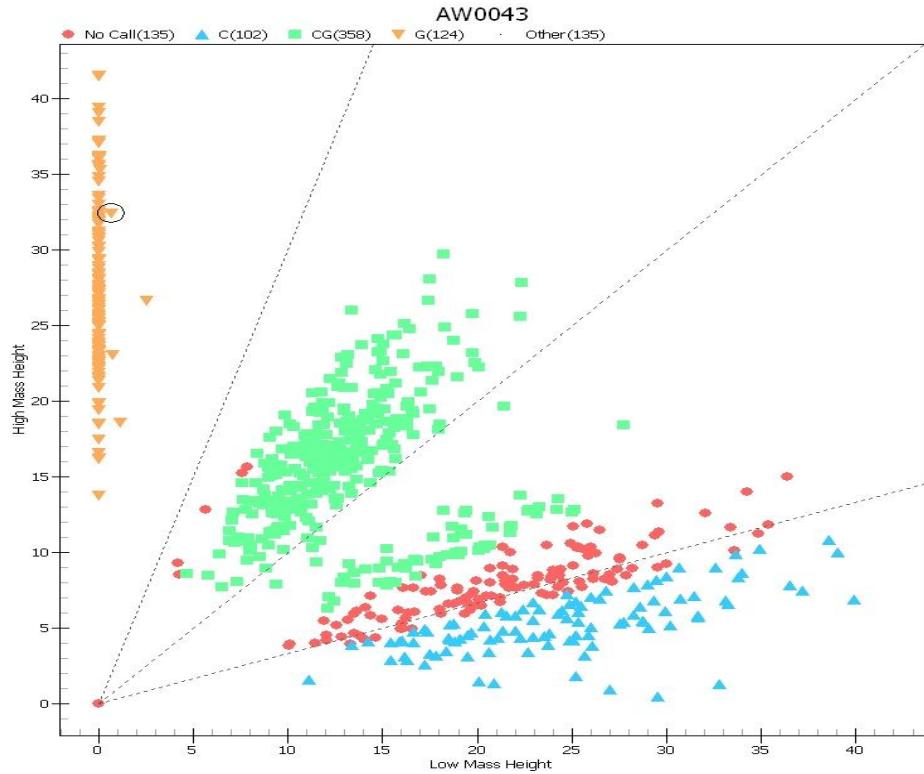
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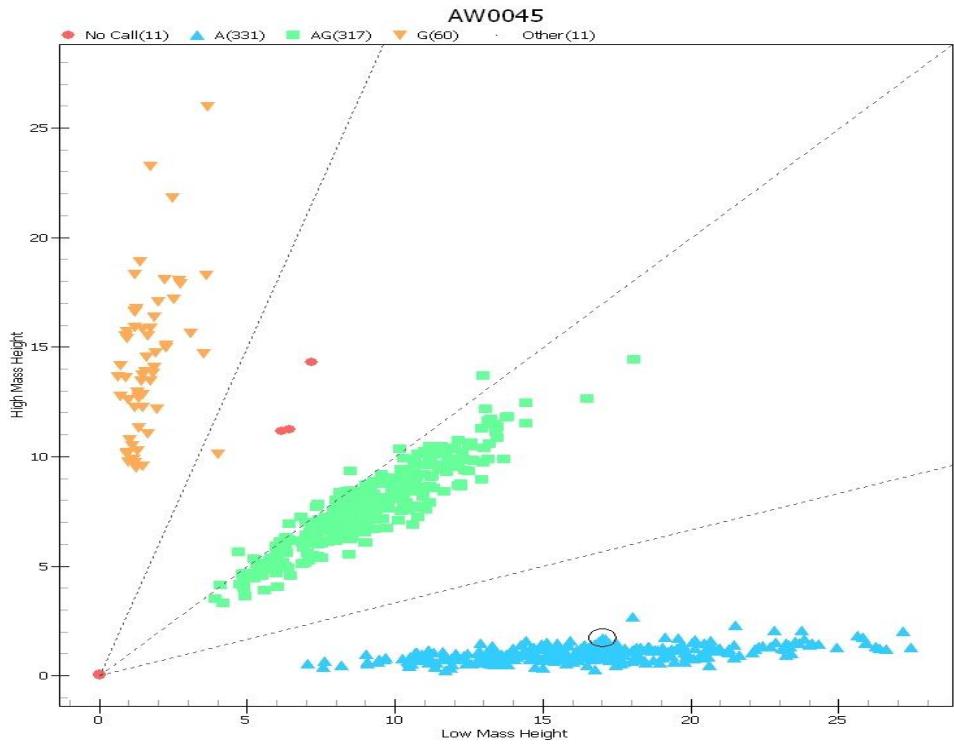
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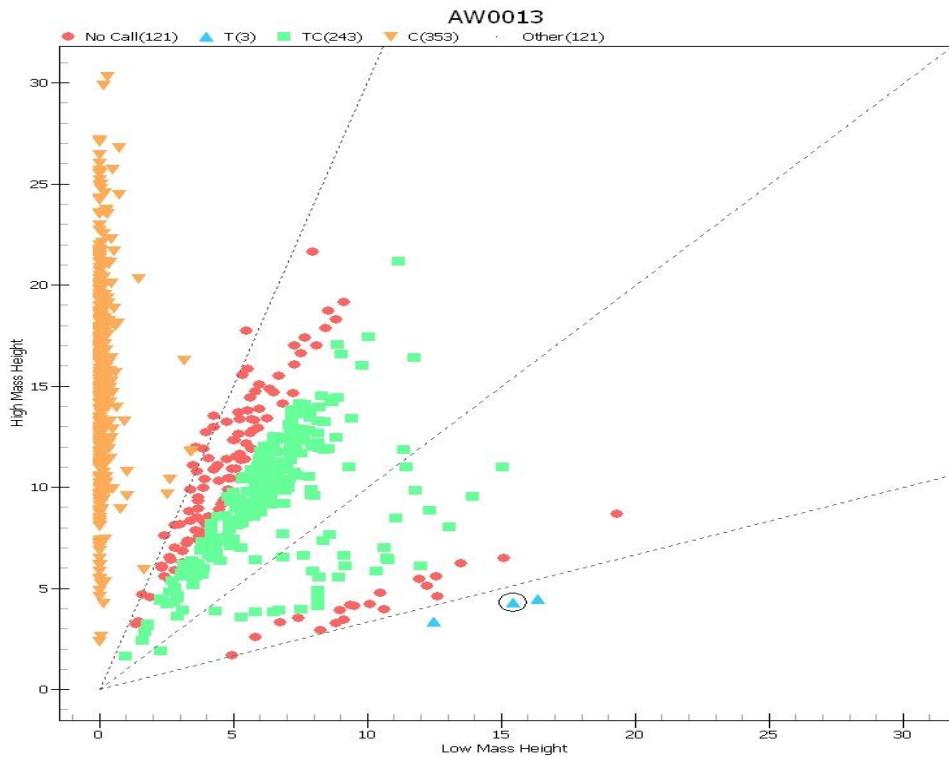
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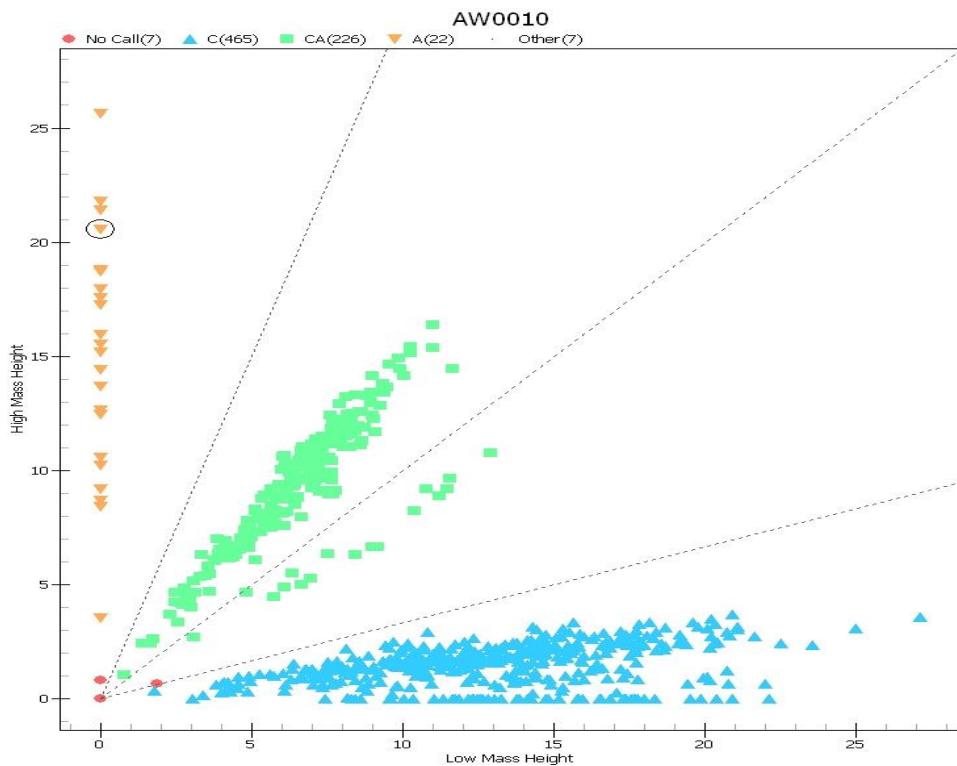
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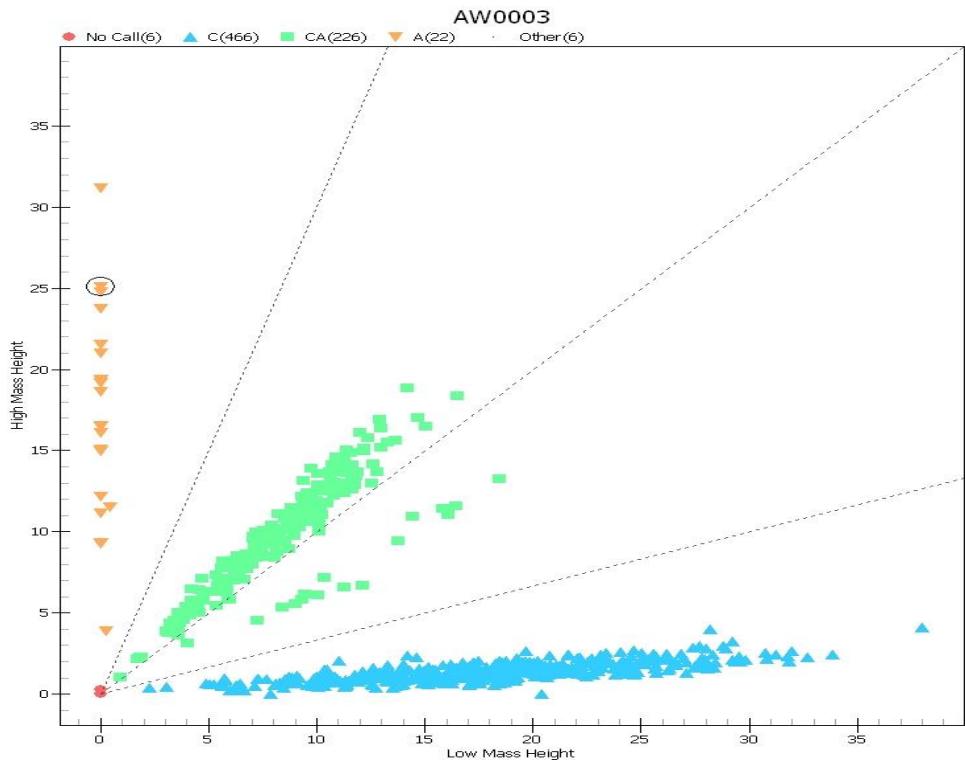
33. LEP rs11770725



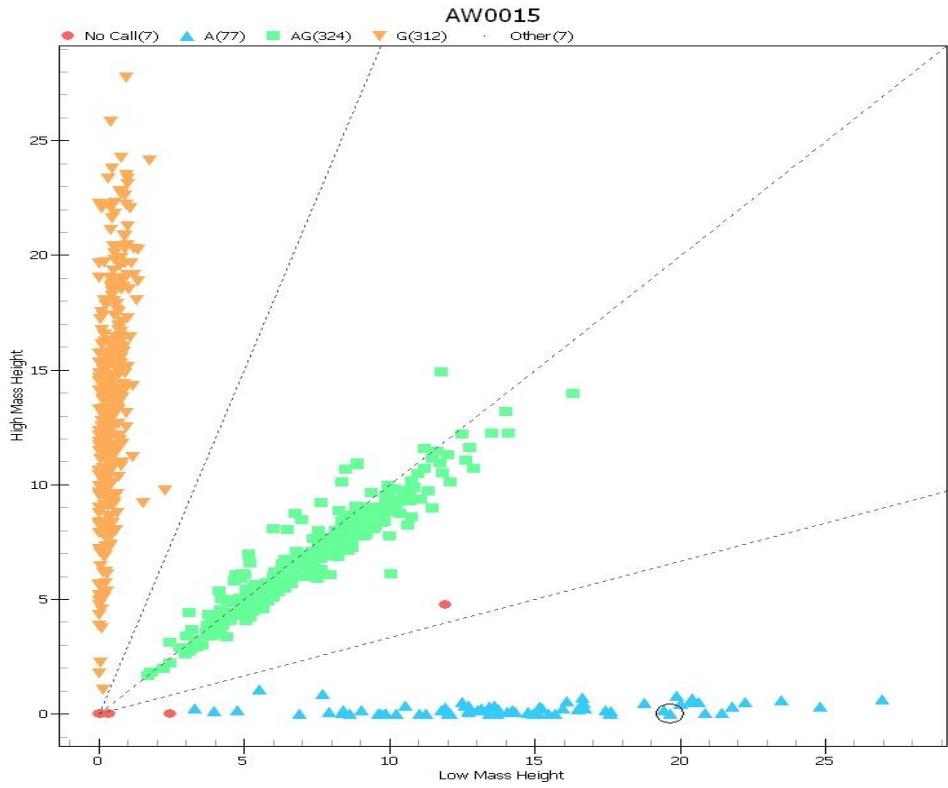
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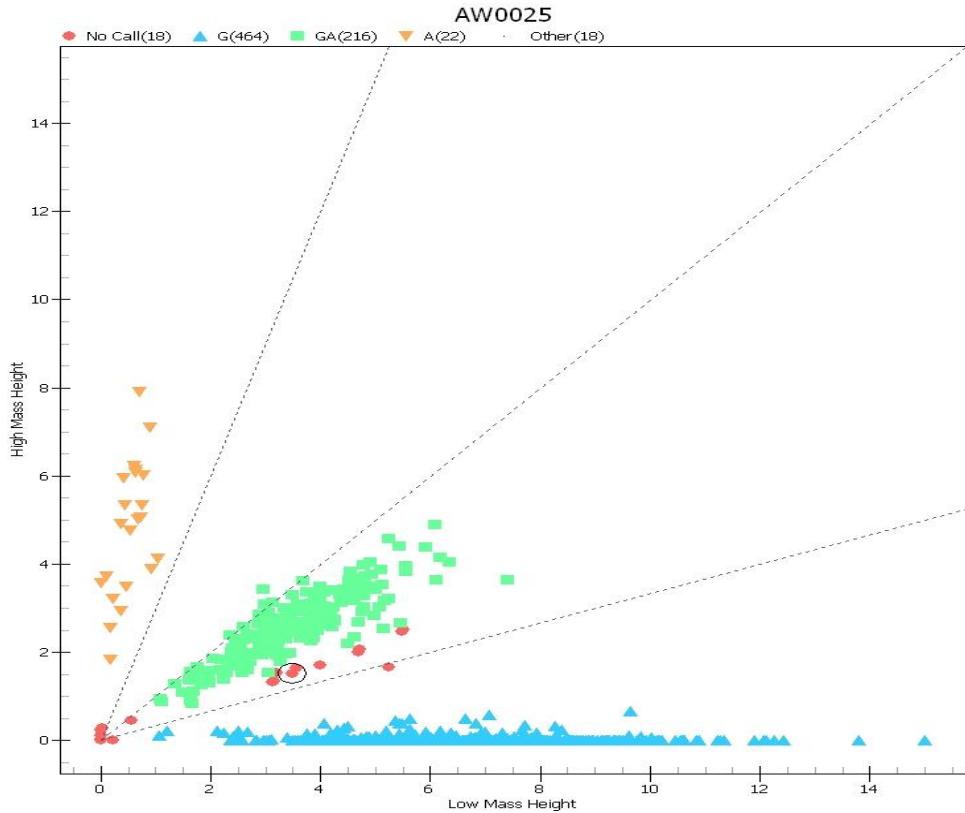
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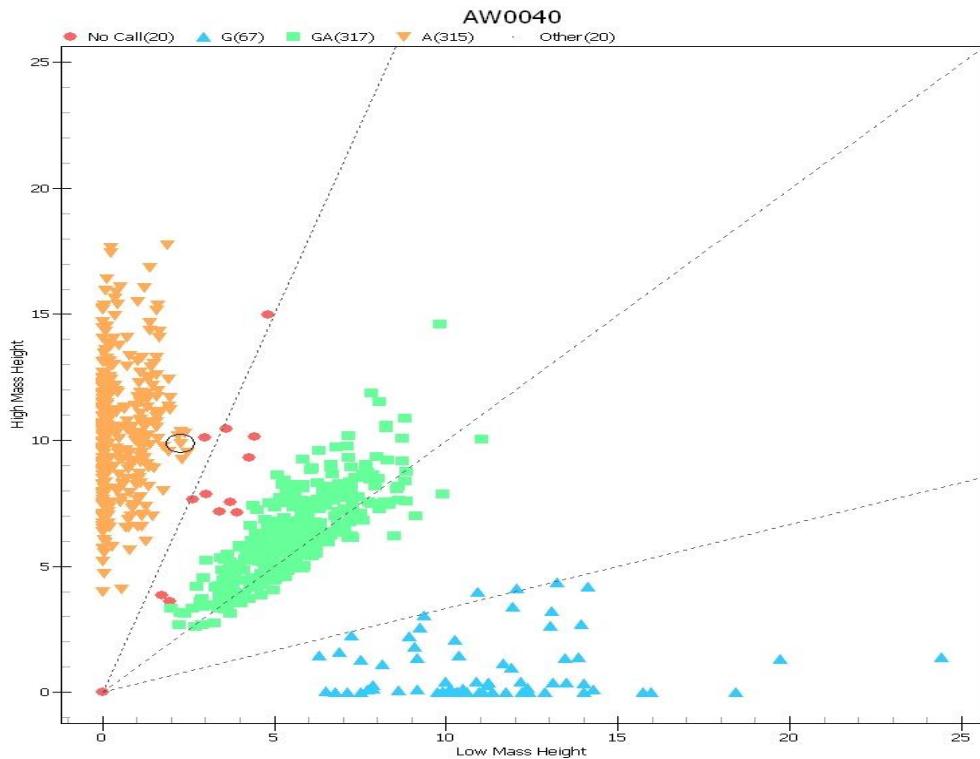
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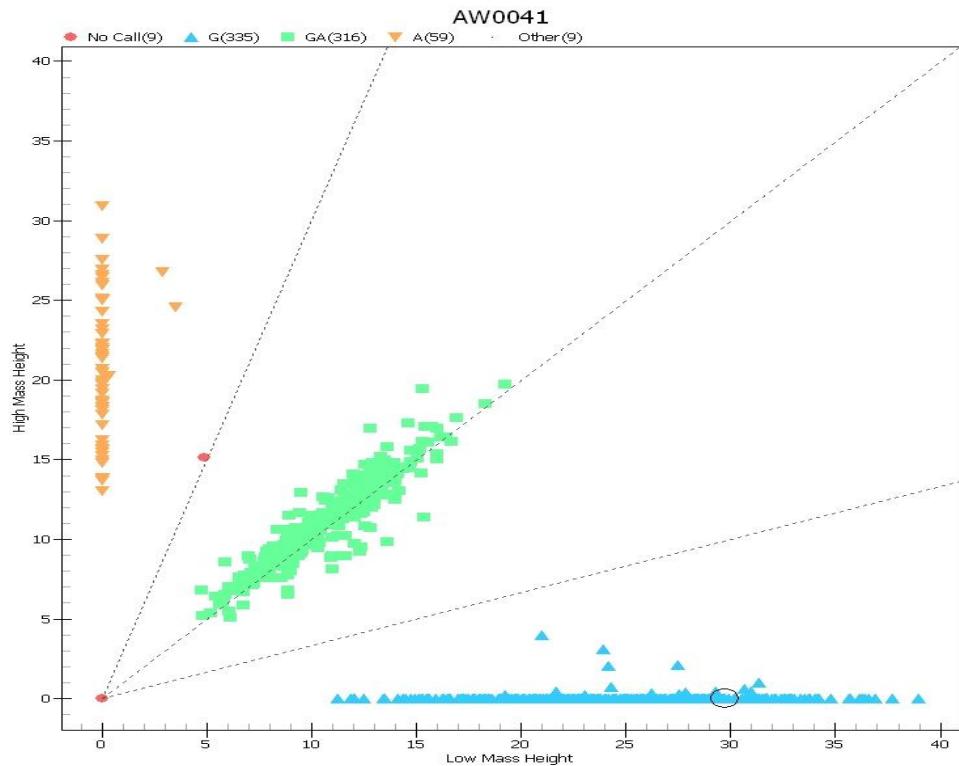
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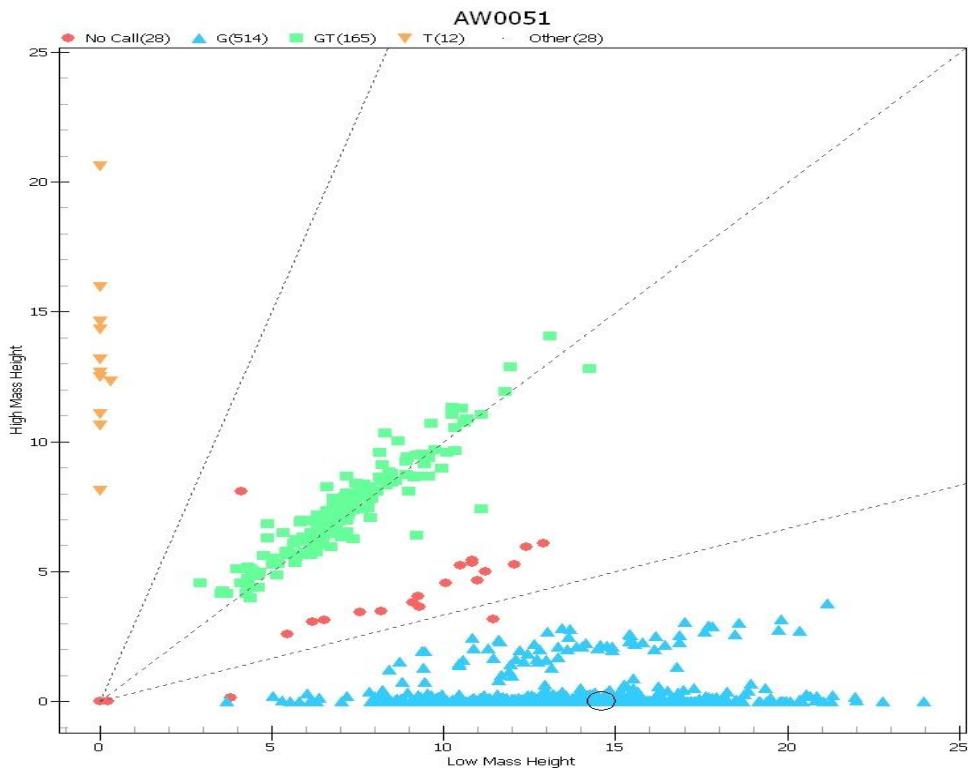
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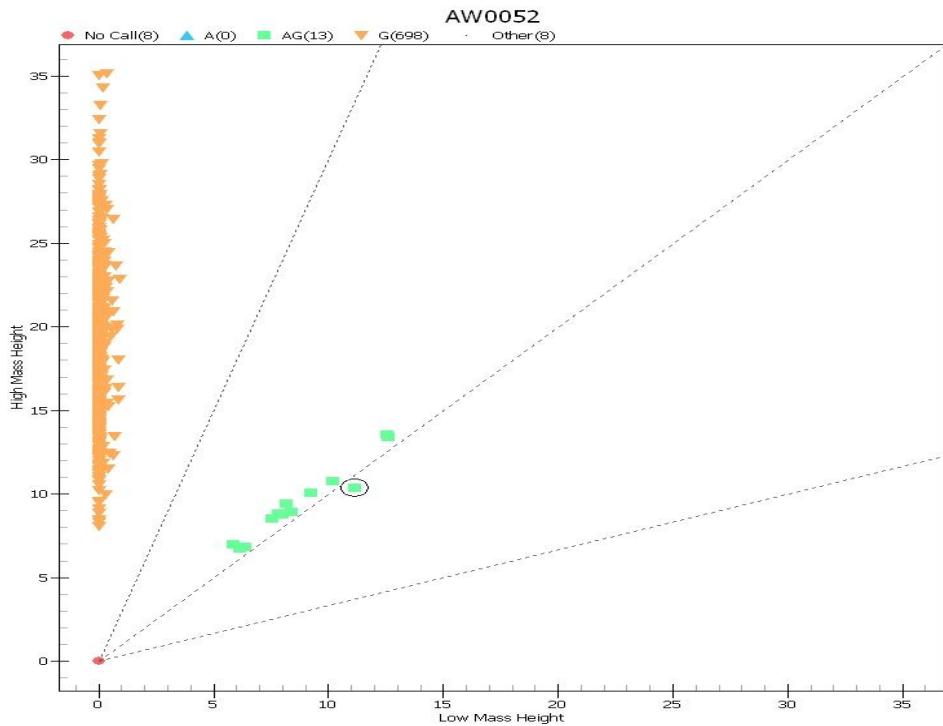
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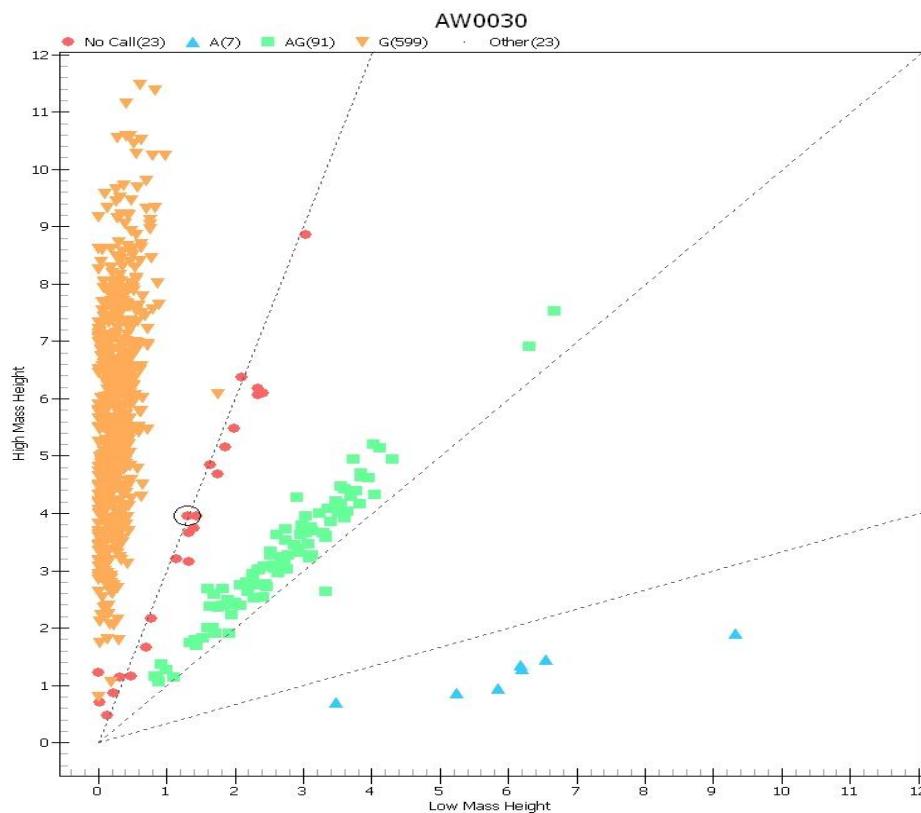
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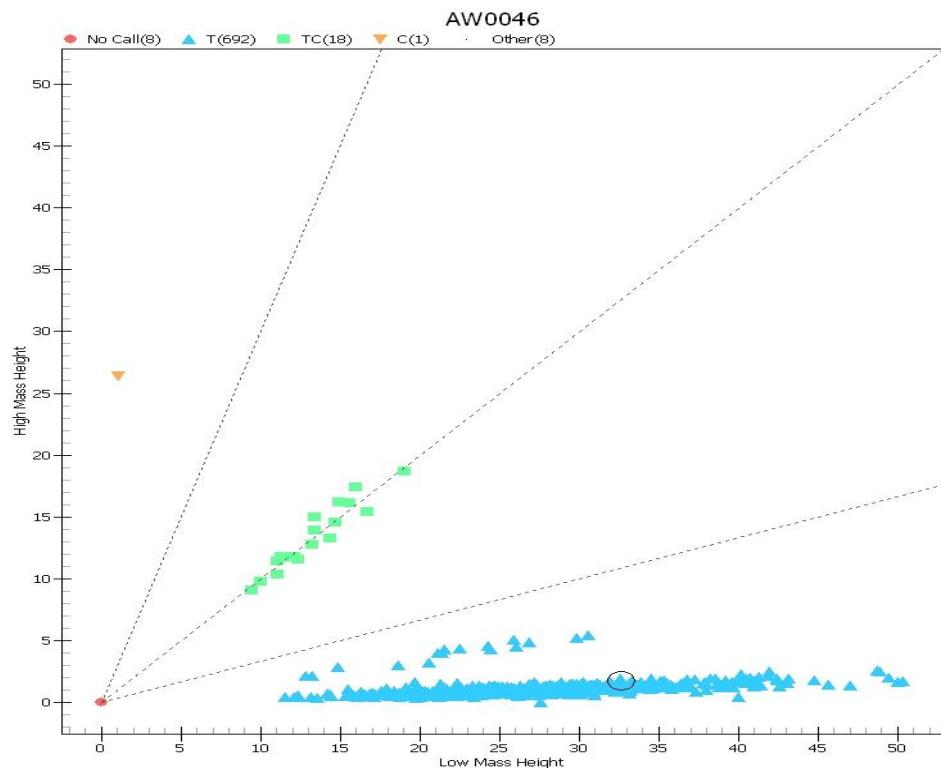
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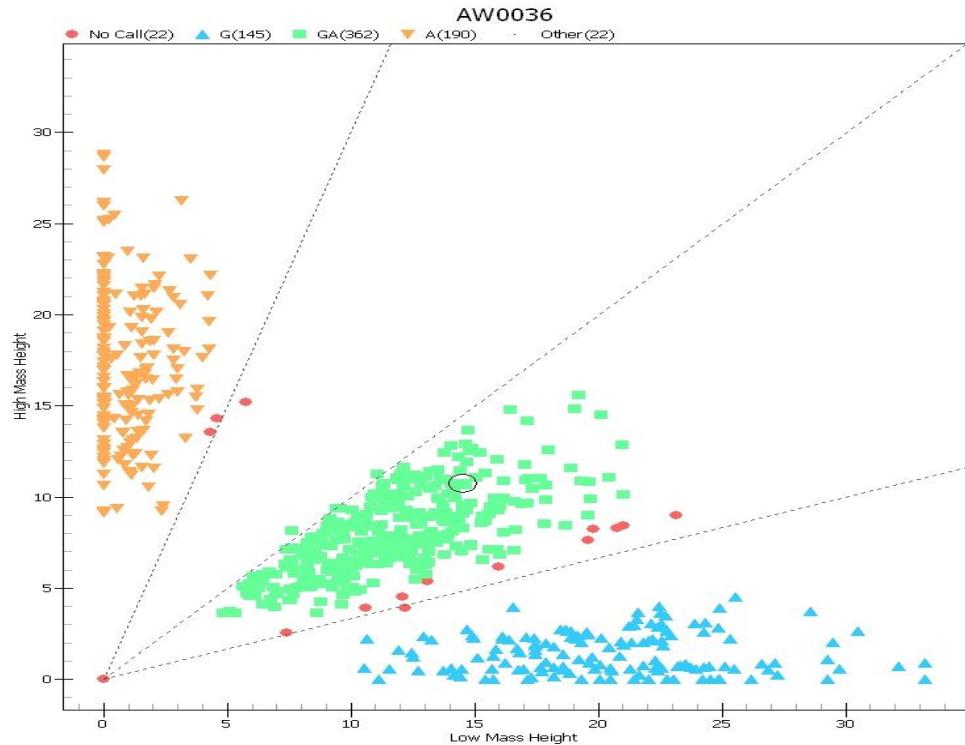
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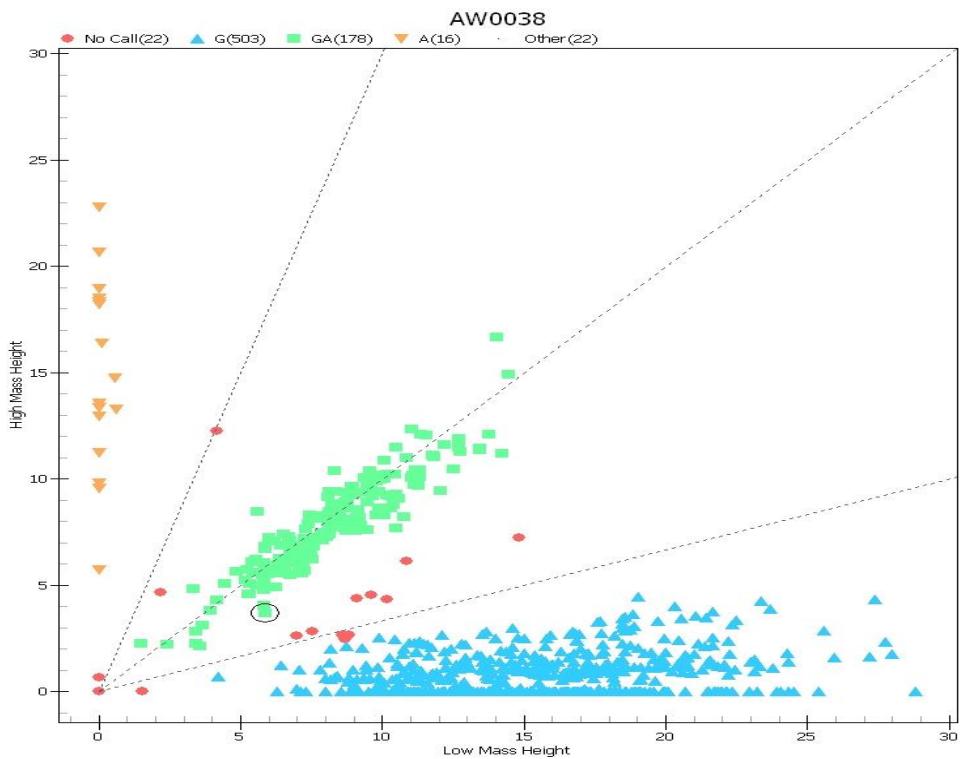
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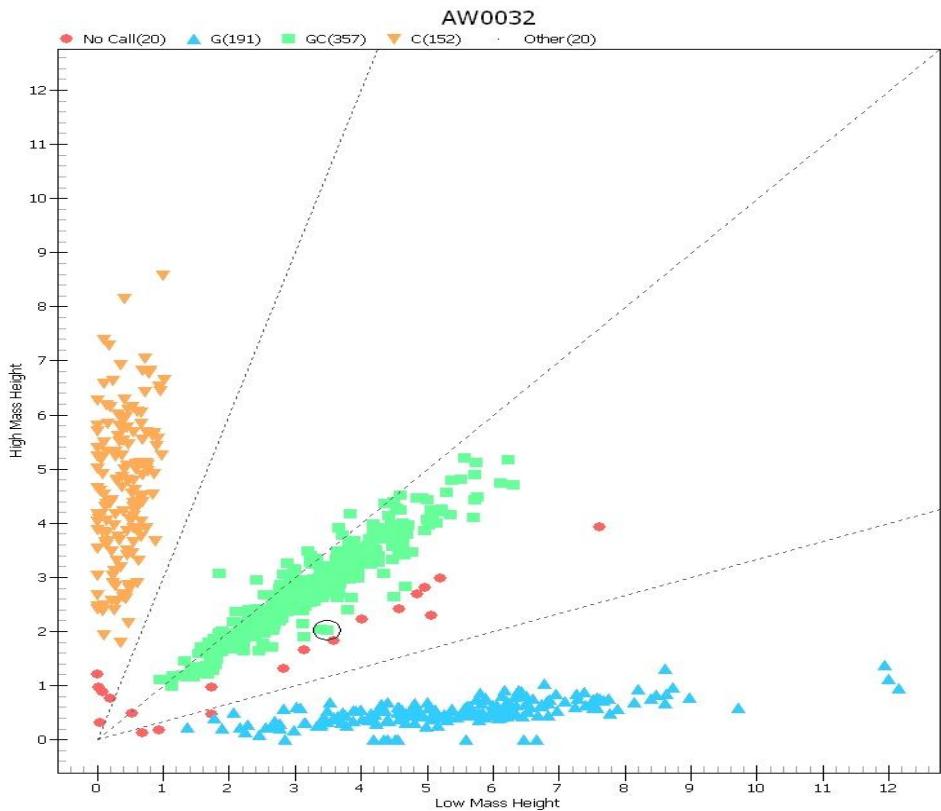
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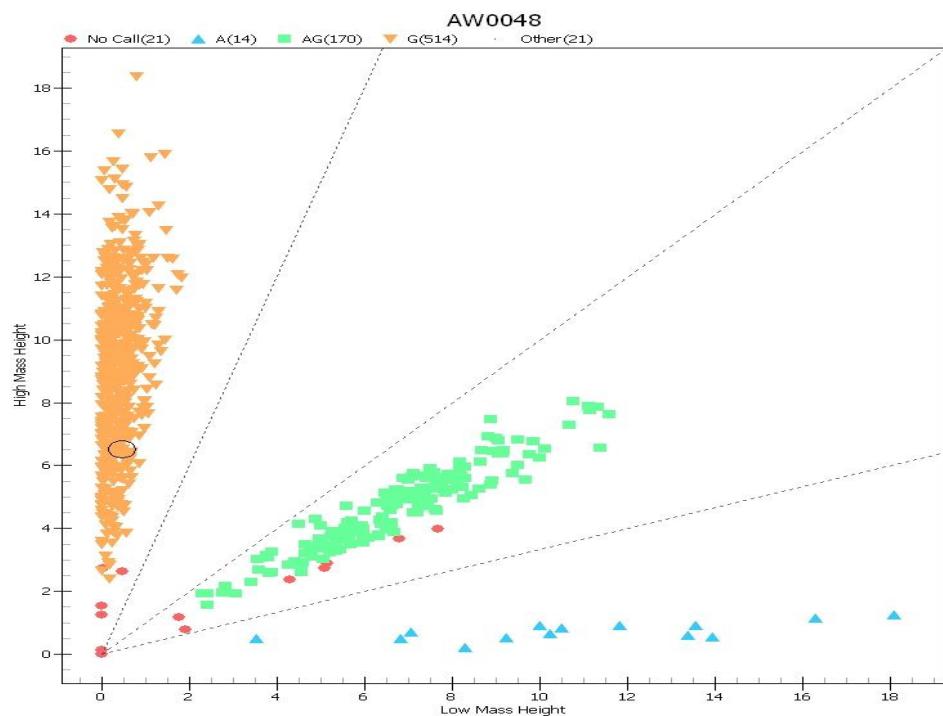
45. RETN rs34861192



46. RETN rs1862513

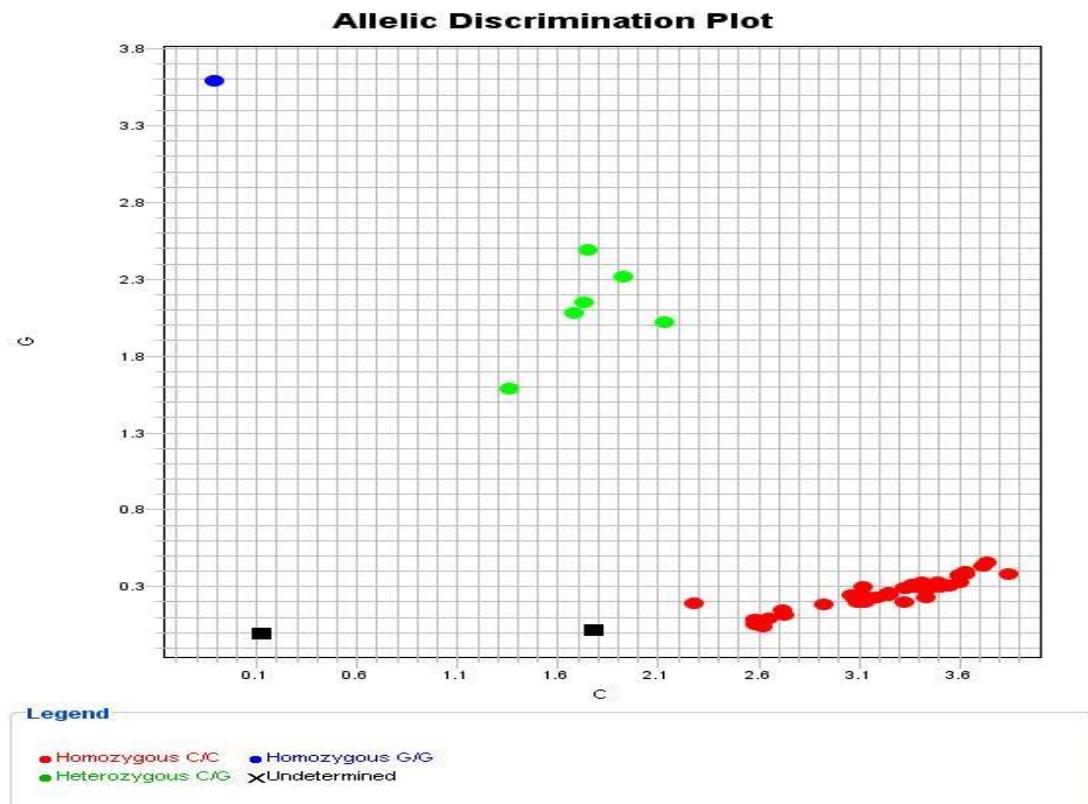


47. RETN rs3219175

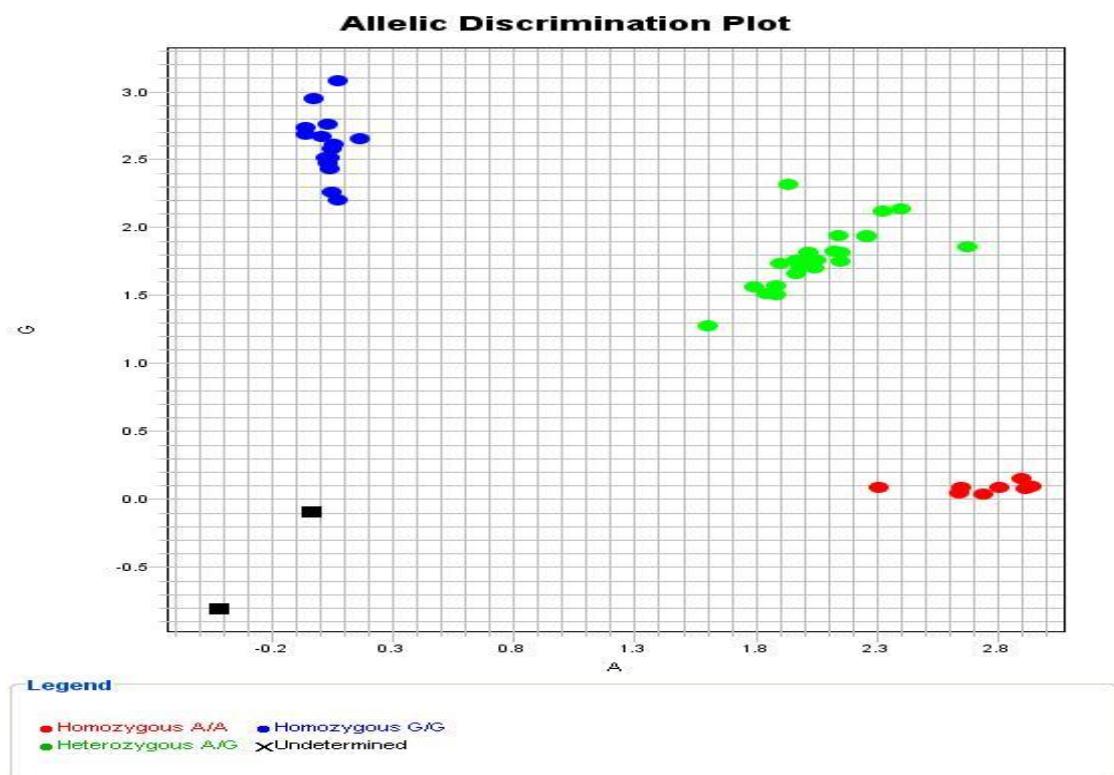


b) Cluster Plots for SNPs using Real-Time PCR

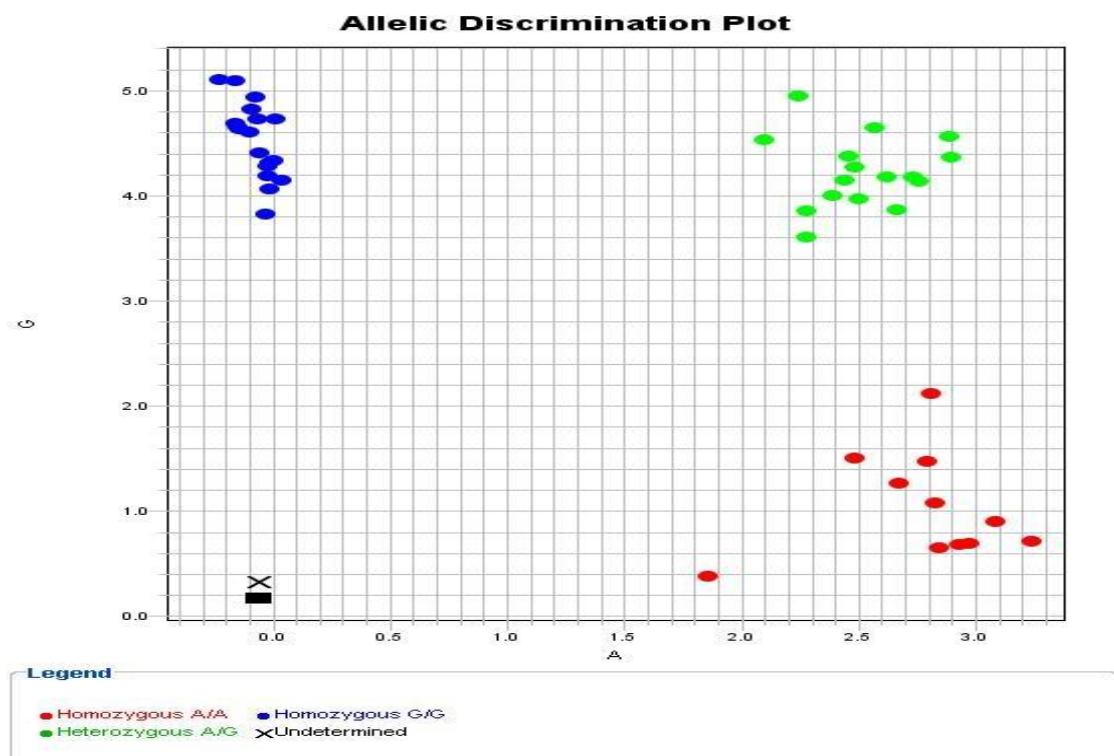
48. ADRB2 rs1042714



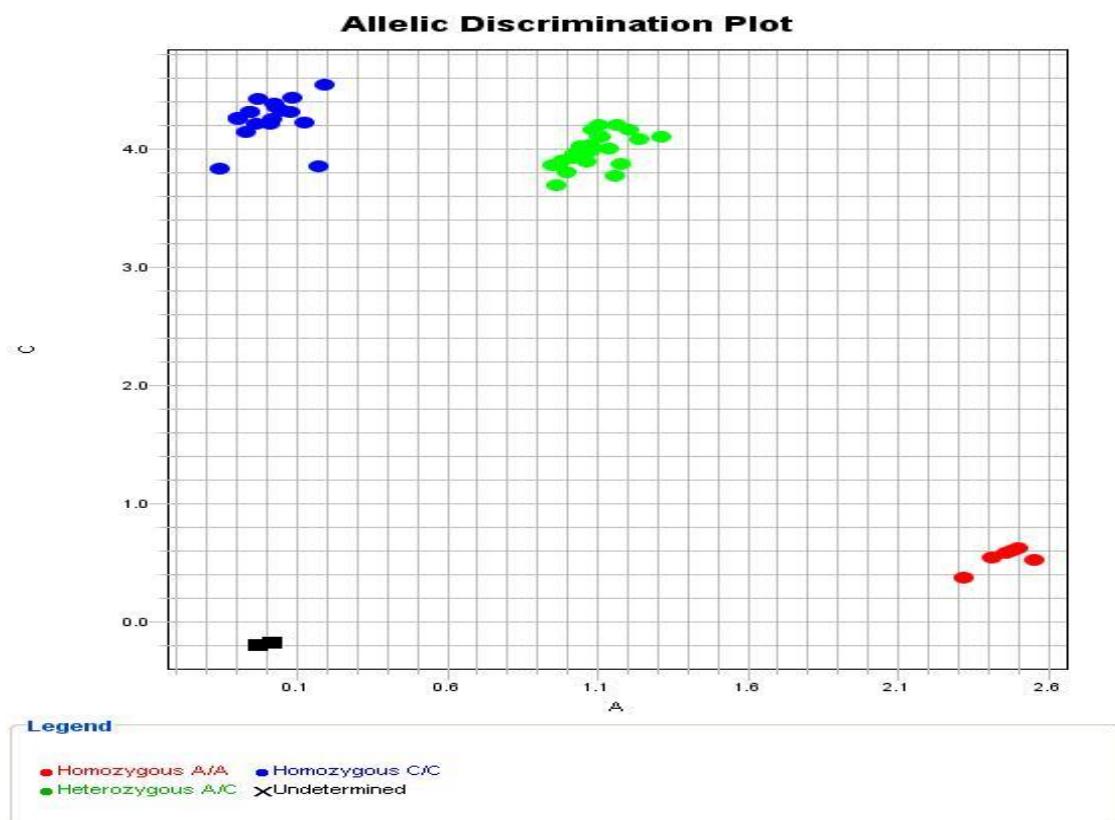
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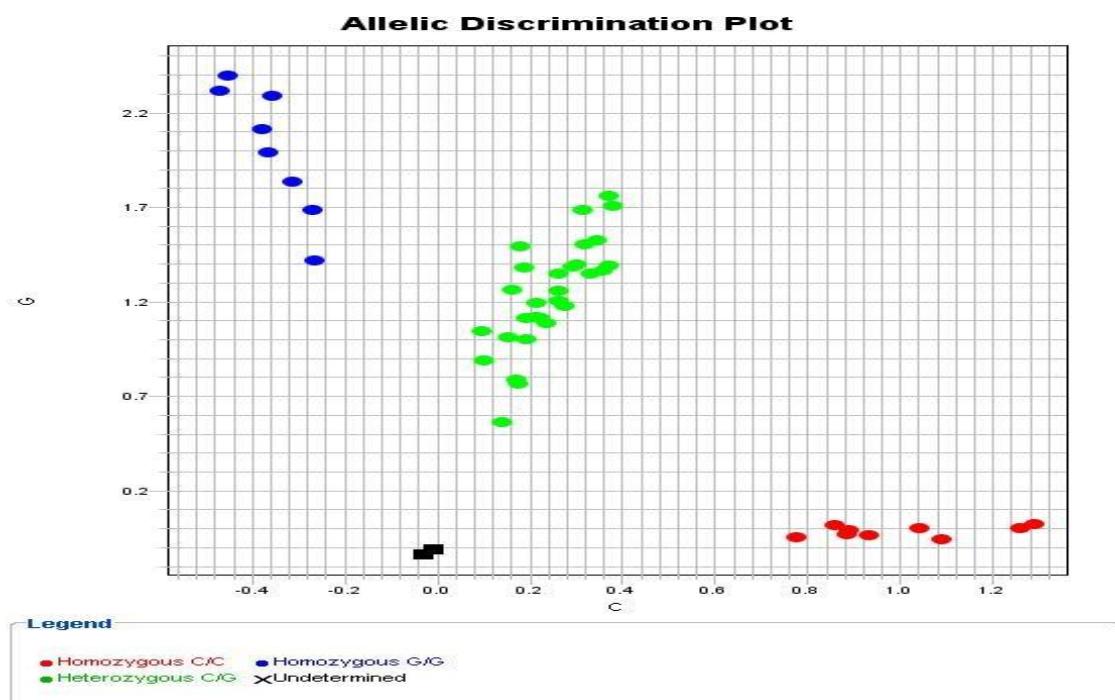
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51. ADRB2 rs1042718

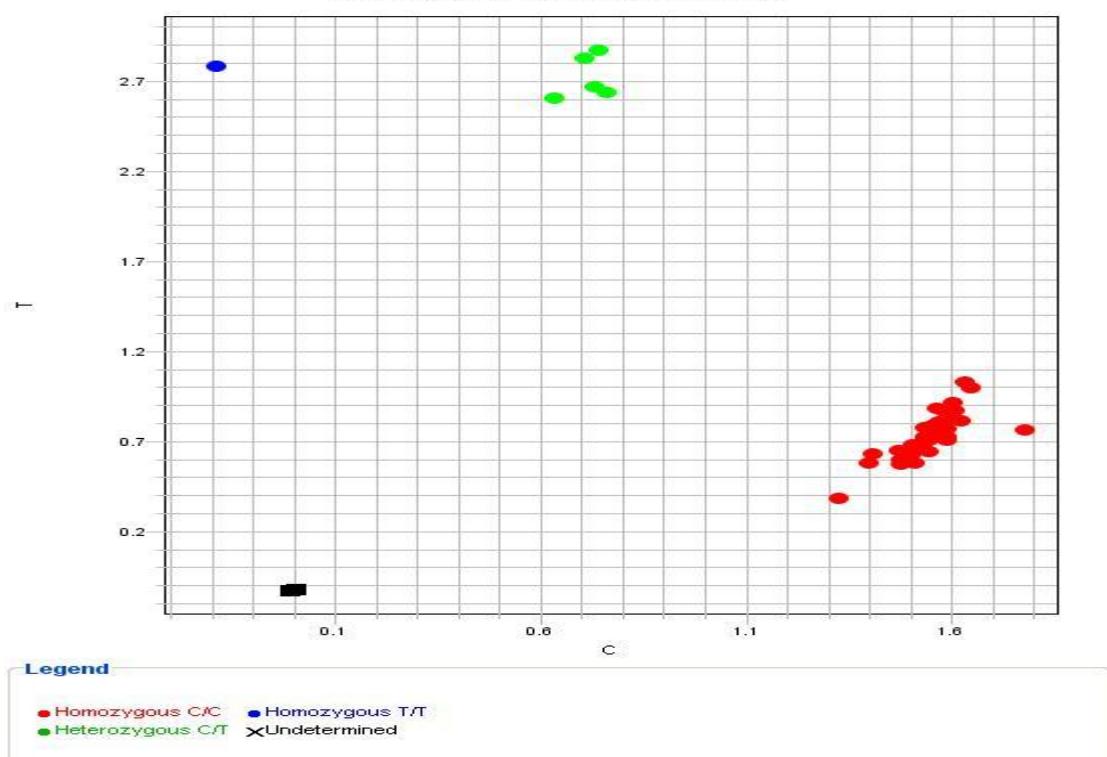


52. ADRB2 rs1042719



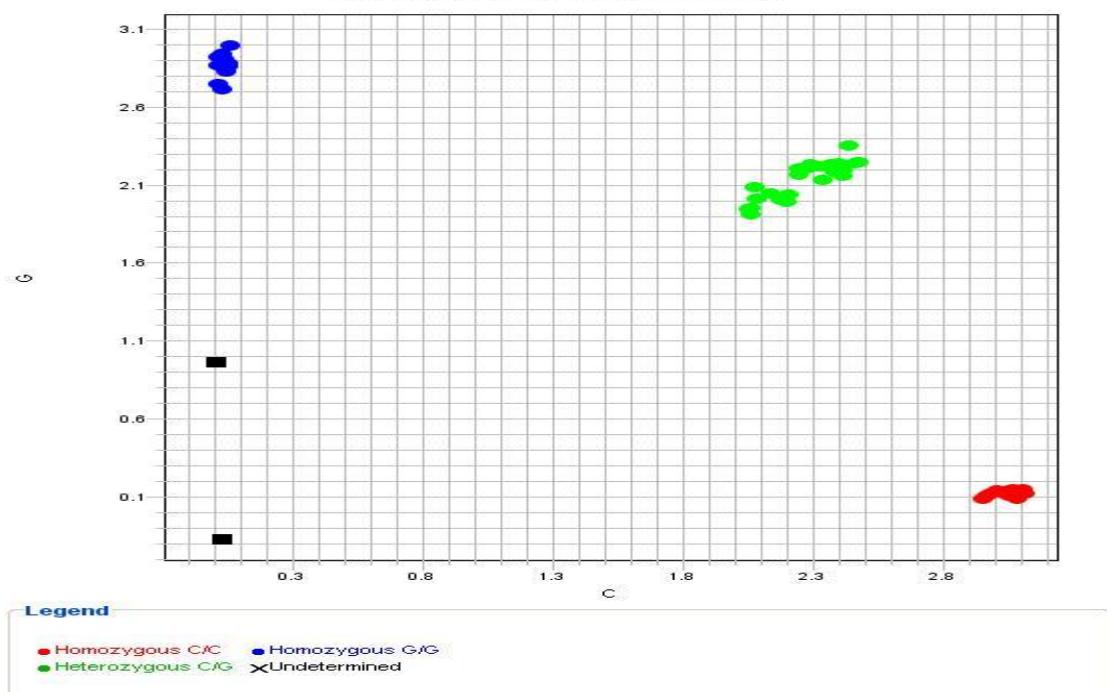
53. SDC3 rs2491132

Allelic Discrimination Plot



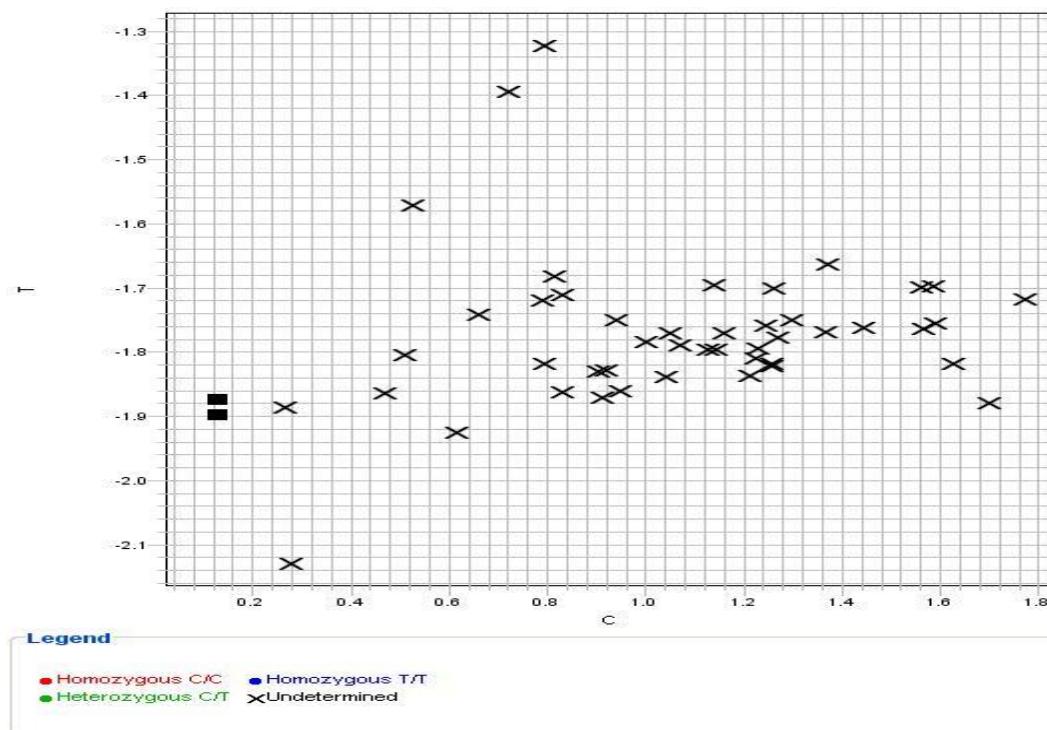
54. INSIG2 rs7566605

Allelic Discrimination Plot



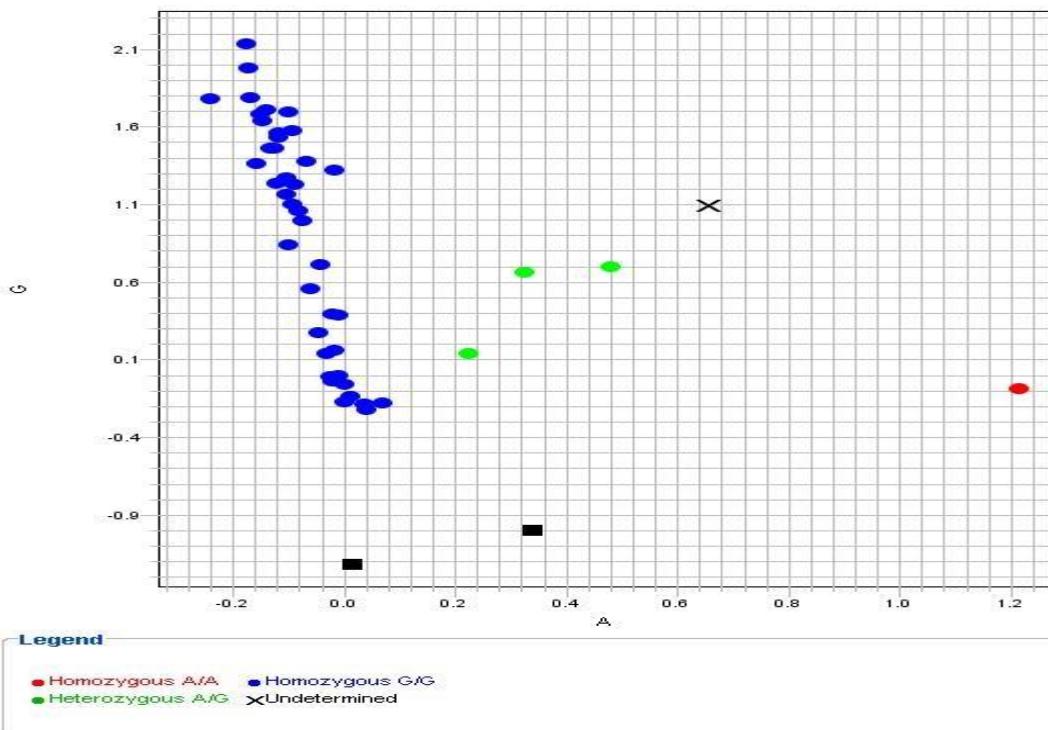
55. MC4R rs2229616

Allelic Discrimination Plot



56. ADIPOQ rs17366568

Allelic Discrimination Plot



APPENDIX C

A) Genotype distribution tables of SNPs

Table 1 : Genotype distribution of FTO SNPs in obese and non-obese groups

SNP	Non-obese			Obese			p
	GG	GT	TT	GG	GT	TT	
rs1077128	43.12	46.15	10.72	47.47	38.61	13.92	0.22
	53.38	39.63	6.99	56.33	35.44	8.23	
rs10852521	AA	AG	GG	AA	AG	GG	0.27
	1.86	23.54	74.59	1.27	17.72	81.01	
rs11075994	CC	TC	TT	CC	TC	TT	0.62
	44.06	43.82	12.12	44.94	41.14	13.92	
rs1121980	AA	CA	CC	AA	CA	CC	0.48
	1.63	26.34	72.03	2.53	22.15	75.32	
rs11643744	AA	GA	GG	AA	GA	GG	0.81
	41.96	46.15	11.89	39.24	47.47	13.29	
rs13334933	AA	AG	GG	AA	AG	GG	0.31
	42.89	46.15	10.96	47.47	39.24	13.29	
rs1421085	CC	CT	TT	CC	CT	TT	0.75
	10.03	40.79	49.18	12.03	38.61	49.37	
rs1421090	CC	CT	TT	CC	CT	TT	0.05
	11.19	42.42	46.39	18.35	43.04	38.61	
rs1558902	AA	AT	TT	AA	AT	TT	0.75
	10.02	40.79	49.18	12.03	38.61	49.37	
rs16945088	AA	AG	GG	AA	AG	GG	0.94
	83.45	16.08	0.47	84.18	15.19	0.63	
rs16952517	AA	AG	GG	AA	AG	GG	0.30
	7.23	37.06	55.71	10.13	40.51	49.37	
rs16952522	CC	GC	GG	CC	GC	GG	0.44
	72.96	24.01	3.03	68.35	29.11	2.53	
rs17218700	AA	AG	GG	AA	AG	GG	0.32
	1.86	24.94	73.19	1.9	18.99	79.11	
rs17817288	AA	AG	GG	AA	AG	GG	0.79
	8.86	42.42	48.72	9.49	39.24	51.27	
rs17817449	GG	GT	TT	GG	GT	TT	0.42
	9.32	41.96	48.72	12.66	37.97	49.37	

Table 1, continued

SNP	Non-obese			Obese			p
rs17818902	GG 5.59	GT 38	TT 56.41	GG 6.33	GT 36.08	TT 57.59	0.88
rs1861867	GG 77.16	GT 20.75	TT 2.1	GG 76.58	GT 20.89	TT 2.53	0.95
rs3751812	GG 48.72	GT 41.72	TT 9.56	GG 49.37	GT 38.61	TT 12.03	0.62
rs4784323	AA 2.1	GA 21.91	GG 75.99	AA 2.53	GA 20.25	GG 77.22	0.87
rs6499643	CC 4.9	TC 37.53	TT 57.58	CC 3.8	TC 31.65	TT 64.56	0.31
rs7186521	AA 46.15	GA 43.36	GG 10.49	AA 49.37	GA 37.97	GG 12.66	0.46
rs7190492	AA 1.86	AG 21.45	GG 76.69	AA 3.16	AG 20.89	GG 75.95	0.64
rs7191513	AA 9.55	GA 43.59	GG 46.85	AA 15.19	GA 39.24	GG 45.57	0.15
rs7204609	CC 12.35	TC 42.19	TT 45.45	CC 12.66	TC 44.3	TT 43.04	0.87
rs7206790	CC 49.65	CG 41.72	GG 8.62	CC 50.63	CG 39.24	GG 10.13	0.79
rs8050136	AA 9.56	CA 41.72	CC 48.72	AA 12.03	CA 38.61	CC 49.37	0.62
rs9935401	AA 9.56	GA 41.96	GG 48.48	AA 12.66	GA 37.97	GG 49.37	0.46
rs9939609	AA 9.56	AT 41.72	TT 48.72	AA 12.66	AT 37.97	TT 49.37	0.48
rs9939973	AA 12.12	AG 43.36	GG 44.52	AA 13.92	AG 41.14	GG 44.94	0.81

Table 2 : Genotype distribution of MC4R SNPs among obese and non-obese groups

SNP	Obese			Non-obese		p
rs571312	GG	GT	TT	GG	GT	TT
	0.73	0.27	0.01	0.76	0.22	0.02
rs7227255	AA	AG	GG	AA	AG	GG
	0.00	0.03	0.97	0.00	0.02	0.98
rs2229616	AA	AG	GG	AA	AG	GG
	0.00	0.05	0.95	0.00	0.05	0.95

Table 3 : Genotype distribution of ADRB2 SNPs among obese and non-obese groups

SNP	Obese			Non-obese		p
rs1042713	AA	AG	GG	AA	AG	GG
	0.17	0.54	0.29	0.20	0.51	0.29
rs1042714	CC	CG	GG	CC	CG	GG
	0.85	0.15	0.00	0.85	0.14	0.01
rs1042717	AA	AG	GG	AA	AG	GG
	0.19	0.53	0.29	0.18	0.51	0.31
rs1042718	AA	AC	CC	AA	AC	CC
	0.19	0.51	0.30	0.18	0.51	0.31
rs1042719	CC	CG	GG	CC	CG	GG
	0.33	0.49	0.17	0.28	0.53	0.19

Table 4 : Genotype distribution of LEP SNPs among obese and non-obese groups

SNP	Obese			Non-obese			p
rs1349419	AA	AG	GG	AA	AG	GG	
	0.09	0.34	0.57	0.07	0.36	0.58	0.69
rs12535708	AA	AC	CC	AA	AC	CC	
	0.04	0.20	0.76	0.04	0.25	0.72	0.53
rs12535747	AA	AC	CC	AA	AC	CC	
	0.04	0.20	0.76	0.04	0.25	0.72	0.53
rs7799039	AA	AG	GG	AA	AG	GG	
	0.53	0.36	0.11	0.56	0.37	0.07	0.42
rs2167270	AA	AG	GG	AA	AG	GG	
	0.04	0.20	0.76	0.04	0.25	0.71	0.50
rs2278815	AA	AG	GG	AA	AG	GG	
	0.57	0.33	0.10	0.57	0.37	0.06	0.31
rs12706832	AA	AG	GG	AA	AG	GG	
	0.13	0.36	0.51	0.07	0.39	0.54	0.12

Table 5 : Genotype distribution of RETN SNPs among obese and non-obese groups

	Non-obese			Obese		p	
rs34861192	AA	AG	GG	AA	AG	GG	
	0.03	0.27	0.70	0.03	0.22	0.76	0.22
rs1862513	CC	CG	GG	CC	CG	GG	
	0.22	0.50	0.29	0.21	0.53	0.27	0.81
rs3219175	AA	AG	GG	AA	AG	GG	
	0.02	0.26	0.72	0.03	0.22	0.76	0.53

Table 6 : Genotype Distribution of INSIG2 rs7566605 SNP

SNP	Non-obese			Obese			p
rs7566605	GG	GC	CC	GG	GC	CC	

Table 7 : Genotype Distribution of ADIPOQ SNPs

SNP	Non-obese			Obese			p
rs3774261	AA	AG	GG	AA	AG	GG	
	29.5	51.4	19.1	27.3	48.7	24.0	0.439
rs17366568	AA	AG	GG	AA	AG	GG	
	0	5.4	94.6	0.7	10.0	89.3	0.036

A) Genetic profiling of SNPs on obesity parameters for unadjusted estimates**Table 8 : Genetic effects of FTO rs1077128 SNP on obesity parameters**

Parameter	GG	GT	TT	p (R²)
Height(m)	1.58±0.10 (n=260)	1.58±0.09 (n=259)	1.59±0.08 (n=68)	0.70 (0.00)
Weight(kg)	68.19±14.93 (n=260)	71.09±13.45 (n=259)	71.09±13.45 (n=68)	0.31 (0.00)
LogBMI	3.29±0.19 (n=260)	3.29±0.18 (n=259)	3.32±0.18 (n=68)	0.33 (0.00)
WC (cm)	89.68±12.21 (n=260)	89.08±11.69 (n=259)	89.77±12.24 (n=68)	0.82 (0.00)
HC (cm)	101.71±10.19(n=260)	102.40±9.46 (n=259)	103.40±11.53 (n=68)	0.43 (0.00)
WHR	0.88±0.07 (n=260)	0.87±0.08(n=259)	0.87±0.09 (n=68)	0.21 (0.01)
SBP (mm Hg)	130.63±18.94 (n=260)	130.34±18.07 (n=259)	133.51±17.17 (n=68)	0.42 (0.00)
DBP (mm Hg)	81.92±12.68 (n=260)	82.47±11.71(n=259)	83.26±10.56 (n=68)	0.69 (0.00)
LogTG	0.23±0.59 (n=168)	0.22±0.52 (n=187)	0.25±0.55 (n=54)	0.94 (0.00)
TC (mmol/l)	5.51±1.0 (n=168)	5.41±0.89 (n=187)	5.59±0.78 (n=54)	0.33 (0.01)
HDL-C (mmol/l)	1.30±0.29 (n=168)	1.29±0.25 (n=187)	1.33±0.28 (n=54)	0.71 (0.00)
LDL-C (mmol/l)	3.55±0.89 (n=168)	3.46±0.78 (n=187)	3.59±0.72(n=54)	0.50 (0.00)

Table 9 : Genetics effects of FTO rs10852521 SNP on obesity parameters

Parameter	CC	CT	TT	p (R²)
Height(m)	1.58±0.09 (n=318)	1.59±0.10 (n=226)	1.59±0.10 (n=43)	0.29 (0.00)
Weight(kg)	68.45±14.19 (n=318)	68.58±13.80(n=226)	70.43±16.44 (n=43)	0.69 (0.00)
LogBMI	3.29±0.19 (n=318)	3.28±0.18(n=226)	3.30±0.20 (n=43)	0.75 (0.00)
WC (cm)	89.23±11.98 (n=318)	89.35±11.54 (n=226)	91.33±14.10 (n=43)	0.56 (0.00)
HC (cm)	102.31±10.21 (n=318)	101.84±9.75 (n=226)	103.40±10.39 (n=43)	0.63 (0.00)
WHR	0.87±0.08 (n=318)	0.88±0.09 (n=226)	0.88±0.09 (n=43)	0.67 (0.00)
SBP (mm Hg)	131.19±17.42 (n=318)	130.32±18.59 (n=226)	130.92±19.63 (n=43)	0.86 (0.00)
DBP (mm Hg)	82.56±11.89 (n=317)	81.98±11.71 (n=226)	83.72±14.48 (n=43)	0.68 (0.00)
LogTG (mmol/l)	0.20±0.52 (n=318)	0.25±0.58(n=226)	0.28±0.64 (n=43)	0.59 (0.00)
TC (mmol/l)	5.46±0.91 (n=218)	5.57±0.93(n=160)	5.11±0.95 (n=31)	0.04 (0.02)
HDL-C (mmol/l)	1.31±0.27 (n=218)	1.29±0.28 (n=160)	1.26±0.23 (n=31)	0.58 (0.00)
LDL-C (mmol/l)	3.50±0.81 (n=218)	3.61±0.83 (n=160)	3.13±.73 (n=31)	0.01 (0.02)

Table 10 : Genetic effects of FTO rs11075994 SNP of obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.60±0.11 (n=448)	1.59±0.10 (n=129)	1.58±0.09 (n=10)	0.03 (0.01)
Weight(kg)	65.77±17.95 (n=448)	68.46±14.18 (n=129)	65.77±14.14 (n=10)	0.79 (0.00)
LogBMI	3.21±0.26 (n=448)	3.28±0.17 (n=129)	3.30±0.18 (n=10)	0.17 (0.01)
WC (cm)	89.45± 11.90(n=448)	89.40±12.30 (n=129)	88.70±11.77 (n=10)	0.98 (0.00)
HC (cm)	102.20±10.60 (n=448)	101.71±0.82 (n=129)	100.40±10.10 (n=10)	0.65 (0.00)
WHR	0.89±0.38 (n=448)	0.88±0.07 (n=129)	0.87±0.08 (n=10)	0.87 (0.00)
SBP (mm Hg)	135.10±19.70 (n=448)	130.50±18.53 (n=129)	130.84±17.86 (n=10)	0.76 (0.00)
DBP (mm Hg)	83.10±14.81 (n=447)	82.01±12.42 (n=129)	82.39±11.86(n=10)	0.93 (0.00)
LogTG	0.15±0.46 (n=306)	0.20±0.54 (n=95)	0.23±0.56 (n=8)	0.80 (0.00)
TC (mmol/l)	5.60±0.95 (n=306)	5.53±0.90 (n=95)	5.45±0.93 (n=8)	0.73 (0.00)
HDL-C (mmol/l)	1.32±0.28 (n=306)	1.31±0.23 (n=95)	1.30±0.28 (n=8)	0.90 (0.00)
LDL-C (mmol/l)	3.70±0.84 (n=306)	3.58±0.79 (n=95)	3.49±0.83 (n=8)	0.53 (0.00)

Table 11 : Genetic effects of FTO rs1121980 SNP on obesity parameters

Parameter	CC	CT	TT	p (R^2)
Height(m)	1.58±0.10 (n=258)	1.58±0.09 (n=253)	1.59±0.09 (n=76)	0.92 (0.00)
Weight(kg)	68.70±14.47 (n=258)	68.35±13.41 (n=253)	69.47±15.92 (n=76)	0.83 (0.00)
LogBMI	3.29±0.18 (n=258)	3.29±0.18 (n=253)	3.29±0.21 (n=76)	0.99 (0.00)
WC (cm)	89.17±12.30 (n=258)	89.55±11.56 (n=253)	89.90±12.31 (n=76)	0.88 (0.00)
HC (cm)	102.28±9.97 (n=258)	102.02±9.67 (n=253)	102.61±11.59 (n=76)	0.90 (0.00)
WHR	0.87±0.80 (n=258)	0.88±0.08 (n=253)	0.88±0.07 (n=76)	0.64 (0.00)
SBP (mm Hg)	131.23±18.79 (n=258)	129.75±17.19 (n=253)	133.18±17.96 (n=76)	0.32 (0.00)
DBP (mm Hg)	82.33±11.96 (n=258)	82.29±11.85 (n=252)	82.36±12.91 (n=76)	1.00 (0.00)
LogTG	0.23±0.57 (n=175)	0.22±0.54 (n=181)	0.20±0.56 (n=53)	0.93 (0.00)
TC (mmol/l)	5.40±0.92 (n=175)	5.49±0.89 (n=181)	5.66±1.08 (n=53)	0.21 (0.01)
HDL-C (mmol/l)	1.31±0.28 (n=175)	1.30±0.26 (n=181)	1.29±0.30 (n=53)	0.91 (0.00)
LDL-C (mmol/l)	3.43±0.80 (n=175)	3.55±0.81 (n=181)	3.70±0.89 (n=53)	0.09 (0.01)

Table 12 : Genetic effects of FTO rs11642841 SNP on obesity parameters

Parameter	CC	CA	AA	p (R^2)
Height(m)	1.60±0.11 (n=428)	1.59±0.09 (n=148)	1.58±0.09 (n=11)	0.65 (0.00)
Weight(kg)	68.47±14.24 (n=428)	68.86±14.14(n=148)	72.96±13.81 (n=11)	0.57 (0.00)
LogBMI	3.29±0.18 (n=428)	3.29±0.18 (n=148)	3.33±0.16 (n=11)	0.76 (0.00)
WC (cm)	89.03±11.88 (n=428)	90.03±12.34 (n=148)	95.09±9.30 (n=11)	0.20 (0.01)
HC (cm)	102.31±10.10 (n=428)	101.89±9.99 (n=148)	102.82±9.33 (n=11)	0.89 (0.00)
WHR	0.87±0.07 (n=428)	0.88±0.08 (n=148)	0.93±0.05 (n=11)	0.02 (0.01)
SBP (mm Hg)	130.39±18.26 (n=428)	131.84±17.65 (n=148)	134.64±12.60 (n=11)	0.55 (0.00)
DBP (mm Hg)	81.90±12.16 (n=428)	83.41±11.49 (n=148)	83.64±13.23 (n=11)	0.39 (0.00)
LogTG	0.21±0.56 (n=295)	0.27±0.54 (n=105)	0.19±0.60 (n=8)	0.65 (0.00)
TC (mmol/l)	5.41±0.91 (n=295)	5.66±0.93 (n=106)	5.31±0.86 (n=8)	0.05 (0.01)
HDL-C (mmol/l)	1.30±0.28 (n=295)	1.31±0.26 (n=106)	1.31±0.35 (n=8)	0.94 (0.00)
LDL-C (mmol/l)	3.46±0.80 (n=295)	3.68±0.84 (n=106)	3.35±0.92 (n=8)	0.04 (0.02)

Table 13 : Genetics effects of FTO rs11643744 SNP on obesity parameters

Parameter	AA	AG	GG	p (R ²)
Height(m)	1.59±0.09 (n=242)	1.58±0.09 (n=273)	1.58±0.10 (n=72)	0.50 (0.00)
Weight(kg)	69.58±14.39 (n=242)	67.85±13.76 (n=273)	68.56±15.19 (n=72)	0.39 (0.00)
LogBMI	3.30±0.17 (n=242)	3.29±0.19 (n=273)	3.29±0.20 (n=72)	0.71 (0.00)
WC (cm)	89.82±12.86 (n=242)	89.06±11.14 (n=273)	89.52±12.06 (n=72)	0.77 (0.00)
HC (cm)	102.78±10.38 (n=242)	101.78±9.67 (n=273)	101.85±10.34 (n=72)	0.52 (0.00)
WHR	0.87±0.90 (n=242)	0.87±0.07 (n=273)	0.88±0.08 (n=72)	0.90 (0.00)
SBP (mm Hg)	131.10±16.99 (n=242)	130.80±18.43 (n=273)	130.08±19.93 (n=72)	0.91 (0.00)
DBP (mm Hg)	82.54±11.76 (n=242)	82.17±11.31 (n=272)	82.11±15.25 (n=72)	0.93 (0.00)
LogTG	0.20±0.54 (n=176)	0.25±0.57 (n=186)	0.21±0.57 (n=47)	0.76 (0.00)
TC (mmol/l)	5.47±0.83 (n=176)	5.44±0.94 (n=186)	5.61±1.16 (n=47)	0.55 (0.00)
HDL-C (mmol/l)	1.31±0.28 (n=176)	1.29±0.26 (n=186)	1.30±0.32 (n=47)	0.77 (0.00)
LDL-C (mmol/l)	3.52±0.75 (n=176)	3.47±0.82 (n=186)	3.70±1.01 (n=47)	0.23 (0.01)

Table 14 : Genetic effects of FTO rs1333493 SNP on obesity parameters

Parameter	AA	AG	GG	p (R ²)
Height(m)	1.58±0.10 (n=259)	1.59±0.09 (n=260)	1.59±0.08 (n=68)	0.65 (0.00)
Weight(kg)	68.21±14.96 (n=259)	68.52±13.58 (n=260)	70.79±13.53 (n=68)	0.41 (0.00)
LogBMI	3.29±0.19 (n=259)	3.29±0.17 (n=260)	3.31±0.17 (n=68)	0.56 (0.00)
WC (cm)	89.65±12.25 (n=259)	89.20±11.63 (n=260)	89.46±12.31 (n=68)	0.91 (0.00)
HC (cm)	101.69±10.21 (n=259)	102.52±9.47 (n=260)	102.99±11.47 (n=68)	0.51 (0.00)
WHR	0.88±0.07 (n=259)	0.87±0.08 (n=260)	0.87±0.09 (n=68)	0.23 (0.01)
SBP (mm Hg)	130.67±18.17 (n=259)	130.29±18.09 (n=260)	133.57±17.14 (n=68)	0.40 (0.00)
DBP (mm Hg)	81.99±12.68 (n=259)	82.32±11.74 (n=259)	83.51±10.42 (n=68)	0.65 (0.00)
LogTG	0.22±0.59 (n=169)	0.22±0.52 (n=186)	0.26±0.54 (n=54)	0.87 (0.00)
TC (mmol/l)	5.51±1.0 (n=169)	5.41±0.89 (n=186)	5.59±0.79 (n=54)	0.38 (0.01)
HDL-C (mmol/l)	1.30±0.29 (n=169)	1.32±0.25 (n=186)	1.32±0.29 (n=54)	0.82 (0.00)
LDL-C (mmol/l)	3.54±0.88 (n=169)	3.47±0.78 (n=186)	3.58±0.73 (n=54)	0.56 (0.00)

Table 15 : Genetic effects of FTO rs1421085 SNP on obesity parameters

Parameter	TT	CT	CC	p (R ²)
Height(m)	1.58±0.10 (n=289)	1.58±0.09 (n=236)	1.60±0.08 (n=62)	0.34 (0.00)
Weight(kg)	68.33±14.48(n=289)	68.39±13.60 (n=236)	71.13±15.05 (n=62)	0.35 (0.00)
LogBMI	3.29±0.18 (n=289)	3.29±0.18 (n=236)	3.30±0.20 (n=62)	0.80 (0.00)
WC (cm)	88.90±12.30 (n=289)	89.65±11.66 (n=236)	91.02±11.60 (n=62)	0.42 (0.00)
HC (cm)	102.09±10.13 (n=289)	102.16±9.86 (n=236)	102.97±10.46 (n=62)	0.82 (0.00)
WHR	0.87±0.08 (n=289)	0.88±0.07 (n=236)	0.88±0.07 (n=62)	0.37 (0.00)
SBP (mm Hg)	131.02±18.77 (n=289)	130.00±17.37 (n=236)	133.21±16.85 (n=62)	0.44 (0.00)
DBP (mm Hg)	82.28±12.06 (n=289)	82.20±11.82 (n=236)	82.94±12.70 (n=62)	0.91 (0.00)
LogTG	0.22±0.56 (n=191)	0.23±0.56 (n=172)	0.22±0.55 (n=45)	0.98 (0.00)
TC (mmol/l)	5.40±0.91 (n=191)	5.50±0.90 (n=172)	5.67±1.07 (n=45)	0.19 (0.01)
HDL-C (mmol/l)	1.31±0.28 (n=191)	1.30±0.26 (n=172)	1.28±0.30 (n=45)	0.85 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=191)	3.55±0.82 (n=172)	3.70±0.88 (n=45)	0.12 (0.01)

Table 16 : Genetic effects of FTO rs1421090 SNP on obesity parameters

Parameter	TT	CT	CC	p (R^2)
Height(m)	1.58±0.10 (n=260)	1.58±0.09 (n=250)	1.59 ± 0.10 (n=77)	0.94 (0.00)
Weight(kg)	68.78±14.03 (n=260)	68.02 ±14.49 (n=250)	70.27±13.83 (n=77)	0.47 (0.00)
LogBMI	3.29±0.17 (n=260)	3.28±0.19 (n=250)	3.13±0.20 (n=77)	0.41 (0.00)
WC (cm)	89.07±11.11 (n=260)	89.56±12.68 (n=250)	90.21±12.49 (n=77)	0.74 (0.00)
HC (cm)	101.79±9.78 (n=260)	102.06±11.01 (n=250)	104.14±10.89 (n=77)	0.19 (0.01)
WHR	0.88±0.07 (n=260)	0.88±0.08 (n=250)	0.87±0.08 (n=77)	0.58 (0.00)
SBP (mm Hg)	131.67±18.48 (n=260)	130.06±17.76 (n=250)	130.53±17.35 (n=77)	0.60 (0.00)
DBP (mm Hg)	83.28±12.30 (n=260)	81.12±11.92 (n=250)	82.92±11.14 (n=77)	0.11 (0.01)
LogTG	0.24±0.54 (n=190)	0.16±0.57 (n=168)	0.35±0.50 (n=51)	0.08 (0.01)
TC (mmol/l)	5.44±0.95(n=190)	5.52±0.89 (n=168)	5.45±0.94 (n=51)	0.74 (0.00)
HDL-C (mmol/l)	1.29±0.27 (n=190)	1.33±0.27 (n=168)	1.27±0.29 (n=51)	0.33 (0.01)
LDL-C (mmol/l)	3.50±0.85 (n=190)	3.56±0.79 (n=168)	3.42±0.82 (n=51)	0.53 (0.00)

Table 17 : Genetic effects of FTO rs1558902 SNP on obesity parameters

Parameter	TT	AT	AA	p (R^2)
Height(m)	1.58±0.10 (n=289)	1.58±0.09 (n=236)	1.60±0.08 (n=62)	0.34 (0.00)
Weight(kg)	68.33±14.48(n=289)	68.39±13.60 (n=236)	71.13±15.05 (n=62)	0.35 (0.00)
LogBMI	3.29±0.18 (n=289)	3.29±0.18 (n=236)	3.30±0.20 (n=62)	0.80 (0.00)
WC (cm)	88.90±12.30 (n=289)	89.65±11.66 (n=236)	91.02±11.60 (n=62)	0.42 (0.00)
HC (cm)	102.09±10.12 (n=289)	102.16±9.86 (n=236)	102.97±10.46 (n=62)	0.82 (0.00)
WHR	0.87±0.08 (n=289)	0.88±0.07 (n=236)	0.88±0.07 (n=62)	0.37 (0.00)
SBP (mm Hg)	131.02±18.77 (n=289)	130.00±18.25 (n=236)	133.21±16.85 (n=62)	0.44 (0.00)
DBP (mm Hg)	82.28±12.06 (n=289)	82.20±11.82 (n=235)	82.94±12.70 (n=62)	0.91 (0.00)
LogTG	0.22±0.56 (n=192)	0.23±0.56 (n=172)	0.22±0.55 (n=45)	0.98 (0.00)
TC (mmol/l)	5.40±0.91 (n=192)	5.50±1.00 (n=172)	5.67±1.07 (n=45)	0.19 (0.01)
HDL-C (mmol/l)	1.31±0.28 (n=192)	1.30±0.26 (n=172)	1.28±0.30 (n=45)	0.85 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=192)	3.55±0.82 (n=172)	3.70±0.88 (n=45)	0.12 (0.01)

Table 18 : Genetic effects of FTO rs16945088 SNP on obesity parameters

Parameter	AA	AG	GG	p (R^2)
Height(m)	1.59±0.09 (n=491)	1.57±0.09 (n=93)	1.57±0.02 (n=3)	0.20 (0.01)
Weight(kg)	68.93±14.08 (n=491)	67.42±14.81 (n=93)	60.73±15.72 (n=3)	0.40 (0.00)
LogBMI	3.29±0.18 (n=491)	3.29±0.19(n=93)	3.18±0.30 (n=3)	0.55 (0.00)
WC (cm)	89.60±11.86 (n=491)	88.69±12.35 (n=93)	84.33±21.46 (n=3)	0.61 (0.00)
HC (cm)	102.32±9.80 (n=491)	101.83±11.26 (n=93)	96.33±11.59 (n=3)	0.55 (0.00)
WHR	0.88±0.08 (n=491)	0.87±0.08 (n=93)	0.87±0.14 (n=3)	0.89 (0.00)
SBP (mm Hg)	131.15±17.95 (n=491)	129.30±18.51 (n=93)	127.00±15.40 (n=3)	0.62 (0.00)
DBP (mm Hg)	82.51±12.23 (n=491)	81.57±10.78 (n=92)	74.00±12.17 (n=3)	0.38 (0.00)
LogTG	0.23±0.56 (n=350)	0.19±0.55 (n=63)	0.47±0.00 (n=1)	0.81 (0.00)
TC (mmol/l)	5.47±0.94 (n=350)	5.53±0.84 (n=63)	5.40±0.00 (n=1)	0.81 (0.00)
HDL-C (mmol/l)	1.31±0.28 (n=350)	1.28±0.25 (n=63)	1.49±0.00 (n=1)	0.60 (0.00)
LDL-C (mmol/l)	3.50±0.83 (n=350)	3.62±0.73 (n=63)	3.18±0.00 (n=1)	0.55 (0.00)

Table 19 : Genetic effects of FTO rs16952517 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.59±0.10 (n=317)	1.58±0.09 (n=223)	1.60±0.09 (n=47)	0.24 (0.01)
Weight(kg)	68.40±14.21 (n=317)	68.61±14.11 (n=223)	70.50±14.72 (n=47)	0.64 (0.00)
LogBMI	27.12±4.94 (n=317)	27.51±5.09 (n=223)	27.46±5.49 (n=47)	0.71 (0.00)
WC (cm)	89.40±11.87 (n=317)	89.67±12.38 (n=223)	88.45±10.78 (n=47)	0.82 (0.00)
HC (cm)	101.68±11.18 (n=317)	103.81±22.69 (n=223)	102.57±9.24 (n=47)	0.33 (0.00)
WHR	0.90±0.45 (n=317)	0.87±0.09 (n=223)	0.86±0.06 (n=47)	0.54 (0.00)
SBP (mm Hg)	130.62±18.78 (n=317)	131.53±18.34 (n=223)	130.94±15.58 (n=47)	0.85 (0.00)
DBP (mm Hg)	82.03±12.44 (n=316)	82.52±12.19 (n=223)	84.32±9.87 (n=47)	0.48 (0.00)
LogTG	0.22±0.57 (n=212)	0.25±0.52 (n=160)	0.15±0.59 (n=37)	0.57 (0.00)
TC (mmol/l)	5.45±0.88 (n=212)	5.51±0.98 (n=160)	5.47±0.92 (n=37)	0.83 (0.00)
HDL-C (mmol/l)	1.30±0.36 (n=212)	1.33±0.28 (n=160)	1.29±0.31 (n=37)	0.68 (0.00)
LDL-C (mmol/l)	3.51±0.76 (n=212)	3.51±0.88 (n=160)	3.56±0.87 (n=37)	0.93 (0.00)

Table 20: Genetic effects of FTO rs16952522 SNP on obesity parameters

Parameter	CC	CG	GG	p (R^2)
Height(m)	1.58±0.09 (n=429)	1.59±0.09 (n=149)	1.59±0.09 (n=17)	0.63 (0.00)
Weight(kg)	68.16±14.08 (n=429)	70.02±14.72 (n=149)	68.84±12.27 (n=17)	0.39 (0.00)
LogBMI	3.29±0.18 (n=429)	3.30±0.20 (n=149)	3.29±0.18 (n=17)	0.65 (0.00)
WC (cm)	89.15±12.26 (n=429)	90.16±11.33 (n=149)	89.82±10.52 (n=17)	0.67 (0.00)
HC (cm)	101.91±9.88 (n=429)	103.20±10.69 (n=149)	100.88±7.78 (n=17)	0.35 (0.00)
WHR	0.87±0.08 (n=429)	0.87±0.06 (n=149)	0.89±0.06 (n=17)	0.73 (0.00)
SBP (mm Hg)	131.25±18.68 (n=429)	129.27±16.28 (n=149)	134.35±15.53 (n=17)	0.37 (0.00)
DBP (mm Hg)	82.60±11.80 (n=420)	81.61±12.67 (n=149)	81.59±11.85 (n=17)	0.67 (0.00)
LogTG	0.24±0.56 (n=286)	0.17±0.54 (n=111)	0.38±0.64 (n=12)	0.35 (0.01)
TC (mmol/l)	5.47±0.91 (n=286)	5.45±0.91 (n=111)	5.84±1.40 (n=12)	0.37 (0.01)
HDL-C (mmol/l)	1.30±0.28 (n=286)	1.31±0.26 (n=111)	1.20±0.34 (n=12)	0.39 (0.01)
LDL-C (mmol/l)	3.50±0.81 (n=286)	3.52±0.80 (n=111)	3.78±1.08 (n=12)	0.56 (0.00)

Table 21 : Genetic effects of FTO rs17218700 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.58±0.09 (n=439)	1.59±0.09 (n=137)	1.57±0.14 (n=11)	0.75 (0.00)
Weight(kg)	69.00±14.48 (n=439)	67.13±12.75 (n=137)	73.43±18.98 (n=11)	0.21 (0.01)
LogBMI	3.37±0.16 (n=439)	3.27±0.18 (n=137)	3.30±0.18 (n=11)	0.08 (0.01)
WC (cm)	94.09±18.28 (n=439)	88.55±11.81 (n=137)	89.58±11.83 (n=11)	0.29 (0.00)
HC (cm)	107.46±12.09 (n=439)	100.87±10.09 (n=137)	102.50±9.93 (n=11)	0.06 (0.00)
WHR	0.87±0.10 (n=439)	0.88±0.07 (n=137)	0.87±0.08 (n=11)	0.92 (0.00)
SBP (mm Hg)	133.86±17.43 (n=439)	128.15±18.43 (n=137)	131.60±17.86 (n=11)	0.13 (0.01)
DBP (mm Hg)	82.36±12.89 (n=438)	81.28±11.41 (n=137)	82.54±13.15 (n=11)	0.30 (0.00)
LogTG	0.29±0.37 (n=307)	0.27±0.61 (n=96)	0.20±0.54 (n=6)	0.58 (0.00)
TC (mmol/l)	5.47±0.94 (n=307)	5.54±0.89 (n=96)	4.72±0.50 (n=6)	0.11 (0.01)
HDL-C (mmol/l)	1.11±0.09 (n=307)	1.29±0.27 (n=96)	1.31±0.27 (n=6)	0.21 (0.01)
LDL-C (mmol/l)	3.52±0.83 (n=307)	3.54±0.78 (n=96)	2.96±0.35 (n=6)	0.24 (0.01)

Table 22 : Genetic effects of FTO rs17817288 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.58±0.09 (n=289)	1.58±0.10 (n=245)	1.59±0.09 (n=53)	0.87 (0.00)
Weight(kg)	68.78±13.84 (n=289)	68.49±14.23 (n=245)	68.68±16.11 (n=53)	0.97 (0.00)
LogBMI	3.30±0.18 (n=289)	3.29±0.18 (n=245)	3.28±0.21 (n=53)	0.77 (0.00)
WC (cm)	89.52±11.82 (n=289)	89.16±11.69 (n=245)	90.13±14.11 (n=53)	0.85 (0.00)
HC (cm)	102.33±9.74 (n=289)	101.13±10.31 (n=245)	101.93±10.60 (n=53)	0.95 (0.00)
WHR	0.88±0.08 (n=289)	0.87±0.07 (n=245)	0.88±0.08 (n=53)	0.76 (0.00)
SBP (mm Hg)	131.28±17.19 (n=289)	130.28±18.51 (n=245)	130.95±20.23 (n=53)	0.82 (0.00)
DBP (mm Hg)	82.49±11.89 (n=288)	82.00±11.45 (n=245)	82.92±15.06 (n=53)	0.82 (0.00)
LogTG	0.21±0.53 (n=206)	0.23±0.58 (n=165)	0.25±0.60 (n=38)	0.90 (0.00)
TC (mmol/l)	5.44±0.91 (n=206)	5.61±0.93 (n=165)	5.07±0.90 (n=38)	0.00 (0.03)
HDL-C (mmol/l)	1.31±0.27 (n=206)	1.32±0.28 (n=165)	1.25±0.24 (n=38)	0.49 (0.00)
LDL-C (mmol/l)	3.48±0.80 (n=206)	3.65±0.85 (n=165)	3.13±0.69 (n=38)	0.001* (0.03)

Table 23 : Genetic effects of FTO rs17817449 SNP on obesity parameters

Parameter	TT	GT	GG	p (R^2)
Height(m)	1.58±0.10 (n=287)	1.58±0.09 (n=240)	1.60±0.09 (n=60)	0.30 (0.00)
Weight(kg)	68.35±14.54 (n=287)	68.15±13.53 (n=240)	72.11±14.92 (n=60)	0.14 (0.01)
LogBMI	3.29±0.18 (n=287)	3.29±0.18 (n=240)	3.31±0.20 (n=60)	0.49 (0.00)
WC (cm)	88.91±12.35 (n=287)	89.55±11.63 (n=240)	91.39±11.46 (n=60)	0.34 (0.00)
HC (cm)	102.08±10.17 (n=287)	101.97±9.73 (n=240)	103.80±10.70 (n=60)	0.43 (0.00)
WHR	0.87±0.08 (n=287)	0.88±0.07 (n=240)	0.88±0.07 (n=60)	0.46 (0.00)
SBP (mm Hg)	130.97±18.84 (n=287)	130.09±17.27 (n=240)	133.20±16.96 (n=60)	0.48 (0.00)
DBP (mm Hg)	82.19±12.08 (n=287)	82.43±11.88 (n=239)	82.47±12.44 (n=60)	0.97 (0.00)
LogTG	0.22±0.56 (n=190)	0.22±0.56 (n=173)	0.23±0.55 (n=46)	0.99 (0.00)
TC (mmol/l)	5.40±0.92 (n=190)	5.51±0.90 (n=173)	5.65±1.07 (n=46)	0.22 (0.01)
HDL-C (mmol/l)	1.31±0.28 (n=190)	1.30±0.26 (n=173)	1.27±0.30 (n=46)	0.78 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=190)	3.56±0.82 (n=173)	3.68±0.88 (n=46)	0.13 (0.01)

Table 24 : Genetic effects of FTO rs17818902 SNP on obesity parameters

Parameter	TT	GT	GG	p (R^2)
Height(m)	1.59±0.10 (n=333)	1.59±0.09 (n=220)	1.55±0.07 (n=34)	0.14 (0.01)
Weight(kg)	69.27±14.68 (n=333)	68.21±13.34 (n=220)	65.43±14.62 (n=34)	0.27 (0.00)
LogBMI	3.30±0.18 (n=333)	3.28±0.18 (n=220)	3.28±0.20 (n=34)	0.71 (0.00)
WC (cm)	89.80±11.94 (n=333)	89.34±11.90 (n=220)	86.36±12.63 (n=34)	0.28 (0.00)
HC (cm)	102.49±9.96 (n=333)	102.12±10.02 (n=220)	100.04±10.89 (n=34)	0.40 (0.00)
WHR	0.88±0.08 (n=333)	0.87±0.08 (n=220)	0.86±0.08 (n=34)	0.66 (0.00)
SBP (mm Hg)	130.64±17.34 (n=333)	131.71±18.90 (n=220)	127.03±18.66 (n=34)	0.35 (0.00)
DBP (mm Hg)	81.80±12.20 (n=333)	83.58±11.57 (n=219)	79.29±12.45 (n=34)	0.08 (0.01)
LogTG	0.23±0.57 (n=235)	0.20±0.55 (n=151)	0.29±0.50 (n=23)	0.69 (0.00)
TC (mmol/l)	5.46±0.88 (n=235)	5.49±0.96 (n=151)	5.50±1.16 (n=23)	0.94 (0.00)
HDL-C (mmol/l)	1.31±0.29 (n=235)	1.29±0.25 (n=151)	1.28±0.27 (n=23)	0.60 (0.00)
LDL-C (mmol/l)	3.48±0.79 (n=235)	3.57±0.83 (n=151)	3.53±1.02 (n=23)	0.51 (0.00)

Table 25 : Genetic effects of FTO rs1861867 SNP on obesity parameters

Parameter	CC	CT	TT	p (R^2)
Height(m)	1.58±0.09 (n=452)	1.60±0.09 (n=122)	1.61±0.09 (n=13)	0.18 (0.01)
Weight(kg)	68.07±14.16 (n=452)	70.84±14.22 (n=122)	68.35±14.32 (n=13)	0.16 (0.01)
LogBMI	3.29±0.18 (n=452)	3.31±0.18 (n=122)	3.25±0.20 (n=13)	0.31 (0.04)
WC (cm)	89.12±12.18 (n=452)	90.56±11.60 (n=122)	89.54±6.67 (n=13)	0.50 (0.00)
HC (cm)	101.96±10.28 (n=452)	103.02±9.46 (n=122)	103.46±6.28 (n=13)	0.53 (0.00)
WHR	0.87±0.08 (n=452)	0.88±0.07 (n=122)	0.87±0.05 (n=13)	0.79 (0.00)
SBP (mm Hg)	130.37±17.48 (n=452)	133.05±20.06 (n=122)	126.38±15.03 (n=13)	0.23 (0.01)
DBP (mm Hg)	82.08±11.77 (n=451)	83.20±13.12 (n=122)	82.15±9.76 (n=13)	0.66 (0.00)
LogTG	0.21±0.54 (n=309)	0.26±0.60 (n=89)	0.39±0.60 (n=11)	0.48 (0.00)
TC (mmol/l)	5.48±0.90 (n=309)	5.50±1.03 (n=89)	5.20±0.74 (n=11)	0.59 (0.00)
HDL-C (mmol/l)	1.31±0.28 (n=309)	1.29±0.23 (n=89)	1.26±0.28 (n=11)	0.72 (0.00)
LDL-C (mmol/l)	3.52±0.80 (n=309)	3.54±0.90 (n=89)	3.16±0.72 (n=11)	0.34 (0.01)

Table 26 : Genetic effects of FTO rs3751812 SNP on obesity parameters

Parameter	GG	GT	TT	P (R^2)
Height(m)	1.58±0.10 (n=287)	1.58±0.09 (n=240)	1.60±0.09 (n=60)	0.29 (0.00)
Weight(kg)	68.38±14.52 (n=287)	68.21±13.59 (n=240)	71.70±14.89 (n=60)	0.21 (0.01)
LogBMI	3.29±0.18 (n=287)	3.29±0.18 (n=240)	3.31±0.19 (n=60)	0.65 (0.00)
WC (cm)	88.93±12.33 (n=287)	89.55±11.65 (n=240)	91.31±11.49 (n=60)	0.37 (0.00)
HC (cm)	102.09±10.16 (n=287)	102.09±9.82 (n=240)	103.25±10.44 (n=60)	0.70 (0.00)
WHR	0.87±0.08 (n=287)	0.88±0.07 (n=240)	0.88±0.07 (n=60)	0.40 (0.00)
SBP (mm Hg)	131.00±18.83 (n=287)	129.87±17.19 (n=240)	133.88±17.16 (n=60)	0.30 (0.00)
DBP (mm Hg)	82.21±12.07 (n=287)	82.36±11.91 (n=240)	82.63±12.40 (n=60)	0.97 (0.00)
LogTG	0.22±0.56 (n=190)	0.22±0.55 (n=173)	0.23±0.55 (n=46)	1.00 (0.00)
TC (mmol/l)	5.40±0.91 (n=190)	5.50±0.90 (n=173)	5.67±1.06 (n=46)	0.19 (0.02)
HDL-C (mmol/l)	1.30±0.28 (n=190)	1.31±0.26 (n=173)	1.27±0.30 (n=46)	0.76 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=190)	3.54±0.82 (n=173)	3.71±0.87 (n=46)	0.12 (0.01)

Table 27 : Genetic effects of FTO rs4784323 SNP on obesity parameters

Parameter	GG	AG	AA	P (R^2)
Height(m)	1.58±0.09 (n=448)	1.59±0.10 (n=126)	1.63±0.06 (n=13)	0.17 (0.01)
Weight(kg)	68.57±13.91 (n=448)	68.38±15.64 (n=126)	73.87±7.74 (n=13)	0.40 (0.00)
LogBMI	3.29±0.18 (n=448)	3.28±0.19 (n=126)	3.32±0.11 (n=13)	0.70 (0.00)
WC (cm)	89.23±11.52 (n=448)	89.73±13.85 (n=126)	93.23±6.14 (n=13)	0.47 (0.00)
HC (cm)	102.15±10.10 (n=448)	102.31±10.31 (n=126)	103.31±4.23 (n=13)	0.91 (0.00)
WHR	0.87±0.07 (n=448)	0.88±0.09 (n=126)	0.90±0.05 (n=13)	0.40 (0.00)
SBP (mm Hg)	130.67±17.89 (n=448)	131.35±18.43 (n=126)	131.54±19.56 (n=13)	0.92 (0.00)
DBP (mm Hg)	82.12±11.57 (n=448)	82.73±13.57 (n=126)	84.92±11.572 (n=13)	0.65 (0.00)
LogTG	0.22±0.55 (n=316)	0.23±0.57 (n=80)	0.42±0.57 (n=13)	0.44 (0.00)
TC (mmol/l)	5.48±0.91 (n=316)	5.50±0.98 (n=80)	5.09±0.92 (n=13)	0.30 (0.01)
HDL-C (mmol/l)	1.31±0.28 (n=316)	1.30±0.24 (n=80)	1.19±0.23 (n=13)	0.31 (0.01)
LDL-C (mmol/l)	3.52±0.80 (n=316)	3.56±0.87 (n=80)	3.10±0.82 (n=13)	0.17 (0.01)

Table 28 : Genetic effects of FTO rs6499643 SNP on obesity parameters

Parameter	TT	CT	CC	P (R^2)
Height(m)	1.58±0.09 (n=350)	1.59±0.09 (n=210)	1.57±0.11 (n=27)	0.70 (0.00)
Weight(kg)	68.92±14.52 (n=350)	68.11±13.87 (n=210)	69.28±12.76 (n=27)	0.79 (0.00)
LogBMI	3.30±0.19 (n=350)	3.28±0.18 (n=210)	3.31±0.14 (n=27)	0.42 (0.00)
WC (cm)	89.28±12.15 (n=350)	89.75±11.67 (n=210)	88.78±12.34 (n=27)	0.87 (0.00)
HC (cm)	102.53±10.10 (n=350)	101.37±9.73 (n=210)	104.63±11.43 (n=27)	0.18 (0.01)
WHR	0.87±0.08 (n=350)	0.89±0.07 (n=210)	0.85±0.10 (n=27)	0.03 (0.01)
SBP (mm Hg)	131.41±17.77 (n=350)	130.07±18.54 (n=210)	129.39±17.47 (n=27)	0.64 (0.00)
DBP (mm Hg)	82.67±12.68 (n=350)	81.73±10.88 (n=209)	82.22±11.76 (n=27)	0.67 (0.00)
LogTG	0.21±0.55 (n=241)	0.24±0.56 (n=150)	0.32±0.58 (n=18)	0.67 (0.00)
TC (mmol/l)	5.46±0.98 (n=241)	5.50±0.86 (n=150)	5.45±0.75 (n=18)	0.93 (0.00)
HDL-C (mmol/l)	1.30±0.27 (n=241)	1.30±0.29 (n=150)	1.26±0.25 (n=18)	0.81 (0.00)
LDL-C (mmol/l)	3.51±0.87 (n=241)	3.52±0.76 (n=150)	3.47±0.57 (n=18)	0.96 (0.00)

Table 29 : Genetic effects of FTO rs7186521 SNP on obesity parameters

Parameter	AA	AG	GG	p (R^2)
Height(m)	1.58±0.09 (n=276)	1.58±0.09 (n=246)	1.59±0.11 (n=65)	0.89 (0.00)
Weight(kg)	68.95±14.15 (n=276)	67.75±13.38 (n=246)	70.76±17.11 (n=65)	0.28 (0.00)
LogBMI	3.29±0.19 (n=276)	3.28±0.17 (n=246)	3.31±0.19 (n=65)	0.48 (0.00)
WC (cm)	88.99±11.63 (n=276)	89.44±11.99 (n=246)	91.23±13.27 (n=65)	0.40 (0.00)
HC (cm)	102.40±10.40 (n=276)	101.82±9.29 (n=246)	102.85±11.27 (n=65)	0.69 (0.00)
WHR	0.87±0.07 (n=276)	0.88±0.08 (n=246)	0.89±0.07 (n=65)	0.18 (0.01)
SBP (mm Hg)	130.97±19.07 (n=276)	130.45±17.08 (n=246)	131.72±17.07 (n=65)	0.87 (0.00)
DBP (mm Hg)	82.86±12.51 (n=275)	81.30±11.59 (n=246)	83.88±11.28 (n=65)	0.18 (0.01)
LogTG	0.27±0.56 (n=196)	0.15±0.54 (n=173)	0.33±0.59 (n=40)	0.05 (0.02)
TC (mmol/l)	5.55±0.95 (n=196)	5.38±0.91 (n=173)	5.51±0.84 (n=40)	0.18 (0.01)
HDL-C (mmol/l)	1.29±0.27 (n=196)	1.31±0.26 (n=173)	1.29±0.32 (n=40)	0.76 (0.00)
LDL-C (mmol/l)	3.58±0.83 (n=196)	3.45±0.81 (n=173)	3.49±0.80 (n=40)	0.30 (0.01)

Table 30 : Genetic effects of FTO rs7190492 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	11.58±0.09 (n=449)	1.60±0.10 (n=125)	1.61±0.06 (n=13)	0.15 (0.01)
Weight(kg)	68.18±13.94 (n=449)	70.05±15.14 (n=125)	71.72±13.68 (n=13)	0.32 (0.00)
LogBMI	3.29±0.18 (n=449)	3.29±0.18 (n=125)	3.30±0.20 (n=13)	0.94 (0.00)
WC (cm)	89.18±11.98 (n=449)	90.08±12.40 (n=125)	91.69±6.28 (n=13)	0.60 (0.00)
HC (cm)	102.05±10.25 (n=449)	102.53±9.61 (n=125)	104.62±5.58 (n=13)	0.61 (0.00)
WHR	0.87±0.08 (n=449)	0.88±0.08 (n=125)	0.88±0.05 (n=13)	0.90 (0.00)
SBP (mm Hg)	130.67±17.69 (n=449)	131.34±18.96 (n=125)	131.77±21.30 (n=13)	0.92 (0.00)
DBP (mm Hg)	82.18±11.55 (n=448)	82.61±13.60 (n=125)	84.23±12.30 (n=13)	0.79 (0.00)
LogTG	0.23±0.53 (n=309)	0.19±0.62 (n=90)	0.39±0.62 (n=10)	0.50 (0.00)
TC (mmol/l)	5.47±0.90 (n=309)	5.53±1.00 (n=90)	5.09±1.01 (n=10)	0.37 (0.01)
HDL-C (mmol/l)	1.30±0.27 (n=309)	1.30±0.27 (n=90)	1.27±0.29 (n=10)	0.92 (0.00)
LDL-C (mmol/l)	3.51±0.80 (n=309)	3.59±0.87 (n=90)	3.04±0.87 (n=10)	0.13 (0.01)

Table 31 : Genetic effects of FTO rs7191513 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.58±0.09 (n=273)	1.59±0.10 (n=249)	1.58±0.10 (n=65)	0.75 (0.00)
Weight(kg)	68.14±13.92 (n=273)	68.50±14.82 (n=249)	71.34±12.77 (n=65)	0.26 (0.01)
LogBMI	3.29±0.18 (n=273)	3.28±0.18 (n=249)	3.34±0.17 (n=65)	0.09 (0.01)
WC (cm)	89.21±11.50 (n=273)	89.33±12.92 (n=249)	90.70±10.06 (n=65)	0.66 (0.00)
HC (cm)	101.69±9.90 (n=273)	102.12±10.36 (n=249)	104.74±9.10 (n=65)	0.09 (0.01)
WHR	0.88±0.07 (n=273)	0.87±0.08 (n=249)	0.87±0.08 (n=65)	0.65 (0.00)
SBP (mm Hg)	130.39±17.77 (n=273)	131.00±18.52 (n=249)	132.08±17.27 (n=65)	0.78 (0.00)
DBP (mm Hg)	81.96±11.56 (n=273)	82.28±12.37 (n=249)	83.94±12.56 (n=65)	0.49 (0.00)
LogTG	0.26±0.54 (n=185)	0.20±0.58 (n=178)	0.20±0.50 (n=46)	0.54 (0.00)
TC (mmol/l)	5.46±0.97 (n=185)	5.47±0.85 (n=178)	5.59±1.02 (n=46)	0.69 (0.00)
HDL-C (mmol/l)	1.30±0.27 (n=185)	1.30±0.27 (n=178)	1.32±0.25 (n=46)	0.92 (0.00)
LDL-C (mmol/l)	3.47±0.85 (n=185)	3.53±0.76 (n=178)	3.64±0.90 (n=46)	0.47 (0.00)

Table 32 : Genetic effects of FTO rs7204609 SNP on obesity parameters

Parameter	TT	CT	CC	p (R^2)
Height(m)	1.59±0.09 (n=263)	1.58±0.09 (n=251)	1.58±0.10 (n=73)	0.34 (0.00)
Weight(kg)	69.04±14.37 (n=263)	68.48±14.31 (n=251)	67.80±13.27 (n=73)	0.78 (0.00)
LogBMI	3.29±0.19 (n=263)	3.30±0.18 (n=251)	3.28±0.18 (n=73)	0.87 (0.00)
WC (cm)	89.67±11.96 (n=263)	89.81±12.14 (n=251)	87.26±11.34 (n=73)	0.25 (0.01)
HC (cm)	102.20±10.22 (n=263)	102.31±10.04 (n=251)	101.88±9.51 (n=73)	0.95 (0.00)
WHR	0.88±0.07 (n=263)	0.88±0.08 (n=251)	0.86±0.08 (n=73)	0.09 (0.01)
SBP (mm Hg)	130.62±18.40 (n=263)	130.38±17.16 (n=251)	133.16±19.52 (n=73)	0.50 (0.00)
DBP (mm Hg)	82.18±12.42 (n=263)	82.49±11.45 (n=251)	82.28±12.59 (n=73)	0.95 (0.00)
LogTG	0.22±0.58 (n=191)	0.25±0.55 (n=166)	0.14±0.47 (n=52)	0.44 (0.00)
TC (mmol/l)	5.49±0.97 (n=191)	5.54±0.87 (n=166)	5.19±0.89 (n=52)	0.05 (0.01)
HDL-C (mmol/l)	1.28±0.26 (n=191)	1.31±0.27 (n=166)	1.35±0.30 (n=52)	0.23 (0.01)
LDL-C (mmol/l)	3.55±0.83 (n=191)	3.56±0.81 (n=166)	3.26±0.77 (n=52)	0.05 (0.02)

Table 33 : Genetic effects of FTO rs7206790 SNP on obesity parameters

Parameter	CC	CG	GG	p (R^2)
Height(m)	1.58±0.09 (n=293)	1.58±0.09 (n=241)	1.59±0.08 (n=53)	0.70 (0.00)
Weight(kg)	68.26±14.48 (n=293)	68.85±14.16 (n=241)	69.90±12.90 (n=53)	0.71 (0.00)
LogBMI	3.29±0.19 (n=293)	3.29±0.18 (n=241)	3.30±0.18 (n=53)	0.82 (0.00)
WC (cm)	88.79±11.94 (n=293)	90.00±12.22 (n=241)	90.34±10.98 (n=53)	0.43 (0.00)
HC (cm)	102.20±10.00 (n=293)	101.95±10.14 (n=241)	103.49±9.95 (n=53)	0.60 (0.00)
WHR	0.87±0.08 (n=293)	0.88±0.08 (n=241)	0.87±0.08 (n=53)	0.10 (0.01)
SBP (mm Hg)	130.96±19.37 (n=293)	130.53±16.16 (n=241)	131.51±18.56 (n=53)	0.92 (0.00)
DBP (mm Hg)	82.20±12.53 (n=293)	82.55±11.38 (n=241)	81.87±12.13 (n=53)	0.91 (0.00)
LogTG	0.23±0.55 (n=198)	0.23±0.56 (n=176)	0.19±0.52 (n=35)	0.92 (0.00)
TC (mmol/l)	5.42±0.96 (n=198)	5.53±0.91 (n=176)	5.48±0.77 (n=35)	0.51 (0.00)
HDL-C (mmol/l)	1.30±0.28 (n=198)	1.31±0.27 (n=176)	1.25±0.25 (n=35)	0.57 (0.00)
LDL-C (mmol/l)	3.46±0.86 (n=198)	3.56±0.79 (n=176)	3.60±0.73 (n=35)	0.40 (0.01)

Table 34 : Genetic effects of FTO rs8050136 SNP on obesity parameters

Parameter	CC	CA	AA	p (R^2)
Height(m)	1.58±0.10 (n=287)	1.58±0.09 (n=240)	1.60±0.09 (n=60)	0.28 (0.00)
Weight(kg)	68.41±14.50 (n=287)	68.17±13.62 (n=240)	71.70±14.89 (n=60)	0.21 (0.01)
LogBMI	3.29±0.18 (n=287)	3.29±0.19 (n=240)	3.31±0.19 (n=60)	0.65 (0.00)
WC (cm)	88.98±12.30 (n=287)	89.49±11.69 (n=240)	91.31±11.48 (n=60)	0.39 (0.00)
HC (cm)	102.08±10.17 (n=287)	102.10±9.82 (n=240)	103.25±10.44 (n=60)	0.70 (0.00)
WHR	0.87±0.08 (n=287)	0.88±0.07 (n=240)	0.88±0.07 (n=60)	0.46 (0.00)
SBP (mm Hg)	131.09±18.78 (n=287)	129.77±17.25 (n=240)	133.88±17.16 (n=60)	0.27 (0.00)
DBP (mm Hg)	82.23±12.05 (n=287)	82.34±11.93 (n=240)	82.63±12.40 (n=60)	0.97 (0.00)
LogTG	0.22±0.56 (n=192)	0.22±0.55 (n=171)	0.23±0.55 (n=46)	1.00 (0.00)
TC (mmol/l)	5.40±0.91 (n=192)	5.50±0.90 (n=171)	5.67±1.06 (n=46)	0.20 (0.01)
HDL-C (mmol/l)	1.30±0.28 (n=192)	1.31±0.26 (n=171)	1.27±0.30 (n=46)	0.75 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=192)	3.54±0.83 (n=171)	3.71±0.87 (n=46)	0.12 (0.00)

Table 35 : Genetic effects of FTO rs9935401 SNP on obesity parameters

Parameter	GG	GA	AA	p (R^2)
Height(m)	1.58±0.10 (n=287)	1.58±0.09 (n=240)	1.60±0.09 (n=60)	0.28 (0.00)
Weight(kg)	68.37±14.52 (n=287)	68.12±13.55 (n=240)	72.09±14.94 (n=60)	0.14 (0.01)
LogBMI	3.29±0.18 (n=287)	3.29±0.18 (n=240)	3.32±0.20 (n=60)	0.51 (0.00)
WC (cm)	88.91±12.35 (n=287)	89.51±11.66 (n=240)	91.56±11.30 (n=60)	0.30 (0.00)
HC (cm)	102.11±10.16 (n=287)	101.99±9.71 (n=240)	103.57±10.81 (n=60)	0.54 (0.00)
WHR	0.87±0.08 (n=287)	0.88±0.07 (n=240)	0.88±0.07 (n=60)	0.35 (0.00)
SBP (mm Hg)	130.96±18.84 (n=287)	129.93±17.18 (n=240)	133.85±17.19 (n=60)	0.32 (0.00)
DBP (mm Hg)	82.21±12.07 (n=287)	82.37±11.90 (n=239)	82.62±12.41 (n=60)	0.97 (0.00)
LogTG	0.23±0.56 (n=189)	0.22±0.56 (n=173)	0.24±0.55 (n=47)	0.95 (0.00)
TC (mmol/l)	5.40±0.91 (n=189)	5.50±0.90 (n=173)	5.65±1.06 (n=47)	0.23 (0.01)
HDL-C (mmol/l)	1.30±0.28 (n=189)	1.31±0.26 (n=173)	1.27±0.30 (n=47)	0.68 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=189)	3.55±0.82 (n=173)	3.69±0.87 (n=47)	0.14 (0.01)

Table 36 : Genetic effects of FTO rs9939609 SNP on obesity parameters

Parameter	TT	TA	AA	p (R^2)
Height(m)	1.58±0.10 (n=288)	1.58±0.09 (n=239)	1.60±0.09 (n=60)	0.28 (0.00)
Weight(kg)	68.38±14.50 (n=288)	68.11±13.57 (n=239)	72.09±14.94 (n=60)	0.14 (0.01)
LogBMI	3.29±0.18 (n=288)	3.29±0.18 (n=239)	3.32±0.20 (n=60)	0.51 (0.00)
WC (cm)	88.95±12.34 (n=288)	89.47±11.67 (n=239)	91.56±11.30 (n=60)	0.31 (0.00)
HC (cm)	102.13±10.15 (n=288)	101.97±9.72 (n=239)	103.57±10.81 (n=60)	0.54 (0.00)
WHR	0.87±0.08 (n=287)	0.88±0.07 (n=239)	0.88±0.07 (n=60)	0.37 (0.00)
SBP (mm Hg)	130.95±18.81 (n=288)	129.94±17.21 (n=239)	133.85±17.19 (n=60)	0.32 (0.00)
DBP (mm Hg)	82.18±12.06 (n=288)	82.41±11.92 (n=239)	82.62±12.41 (n=60)	0.96 (0.00)
LogTG	0.23±0.56 (n=190)	0.21±0.56 (n=172)	0.24±0.55 (n=47)	0.92 (0.00)
TC (mmol/l)	5.41±0.91 (n=190)	5.50±0.90 (n=172)	5.65±1.06 (n=47)	0.24 (0.01)
HDL-C (mmol/l)	1.30±0.28 (n=190)	1.31±0.26 (n=172)	1.27±0.30 (n=47)	0.67 (0.00)
LDL-C (mmol/l)	3.44±0.80 (n=190)	3.55±0.82 (n=172)	3.69±0.87 (n=47)	0.14 (0.01)

Table 37 : Genetic effects of FTO rs9939973 SNP on obesity parameters

Parameter	GG	GA	AA	P (R^2)
Height(m)	1.58±0.10 (n=271)	1.58±0.09 (n=243)	1.59±0.09 (n=73)	0.89 (0.00)
Weight(kg)	68.52±14.42 (n=271)	68.62±14.43 (n=243)	69.21±15.93 (n=73)	0.93 (0.00)
LogBMI	3.29±0.18 (n=271)	3.29±0.18 (n=243)	3.29±0.21 (n=73)	0.94 (0.00)
WC (cm)	88.99±12.31(n=271)	89.79±11.54 (n=243)	89.84±12.19 (n=73)	0.72 (0.00)
HC (cm)	102.18±10.03 (n=271)	102.25±9.60 (n=243)	102.19±11.55 (n=73)	1.00 (0.00)
WHR	0.87±0.08 (n=271)	0.88±0.08 (n=243)	0.88±0.07 (n=73)	0.48 (0.00)
SBP (mm Hg)	130.88±19.04 (n=271)	130.02±16.78 (n=243)	133.40±18.08 (n=73)	0.37 (0.00)
DBP (mm Hg)	82.15±12.11 (n=271)	82.48±11.66 (n=243)	82.38±12.94 (n=73)	0.95 (0.00)
LogTG	0.23±0.56 (n=183)	0.22±0.55 (n=173)	0.21±0.55 (n=52)	0.97 (0.00)
TC (mmol/l)	5.39±0.91 (n=183)	5.51±0.89 (n=173)	5.66±1.07 (n=52)	0.15 (0.01)
HDL-C (mmol/l)	1.31±0.29 (n=183)	1.30±0.25 (n=173)	1.28±0.30 (n=52)	0.86 (0.00)
LDL-C (mmol/l)	3.42±0.79 (n=183)	3.55±0.82 (n=173)	3.71±0.89 (n=52)	0.06 (0.01)

Table 38 : Genetic effects of MC4R rs571312 SNP on obesity parameters

	GG	GT	TT	p (R^2)
Height(m)	1.59±0.09 (n=489)	1.57±0.09 (n=151)	1.57±0.09 (n=12)	0.16 (0.01)
Weight(kg)	68.16±13.99 (n=489)	70.22±13.75 (n=151)	62.47±19.44 (n=12)	0.093 (0.01)
LogBMI	3.28±0.18 (n=489)	3.40±0.16 (n=151)	3.19±0.22 (n=12)	0.001* (0.02)
WC (cm)	89.12±11.97 (n=489)	90.45±10.69 (n=151)	84.21±17.60 (n=12)	0.15 (0.01)
HC (cm)	102.04±9.83 (n=489)	102.98±9.98 (n=151)	97.04±14.77 (n=12)	0.12 (0.01)
WHR	0.87±0.08 (n=489)	0.88±0.08 (n=151)	0.86±0.06 (n=12)	0.61 (0.01)
SBP (mm Hg)	130.36±18.29 (n=489)	131.37±17.30 (n=151)	145.67±36.50 (n=12)	0.018 * (0.01)
DBP (mm Hg)	81.99±12.23 (n=489)	82.92±11.32 (n=151)	85.08±16.66 (n=12)	0.51 (0.00)
LogTG	0.22±0.56 (n=346)	0.29±0.55 (n=100)	0.02±0.73 (n=10)	0.29 (0.01)
TC (mmol/l)	5.49±0.94 (n=346)	5.49±1.00 (n=100)	5.22±0.84 (n=10)	0.67 (0.00)
HDL-C(mmol/l)	1.30±0.28 (n=346)	1.31±0.26 (n=100)	1.28±0.20 (n=10)	0.92 (0.00)
LDL-C (mmol/l)	3.53±0.83 (n=346)	3.50±0.88 (n=100)	3.37±0.70 (n=10)	0.78 (0.00)

Table 39 : Genetic effects of MC4R rs7227255 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.58±0.09 (n=639)	1.60±0.11 (n=13)	0	0.61 (0.00)
Weight(kg)	68.42±14.07 (n=639)	73.98±14.02 (n=13)	0	0.16 (0.00)
LogBMI	3.29±0.18 (n=639)	3.35±0.16 (n=13)	0	0.20 (0.00)
WC (cm)	89.28±11.83 (n=639)	92.38±11.67 (n=13)	0	0.35 (0.00)
HC (cm)	102.12±10.00 (n=639)	104.15±9.25 (n=13)	0	0.47 (0.00)
WHR	0.87±0.08 (n=639)	0.89±0.10 (n=13)	0	0.53 (0.00)
SBP (mm Hg)	130.79±18.42(n=639)	135.23±27.19 (n=13)	0	0.40 (0.00)
DBP (mm Hg)	82.24±11.98 (n=639)	83.31±17.94 (n=13)	0	0.75 (0.00)
LogTG	0.23±0.56 (n=443)	0.13±0.59 (n=13)	0	0.52 (0.00)
TC (mmol/l)	5.50±0.94 (n=443)	5.17±1.11 (n=13)	0	0.22 (0.00)
HDL-C (mmol/l)	1.30±0.27 (n=443)	1.18±0.23 (n=13)	0	0.11 (0.01)
LDL-C (mmol/l)	3.53±0.83 (n=443)	3.38±0.98 (n=13)	0	0.54 (0.00)

Table 40 : Genetic effects of MC4R rs2229616 SNP on obesity parameters

Parameter	GG	GA	AA	p (R^2)
Height(m)	1.59±0.09 (n=620)	1.57±0.09 (n=32)	0	0.28 (0.00)
Weight(kg)	68.49±14.05 (n=620)	69.43±14.75 (n=32)	0	0.71 (0.00)
LogBMI	3.29±0.18 (n=620)	3.32±0.16 (n=32)	0	0.29 (0.00)
WC (cm)	89.31±11.81 (n=620)	89.91±12.33 (n=32)	0	0.78 (0.00)
HC (cm)	102.14±10.03 (n=620)	102.69±9.05 (n=32)	0	0.76 (0.00)
WHR	0.87±0.08 (n=620)	0.87±0.09 (n=32)	0	0.99 (0.00)
SBP (mm Hg)	130.91±18.30 (n=620)	130.28±24.27 (n=32)	0	0.85 (0.00)
DBP (mm Hg)	82.33±12.05 (n=620)	80.88±13.42 (n=32)	0	0.51 (0.00)
LogTG	0.24±0.57 (n=437)	0.11±0.53 (n=19)	0	0.34 (0.00)
TC (mmol/l)	5.51±0.95 (n=437)	4.98±0.86 (n=19)	0	0.017* (0.01)
HDL-C (mmol/l)	1.30±0.27 (n=437)	1.23±0.27 (n=19)	0	0.26 (0.00)
LDL-C (mmol/l)	3.54±0.84 (n=437)	3.17±0.70 (n=19)	0	0.06 (0.01)

Table 41 : Genetic effects of ADRB2 rs1042713 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.58±0.10 (n=195)	1.59±0.09 (n=347)	1.59±0.09 (n=128)	0.74 (0.00)
Weight(kg)	68.49±13.94 (n=195)	68.50±14.69 (n=347)	67.85±13.16 (n=128)	0.90 (0.00)
LogBMI	3.29±0.18 (n=195)	3.28±0.19 (n=347)	3.28±0.18 (n=128)	0.69 (0.00)
WC (cm)	88.85±12.11 (n=195)	89.29±12.10 (n=347)	88.95±11.04 (n=128)	0.91 (0.00)
HC (cm)	102.49±9.96 (n=195)	101.84±10.36 (n=347)	101.90±9.28 (n=128)	0.76 (0.00)
WHR	0.87±0.08 (n=195)	0.88±0.08 (n=347)	0.87±0.07 (n=128)	0.34 (0.00)
SBP (mm Hg)	129.99±17.81 (n=195)	131.28±18.79 (n=347)	130.21±19.16 (n=128)	0.70 (0.00)
DBP (mm Hg)	81.42±13.37 (n=195)	82.49±12.05 (n=347)	82.61±11.77 (n=128)	0.56 (0.00)
LogTG	0.21±0.57 (n=133)	0.23±0.54 (n=244)	0.24±0.60 (n=86)	0.92 (0.00)
TC (mmol/l)	5.40±0.92 (n=133)	5.52±0.91 (n=244)	5.52±1.09 (n=86)	0.45 (0.00)
HDL-C (mmol/l)	1.30±0.25 (n=133)	1.29±0.27 (n=244)	1.32±0.29 (n=86)	0.63 (0.00)
LDL-C (mmol/l)	3.44±0.84 (n=133)	3.57±0.81 (n=244)	3.52±0.92 (n=86)	0.38 (0.00)

Table 42 : Genetic effects of ADRB2 rs1042714 SNP on obesity parameters

Parameter	GG	GC	CC	p (R^2)
Height(m)	1.62±0.10 (n=6)	1.58±0.09 (n=95)	1.59±0.09 (n=571)	0.45 (0.00)
Weight(kg)	65.13±7.01 (n=6)	67.67±14.19 (n=95)	68.50±14.23 (n=571)	0.75 (0.00)
LogBMI	3.20±0.09 (n=6)	3.20±0.09 (n=95)	3.29±5.00 (n=571)	0.48 (0.00)
WC (cm)	85.67±5.82 (n=6)	89.38±13.11 (n=95)	89.05±11.73 (n=571)	0.76 (0.00)
HC (cm)	100.33±8.82 (n=6)	101.69±10.40 (n=95)	102.11±10.00 (n=571)	0.85 (0.00)
WHR	0.85±0.04 (n=6)	0.88±0.07 (n=95)	0.89±0.34 (n=571)	0.94 (0.00)
SBP (mm Hg)	128.17±27.82 (n=6)	127.74±18.41 (n=95)	131.23±18.46 (n=571)	0.22 (0.00)
DBP (mm Hg)	75.33±11.02 (n=6)	79.16±13.84 (n=95)	82.79±11.68 (n=571)	0.009*(0.01)
LogTG	2.17±1.09 (n=2)	1.27±0.61 (n=59)	1.50±0.92 (n=403)	0.17 (0.01)
TC (mmol/l)	5.65±0.50 (n=2)	5.51±0.94 (n=59)	5.48±0.95 (n=403)	0.94 (0.00)
HDL-C (mmol/l)	1.08±0.06 (n=2)	1.36±0.26 (n=59)	1.29±0.27 (n=403)	0.11 (0.01)
LDL-C (mmol/l)	3.58±0.06 (n=2)	3.58±0.89 (n=59)	3.52±0.83 (n=403)	0.87 (0.00)

Table 43 : Genetic effects of ADRB2 rs1042717 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.59±0.09 (n=204)	1.58±0.09 (n=345)	1.58±0.09 (n=121)	0.86 (0.00)
Weight(kg)	67.66±13.01 (n=204)	68.08±15.05 (n=345)	68.33±13.50 (n=121)	0.66 (0.00)
LogBMI	3.28±0.18 (n=204)	3.29±0.19 (n=345)	3.29±0.18 (n=121)	0.63 (0.00)
WC (cm)	89.08±12.27 (n=204)	89.33±11.87 (n=345)	88.47±11.38 (n=121)	0.79 (0.00)
HC (cm)	101.47±9.42 (n=204)	102.28±10.34 (n=345)	102.31±10.34 (n=121)	0.63 (0.00)
WHR	0.88±0.08 (n=204)	0.87±0.07 (n=345)	0.87±0.08 (n=121)	0.43 (0.00)
SBP (mm Hg)	129.53±19.31 (n=204)	131.58±18.83 (n=345)	130.14±16.42 (n=121)	0.43 (0.00)
DBP (mm Hg)	81.75±12.86 (n=204)	82.75±11.99 (n=345)	81.37±10.96 (n=121)	0.46 (0.00)
LogTG	0.24±0.58 (n=141)	0.22±0.54 (n=241)	0.23±0.60 (n=81)	0.98 (0.00)
TC (mmol/l)	5.45±1.02 (n=141)	5.53±0.94 (n=241)	5.42±0.86 (n=81)	0.61 (0.00)
HDL-C (mmol/l)	1.32±0.29 (n=141)	1.28±0.26 (n=241)	1.32±0.27 (n=81)	0.28 (0.01)
LDL-C (mmol/l)	3.47±0.89 (n=141)	3.59±0.82 (n=241)	3.43±0.78 (n=81)	0.25 (0.00)

Table 44 : Genetic effects of ADRB2 rs1042718 SNP on obesity parameters

Parameter	CC	CA	AA	p (R^2)
Height(m)	1.59±0.09 (n=208)	1.58±0.09 (n=339)	1.58±0.10 (n=123)	0.83 (0.00)
Weight(kg)	67.51±12.48 (n=208)	68.75±15.19 (n=339)	68.78±14.01 (n=123)	0.58 (0.00)
LogBMI	3.27±0.18 (n=208)	3.29±0.19 (n=339)	3.30±0.17 (n=123)	0.46 (0.00)
WC (cm)	89.13±11.99 (n=208)	89.26±11.86 (n=339)	88.61±11.89 (n=123)	0.88 (0.00)
HC (cm)	101.43±9.27 (n=208)	102.27±10.52 (n=339)	102.43±9.95 (n=123)	0.57 (0.00)
WHR	0.88±0.08 (n=208)	0.87±0.08 (n=339)	0.86±0.08 (n=123)	0.33 (0.00)
SBP (mm Hg)	128.62±18.92 (n=208)	132.13±18.99 (n=339)	130.28±16.44 (n=123)	0.10 (0.01)
DBP (mm Hg)	80.94±12.19 (n=208)	83.18±12.32 (n=339)	81.63±11.04 (n=123)	0.09 (0.01)
LogTG	0.23±0.59 (n=142)	0.22±0.54 (n=238)	0.25±0.59 (n=83)	0.93 (0.00)
TC (mmol/l)	5.47±1.03 (n=142)	5.51±0.95 (n=238)	5.44±0.82 (n=83)	0.82 (0.00)
HDL-C (mmol/l)	1.32±0.29 (n=142)	1.28±0.26 (n=238)	1.31±0.28 (n=83)	0.29 (0.01)
LDL-C (mmol/l)	3.48±0.89 (n=142)	3.58±0.83 (n=238)	3.44±0.74 (n=83)	0.35 (0.01)

Table 45 : Genetic effects of ADRB2 rs1042719 SNP on obesity parameters

Parameter	CC	CG	GG	p (R^2)
Height(m)	1.58±0.10 (n=194)	1.59±0.09 (n=351)	1.58±0.08 (n=125)	0.96 (0.00)
Weight(kg)	69.29±14.80 (n=194)	68.30±14.24 (n=351)	67.13±12.95 (n=125)	0.41 (0.00)
LogBMI	3.30±0.19 (n=194)	3.28±0.18 (n=351)	3.27±0.17 (n=125)	0.39 (0.00)
WC (cm)	89.56±11.75 (n=194)	88.99±11.39 (n=351)	88.68±13.48 (n=125)	0.79 (0.00)
HC (cm)	103.07±10.61 (n=194)	101.65±9.82 (n=351)	101.55±9.68 (n=125)	0.24 (0.00)
WHR	0.87±0.08 (n=194)	0.88±0.07 (n=351)	0.87±0.09 (n=125)	0.69 (0.00)
SBP (mm Hg)	131.23±17.48 (n=194)	130.66±18.78 (n=351)	129.99±19.69 (n=125)	0.84 (0.00)
DBP (mm Hg)	82.64±12.08 (n=194)	82.15±11.62 (n=351)	81.65±13.39 (n=125)	0.77 (0.00)
LogTG	0.23±0.56 (n=132)	0.22±0.56 (n=244)	0.24±0.57 (n=87)	0.94 (0.00)
TC (mmol/l)	5.38±0.92 (n=132)	5.52±0.95 (n=244)	5.54±1.00 (n=87)	0.32 (0.01)
HDL-C (mmol/l)	1.27±0.26 (n=132)	1.30±0.26 (n=244)	1.32±0.31 (n=87)	0.36 (0.00)
LDL-C (mmol/l)	3.43±0.79 (n=132)	3.57±0.85 (n=244)	3.55±0.87 (n=87)	0.32 (0.01)

Table 46 : Genetic effects of LEP rs1349419 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.59±0.09 (n=306)	1.57±0.09 (n=189)	1.58±0.10 (n=38)	0.14 (0.01)
Weight(kg)	68.82±14.05 (n=306)	67.23±14.06 (n=189)	69.26±13.66 (n=38)	0.43 (0.00)
LogBMI	3.29±0.18 (n=306)	3.28±0.19 (n=189)	3.31±0.18 (n=38)	0.78 (0.00)
WC (cm)	89.58±11.28 (n=306)	88.94±12.89 (n=189)	88.75±11.13 (n=38)	0.81 (0.00)
HC (cm)	102.31±10.22 (n=306)	101.69±9.98 (n=189)	103.36±9.88 (n=38)	0.60 (0.00)
WHR	0.88±0.07 (n=306)	0.87±0.09 (n=189)	0.86±0.07 (n=38)	0.43 (0.00)
SBP (mm Hg)	130.31±17.50 (n=306)	131.61±20.26 (n=189)	129.25±20.94 (n=38)	0.67 (0.00)
DBP (mm Hg)	81.96±12.23 (n=306)	82.63±12.10 (n=189)	80.79±14.16 (n=38)	0.66 (0.00)
LogTG	0.18±0.55 (n=205)	0.26±0.54 (n=127)	0.35±0.42 (n=24)	0.22 (0.01)
TC (mmol/l)	5.50±0.87 (n=205)	5.49±0.90 (n=127)	5.48±1.03 (n=24)	0.99 (0.00)
HDL-C (mmol/l)	1.31±0.26 (n=205)	1.29±0.29 (n=127)	1.30±0.25 (n=24)	0.87 (0.00)
LDL-C (mmol/l)	3.56±0.77 (n=205)	3.52±0.81 (n=127)	3.48±0.92 (n=24)	0.85 (0.00)
Log-leptin	2.48±0.72 (n=15)	1.56±1.08 (n=10)	1.47±0.00 (n=1)	0.05 (0.23)

Table 47 : Genetic effects of LEP rs12535708 SNP on obesity parameters

Parameter	CC	AC	AA	p (R^2)
Height(m)	1.59±0.09 (n=387)	1.57±0.10 (n=127)	1.60±0.08 (n=19)	0.09 (0.01)
Weight(kg)	68.23±13.86 (n=387)	68.19±14.46 (n=127)	70.19±14.86 (n=19)	0.84 (0.00)
LogBMI	3.28±0.18 (n=387)	3.30±0.19 (n=127)	3.29±0.18 (n=19)	0.48 (0.00)
WC (cm)	89.41±11.90 (n=387)	88.96±11.82 (n=127)	89.08±11.43 (n=19)	0.93 (0.00)
HC (cm)	102.07±10.01 (n=387)	102.27±10.43 (n=127)	103.45±10.33 (n=19)	0.84 (0.00)
WHR	0.88±0.08 (n=387)	0.87±0.08 (n=127)	0.86±0.06 (n=19)	0.58 (0.00)
SBP (mm Hg)	130.25±18.24 (n=387)	132.36±20.30 (n=127)	128.58±18.61 (n=19)	0.48 (0.00)
DBP (mm Hg)	82.07±13.40 (n=387)	82.64±12.16 (n=127)	79.58±11.81 (n=19)	0.60 (0.00)
LogTG	0.19±0.55 (n=255)	0.28±0.54 (n=88)	0.36±0.37 (n=13)	0.25 (0.01)
TC (mmol/l)	5.50±0.87 (n=255)	5.50±0.87 (n=88)	5.27±0.65 (n=13)	0.66 (0.00)
HDL-C (mmol/l)	1.31±0.27 (n=255)	1.29±0.28 (n=88)	1.26±0.17 (n=13)	0.78 (0.00)
LDL-C (mmol/l)	3.56±0.77 (n=255)	3.52±0.87 (n=88)	3.31±0.71 (n=13)	0.51 (0.00)
Log-leptin	1.47±0.00 (n=1)	1.64±1.29 (n=6)	2.26±0.84 (n=19)	0.33 (0.09)

Table 48 : Genetic effects of LEP rs12535747 SNP on obesity parameters

Parameter	CC	AC	AA	p (R^2)
Height(m)	1.59±0.09 (n=387)	1.57±0.10 (n=127)	1.60±0.08 (n=19)	0.09 (0.01)
Weight(kg)	68.22±13.86 (n=387)	68.19±14.46 (n=127)	70.19±14.86 (n=19)	0.84 (0.00)
LogBMI	3.28±0.18 (n=387)	3.30±0.19 (n=127)	3.29±0.18 (n=19)	0.48 (0.00)
WC (cm)	89.41±11.90 (n=387)	88.96±11.83 (n=127)	89.08±11.43 (n=19)	0.93 (0.00)
HC (cm)	102.07±10.01 (n=387)	102.27±10.43 (n=127)	103.45±10.33 (n=19)	0.83 (0.00)
WHR	0.88±0.08 (n=387)	0.87±0.08 (n=127)	0.86±0.06 (n=19)	0.58 (0.00)
SBP (mm Hg)	130.25±18.24 (n=387)	132.36±20.30 (n=127)	128.58±18.61 (n=19)	0.48 (0.00)
DBP (mm Hg)	82.07±12.40 (n=387)	82.64±12.16 (n=127)	79.58±11.81 (n=19)	0.60 (0.00)
LogTG	0.19±0.55 (n=255)	0.28±0.54 (n=88)	0.36±0.37 (n=13)	0.25 (0.01)
TC (mmol/l)	5.50±0.87 (n=255)	5.50±0.97 (n=88)	5.27±0.65 (n=13)	0.66 (0.00)
HDL-C (mmol/l)	1.31±0.27 (n=255)	1.29±0.28 (n=88)	1.26±0.17 (n=13)	0.78 (0.00)
LDL-C (mmol/l)	3.56±0.77 (n=255)	3.52±0.87 (n=88)	3.31±0.71 (n=13)	0.51 (0.00)
Log-leptin	1.47±0.00 (n=1)	1.64±1.29 (n=6)	2.26±0.84 (n=19)	0.33 (0.09)

Table 49 : Genetic effects of LEP rs7799039 SNP on obesity parameters

Parameter	AA	GA	GG	p (R^2)
Height(m)	1.58±0.09 (n=294)	1.58±0.09 (n=195)	1.61±0.09 (n=44)	0.06 (0.01)
Weight(kg)	67.86±13.66 (n=294)	68.09±14.95 (n=195)	72.01±11.72 (n=44)	0.18 (0.02)
LogBMI	3.29±0.17 (n=294)	3.28±0.20 (n=195)	3.31±0.18 (n=44)	0.66 (0.00)
WC (cm)	89.05±10.90 (n=294)	89.62±13.54 (n=195)	89.49±9.90 (n=44)	0.87 (0.00)
HC (cm)	101.89±9.68 (n=294)	102.33±10.82 (n=195)	103.25±9.74 (n=44)	0.68 (0.00)
WHR	0.87±0.08 (n=294)	0.87±0.08 (n=195)	0.87±0.07 (n=44)	0.86 (0.00)
SBP (mm Hg)	131.02±18.13 (n=294)	130.28±18.90 (n=195)	130.34±22.29 (n=44)	0.96 (0.00)
DBP (mm Hg)	82.52±11.52 (n=294)	81.89±12.42 (n=195)	80.43±16.48 (n=44)	0.55 (0.00)
LogTG	0.22±0.55 (n=200)	0.16±0.54 (n=123)	0.41±0.50 (n=33)	0.06 (0.02)
TC (mmol/l)	5.46±0.89 (n=200)	5.52±0.86 (n=123)	5.56±1.00 (n=33)	0.76 (0.00)
HDL-C (mmol/l)	1.31±0.29 (n=200)	1.32±0.24 (n=123)	1.20±0.26 (n=33)	0.07 (0.02)
LDL-C (mmol/l)	3.50±0.81 (n=200)	3.59±0.74 (n=123)	3.58±0.91 (n=33)	0.61 (0.00)
Log-leptin	1.47±0.00 (n=1)	1.69±1.11 (n=11)	2.44±0.74 (n=14)	0.12 (0.17)

Table 50 : Genetic effects of LEP rs2167270 SNP on obesity parameters

Parameter	GG	GA	AA	p (R^2)
Height(m)	1.59±0.09 (n=386)	1.57±0.10 (n=128)	1.60±0.08 (n=19)	0.13 (0.01)
Weight(kg)	68.20±13.87 (n=386)	68.26±14.43 (n=128)	70.19±14.86 (n=19)	0.83 (0.00)
LogBMI	3.28±0.18 (n=386)	3.30±0.19 (n=128)	3.29±0.18 (n=19)	0.48 (0.00)
WC (cm)	89.38±11.90 (n=386)	89.06±11.83 (n=128)	89.08±11.43 (n=19)	0.96 (0.00)
HC (cm)	102.07±10.02 (n=386)	102.24±10.40 (n=128)	103.45±10.33 (n=19)	0.84 (0.00)
WHR	0.88±0.08 (n=386)	0.87±0.08 (n=128)	0.86±0.06 (n=19)	0.66 (0.00)
SBP (mm Hg)	130.22±18.25 (n=386)	132.44±20.24 (n=128)	128.58±18.61 (n=19)	0.45 (0.00)
DBP (mm Hg)	82.04±12.40 (n=386)	82.73±12.17 (n=128)	79.58±11.81 (n=19)	0.57 (0.00)
LogTG	0.19±0.55 (n=254)	0.27±0.55 (n=89)	0.36±0.37 (n=13)	0.30 (0.01)
TC (mmol/l)	5.50±0.87 (n=254)	5.51±0.97 (n=89)	5.27±0.65 (n=13)	0.65 (0.00)
HDL-C (mmol/l)	1.31±0.27 (n=254)	1.29±0.28 (n=89)	1.26±0.17 (n=13)	0.79 (0.00)
LDL-C (mmol/l)	3.55±0.77 (n=254)	3.53±0.87 (n=89)	3.31±0.71 (n=13)	0.55 (0.00)
Log-leptin	1.47±0.00 (n=1)	1.64±1.29 (n=6)	2.26±0.84 (n=19)	0.33 (0.09)

Table 51 : Genetic effect of LEP rs2278815 SNP on obesity parameters

Parameter	AA	AG	GG	p (R^2)
Height(m)	1.59±0.09 (n=303)	1.58±0.09 (n=191)	1.57±0.10 (n=39)	0.18 (0.01)
Weight(kg)	68.81±14.11 (n=303)	67.29±14.01 (n=191)	69.12±13.44 (n=39)	0.47 (0.00)
LogBMI	3.29±0.19 (n=303)	3.28±0.18 (n=191)	3.32±0.18 (n=39)	0.52 (0.00)
WC (cm)	89.56±11.33 (n=303)	88.94±12.81 (n=191)	88.96±11.07 (n=39)	0.84 (0.00)
HC (cm)	102.32±10.27 (n=303)	101.57±9.83 (n=191)	103.88±10.14 (n=39)	0.40 (0.00)
WHR	0.88±0.07 (n=303)	0.88±0.09 (n=191)	0.86±0.07 (n=39)	0.33 (0.00)
SBP (mm Hg)	130.17±17.43 (n=303)	131.56±20.64 (n=191)	130.50±19.28 (n=39)	0.73 (0.00)
DBP (mm Hg)	81.91±12.24 (n=303)	82.50±12.37 (n=191)	81.82±12.86 (n=39)	0.87 (0.00)
LogTG	0.18±0.55 (n=204)	0.25±0.54 (n=129)	0.36±0.43 (n=23)	0.24 (0.01)
TC (mmol/l)	5.50±0.87 (n=204)	5.48±0.90 (n=129)	5.50±1.05 (n=23)	0.98 (0.00)
HDL-C (mmol/l)	1.31±0.26 (n=204)	1.29±0.28 (n=129)	1.30±0.26 (n=23)	0.85 (0.00)
LDL-C (mmol/l)	3.56±0.77 (n=204)	3.52±0.81 (n=129)	3.49±0.93 (n=23)	0.88 (0.00)
Log-leptin	2.48±0.72 (n=14)	1.56±1.08 (n=11)	1.47±0.00 (n=1)	0.05 (0.23)

Table 52 : Genetics effects of LEP rs12706832 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.58±0.09 (n=281)	1.59±0.09 (n=205)	1.60±0.09 (n=47)	0.21 (0.01)
Weight(kg)	67.98±13.65 (n=281)	67.99±15.04 (n=205)	71.43±11.19 (n=47)	0.27 (0.01)
LogBMI	3.29±0.17 (n=281)	3.28±0.20 (n=205)	3.32±0.17 (n=47)	0.37 (0.00)
WC (cm)	88.98±10.85 (n=281)	89.70±13.45 (n=205)	89.38±10.13 (n=47)	0.81 (0.00)
HC (cm)	102.04±9.70 (n=281)	102.00±11.00 (n=205)	103.63±8.37 (n=47)	0.58 (0.00)
WHR	0.87±0.08 (n=281)	0.88±0.08 (n=205)	0.86±0.07 (n=47)	0.40 (0.00)
SBP (mm Hg)	130.93±18.33 (n=281)	130.40±19.03 (n=205)	130.55±20.36 (n=47)	0.95 (0.00)
DBP (mm Hg)	82.38±11.58 (n=281)	82.15±12.49 (n=205)	80.44±15.56 (n=47)	0.61 (0.00)
LogTG	0.22±0.54 (n=193)	0.17±0.54 (n=129)	0.39±0.52 (n=34)	0.10 (0.01)
TC (mmol/l)	5.47±0.90 (n=193)	5.49±0.85 (n=129)	5.64±1.00 (n=34)	0.58 (0.00)
HDL-C (mmol/l)	1.31±0.29 (n=193)	1.31±0.23 (n=129)	1.22±0.28 (n=34)	0.15 (0.01)
LDL-C (mmol/l)	3.51±0.82 (n=193)	3.56±0.73 (n=129)	3.65±0.93 (n=34)	0.60 (0.00)
Log-leptin	1.47±0.00 (n=1)	1.69±1.11 (n=10)	2.44±0.74 (n=15)	0.12 (0.17)

Table 53 : Genetic effects of RETN rs34861192 SNP on obesity parameters

Parameter	GG	GA	AA	p (R^2)
Height(m)	1.59±0.09 (n=451)	1.59±0.09 (n=159)	1.52±0.11 (n=15)	0.033(0.01)
Weight(kg)	69.18±14.39 (n=451)	67.56±12.69 (n=159)	61.57±15.62 (n=15)	0.07 (0.01)
LogBMI	3.29±0.18 (n=451)	3.28±0.17 (n=159)	3.25±0.21 (n=15)	0.38 (0.00)
WC (cm)	89.47±11.37 (n=451)	88.43±11.05 (n=159)	91.00±14.25 (n=15)	0.51 (0.00)
HC (cm)	102.49±9.98 (n=451)	101.18±8.89 (n=159)	102.73±15.45(n=15)	0.35 (0.00)
WHR	0.87±0.07 (n=451)	0.87±0.07 (n=159)	0.89±0.07 (n=15)	0.76 (0.00)
SBP (mmHg)	131.05±18.95(n=451)	130.14±16.66 (n=159)	136.73±14.02 (n=15)	0.40 (0.00)
DBP (mmHg)	82.48±12.09 (n=451)	81.96±11.87 (n=159)	85.07±11.10 (n=15)	0.62 (0.00)
TC (mmol/L)	5.54±0.95 (n=316)	5.39±0.90 (n=119)	4.64±0.63 (n=5)	0.04 (0.01)
LDL-C (mmmol/L)	3.58±0.85 (n=316)	3.41±0.76 (n=119)	2.92±0.71 (n=5)	0.05 (0.01)
LogHDL	0.24±0.20 (n=316)	0.24±0.21 (n=119)	0.20±0.15 (n=5)	0.86 (0.00)
LogTG	0.23±0.56 (n=316)	0.26±0.57 (n=119)	0.05±0.26 (n=5)	0.65 (0.00)
Log-resistin	-3.19±0.59 (n=69)	-2.67±0.60 (n=23)	-1.56±0.00 (n=1)	<0.001* (0.20)

Table 54 : Genetic effects of RETN rs34861192 SNP on obesity parameters under dominant model

Parameter	GG	GA + AA	p (R^2)
Height(m)	1.59±0.09 (n=132)	1.58±0.09 (n=493)	0.40 (0.00)
Weight(kg)	69.17±14.39 (n=132)	67.04±13.02 (n=493)	0.09 (0.01)
LogBMI	3.29±0.18 (n=132)	3.27±0.17 (n=493)	0.21 (0.00)
WC (cm)	89.47±11.37 (n=132)	88.65±11.33 (n=493)	0.42 (0.00)
HC (cm)	102.49±9.98 (n=132)	101.32±9.58 (n=493)	0.18 (0.00)
WHR (cm)	0.87±0.07 (n=132)	0.87±0.07 (n=493)	0.80 (0.00)
SBP (mm Hg)	131.05±18.95 (n=132)	130.71±16.52 (n=493)	0.83 (0.00)
DBP (mm Hg)	82.48±12.09 (n=132)	82.22±11.81 (n=493)	0.82 (0.00)
TC (mmol/L)	5.54±0.95 (n=81)	5.36±0.90 (n=335)	0.08 (0.01)
LDL (mmol/L)	3.58±0.85 (n=80)	3.39±0.76 (n=335)	0.03 (0.01)
LogHDL	0.24±0.20 (n=81)	0.24±0.21 (n=235)	0.74 (0.00)
LogTG	0.23±0.56 (n=81)	0.25±0.56 (n=235)	0.67 (0.00)
LogResistin	-3.19±0.59 (n=24)	-2.62±0.63 (n=69)	<0.001* (0.15)

Table 55: Genetic effects of RETN rs1862513 SNP on obesity parameters

Parameter	CC	GC	GG	p (R^2)
Height(m)	1.57±0.10 (n=132)	1.59±0.09(n=315)	1.58±0.09 (n=178)	0.09 (0.01)
Weight(kg)	68.97±13.97 (n=132)	68.43±13.63(n=315)	68.43±13.63 (n=178)	0.71 (0.00)
LogBMI	3.29±0.19 (n=132)	3.29±0.18 (n=315)	3.30±0.18 (n=178)	0.82 (0.00)
WC (cm)	89.63±11.24 (n=132)	89.06±11.24(n=315)	89.28±11.12 (n=178)	0.89 (0.00)
HC (cm)	102.22±10.77 (n=132)	101.83±9.36(n=315)	102.70±10.09 (n=178)	0.64 (0.00)
WHR	0.88±0.08 (n=132)	0.87±0.07(n=315)	0.87±0.07 (n=178)	0.62 (0.00)
SBP (mm Hg)	132.27±15.96 (n=132)	131.65±19.22 (n=315)	128.77±18.13 (n=178)	0.16 (0.01)
DBP (mm Hg)	81.89±10.68 (n=132)	82.80±12.17 (n=315)	82.08±12.66 (n=178)	0.70 (0.00)
TC (mmol/L)	5.40±0.98 (n=81)	5.50±0.96 (n=235)	5.53±0.87 (n=124)	0.63 (0.00)
LDL-C (mmol/l)	3.42±0.87 (n=81)	3.54±0.86(n=235)	3.57±0.75 (n=124)	0.44 (0.00)
LogHDL	0.24±0.23 (n=81)	0.25±0.21 (n=235)	0.22±0.17 (n=124)	0.31 (0.01)
LogTG	0.22±0.57 (n=81)	0.21±0.57(n=235)	0.29±0.52 (n=124)	0.44 (0.00)
Log-resistin	-2.77±0.68 (n=24)	-3.11±0.63 (n=45)	-3.19±0.59 (n=24)	0.05 (0.07)

Table 56 : Genetic effects of RETN rs3219175 SNP on obesity parameters

Parameter	GG	AG	AA	p (R^2)
Height(m)	1.59±0.09 (n=458)	1.59±0.09 (n=154)	1.52±0.10 (n=13)	0.05 (0.010)
Weight(kg)	69.10±14.31 (n=458)	67.59±13.15 (n=154)	62.24±13.82 (n=13)	0.13 (0.006)
LogBMI	3.29±0.18 (n=458)	3.28±0.18 (n=154)	3.27±0.19 (n=13)	0.53 (0.002)
WC (cm)	89.46±11.29 (n=458)	88.30±11.42 (n=154)	93.08±12.51 (n=13)	0.26 (0.004)
HC (cm)	102.47±9.96 (n=458)	101.06±9.05 (n=154)	104.38±15.11 (n=13)	0.22 (0.005)
WHR	0.87±0.07 (n=458)	0.87±0.07 (n=154)	0.90±0.07 (n=13)	0.55 (0.002)
SBP (mm Hg)	131.00±18.94 (n=458)	130.46±16.59 (n=154)	135.31±14.38 (n=13)	0.66 (0.001)
DBP (mm Hg)	82.50±12.11 (n=458)	82.06±11.82 (n=154)	83.92±11.12 (n=13)	0.84 (0.001)
TC (mmol/L)	5.53±0.95 (n=322)	5.40±0.91 (n=114)	4.65±0.73 (n=4)	0.09 (0.011)
LDL-C (mmol/l)	3.57±0.85 (n=322)	3.41±0.78 (n=114)	2.95±0.81 (n=4)	0.09 (0.011)
LogHDL	0.24±0.20 (n=322)	0.24±0.22 (n=114)	0.21±0.17 (n=4)	0.95 (0.000)
LogTG	0.23±0.56 (n=322)	0.26±0.56 (n=114)	0.02±0.23 (n=4)	0.56 (0.003)
Log-resistin	-3.19±0.59 (n=70)	-2.66±0.62 (n=22)	-1.56±0.00 (n=1)	<0.001* (0.18)

Table 57 : Genetic effects of RETN rs3219175 SNP on obesity parameters dominant model

Parameter	GG	AG + AA	p (R^2)
Height(m)	1.59±0.09 (n=458)	1.58±0.09 (n=154)	0.39 (0.00)
Weight(kg)	69.10±14.31 (n=458)	67.08±13.22 (n=154)	0.11 (0.00)
LogBMI	3.29±0.18 (n=458)	3.28±0.18 (n=154)	0.25 (0.00)
WC (cm)	89.46±11.29 (n=458)	88.63±11.56 (n=154)	0.42 (0.00)
HC (cm)	102.47±9.96 (n=458)	101.27±9.62 (n=154)	0.18 (0.00)
WHR (cm)	0.87±0.07 (n=458)	0.87±0.07 (n=154)	0.81 (0.00)
SBP (mm Hg)	131.00±18.94 (n=458)	130.67±16.35 (n=154)	0.84 (0.00)
DBP (mm Hg)	82.48±12.11 (n=458)	82.14±11.76 (n=154)	0.76 (0.00)
TC (mmol/L)	5.53±0.95 (n=322)	5.38±0.92 (n=114)	0.13 (0.01)
LDL (mmol/L)	3.57±0.85 (n=322)	3.40±0.79 (n=114)	0.06 (0.01)
LogHDL	0.24±0.20 (n=322)	0.25±0.21 (n=114)	0.84 (0.00)
LogTG	0.23±0.56 (n=322)	0.25±0.55 (n=114)	0.74 (0.00)
LogResistin	-3.19±0.59 (n=24)	-2.62±0.65 (n=69)	<0.001* (0.15)

Table 58 : Genetic effects of INSIG2 rs7566605 SNP on obesity parameters

Parameter	CC	GC	GG	p (R^2)
Height(m)	1.59±0.09 (n=213)	1.59±0.09 (n=336)	1.57±0.09 (n=123)	0.12 (0.01)
Weight(kg)	68.70±13.44 (n=213)	68.16±14.80 (n=336)	68.26±13.75 (n=123)	0.91 (0.00)
LogBMI	3.29±0.16 (n=213)	3.28±0.19 (n=336)	3.30±0.18 (n=123)	0.29 (0.00)
WC (cm)	88.66±11.39 (n=213)	88.78±11.78 (n=336)	88.84±13.05 (n=123)	0.68 (0.00)
HC (cm)	102.05±10.92 (n=213)	101.57±10.60 (n=336)	102.57±10.25 (n=123)	0.65 (0.00)
WHR	0.91±0.55 (n=213)	0.87±0.07 (n=336)	0.87±0.09 (n=123)	0.31 (0.00)
SBP (mm Hg)	131.33±19.14 (n=213)	130.15±17.90 (n=336)	131.19±19.39 (n=123)	0.73 (0.00)
DBP (mm Hg)	82.13±11.33 (n=213)	82.08±12.51 (n=336)	82.69±12.17 (n=123)	0.89 (0.00)
LogTG	0.20±0.54 (n=148)	0.23±0.58 (n=233)	0.25±0.56 (n=83)	0.78 (0.00)
TC (mmol/l)	5.39±0.91 (n=148)	5.50±1.01 (n=233)	5.62±0.81 (n=83)	0.19 (0.01)
HDL-C (mmol/l)	1.28±0.25(n=148)	1.30±0.29 (n=233)	1.32±0.24 (n=83)	0.51 (0.00)
LDL-C (mmol/l)	3.48±0.79 (n=148)	3.52±0.92 (n=233)	3.63±0.67 (n=83)	0.43 (0.00)

Table 59 : Genetics effects of ADIPOQ rs3774261 SNP on obesity parameters

Parameter	CC	GC	GG	p (R^2)
Height(m)	1.58±0.08 (n=179)	1.59±0.09 (n=324)	1.58±0.10 (n=136)	0.40 (0.00)
Weight(kg)	67.33±12.80 (n=179)	68.75±14.28 (n=324)	69.42±15.35 (n=136)	0.39 (0.00)
LogBMI	3.28±0.17 (n=179)	3.29±0.18 (n=324)	3.30±0.20 (n=136)	0.53 (0.00)
WC (cm)	88.57±10.91 (n=179)	89.01±11.81 (n=324)	90.99±12.93 (n=136)	0.17 (0.01)
HC (cm)	101.38±9.57 (n=179)	102.03±9.86 (n=324)	103.57±10.90(n=136)	0.15 (0.01)
WHR	0.87±0.07 (n=179)	0.87±0.07 (n=324)	0.88±0.09 (n=136)	0.65 (0.00)
SBP (mm Hg)	130.20±17.90 (n=179)	131.16±19.20 (n=324)	130.56±16.98 (n=136)	0.85 (0.00)
DBP (mm Hg)	81.08±11.39 (n=179)	82.47±12.43 (n=324)	82.93±11.37 (n=136)	0.33 (0.00)
LogTG	0.15±0.52 (n=82)	0.27±0.56 (n=220)	0.26±0.61 (n=142)	0.12 (0.01)
TC (mmol/l)	5.55±1.00 (n=82)	5.45±0.96 (n=220)	5.52±0.87 (n=142)	0.61 (0.00)
HDL-C(mmol/l)	1.33±0.29 (n=82)	1.28±0.26 (n=220)	1.28±0.27 (n=142)	0.16 (0.01)
LDL-C (mmol/l)	3.61±0.89 (n=82)	3.48±0.83 (n=220)	3.53±0.81 (n=142)	0.42 (0.00)
Log-adiponectin	2.80±1.01 (n=19)	2.60±1.16 (n=52)	2.26±1.08 (n=30)	0.21 (0.03)

Table 60 : Genetics effects of ADIPOQ rs17366568 SNP on obesity parameters

	GG	AG	AA	p (R^2)
Height (m)	1.59±0.09 (n=535)	1.59±0.09 (n=38)	1.51±0.00 (n=1)	0.68 (0.00)
LogWeight	4.20±0.20 (n=535)	4.27±0.23 (n=38)	4.37±0.00 (n=1)	0.08 (0.01)
BMI (Kg/m²)	27.00±4.57 (n=535)	29.11±6.03 (n=38)	34.88±0.00 (n=1)	0.007* (0.02)
WC (cm)	89.31±11.59 (n=535)	91.55±13.24 (n=38)	97.00±0.00 (n=1)	0.43 (0.00)
LogHC	4.62±0.11 (n=535)	4.66±0.11 (n=38)	4.75±0.00 (n=1)	0.04 (0.01)
WHR	0.88±0.08 (n=535)	0.86±0.07 (n=38)	0.84±0.00 (n=1)	0.29 (0.00)
SBP (mm Hg)	130.79±18.27 (n=535)	129.64±15.38 (n=38)	156.00±0.00 (n=1)	0.35 (0.00)
DBP (mm Hg)	81.98±12.01 (n=535)	83.11±10.66 (n=38)	117.00±0.00 (n=1)	0.012* (0.02)
TC (mmol/l)	5.52±0.98 (n=369)	5.26±0.85 (n=31)	7.00±0.00 (n=1)	0.11 (0.01)
LDL(mmol/l)	3.54±0.86 (n=369)	3.33±0.82 (n=31)	4.75±0.00 (n=1)	0.16 (0.01)
LogHDL	0.24±0.22 (n=369)	0.23±0.16 (n=31)	0.36±0.00 (n=1)	0.86 (0.001)
LogTG	0.25±0.55 (n=369)	0.20±0.61 (n=31)	0.59±0.00 (n=1)	0.74 (0.001)
Log-adiponectin	2.57±1.08 (n=369)	2.00±1.10 (n=31)	0	0.16 (0.022)

Table 61 : Genetics effects of ADIPOQ rs17366568 SNP on obesity parameters under dominant model

	GG	AG + AA	p (R^2)
Height (m)	1.59±0.09 (n=535)	1.59±0.09 (n=39)	0.97 (0.00)
LogWeight	4.20±0.20 (n=535)	4.27±0.23 (n=39)	0.03 (0.01)
BMI (Kg/m2)	27.00±4.57 (n=535)	29.26±6.02 (n=39)	0.004* (0.02)
WC (cm)	89.31±11.59 (n=535)	91.69±13.09 (n=39)	0.22 (0.00)
LogHC	4.62±0.11 (n=535)	4.66±0.11 (n=39)	0.015* (0.01)
WHR	0.88±0.08 (n=535)	0.86±0.07 (n=39)	0.12 (0.00)
SBP (mm Hg)	130.79±18.27 (n=535)	130.32±15.75 (n=39)	0.88 (0.00)
DBP (mm Hg)	81.98±12.01 (n=535)	83.97±11.84 (n=39)	0.32 (0.00)
TC (mmol/l)	5.52±0.98 (n=369)	5.31±0.89 (n=32)	0.25 (0.00)
LDL(mmol/l)	3.54±0.86 (n=369)	3.38±0.85 (n=31)	0.30 (0.00)
LogHDL(mmol/l)	0.24±0.22 (n=369)	0.24±0.16 (n=32)	0.95 (0.00)
LogTG	0.25±0.55 (n=369)	0.20±0.61 (n=32)	0.72 (0.00)
Log-adiponectin	2.57±1.08 (n=84)	2.00±1.10 (n=8)	0.16 (0.02)