



DNA Wellness Report:

Weight Management Insights

For:

Alex Morgan

KIT ID: SAMPLE-DNA-0001

Report type: Wellness

Genetic variations: 32 SNPs

Date: 2026-10-01

Dear Alex Morgan

Thank you for choosing our genetic analysis service.

We are pleased to provide you with personalized genetic insights based on selected variants identified in your DNA. This report is designed to provide educational and general wellness information about genetic variants and associations reported in scientific literature.

Our goal is to present your results in a clear and informative format to help you better understand selected genetic characteristics related to general wellness.

This report is intended for educational and general wellness purposes only. It is not intended to diagnose, treat, cure, mitigate, or prevent any disease or medical condition, and it should not be used as a substitute for professional medical advice.

We hope your experience with our service has been clear, informative, and valuable. If you have any questions or need additional assistance, our team is available to help.

Thank you again for placing your trust in us.

Sincerely,
MAGISNAT OMICS LLC Team

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Introduction

GENETICS is important

DNA Wellness Report: Weight Management Insights

Weight management-related biological processes are influenced by genetic variation together with diet, physical activity, lifestyle, environmental, and other biological factors. This DNA report analyzes **32 selected genetic variants (SNPs)** that have been studied in relation to biological pathways associated with nutrient metabolism, energy balance, diet response, BMI-related traits, fat distribution, and body composition. Scientific literature suggests that genetic variation may be associated with differences in certain weight- and body composition-related characteristics and biological processes among individuals. The information in this report is provided for educational and general wellness purposes and is intended to offer context about genetic variation and weight management-related biological pathways. **This report is not intended to diagnose, treat, cure, mitigate, or prevent any disease or medical condition.**

Traits



Diet Response



BMI-related traits



Fat Distribution
Insights

Understanding the Report

How to Read Your Genetic Results

This report presents information about selected genetic variants, specifically single nucleotide polymorphisms (SNPs), analyzed within or in relation to specific genes.

Each result includes the gene name, gene function, SNP ID, genotype, represented by the combination of alleles detected at that genetic position, outcome, and recommendation.

The outcome summarizes the reported scientific association between the identified genotype and a general wellness-related trait or biological process.

The recommendation provides general wellness information based on this association and is not intended as medical advice.

The information provided in this report is based on published scientific research describing associations between selected genetic variants and biological traits or processes related to general wellness.

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Report summary

Diet Response

Gene	SNP ID	Genotype	Page
MTHFR	rs1801133	G/A	6
MTHFR	rs1801131	T/G	7
FUT2	rs602662	G/G	8
GC	rs2282679	G/G	8
TMPRSS6	rs855791	A/A	9
ADIPOQ	rs266729	C/C	10
LEP	rs7799039	G/G	11
UCP3	rs1800849	A/A	12
PPARG	rs1801282	C/G	12
FTO	rs1558902	A/A	13
APOA2	rs5082	G/A	14
APOA5	rs662799	A/G	14
PPARGC1A	rs8192678	T/T	15
GHSR	rs490683	C/C	16
ADIPOQ	rs17300539	A/A	17
ADIPOQ	rs3774261	G/G	18
AMY1-AMY2	rs11185098	G/G	19

BMI-related traits

Gene	SNP ID	Genotype	Page
TFAP2B	rs987237	A/A	20
TFAP2B	rs2272903	G/A	21

Fat Distribution Insights

Gene	SNP ID	Genotype	Page
MAP2K5	rs2241423	A/G	22
MAP2K5	rs997295	G/T	23
FTO	rs8050136	C/C	24
FTO	rs3751812	T/T	24
ADIPOQ	rs182052	A/A	25
Intergenic (near TFAP2B)	rs734597	G/G	26
FTO	rs62033400	G/G	27
FTO	rs17817449	T/G	27
FTO	rs9936385	T/C	28
FTO	rs7202116	A/A	29
FTO	rs9930506	A/A	29
FTO	rs12149832	A/A	30
FTO	rs1121980	G/G	31

Genetic Data Results

Diet Response

Diet response–related biological processes include mechanisms associated with fat metabolism, carbohydrate metabolism, energy balance, and other diet-related characteristics. This section presents information about selected genetic variants that have been studied in relation to biological pathways associated with dietary response. Scientific literature suggests that genetic variation may be associated with differences in certain diet-related characteristics and biological processes among individuals.

This report is provided for educational and general wellness purposes only. It is not intended to diagnose, treat, cure, mitigate, or prevent any disease or medical condition. The reported genetic associations do not determine an individual's response to a particular diet, body weight, or ability to lose or maintain weight and are not intended to diagnose or assess any disease or medical condition.

Reference:

Singar, Saiful, et al. "Personalized Nutrition: Tailoring Dietary Recommendations through Genetic Insights." *Nutrients*, vol. 16, no. 16, 2024, article 2673. doi:10.3390/nu16162673.

Results

Scientific Details

Gene:

MTHFR

Gene function:

Methylenetetrahydrofolate reductase.

Enzyme involved in folate metabolism that converts 5,10-methylenetetrahydrofolate to 5-methyltetrahydrofolate and contributes to homocysteine remethylation.

SNP:

rs1801133

Genotype and Outcome

Genotype:

G/A

Associated outcome:

Possible moderately reduced MTHFR activity. [\[1-3\]](#)

Recommendation

The MTHFR gene encodes methylenetetrahydrofolate reductase, an enzyme involved in folate metabolism. Functional and dietary-intervention studies have explored whether rs1801133 is associated with differences in MTHFR activity and folate-related response.[\[1-3\]](#) Having one copy (heterozygosity) of the A allele, corresponding to the G/A genotype, is associated with moderately reduced MTHFR activity compared with the G/G genotype.[\[1\]\[2\]](#) In an 18-month dietary intervention, individuals with the G/G and G/A genotypes, considered together, showed greater increases in serum folate following a green-Mediterranean dietary intervention than individuals with the A/A genotype.[\[3\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

MTHFR

Gene function:

Methylenetetrahydrofolate reductase.

Enzyme involved in folate metabolism that converts 5,10-methylenetetrahydrofolate to 5-methyltetrahydrofolate and contributes to homocysteine remethylation.

SNP:

rs1801131

Genotype and Outcome

Genotype:

T/G

Associated outcome:

Possible modest reduction in MTHFR enzyme activity. [\[4-6\]](#)

Recommendation

The MTHFR gene encodes methylenetetrahydrofolate reductase, an enzyme involved in folate metabolism. Genetic and functional studies have explored whether rs1801131 is associated with differences in MTHFR activity and folate-related measures.[\[4-6\]](#) Having one copy (heterozygosity) of the G allele, corresponding to the T/G genotype, is associated with a possible modest reduction in MTHFR activity compared with the T/T genotype.[\[4-6\]](#) However, this variant alone has not been consistently associated with lower circulating folate or higher homocysteine levels.[\[4\]\[6\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FUT2

Gene function:

Fucosyltransferase 2.

Enzyme that adds fucose to glycans on mucosal surfaces and contributes to secretor status.

SNP:

rs602662

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible lower circulating vitamin B12 levels. [\[7\]](#)[\[8\]](#)

Recommendation

The FUT2 gene encodes fucosyltransferase 2, an enzyme involved in glycan fucosylation and secretor status. Genetic association studies have explored whether rs602662 is associated with circulating vitamin B12 levels.[\[7\]](#)[\[8\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, is included within the G-allele-associated profile linked to relatively lower circulating vitamin B12 levels compared with the A/A genotype; however, available evidence does not establish a stronger effect for G/G compared with G/A.[\[7\]](#)[\[8\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

GC

Gene function:

Vitamin D-binding protein.

Protein that binds vitamin D and its metabolites in plasma and transports them to target tissues.

SNP:

rs2282679

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible lower circulating 25-hydroxyvitamin D levels. [\[9\]](#)[\[10\]](#)

Recommendation

The GC gene encodes vitamin D-binding protein, which binds and transports vitamin D and its metabolites in the bloodstream. Genome-wide genetic association studies have explored whether rs2282679 is associated with circulating 25-hydroxyvitamin D [25(OH)D] levels.[\[9\]\[10\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, is associated with relatively lower circulating 25(OH)D levels compared with the T/T genotype.[\[9\]\[10\]](#) This genetic result does not determine individual vitamin D levels, body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

TMPRSS6

Gene function:

Transmembrane protease serine 6 or Matriptase-2.

Protein playing a critical role in the regulation of iron homeostasis in the body.

SNP:

rs855791

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible lower iron-related measures and reduced iron absorption. [\[11-13\]](#)

Recommendation

The TMPRSS6 gene encodes transmembrane serine protease 6, also known as matriptase-2, a protein involved in the regulation of hepcidin and iron absorption. Genetic, functional, and oral iron-absorption studies have explored whether rs855791 is associated with differences in iron-related measures.[\[11-13\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, is associated with relatively lower iron-related measures compared with the G/G genotype.[\[11-13\]](#) In a study measuring oral iron absorption, the A/A genotype was associated with lower serum iron and transferrin saturation and, after accounting for iron status, with reduced fractional iron absorption compared with the G/G genotype.[\[13\]](#) This genetic result does not determine individual iron status, body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

ADIPOQ

Gene function:

Adiponectin.

Hormone produced mainly by adipose tissue that contributes to the regulation of glucose and lipid metabolism, insulin sensitivity, and energy balance.

SNP:

rs266729

Genotype and Outcome

Genotype:

C/C

Associated outcome:

Possible more favorable improvements in adiponectin and insulin-related metabolic measures following a hypocaloric dietary intervention. [\[14-16\]](#)

Recommendation

The ADIPOQ gene encodes adiponectin, a hormone produced by adipose tissue that is involved in insulin sensitivity and metabolic regulation.[\[14\]](#)[\[15\]](#) A hypocaloric Mediterranean-type dietary intervention study explored whether rs266729 is associated with differences in adiponectin and insulin-related metabolic response.[\[16\]](#) Having two copies (homozygosity) of the C allele, corresponding to the C/C genotype, was associated with more favorable improvements in adiponectin, insulin and insulin-resistance-related measures compared with genotypes carrying the G allele.[\[16\]](#) Reductions in body weight and other adiposity measures occurred in both genotype groups.[\[16\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

LEP

Gene function:

Leptin.

The LEP gene encodes leptin, a hormone produced mainly by adipose tissue that helps regulate appetite, energy balance, and body weight.

SNP:

rs7799039

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible relatively lower insulin and insulin-resistance-related measures.
[17]

Recommendation

The LEP gene encodes leptin, a hormone produced mainly by adipose tissue that helps regulate appetite and energy balance. A meta-analysis of multiple human studies explored whether rs7799039 is associated with circulating leptin and insulin-related measures.^[17] Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, was associated with relatively lower insulin and insulin-resistance-related measures compared with carriers of the A allele, and differences in circulating leptin levels were also reported between genotype groups.^[17] This genetic result does not determine individual appetite, body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

UCP3

Gene function:

Uncoupling Protein 3.

Protein present in mitochondria and involved in energy balance.

SNP:

rs1800849

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible less favorable weight-loss and metabolic response to hypocaloric dietary interventions. [\[18\]](#)

Recommendation

The UCP3 gene encodes uncoupling protein 3, a mitochondrial protein expressed mainly in skeletal muscle and involved in energy metabolism. A hypocaloric dietary-intervention study explored whether rs1800849 is associated with differences in weight-loss and metabolic response.[\[18\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, is included within the A-allele-carrier group that showed less weight improvement and less favorable changes in selected metabolic measures compared with G/G; however, the study does not establish a stronger effect for A/A compared with A/G.[\[18\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

PPARG

Gene function:

Peroxisome proliferator-activated receptor gamma.

Receptor that regulates fatty acid deposition and glucose metabolism.

SNP:

rs1801282

Genotype and Outcome

Genotype:

C/G

Associated outcome:

Possible less favorable weight-loss and metabolic response to a hypocaloric dietary intervention. [\[19-21\]](#)

Recommendation

The PPARG gene encodes peroxisome proliferator-activated receptor gamma, a protein involved in adipocyte function, lipid metabolism, and glucose-related processes.[\[20-21\]](#) A hypocaloric dietary-intervention study explored whether rs1801282 is associated with differences in weight-loss and metabolic response.[\[19\]](#) Having one copy (heterozygosity) of the G allele, corresponding to the C/G genotype, is included within the G-allele-carrier group that showed less favorable reductions in body weight, fat mass, waist circumference and selected metabolic measures compared with C/C.[\[19-21\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs1558902

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible greater weight loss and reductions in several body-fat measures in response to a high-protein diet. [\[22\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. A dietary-intervention study explored whether rs1558902 is associated with differences in response to weight-loss diets.[\[22\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, was associated with greater weight loss and greater reductions in several body-fat measures among individuals following a high-protein weight-loss diet.[\[22\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

APOA2

Gene function:

Apolipoprotein A-II.

Component of blood lipoproteins that plays a crucial role in lipid transport in the body.

SNP:

rs5082

Genotype and Outcome

Genotype:

G/A

Associated outcome:

No specific saturated-fat-related BMI association established for this genotype. [\[23-25\]](#)

Recommendation

The APOA2 gene encodes apolipoprotein A-II, a protein involved in lipid transport and metabolism. Observational studies across several populations have explored whether rs5082 interacts with saturated-fat intake in relation to BMI and body-weight-related measures. [\[23-25\]](#) Having one copy (heterozygosity) of the G allele, corresponding to the G/A genotype, does not have the G/G genotype, in which the higher-BMI association under relatively high saturated-fat intake was primarily observed, and available evidence does not establish the same saturated-fat-related BMI association for G/A. [\[23-25\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

APOA5

Gene function:

Apolipoprotein A-V.

Component of blood lipoproteins that plays a crucial role in lipid transport in the body.

SNP:

rs662799

Genotype and Outcome

Genotype:

A/G

Associated outcome:

Possible intermediate fasting triglyceride levels. [\[26-28\]](#)

Recommendation

The APOA5 gene encodes apolipoprotein A-V, a protein involved in the regulation of triglyceride metabolism. Genetic association studies have explored whether rs662799 is associated with fasting triglyceride levels.[\[26-28\]](#) Having one copy (heterozygosity) of the G allele, corresponding to the A/G genotype, is associated with triglyceride levels that are generally intermediate between those observed in G/G and A/A individuals.[\[26\]\[28\]](#) This genetic result does not determine individual triglyceride levels, body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

PPARGC1A

Gene function:

Peroxisome proliferator-activated receptor gamma coactivator 1 alpha.

Transcriptional coactivator regulating the expression of genes involved in energy metabolism, mitochondrial biogenesis, and adaptive thermogenesis.

SNP:

rs8192678

Genotype and Outcome

Genotype:

T/T

Associated outcome:

Possible differences in metabolic response to energy-restricted dietary interventions. [\[31\]\[32\]](#)

Recommendation

The PPARGC1A gene encodes a transcriptional coactivator involved in energy metabolism, mitochondrial function and adaptive thermogenesis. Dietary-intervention studies have explored whether rs8192678 is associated with metabolic response to energy-restricted diets.[\[31\]\[32\]](#) Having two copies (homozygosity) of the T allele, corresponding to the T/T genotype, is included within the T-allele profile associated with greater reductions in total and LDL cholesterol than C/C during a low-fat energy-restricted diet, and T/T individuals also showed improvement in insulin and insulin-resistance-related measures in a separate low-calorie intervention.[\[31\]\[32\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

GHSR

Gene function:

Growth hormone secretagogue receptor.

Receptor that binds ghrelin, a hormone involved in the regulation of appetite, hunger, and growth hormone release.

SNP:

rs490683

Genotype and Outcome

Genotype:

C/C

Associated outcome:

Possible differences in weight-loss response during lifestyle and hypocaloric dietary interventions. [\[33\]](#)[\[34\]](#)

Recommendation

The GHSR gene encodes the growth hormone secretagogue receptor, which mediates ghrelin signaling involved in appetite and energy balance. Lifestyle and hypocaloric dietary-intervention studies have explored whether rs490683 is associated with differences in weight-loss and metabolic response.[\[33\]](#)[\[34\]](#) Having two copies (homozygosity) of the C allele, corresponding to the C/C genotype, was associated with a more favorable weight-loss response than G-allele carriers and, in a recent hypocaloric intervention, with greater improvements in fat mass, waist circumference and selected glucose- and lipid-related metabolic measures.[\[33\]](#)[\[34\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

ADIPOQ

Gene function:

Adiponectin.

Hormone produced mainly by adipose tissue that contributes to the regulation of glucose and lipid metabolism, insulin sensitivity, and energy balance.

SNP:

rs17300539

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible association with an A-allele-related adiponectin and metabolic profile; an A/A-specific weight-loss response has not been established. [\[35-37\]](#)

Recommendation

The ADIPOQ gene encodes adiponectin, a hormone produced by adipose tissue that contributes to insulin sensitivity and glucose and lipid metabolism. Observational and lifestyle-intervention studies have explored whether rs17300539 is associated with adiponectin-related metabolic traits and weight-loss response. [\[35-37\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, is included within the A-allele profile associated with higher adiponectin levels and differences in metabolic and body-weight-related measures. [\[35\]](#) [\[36\]](#) In one hypocaloric diet and physical exercise intervention, a higher mean weight reduction was observed among only two A/A participants, so an A/A-specific association with weight-loss response has not been established. [\[37\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

ADIPOQ

Gene function:

Adiponectin.

Hormone produced mainly by adipose tissue that contributes to the regulation of glucose and lipid metabolism, insulin sensitivity, and energy balance.

SNP:

rs3774261

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible differences in metabolic response during hypocaloric Mediterranean-pattern dietary interventions. [\[38\]](#)[\[39\]](#)

Recommendation

The ADIPOQ gene encodes adiponectin, a hormone produced by adipose tissue that contributes to insulin sensitivity and glucose and lipid metabolism. Hypocaloric Mediterranean-pattern dietary-intervention studies have explored whether rs3774261 is associated with metabolic response.[\[38\]](#)[\[39\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, is included within the G-allele-carrier group that showed less pronounced improvements in adiponectin, lipid profile, and CRP compared with A/A; however, available evidence does not establish a progressively less favorable response for G/G compared with A/G, and weight loss itself was similar across genotype groups.[\[38\]](#)[\[39\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Carbohydrate Metabolism

Scientific Details

Gene:

AMY1-AMY2

Gene function:

Alpha-Amylase.

Proteins involved in the first steps of digestion of carbohydrates in saliva.

SNP:

rs11185098

Genotype and Outcome

Genotype:

G/G

Associated outcome:

No specific A-allele-associated weight-loss advantage established for this genotype. [\[61\]](#)

Recommendation

The AMY1-AMY2 gene region includes genes involved in starch digestion. A 2-year calorie-restricted dietary-intervention study explored whether rs11185098 is associated with differences in weight-management response.[\[61\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, does not carry the A allele associated with greater reductions in body weight and waist circumference, and no specific A-allele-associated weight-loss advantage was established for this genotype.[\[61\]](#) This genetic result does not determine an individual's response, which is influenced by multiple genetic, dietary, lifestyle, and environmental factors. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

BMI-related traits

BMI is a measure derived from body weight relative to height. Genetic variants associated with BMI may relate to biological pathways involved in energy balance, appetite regulation, and body-weight regulation. This section presents information about selected genetic variants that have been studied in relation to BMI-related traits. Scientific literature suggests that genetic variation may be associated with differences in certain BMI-related characteristics among individuals.

This report is provided for educational and general wellness purposes only. It is not intended to diagnose, treat, cure, mitigate, or prevent any disease or medical condition. The reported genetic associations do not determine an individual's BMI, body weight, body composition, or health outcomes and are not intended to diagnose or assess overweight, obesity, or any disease or medical condition.

Reference:

Yengo, Loïc, et al. "Meta-analysis of Genome-wide Association Studies for Height and Body Mass Index in ~700,000 Individuals of European Ancestry." Human Molecular Genetics, vol. 27, no. 20, 2018, pp. 3641–3649. doi:10.1093/hmg/ddy271

Diet Response

Results

Scientific Details

Gene:

TFAP2B

Gene function:

Transcription factor AP-2 beta.

Transcription factor regulating genes that control cell growth, differentiation, and apoptosis (programmed cell death).

SNP:

rs987237

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible more favorable weight-maintenance response to a high-protein diet. [\[15\]](#)[\[29\]](#)

Recommendation

The TFAP2B gene encodes transcription factor AP-2 beta, a protein involved in the regulation of gene expression and pathways related to adipocyte function and energy balance.^[15] A dietary-intervention trial explored whether rs987237 is associated with weight maintenance after initial weight loss.^[29] Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, was associated with more favorable weight maintenance when following a high-protein diet, whereas this benefit was not established in individuals carrying the G allele.^[29] This genetic result does not determine individual body weight or the ability to maintain weight loss. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

TFAP2B

Gene function:

Transcription factor AP-2 beta.

Transcription factor regulating genes that control cell growth, differentiation, and apoptosis (programmed cell death).

SNP:

rs2272903

Genotype and Outcome

Genotype:

G/A

Associated outcome:

Possible modest genetic tendency toward higher BMI. ^[30]

Recommendation

The TFAP2B gene encodes transcription factor AP-2 beta, a protein involved in the regulation of gene expression and pathways related to adipocyte function and energy balance. A large genetic association study explored whether rs2272903 is associated with BMI and reported a small increase in BMI for each copy of the G allele.^[30] Having one copy (heterozygosity) of the G allele, corresponding to the G/A genotype, is consistent with carrying one copy of the BMI-associated allele and a possible modest BMI-related genetic tendency for this variant.^[30] This genetic result does not determine individual body weight or the ability to maintain weight loss. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Fat Distribution Insights

Fat distribution–related biological processes include mechanisms associated with the distribution of body fat and other body composition–related characteristics. This section presents information about selected genetic variants that have been studied in relation to biological pathways and traits associated with fat distribution and body composition. Scientific literature suggests that genetic variation may be associated with differences in certain fat distribution– and body composition–related characteristics among individuals.

This report is provided for educational and general wellness purposes only. It is not intended to diagnose, treat, cure, mitigate, or prevent any disease or medical condition. The reported genetic associations do not determine an individual's body fat distribution, body composition, body weight, or health outcomes and are not intended to diagnose or assess any disease or medical condition.

Reference:

Agrawal, Saaket, et al. "Inherited Basis of Visceral, Abdominal Subcutaneous and Gluteofemoral Fat Depots." *Nature Communications*, vol. 13, 2022, article 3771. doi:[10.1038/s41467-022-30931-2](https://doi.org/10.1038/s41467-022-30931-2).

Results

Scientific Details

Gene:

MAP2K5

Gene function:

Mitogen-activated protein kinase kinase 5.

Enzyme involved in the response of the cell to external stimuli.

SNP:

rs2241423

Genotype and Outcome

Genotype:

A/G

Associated outcome:

Possible small BMI-associated genetic tendency for this variant. [\[40\]](#)[\[41\]](#)

Recommendation

The MAP2K5 gene encodes a kinase involved in intracellular signaling pathways that contribute to the regulation of cellular responses to external signals. Large genetic association studies have explored whether rs2241423 is associated with BMI and identified the G allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[40\]](#)[\[41\]](#) Having one copy (heterozygosity) of the G allele, corresponding to the A/G genotype, is consistent with a possible modest BMI-related genetic tendency for this variant.[\[40\]](#)[\[41\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

MAP2K5

Gene function:

Mitogen-activated protein kinase kinase 5.

Enzyme involved in the response of the cell to external stimuli.

SNP:

rs997295

Genotype and Outcome

Genotype:

G/T

Associated outcome:

Possible modest genetic tendency toward higher BMI. [\[30\]](#)[\[42\]](#)

Recommendation

The MAP2K5 gene encodes a kinase involved in intracellular signaling pathways that contribute to cellular responses and processes related to energy balance. Large genetic association studies have explored whether rs997295 is associated with BMI and identified the T allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[30\]](#) Having one copy (heterozygosity) of the T allele, corresponding to the G/T genotype, is consistent with a possible modest BMI-related genetic tendency for this variant.[\[30\]](#) Additional research suggests that the association of rs997295 may become more pronounced at higher levels of BMI.[\[42\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs8050136

Genotype and Outcome

Genotype:

C/C

Associated outcome:

Possible relatively lower BMI and body-fat-related genetic tendency.
[\[43\]](#)[\[44\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Genetic association studies have explored whether rs8050136 is associated with BMI and body-fat-related measures and identified the A allele as the higher-BMI-associated allele.[\[43\]](#)[\[44\]](#) Having two copies (homozygosity) of the C allele, corresponding to the C/C genotype, does not carry the BMI-associated A allele and is consistent with a possible relatively lower BMI- and body-fat-related genetic tendency for this variant.[\[43\]](#)[\[44\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs3751812

Genotype and Outcome

Genotype:

T/T

Associated outcome:

Possible greater genetic tendency toward higher BMI. [\[45\]](#)[\[46\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Large genetic association studies have explored whether rs3751812 is associated with BMI and identified the T allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[45\]](#)[\[46\]](#) Having two copies (homozygosity) of the T allele, corresponding to the T/T genotype, is consistent with a possible greater BMI-related genetic tendency for this variant.[\[45\]](#)[\[46\]](#) Physical activity has been reported to attenuate the BMI-related association of this variant.[\[46\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

ADIPOQ

Gene function:

Adiponectin.

Hormone produced mainly by adipose tissue that contributes to the regulation of glucose and lipid metabolism, insulin sensitivity, and energy balance.

SNP:

rs182052

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible waist-circumference-associated difference for this variant. [\[47\]](#)

Recommendation

The ADIPOQ gene encodes adiponectin, a hormone produced by adipose tissue that contributes to insulin sensitivity and glucose and lipid metabolism. An observational study explored whether rs182052 is associated with body-size measures and reported progressively higher waist circumference, body weight, and BMI with increasing numbers of the A allele.[\[47\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, is associated with the higher waist-circumference, body-weight, and BMI profile reported with increasing numbers of the A allele.[\[47\]](#) This genetic result does not determine individual body weight or fat distribution. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

**Intergenic
(near TFAP2B)**

Gene function:

Intergenic region near TFAP2B.

Intergenic region near TFAP2B; rs734597 has been associated with BMI, but a direct functional effect has not been established.

SNP:

rs734597

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible relatively lower BMI-related genetic tendency. [\[40\]](#)[\[48\]](#)

Recommendation

The rs734597 variant is located in an intergenic region near TFAP2B, a genomic region that has been associated with BMI in large genetic studies.[\[40\]](#)[\[48\]](#) Large genetic association studies have explored whether this region is associated with BMI and identified the rs734597 A allele as the BMI-increasing allele.[\[40\]](#)[\[48\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, does not carry the BMI-increasing A allele and is consistent with a possible relatively lower BMI-related genetic tendency for this variant.[\[48\]](#) A direct functional effect of rs734597 has not been established. This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs62033400

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible greater genetic tendency toward higher BMI. [\[49\]](#)[\[50\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Large genetic association studies have explored whether rs62033400 is associated with BMI and identified the G allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[49\]](#)[\[50\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, is consistent with a possible greater BMI-related genetic tendency for this variant.[\[49\]](#)[\[50\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs17817449

Genotype and Outcome

Genotype:

T/G

Associated outcome:

Possible modest genetic tendency toward higher BMI. [\[51\]](#)[\[52\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Large genetic association studies have explored whether rs17817449 is associated with BMI and identified the G allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[51\]\[52\]](#) Having one copy (heterozygosity) of the G allele, corresponding to the T/G genotype, is consistent with a possible modest BMI-related genetic tendency for this variant.[\[51\]\[52\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs9936385

Genotype and Outcome

Genotype:

T/C

Associated outcome:

Possible modestly lower lean-mass-related measures. [\[53\]\[54\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Large genetic and smaller population studies have explored whether rs9936385 is associated with lean-mass and skeletal-muscle-related measures.[\[53\]\[54\]](#) Having one copy (heterozygosity) of the T allele, corresponding to the T/C genotype, is consistent with a possible modestly lower lean-mass-related profile based on a per-allele association, although the smaller study identified the clearer lower-limb skeletal-muscle association in women with T/T.[\[53\]\[54\]](#) This genetic result does not determine individual muscle mass, body composition or body weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs7202116

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible relatively lower BMI-related genetic tendency. [\[40\]](#)[\[55\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Large genetic association studies at the FTO locus have explored whether rs7202116 is associated with BMI and identified the G allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[40\]](#)[\[55\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, does not carry the BMI-associated G allele and is consistent with a possible relatively lower BMI-related genetic tendency for this variant.[\[40\]](#)[\[55\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs9930506

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible relatively lower BMI-, body-weight-, and hip-circumference-related genetic tendency. [\[45\]](#)[\[56\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Genetic association studies have explored whether rs9930506 is associated with body-size measures and identified the G allele as being associated with higher BMI, body weight, and hip circumference in an additive pattern.[\[45\]\[56\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, does not carry the G allele associated with higher BMI, body weight, and hip circumference and is consistent with a possible relatively lower body-size-related genetic tendency for this variant.[\[45\]\[56\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs12149832

Genotype and Outcome

Genotype:

A/A

Associated outcome:

Possible greater genetic tendency toward higher BMI. [\[57\]\[58\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Large genetic association studies have explored whether rs12149832 is associated with BMI and identified the A allele as being associated with slightly higher BMI, with an additive or per-allele pattern across genotypes.[\[57\]\[58\]](#) Having two copies (homozygosity) of the A allele, corresponding to the A/A genotype, is consistent with a possible greater BMI-related genetic tendency for this variant.[\[57\]\[58\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Details

Gene:

FTO

Gene function:

FTO alpha-ketoglutarate dependent dioxygenase.

Enzyme involved in RNA modification and cellular processes related to energy balance and metabolism.

SNP:

rs1121980

Genotype and Outcome

Genotype:

G/G

Associated outcome:

Possible relatively lower BMI- and waist-circumference-related genetic tendency. [\[45\]](#)[\[59\]](#)[\[60\]](#)

Recommendation

The FTO gene encodes an enzyme involved in RNA modification and cellular processes related to energy balance and metabolism. Genetic association studies have explored whether rs1121980 is associated with BMI and waist circumference and identified the A allele used in this report as the higher-BMI-associated allele.[\[45\]](#)[\[59\]](#)[\[60\]](#) Having two copies (homozygosity) of the G allele, corresponding to the G/G genotype, does not carry the A allele associated with higher BMI and waist circumference and is consistent with a possible relatively lower BMI- and waist-related genetic tendency for this variant.[\[45\]](#)[\[59\]](#)[\[60\]](#) Physical activity has been reported to attenuate the BMI- and waist-related association of this variant.[\[60\]](#) This genetic result does not determine individual body weight or the ability to lose weight. A qualified healthcare professional can help assess whether your overall diet and lifestyle are appropriate for your individual needs.

Scientific Glossary

Genetics uses specialized terminology. This glossary explains key terms used in your DNA Wellness Report in clear, accessible language. It is intended for educational purposes and is not exhaustive.

This report provides general wellness information and is not intended to diagnose, treat, cure, mitigate, or prevent any disease or medical condition. Genetic results represent only one of many factors that may influence wellness-related traits and should not be used to make medical decisions or as a substitute for professional medical advice. If you have questions about your health or the interpretation of genetic information, please consult a qualified healthcare professional.

Allele

An allele is one of the different versions of a DNA sequence found at a specific location in the genome. At most autosomal locations, an individual inherits one allele from each biological parent.

Chromosome

Chromosomes are structures made of DNA and proteins that organize and carry our genetic information. Humans typically have 23 pairs of chromosomes, for a total of 46.

DNA

DNA, or deoxyribonucleic acid, contains the genetic information used by our body to develop and function. It is made from four different nucleotides, represented by the letters A, C, G, and T.

Gene

A gene is a region of DNA containing information used to produce a functional product, such as a protein or functional RNA. Genes contribute to many biological processes, and their activity can also be influenced by regulatory DNA sequences and environmental factors.

Genome

The genome is the complete set of an individual's DNA, including genes as well as DNA sequences located outside genes.

Genetic Variant

A genetic variant is a difference in DNA sequence at a particular genomic location. Genetic variants can involve a single DNA base, a small insertion or deletion, or a larger segment of DNA. Most genetic variants are part of normal human genetic diversity.

Genotype

A genotype describes the allele or combination of alleles present at a particular genetic location. For example, at a variant with A and G alleles, possible diploid genotypes may include A/A, A/G, and G/G.

Heterozygous / Heterozygosity

Heterozygous means having two different alleles at a particular diploid genetic location. For example, an A/G genotype is heterozygous.

Homozygous / Homozygosity

Homozygous means having two identical alleles at a particular diploid genetic location. For example, A/A and G/G are homozygous genotypes.

Hemizygous / Hemizygosity

Hemizygous means having only one copy of a gene or genetic locus instead of the usual two copies found at most autosomal locations. This commonly occurs for genes located on the X chromosome in individuals who have only one X chromosome. In these cases, a single allele is present at that location rather than a pair of alleles.

Locus

A locus is a specific position or region in the genome where a gene or genetic variant is located.

Phenotype

A phenotype is an observable or measurable characteristic of an individual. Phenotypes can be influenced by genetic factors as well as diet, lifestyle, environment, age, and other biological factors.

Trait

A trait is a measurable or observable characteristic, such as height, nutrient-related measures, physical-performance characteristics, or sleep-related characteristics. Most wellness-related traits are influenced by multiple genetic and non-genetic factors.

Genetic Association

A genetic association is a statistical relationship observed between a genetic variant and a trait in a study population. An association does not necessarily mean that the genetic variant directly causes the trait, and associations may differ among populations or under different environmental conditions.

rsID

An rsID is a reference identifier beginning with "rs" assigned to a Reference SNP (RefSNP) record in the National Center for Biotechnology Information (NCBI) dbSNP database. For example, rs1801133 is an rsID.

SNP (Single-Nucleotide Polymorphism)

A SNP is a genetic variant involving a difference at a single DNA base position that occurs within a population. SNPs occur throughout the human genome. Many have no known functional effect, while others have been studied for possible associations with biological characteristics or traits.

Loss-of-Function Variant

A loss-of-function variant is a genetic variant that reduces or eliminates the expected function of a gene product. Its biological significance depends on the specific gene and variant, the number of copies present, and other genetic and environmental factors. A loss-of-function classification does not by itself indicate disease or disease risk.

Macronutrient

Macronutrients are nutrients used by the body in relatively large amounts. The primary macronutrients are carbohydrates, fats, and proteins, which provide energy and/or structural components needed for normal biological functions.

Micronutrient

Micronutrients are nutrients required by the body in relatively small amounts. They primarily include vitamins and minerals and contribute to many normal physiological processes.

Dietary Supplement

A dietary supplement is a product intended to supplement the diet and containing one or more dietary ingredients, such as vitamins, minerals, herbs or other botanicals, amino acids, or other dietary substances.

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This DNA Wellness Report is intended only for general wellness, educational, and informational purposes. It provides information about selected genetic variants that may be associated with non-diagnostic wellness traits, such as general nutrition, fitness, lifestyle, and other wellness-related characteristics, based on scientific literature and internal interpretation methods available at the time the report is prepared.

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This report does not provide medical genetic testing, clinical diagnosis, disease-risk assessment, carrier-status testing, pharmacogenetic or medication-response guidance, ancestry analysis, paternity or family-relationship testing, or interpretation of medically actionable variants. Do not use this report as the sole basis for starting, stopping, or changing any medication, medical treatment, supplement program, diet, or exercise program. Consult a qualified healthcare professional before making medical decisions based on genetic information.

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