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Your personalized guide to better health

GENE HEALTH

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Table of contents

Introduction

Have you ever wondered why certain diseases run in families? And how some people could break that chain? When you learn about your predispositions, you have an opportunity to take preventive action.

In a study conducted by The New England Journal of Medicine, 50,000 adults who had a high genetic risk for developing heart disease were asked about 4 essential lifestyle factors, whether they a) exercised every week, b) ate a balanced diet, c) were obese and d) whether they smoked. When the participants met at least three of the four lifestyle factors, their lifestyle was considered favorable.

The study showed that people, even with a high genetic risk for heart disease, could lower their risk for heart disease by 45% if they lead a favorable lifestyle. In other words, even if you had 'bad' genes passed on to you, you could beat the odds of having the disease by leading a healthy lifestyle. So finding out about your genetic risk might just be what you need to structure a healthy lifestyle and improve your chances of a disease free life.

Some interesting facts about genes and health-

- **Studies conducted on twins have shown that 50–70% of the body mass index (BMI) variance may be explained by genetics**
- **One copy of the FTO allele increases the risk of developing type 2 diabetes by 25%, having two by 50%.**
- **People carrying one copy of the FTO allele have a 30% increased risk of being obese compared to a person with no copies. However, a person carrying two copies of the allele has a 70% increased risk of being obese, being on average 3 kg heavier than a similar person with no copies.**
- **According to WHO, the global prevalence of diabetes among people over 18 years is 8.5% (422 million adults).**
- **One third of people with diabetes do not know that they have diabetes.**
- **Heritability studies have shown 30-70% risk for type 2 diabetes among families.**
- **A large Nurses' Health Study concluded that around 30% of the new cases of obesity and 43% of type 2 diabetes could be prevented by adoption of a relatively active lifestyle.**
- **Lifestyle intervention reduced risk for type 2 diabetes by 58% in a Finnish population, 67.4% in a Japanese population and 28.5% in Indian population.**

In this report, we profile genes that have been shown to influence risk of more than 45 health conditions.

We hope that this report will help you understand your body better and to align your lifestyle to your genetics to reduce risk for diseases and live a healthy life.

Introduction

Human health is a complex interplay between genetics and the environment (lifestyle, diet, activity, stress, etc.). Your genes, training and diet, all play a vital role in your well-being.

This report is presented in a user friendly language and format. The following tips will help you get the best information value out of the report.

1. When you have a "high genetic tendency for a health condition" what does it mean?

People generally know that high cholesterol can lead to heart conditions. However, there are individuals with high cholesterol who do not develop heart disease. Similarly, genetic factors may increase the risk for a particular condition but the individual may not always develop the condition during his/her lifetime. There are over 50 gene variations which have been identified for heart disease risk but these constitute only 10% of the heritable risk for heart disease. Moreover, genetic factors could increase the risk for certain health conditions but other factors may modify the risk, which is why the outcomes are termed to be "likely" and not definitive.

2. What does the term "average" mean in the report?

Average implies a lower risk for the particular disease. Average can also be understood in the context of "Normal" or "Typical"

3. How do I know which result is applicable to me?

Only results with a check mark (✓) or exclamation (!) are applicable to you, the others are not applicable. All possible outcomes are provided in the table to provide a context to your outcome.

4. Where did the information contained in the report come from?

The genetic markers that are used in this report are based on scientific studies published in international journals.

5. Some sentences are colored in red, why?

A higher risk for a particular disease is marked in red while a moderate risk is indicated in orange. An average risk for a particular disease is marked in green.

6. My risk for most health conditions is moderately elevated, how do I interpret this?

We analyze a large number of risk variants and calculate a Genetic Risk Score (GRS). Unless you have several of these high risk variants present in your data, you will see mildly or moderately elevated as the outcome.

YOUR SUMMARY RESULTS

Trait Name	Your Result	Your Outcomes
Age-Related Macular Degeneration Age related macular degeneration (AMD) causes blurring of sight or loss of central vision. People of certain genetic types are at a higher risk for AMD. Learn More	⚠	Likely low genetic risk for AMD
		Likely moderate genetic risk for AMD
		Likely high genetic risk for AMD
Alopecia Areata Alopecia areata (AA) is an autoimmune condition in which there is loss of hair. People of certain genetic types are at a higher risk for AA Learn More	⚠	Likely low genetic risk for alopecia areata
		Likely moderate genetic risk for alopecia areata
		Likely high genetic risk for alopecia areata
Alzheimer'S Disease Alzheimer's disease is a progressive neurodegenerative disorder. People of certain genetic types have a higher risk for Alzheimer's disease. Learn More	⚠	Likely low genetic risk for alzheimer's disease
		Likely moderate genetic risk for alzheimer's disease
		Likely high genetic risk for alzheimer's disease

Amyloidosis
Amyloidosis is a condition in which there is an abnormal buildup of amyloid. People of certain genetic types are at a higher risk for amyloidosis.
Learn More

Anemia
Anemia is a condition in which there is insufficient healthy red blood cells. People of certain genetic types are at an increased risk for anemia.
Learn More

Anorexia
Anorexia is a psychological eating disorder. People of certain genetic types are at a higher risk for anorexia
Learn More

Anxiety
Anxiety disorders are characterised by feelings of fear and anxiety. People of certain genetic types are at a higher risk of developing anxiety disorders.
Learn More

Asthma
Asthma is a common chronic inflammatory condition of the airways of the lungs. People of certain genetic types are at a higher risk for asthma.
Learn More

Atrial Fibrillation
Atrial fibrillation is a heart condition in which there is an irregular heartbeat. People of certain genetic types are at a higher risk for atrial fibrillation.
Learn More

Autism
Autism includes a range of disorders associated with social skills. People of certain genetic types have a higher risk for autism
Learn More

Beta Thalassemia
Beta thalassemia results in reduced production of hemoglobin. People of certain genetic types are at a higher risk for beta thalassemia.
Learn More

Bloom Syndrome
Bloom's syndrome (BS) is a condition characterised by an increased risk of genomic instability. People of certain genetic types are at a higher risk for BS.
Learn More

Bone Mineral Density
Bone mineral density (BMD) is the amount of bone mineral in bone tissue. People of certain genetic types are at a higher risk for low BMD.
Learn More

Cardiomyopathy
Cardiomyopathy is a disease of the heart muscles. People of certain genetic types are at a higher risk for cardiomyopathy.
Learn More

Chronic Kidney Disease
Chronic kidney disease (CKD) is a gradual loss of kidney function. People of certain genetic types have a higher risk for CKD.
Learn More

Chronic Obstructive Pulmonary Disease
Chronic obstructive pulmonary disease (COPD) is a progressive lung disease. People of certain genetic types have a higher risk for COPD
Learn More

Cone-Rod Dystrophy
Cone rod dystrophy(CRD) is an inherited disorder of the eye. People of certain genetic types are at a higher risk for CRD.
Learn More

Crohn'S Disease
Crohn's disease (CD) is a chronic inflammatory disease of the digestive tract. People of certain genetic types are at a higher risk for CD.
Learn More

Cystic Fibrosis
Cystic fibrosis (CF) is a condition that affects the lungs and the digestive system. People of certain genetic types have a higher risk for CF.
Learn More

AGE-RELATED MACULAR DEGENERATION

Mild: Likely low genetic risk for AMD

Age related macular degeneration is a condition in which there is blurring of sight or loss of central vision. According to the Centres of Disease Control and Prevention (CDC) , there are 1.8 million people with AMD. People of certain genetic types are at a higher risk of

Recommendations:

- If you recognise any symptoms of this condition, consult your physician for advice.
- **Quit Smoking**: Smoking is an important risk factor for age related macular degeneration and if you do not smoke, don't start. According to a study published in the British Journal of Medicine, 53,900 residents of UK, below the age of 69, were shown to have AMD attributable to smoking, with 17800 amongst them going blind.
- **Eat fruits and Vegetables rich in Carotenoids**: The Nurses' health study that followed 63,443 women and 38,603 men found that there was a 40% reduction in AMD risk among individuals who consumed high amount of carotenoid rich food.

Genes Analyzed: C2, C2-AS1, LOC105378525, ARMS2, SLC44A4, LINC01101 - LOC105373585, COL8A1, TGFBR1, CLIC5, LOC105375078, CFI, LOC105373027, SLC16A8, ABCA4, FRK, MBP - GALR1, B3GALTL, SYN3, NMRK2 - DAPK3, NELFE, NOTCH4, CCDC109B, CX3CR1, REST, LOC105373585, CFB, LOC105378525, LOC101928635, LIPC, C3, CETP, SKIV2L, RAX2, LOC107986598, RAD51B, LOC101928635, GLI3, CFH, FBLN5, COL4A3, LOC654841
Number of Gene Markers Found: 49
Number of Gene Markers Analyzed:60

ALOPECIA AREATA

Mild: Likely low genetic risk for alopecia areata

Alopecia areata is an autoimmune condition in which there is loss of hair in one particular part of the body or throughout. It is also known as spot baldness. The prevalence of this [illegible]

Recommendations:

- If you recognise any symptoms of this condition, consult a qualified physician for diagnosis and treatment of this condition.
- **Lower stress**: Stress is known to be an important trigger for this condition. Learn to manage stress levels and engage in stress relief therapies like yoga and group physical activity.

[illegible]

Genes Analyzed: RAET1M - PHBP1, IL2RA, RNU6-474P - CTLA4, MTCO3P1 - LOC102725019
Number of Gene Markers Found: 5
Number of Gene Markers Analyzed:6

ALZHEIMER'S DISEASE

Mild: Likely low genetic risk for alzheimer's disease

Alzheimer's disease is a progressive neurodegenerative disorder, constituting 60 to 70% of dementia incidences. Approximately 200,000 Americans younger than 65 years of age have

Recommendations:

- If you recognise any symptoms of this condition, consult your physician for advice.
- **Ensure social engagement**: Staying socially active is found to be protective against alzheimer's disease. Older individuals tend to shy away from meeting people, which could increase their risk for the condition. Try to join volunteer groups and social clubs to improve social contact.
- **Exercise regularly**: Alzheimer's research and prevention foundation states that regular exercise can lower the risk of alzheimer's by 50%.
- **Engage in mentally stimulating activities**: An NIH Active study showed that older adults

Genes Analyzed: BZW2, CTNNA2, SAP30L, PVRL2, PRRC2C, CLMN, LOC440390 - LOC105371394, MOBP, TGM6, SP6, RN7SL782P - RN7SKP122, LOC105369915 - NDUFA12, RN7SKP168 - ZFYVE9P2, CLU - SCARA3, CLU; CLU; CLU, CAMK4, CNTNAP2, MS4A6A, KRAS - LOC105369701, PARVB, SPON1, RNU6-560P - LOC107984426, TOMM40, GLIS3, BCAS3, APOE, LOC100420620 - RN7SKP298, DYNLL1P4 - RBM19, ANKRD55, LOC107984589 - VDAC1P12, RPL3P11 - ATP5HP3, HRK, PDE7B, LOC644135, STK24, NCR2 - LOC100505711, CLU, GABRG3, PRSS52P, LINCR-0001, PPP1R3B, POLN, NDUFB2P1 - LRAT, ARHGAP20, PEX6, LOC105375056, TREM2, LOC100379224, RNF6, ATP8A2P3, PGAM5P1, LOC100289673, FRMD4A; FRMD4A; FRMD4A, MS4A4E - MS4A4A, CSMD1, STK32B, SUCLG2, EPC2 - RNU2-9P, PICALM - RNU6-560P, MAPRE1P2 - LOC105374391, DISC1, TSNAX-DISC1, ABCA7, LOC100130674 - PCDH7, ZNF292, SAMD5 - SASH1, MYO16, PICALM, SNAR-I - LOC107986171, LOC105369746, AFF1, CRADD

Number of Gene Markers Found: 77

Number of Gene Markers Analyzed:94

AMYLOIDOSIS

Mild: Likely low genetic risk for amyloidosis

Amyloidosis is a rare condition in which there is an abnormal buildup of a protein called amyloid. One study showed that the prevalence of this condition in the UK is 20 per million.

Recommendations:

- If you recognise any symptoms of this condition, consult a qualified physician for diagnosis and treatment of this condition.
- **Help break down the amyloid protein**: Amyloid proteins are fibrous and insoluble aggregates which could build up in tissues and organs. These amyloid deposits have been shown to be broken down by pineapple enzyme and bromelain.
- **Check for underlying disease**: Certain diseases like rheumatoid arthritis could increase the risk for amvloidosis.

Genes Analyzed: GRAMD1B, CCND1, TTR
Number of Gene Markers Found: 12
Number of Gene Markers Analyzed:13

ANEMIA

High: Likely high genetic risk for anemia

Anemia is a condition in which there is insufficient healthy red blood cells. According to WHO, the highest prevalence of anemia is among pre-school children and the lowest is

Recommendations:

- If you recognise any symptoms of this condition, consult a qualified physician for diagnosis and treatment of this condition.
- **Consume foods rich in iron**: Foods rich in iron include meat, seafood, iron fortified cereals, eggs, pulses beans, dried food and whole grains. Iron supplements should be taken to ensure that the level of hemoglobin is within normal limits. Some people develop side effects to these iron supplements like diarrhoea and abdominal pain, therefore, care should be taken in choosing the appropriate supplement.

Genes Analyzed: BAAT, CUBN, GPI, HBB, SEC23B, OR51B5, GSS, RPS28, RPS26, PAH, AMN, FANCA, FANCC, FANCG, RPS19, RAD51C, DHFR, NT5C3A, OR51L1 - OR51P1P, BRIP1, YARS2, G6PD, BRCA2, ERCC4, SLC19A2, SLC11A2, CDAN1, TMPRSS6, BCL11A, AK1, FANCI
Number of Gene Markers Found: 76
Number of Gene Markers Analyzed:93
Pathogenic Variant found: chr13:g.32913457C>G

ANOREXIA

Mild: Likely low genetic risk for anorexia

Anorexia is a psychological eating disorder. The onset of this condition is during early adolescence or young adulthood, constituting 3% of all eating disorders. People of certain

Recommendations:

- If you recognise any symptoms of this condition, consult a qualified physician for diagnosis and treatment of this condition.
- **Ensure a healthy body weight**: People with anorexia often are thin but they continue to work towards losing weight in order to cater to a 'specific' body image. Prolonged fasting and excessive exercising are some of the measures that are undertaken and which have shown to take a toll on health.

Genes Analyzed: ZNF804B, PPP3CA, GRID1, ALDH4A1, WWOX, FAM155A, LOC107986384 - LOC107986385, CAMK1D
Number of Gene Markers Found: 9
Number of Gene Markers Analyzed:12

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Only full genome sequences are exhaustive. All other forms of genetic tests only provide a limited subset of genetic information relevant to specific conditions. Since this report is not generated by conducting a whole genome sequence test, the results reported are limited to a specific set of mutations known to be associated with specific conditions. Genetic information is also subject to revision based on the latest advances in scientific research. Therefore the interpretation of results reported herein may vary or be altered subject to ongoing research. Sometimes, the interpretations may vary from company to company based on which studies are being given a higher preference compared to others.

Xcode's role is limited to providing genetic test results and a broad set of recommendations. More detailed recommendations that may be specific to you are to be made by qualified Professional Practitioners only. General guidelines provided in our report are for information purposes only and are meant to aid your Professional Practitioner in rendering the relevant professional or medical advice and treatment. While assessing your genetic parameters and providing the report and recommendations, we do not consider your past or existing health conditions and any medication you took (either in the past or currently), even if you may have provided us with such information. Our report and recommendations are to be acted upon in consultation with a medical or other health and wellness professional practitioner.

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