GENOMIC PROFILE

Name: Example Report
Gender: Female
Age: 54
Ethnicity: Caucasian

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Dear Julia Bochsler:

This document is designed to function in both hardcopy and electronic formats, allowing functional access through your computer, tablet, or smartphone.

Easy navigation buttons have been strategically placed within this document to aid with the interpretation and understanding of your personalized results. The guidelines within this report serve to improve you health status and promote your overall wellness.

Welcome,

The following is a guide created to help you reach your health and wellness goals. This guide is based on the personalized medicine algorithm and its primary purpose is to provide mechanisms for reducing the risk of disease development through modification of daily habits such as nutrition, exercise and eating behavior. You will also find suggestions for establishing medical monitoring protocols, as well as information about medical specialists and tests that might help you better mitigate your disease risk.

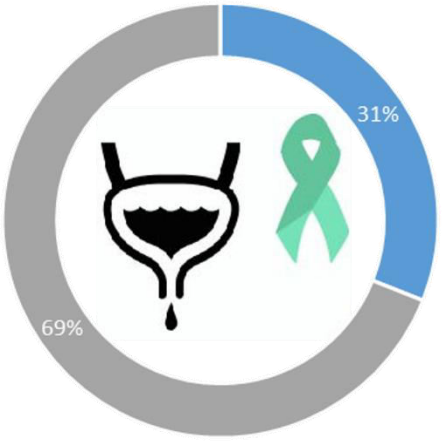
RISK ASSESSMENT RESULTS

AFTER ANALYZING YOUR SAMPLE AND CAREFULLY EVALUATING THE GENETIC VARIANTS FOUND THROUGH OUR PERSONALIZED ALGORITHM, WE HAVE DETERMINED A GENETIC RISK OF DEVELOPING THE FOLLOWING DISEASES:

Risk factors involved in the development of diseases:

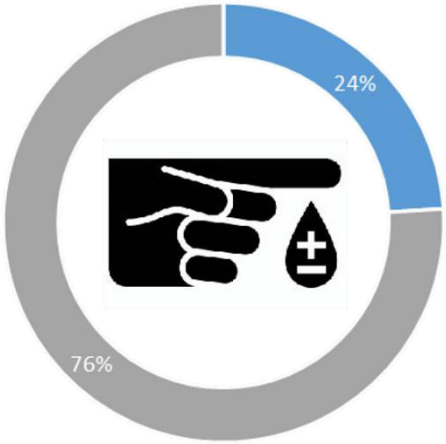
- GENETICS
- ENVIRONMENTAL

BLADDER CANCER



RISK RESULTS

TYPE 2 DIABETES MELLITUS



RISK RESULTS

What can I do to delay or prevent developing the diseases for which I am at risk?

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< ALGORITHM

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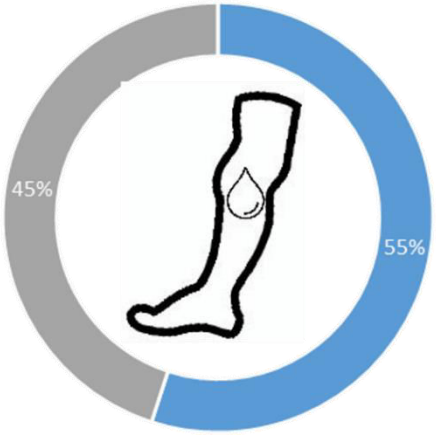
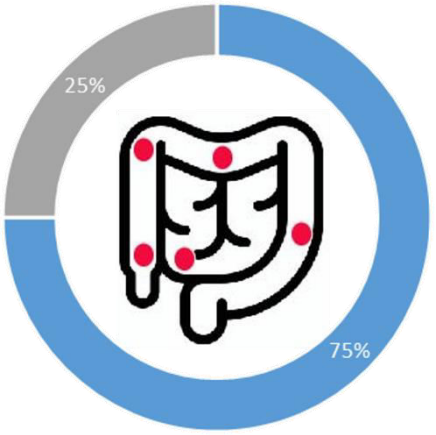
THROMBOEMBOLISM



RISK RESULTS

CROHN'S DISEASE



RISK RESULTS

What can I do to delay or prevent developing the diseases for which I am at risk?

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< ALGORITHM

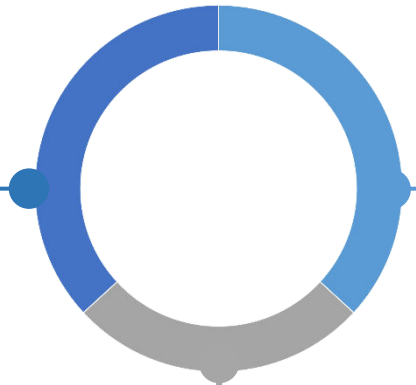
< PREVIOUS NEXT >

PREVENTION: ADEQUATE NUTRITION

PROPER DIET WILL HELP YOU IMPROVE YOUR CURRENT HEALTH STATUS AND REDUCE THE RISK OF DEVELOPING DISEASE. BASED UPON THE INTEGRATION OF GENOTYPING RESULTS AND CLINICAL DATA, THE FOLLOWING DIET MODIFICATIONS ARE RECOMMENDED:

45-50% CARBOHYDRATES

- We recommend a carbohydrate intake between 45-50% of your total energy value.
- Eat 2.5 cups of fruits and vegetables every day.
- Include chia seeds in your regular diet: prepare some lemonade and add 2 tbsp. of chia seeds three times a week. You may also include nopal or cactus pads: 100 grams of roasted nopal cactus three times a week.
- Daily consumption of complex carbohydrates: whole grains and legumes (beans, lentils, peas, and chickpeas). Avoid eating candy and simple sugars.



25-30% FATS

- We recommend a fat intake between 25-30% of total energy value.
- Favor consumption of vegetable fats (nuts and vegetable oils) and avoid saturated fats (from animal origin). Keep total fat consumption to no more than 30% of your total caloric intake.
- Use vegetable oils (olive, soy, sunflower seed) as a source of fat, but do not exceed three teaspoons a day. Eat 1-2 tablespoons of nuts daily: walnuts, almonds, pistachios, etc.
- Consume yogurt or skimmed milk with no added sugar, 2-3 times per week.

20-30% PROTEINS

- We recommend a protein intake between 20-30% of total energy value.
- Limit consumption of red meats to only once a week. Avoid smoked, salted, and cured meats.
- Choose fish (twice a week) over red meat (no more than once a week). Moderate your food portions.

PREVENTION: ADEQUATE NUTRITION

TOLERANCE OR RESISTANCE TO CERTAIN SUBSTANCES MAY RESULT IN OVERCONSUMPTION OF THOSE SUBSTANCES AND ELEVATE THE RISK OF CERTAIN DISEASES. ADOPTING PREVENTIVE MEASURES FOR ADEQUATE CONSUMPTION OF THESE SUBSTANCES MAY BRING BENEFITS TO YOUR HEALTH.

✓ Your genotype is associated with a higher capacity to metabolize and tolerate caffeine. We recommend not exceeding 400mg of caffeine consumption daily, equivalent to 3 cups.

✓ You carry a lower genetic risk of developing adult lactose intolerance. You can consume milk and dairy products.

✓ You are able to metabolize alcohol; your genotype is associated with a normal tolerance towards alcoholic beverages. **Watch your consumption**.

PREVENTION: HABITS AND BEHAVIOR

INADEQUATE NUTRITION HABITS AND BEHAVIORS MAY INCREASE YOUR RISK OF DEVELOPING DISEASES. YOUR GENOTYPE IS ASSOCIATED TO A HIGHER RISK OF COMPULSIVE FOOD CONSUMPTION DUE TO A DECREASED FEELING OF FULLNESS, FAVORING FOOD PRODUCTS CONTAINING HIGH LEVELS OF FAT AND SUGAR.

- Eat three meals per day. Do NOT skip breakfast!
- Eat small quantities of food throughout the day.
- Follow a low sodium diet (<2400mg/day).
- Drink a lot of water (drink in small quantities frequently throughout the day).
- Avoid foods rich in fiber (wheat bran, beans, nuts, seeds, and popcorn).
- Avoid alcoholic beverages and soft drinks. Choose natural juices or water as your fluid intake.
- Avoid exposure to tobacco smoke.

- In case of suffering from varicose veins in the legs, get treatment from a medical specialist as soon as possible.
- Do not remain in the same position/posture for long periods at a time. For instance: if your work requires sitting, try to get up and walk around for 10 minutes for every hour sitting.
- Take necessary precautions during pregnancy (compression tights, etc.).

PREVENTION: NUTRIGENETICS

GUIDED SUPPLEMENTATION IS AIMED TO RESTORE POTENTIAL DEFICIENCIES AND IMPROVE CURRENT HEALTH STATUS. THE ANALYSIS OF THE FUNCTIONAL VARIABLES FROM OUR NUTRIGENETICS PANEL ALLOWS ISSUING THE FOLLOWING SUPPLEMENTATION SUGGESTIONS:

- 4g of Omega 3 per day; or include dietary intake in foods such as oily fish (salmon, tuna), chia seeds and fish oils.
- 10,000 IU of vitamin A per day (dose must be adjusted according to the results of serum analysis of vitamin A/retinol)
- 400mcg of folic acid per day.
- 20mg of vitamin B6 per day.
- 500 mcg of vitamin B12 per day.
- 1000 mg of vitamin C daily.
- 1000 mg daily calcium supplement along with Vitamin D.
- 1000 IU of vitamin D per day (dose adjusted according to the results of analysis of serum vitamin D).
- 400 IU per day of Vitamin E.
- Selenium supplements (100 mcg/d)
- Zinc oxide - 80 mg/d

PREVENTION: EXERCISE

ENGAGING IN THE FOLLOWING PHYSICAL ACTIVITIES MAY HELP IMPROVE YOUR HEALTH STATUS AND KEEP COMPULSIVE BEHAVIORS UNDER CONTROL. HERE ARE THE IDEAL ACTIVITIES FOR YOU:

Your genotype is associated with improved performance in exercises that require muscle contraction: speed and strength. We recommend explosive activities: jumping rope, swimming, or running short distances (100-400 Meters).

Perform at least 30 minutes of moderate intensity physical activity daily or almost daily.
The ideal activities for you are:

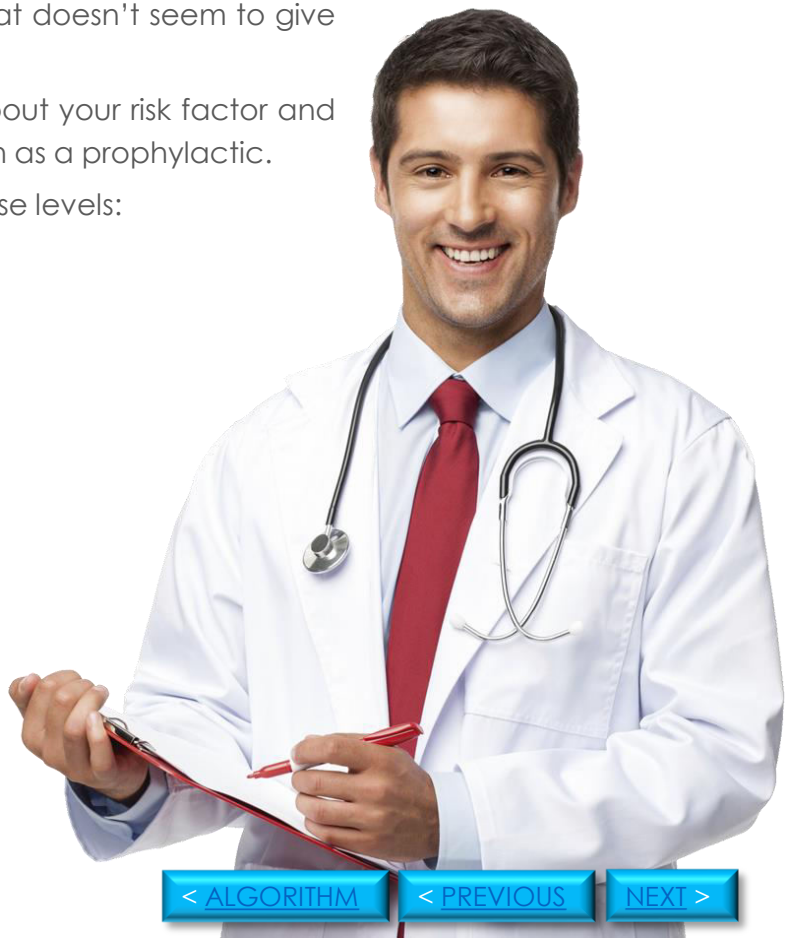
- Swimming
- Hiking
- Spinning
- Yoga

Although your genotype is better suited for explosive physical activities, we recommend moderate, low impact exercises to protect your joints.

MONITORING AND EARLY DIAGNOSIS

MEDICAL MONITORING RECOMMENDATIONS

- The medical specialist for bladder conditions is an Urologist.
- The medical specialists for diabetes treatment are Endocrinologists and Internists.
- In case of suffering from varicose veins in the legs, get treatment from a medical specialist as soon as possible.
- Consult with your physician if you're facing a long-term diarrhea that doesn't seem to give in to medication or is accompanied by any other symptoms.
- In case you have to go under major surgery, talk to your doctor about your risk factor and let them decide whether or not to use low-molecular-weight heparin as a prophylactic.
- Keeping a tight control under medical supervision of lipid and glucose levels:
  - Triglycerides less than 150 mg/dL
  - Total cholesterol less than 200mg/dL
  - LDL cholesterol less than 100 mg/dL
  - HDL cholesterol more than 40 mg/dL
  - Blood glucose (70-110 mg/dL Fasting)



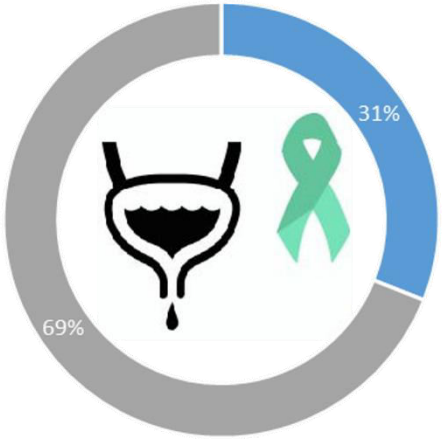
MONITORING AND EARLY DIAGNOSIS

MEDICAL EARLY DETECTION RECOMMENDATIONS

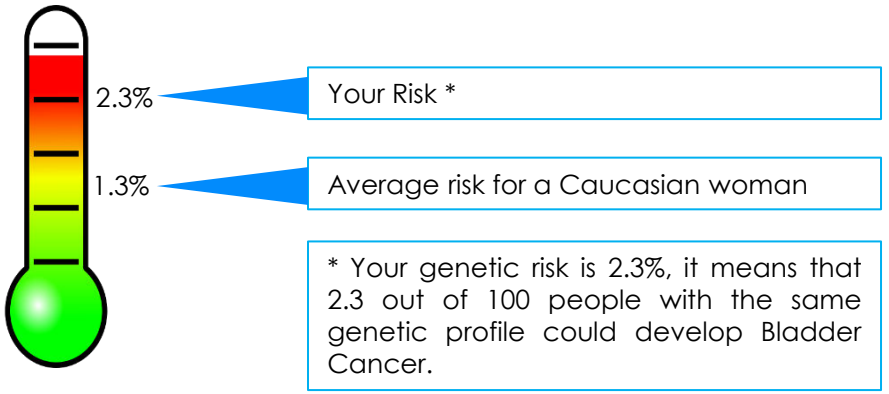
Made the following laboratories at least every six months:

- Serum levels of vitamin D (1,25-dihydroxyvitamin D).
- Serum levels of vitamin A (retinol).
- Comprehensive Metabolic Panel, Hemogram (CBC), Urinalysis, and Glycated Hemoglobin (A1C) Test or Oral Glucose Tolerance Test.
- Urine cytology exam if showing any abnormalities.

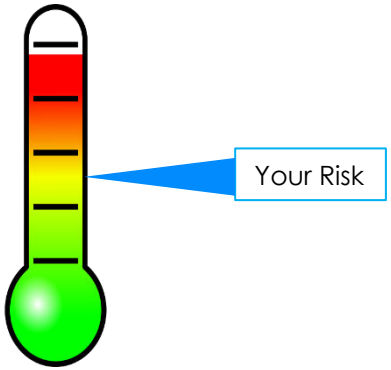
BLADDER CANCER



You have a **high** genetic risk of developing Bladder Cancer



Bladder Cancer has a moderate genetic (31%) and a high environmental (69%) influences to the development of the disease. However, the adjustments suggested in our prevention, monitoring, and early detection sections, may help you reduce risks and improve your health status.



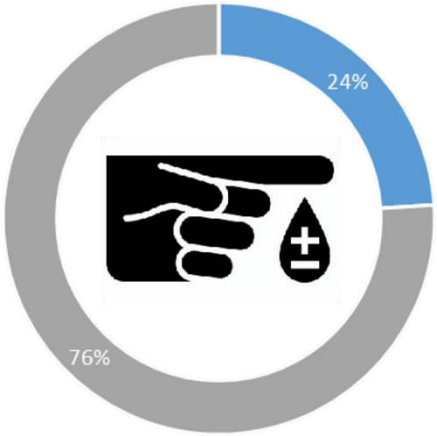
You have a **moderate** environmental risk to developing Bladder Cancer

Both, your environment and current habits, constitute a moderate risk of developing Bladder Cancer.

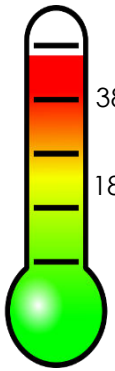
Your current health status suggests a moderate impact from both factors in the onset of the disease.

We recommend following the instructions from the prevention, monitoring, and early detection sections.

TYPE 2 DIABETES MELLITUS



You have a **high** genetic risk of developing Type 2 Diabetes

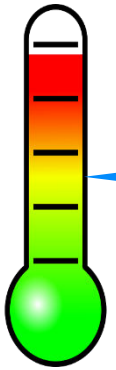


38.2% — Your Risk *

18.2% — Average risk for a Caucasian woman

* Your genetic risk is 38.2%, it means that 38.2 out of 100 people with the same genetic profile could develop Type 2 Diabetes.

Type 2 Diabetes has a moderate genetic (24%) and a high environmental (76%) influences to the development of the disease. However, the adjustments suggested in our prevention, monitoring, and early detection sections, may help you reduce risks and improve your health status.



Your Risk

You have a **moderate** environmental risk to developing Type 2 Diabetes

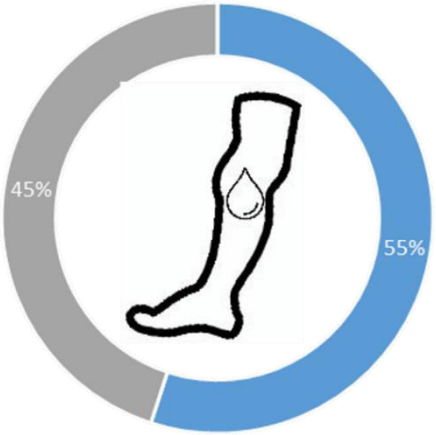
Both, your environment and current habits, constitute a moderate risk of developing Type 2 Diabetes.

Your current health status suggests a moderate impact from both factors in the onset of the disease.

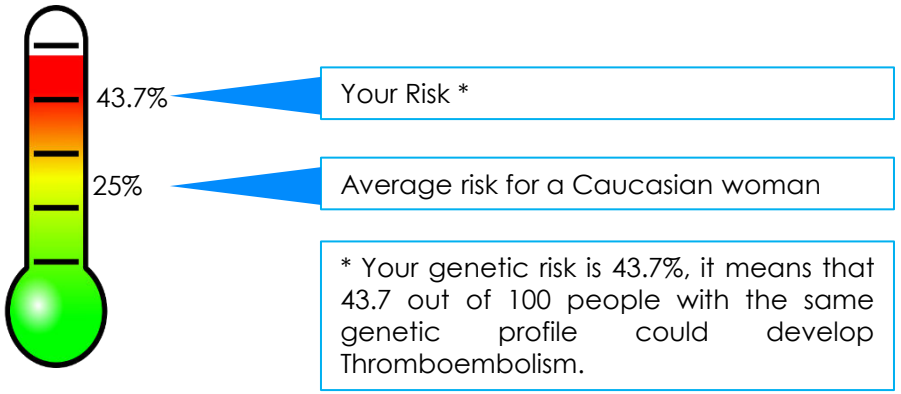
We recommend following the instructions from the prevention, monitoring, and early detection sections.

RISK TEST RESULTS

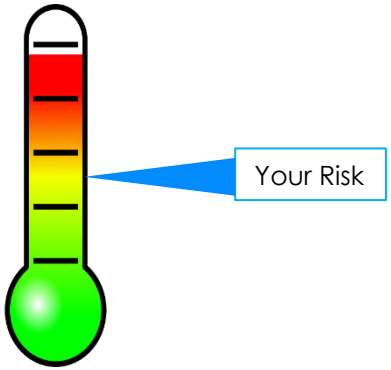
THROMBOEMBOLISM



You have a **high** genetic risk of developing Thromboembolism



Thromboembolism has a high genetic (55%) and a moderate environmental (45%) influences to the development of the disease. However, the adjustments suggested in our prevention, monitoring, and early detection sections, may help you reduce risks and improve your health status.



You have a **moderate** environmental risk to developing Thromboembolism

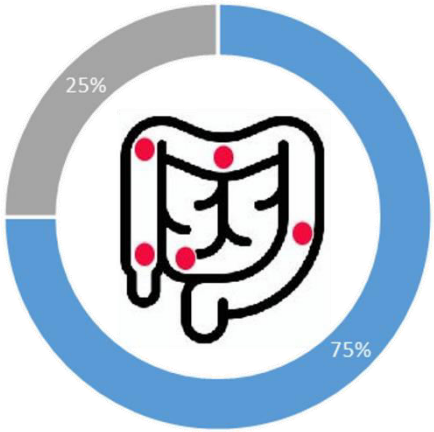
Both, your environment and current habits, constitute a moderate risk of developing Thromboembolism.

Your current health status suggests a moderate impact from both factors in the onset of the disease.

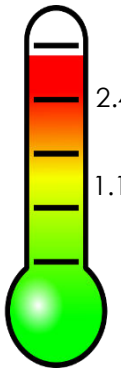
We recommend following the instructions from the prevention, monitoring, and early detection sections.

RISK TEST RESULTS

CROHN'S DISEASE



You have a **high** genetic risk of developing Crohn`s Disease



Your Risk *

Average risk for a Caucasian woman

* Your genetic risk is 2.4%, it means that 2.4 out of 100 people with the same genetic profile could develop Crohn`s Disease.

Crohn`s Disease has a high genetic (75%) and a moderate environmental (25%) influences to the development of the disease. However, the adjustments suggested in our prevention, monitoring, and early detection sections, may help you reduce risks and improve your health status.

Your Risk

You have a **moderate** environmental risk to developing Crohn`s Disease

Both, your environment and current habits, constitute a moderate risk of developing Crohn`s Disease.

Your current health status suggests a moderate impact from both factors in the onset of the disease.

We recommend following the instructions from the prevention, monitoring, and early detection sections.

APPENDIX: DOCUMENTS

- How to understand your results
- Genotyping results
- Disease-specific recommendations
  - Bladder Cancer
  - Type 2 Diabetes
  - Thromboembolism
  - Crohn`s Disease
- Bibliography

Staff highly qualified in their respective areas produced the results appearing in the body and appendices of this report. If you need further clarification of your results, please don't hesitate to contact your service provider. You can contact us via e-mail at genetest@tqmedicine.com

We appreciate your preference and we hope this guide can help you achieve your health goals!

PhD. Martín Enrique Silva Aguilar.
Gene Test Total Quality Medicine

M.D. Gustavo Bernard Esquivel Zavala
Gene Test Total Quality Medicine

These results were obtained by processing a biological test sample from Julia Bochsler, a 61 year-old female of Caucasian descent. This DNA sample collected was processed by RTPCR (Real Time Polymerase Chain Reaction) specifically for the genetic variants required for this test. Analysis was performed on the QuantStudio 12kFlex Mass Array Laboratory by Affiliated Genetics laboratories using validated and accredited processes.

The variants determined here do not exclude the presence of any other variants involved in the evaluated sections. Therefore, results shown on this report are merely informative and the decision to change or modify the patient's current habits, diet, and treatments relies on the specialist currently treating the patient.

The purpose of this service is to determine the genetic variants found in the genome. These variables are known as polymorphisms or SNPs. Knowing these variants allows us to determine if there is some kind of genetic risk of developing any of the 28 evaluated diseases. For this particular test, we perform a haplotype analysis (a group of polymorphisms presenting the risk of developing each disease).

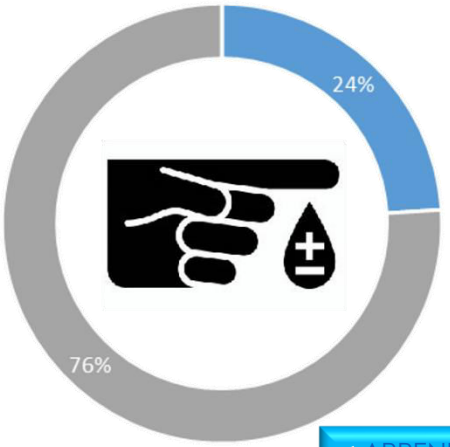
Our analysis employs an algorithm specifically designed to evaluate genetic risks as well as clinical data. This analysis allows experts to incorporate environmental risk factors and clinical data to determine the patient's current risk in order to provide adequate advice according to its specific results.

The diseases evaluated on this test require both environmental and genetic factors for their development. This information might help patients make adjustments in their environment in order to reduce the probability of developing such diseases. Both environmental and genetic factors have different percentage contributions for each of these diseases; therefore the course of action is different for every case. However, adjustment recommendations, continuous check-ups and early detection tests might help avoid or delay its appearance. For example, in the case of developing obesity, 25% is represented by the environment and 75% by genetics. This means influence from genetics is higher than the environment's, but as long as the environmental factors are under control, the individual will be able to stay healthy and in good shape.

TYPE 2 DIABETES MELLITUS (Example Only)

Risk factors involved in the development of diseases:

- GENETICS
- ENVIRONMENTAL

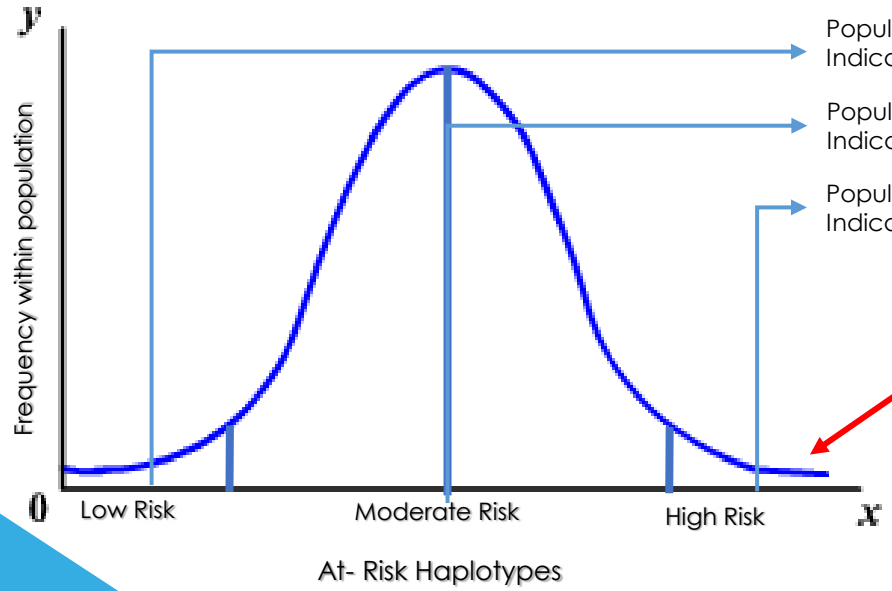


WHAT YOUR GENETIC RISK PERCENTAGE REPRESENTS

APPENDIX

This genetic risk evaluation includes the analysis of different variants that have been researched in several populations. These studies define the ability of developing diseases by the presence of such variants in the population. This is known as relative risk. Our analysis includes the most widely researched variants that represent considerable relative risks.

If the researched population has a high disease prevalence, it means this population's individuals have a medium lifetime risk. However, on the genetic test we compare the presence of associated risk variables in relation to the population's medium risk, in other words, they're evaluated in a distribution based on the probability of presenting the genetic risk variants.



Population with a protective haplotype (less frequent and/or with less probability) Indicates that the person has a lower risk of developing the disease.

Population with a common haplotype (more frequent and/or with more probability) Indicates that the person has a common risk of developing the disease.

Population with an high-risk haplotype (less frequent and/or with less probability) Indicates that the person has a higher risk of developing the disease.

He is showing an **Elevated** genetic risk meaning that his probabilities to develop the disease, according to the genetic variants found, are statistically different than the population's common risk and/or represent at least double of the population's medium risk.

Example: The medium lifetime risk of suffering obesity for a Hispanic man is 25%. When performing analysis of the variants present in his genome, we found that he has a 45% risk, this means that his risk is moderate because his result is not statistically different. However, his risk of suffering bladder cancer is 8.5%, which represents a high risk because it is statistically different to the population's medium risk of 4.1.

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WHAT YOUR ENVIRONMENTAL RISK PERCENTAGE REPRESENTS

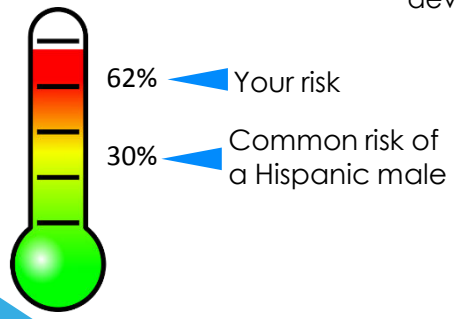
APPENDIX

For the environmental risk evaluation we take into account the information on the clinical survey. The purpose of this survey is to gather up important information for the analysis such as ethnicity, age, gender, habits, and family history among other relevant clinical data. We integrate this information in our algorithm to identify the accumulation of variables that may represent a risk of developing the disease. For example, Hispanic population could present a high risk of developing metabolic diseases, which increases depending on age and gender. On the other hand, European population could present a high risk of developing immune diseases and in this case it is affected by gender, but not by age. For all of the diseases, international guidelines are considered to define clinical and environmental factors representing a risk.

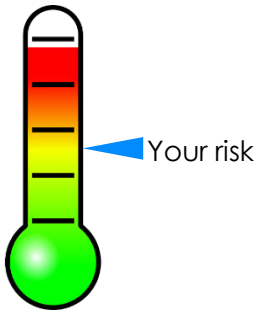
In the case of current health status, this is determined by relevant clinical data such as Body Mass Index (BMI), blood pressure, and heart rate frequency, levels of biochemical molecules in blood, and frequency of signs and symptoms or the development of the disease. These results will let us know if your risk of suffering any of the diseases is elevated. Having knowledge of your environmental settings and health status will allow us to make the most appropriate recommendations.

All of the diseases included in our new panel have different percentages representing the influence of genetic and/or environmental factors. For this reason, there will be some diseases for which these factors represent a higher risk than others:

Your present an **Elevated** risk of developing obesity



You present a **Moderate** environmental risk of developing obesity



An **elevated** genetic risk combined with a **moderate** environmental risk represent a high probability of developing obesity. However, the disease is not present yet or any sign or symptom for that matter, but this person's habits and surroundings represent a danger, for this reason the recommendations provided regarding these factors need to be followed very closely.

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This test is limited to the study of SNP and it is not intended to evaluate other variants present in rare diseases of lower prevalence among general population. Furthermore, it is important to mention that there can be variables that have not been studied yet, that could be present in the patient's genome, and contribute to the development of a disease covered by the test, but are not analyzed by this study.

The results report is only for informational purposes and does not substitute your physician's medical advice. All of the adjustments are suggested by our team of experts, but your healthcare provider is the only one that could help you decide how to accomplish them.

RECOMMENDATIONS TO REDUCE RISK OF CROHN'S DISEASE

Crohn's disease is an inflammatory condition that affects different parts of the GI tract.

- In most cases, it involves the lower end of the small intestines and the beginning of the large intestine.
- It can also affect any part of the digestive tract, from mouth to anus.

Crohn's disease is a form of inflammatory bowel disease (IBD).

The exact cause of Crohn's disease is unknown. This disease occurs when your body's immune system attacks and destroys healthy bodily tissues by mistake (autoimmune disorder).

Factors that could have an effect on Crohn's disease:

- Genes and family history. For instance: people of Jewish descent are at higher risk.
- Environmental factors
- Tendency of your body to react excessively towards normal bacteria in your intestines.
- Tobacco consumption.

Crohn's disease may appear at any age. It appears most often in people between the ages of 15 and 35.

Symptoms vary depending on the part of the digestive tract affected. These symptoms fluctuate from mild to severe and could appear and disappear through periods of flare-ups.

The main symptoms of Crohn's Disease are:

- Abdominal pain accompanied by cramps and diarrhea.
- Fever without an apparent reason.
- Loss of appetite.
- Feeling that you need to pass stools, even though your bowels are already empty. It could be accompanied by strain, pain, and cramps.
- Watery diarrhea, which may contain blood or rectal bleeding.
- Weight loss

Other symptoms may include:

- Constipation
- Ulcers or swelling around the eyes
- Draining of pus, mucus, or stool from around the rectum or anus.
- Swelling and joint pain
- Mouth ulcers

Crohn's disease diagnosis isn't easy to determine since there is no single test or screening that can lead to a precise diagnosis. The latest consensus of the European Crohn's and Colitis Organization (ECCO) highlights that the disease's diagnosis is made through a non-strictly defined combination of clinical, endoscopic, radiologic, and histologic data, as well as surgical findings. Therefore, you need to consult with your physician if you're facing a long-term diarrhea that doesn't seem to give in to medication or is accompanied by any of the other symptoms. Your doctor will then determine if any complimentary tests are needed if the suspicion of this disease arises (endoscopy, colonoscopy, biopsy, etc.).

PREVENTIVE NUTRITIONAL GUIDELINES

If you suffer from this disease, you must follow a healthy and well-balanced diet. Include enough calories, proteins, and nutrients from a wide variety of food groups.

It hasn't been proved that any given diet can improve or worsen symptoms from Crohn's Disease. Problems arisen from consuming certain foods may vary among different individuals.

Some foods may worsen diarrhea and flatulence symptoms. In order to improve these symptoms, try to:

- Eat small quantities of food throughout the day.
- Drink a lot of water (drink in small quantities frequently throughout the day).
- Avoid foods rich in fiber (wheat bran, beans, nuts, seeds, and popcorn).
- Avoid fatty, greasy, or fried foods, and sauces (butter, margarine, and heavy cream).
- Reduce dairy consumption in case you have problems digesting fats found in dairy. Try low-dairy cheeses such as Swiss or Cheddar, followed by a lactase enzyme product like Lactaid to help digesting dairy.
- Avoid foods known to cause flatulence (e.g. legumes).

Ask your doctor about additional vitamins and minerals you might need, such as:

- Iron supplements (if suffering from anemia)
- Vitamin D and calcium supplements (to maintain bone strength)
- Vitamin B12 to prevent anemia

RECOMMENDATIONS TO REDUCE RISK OF VENOUS THROMBOEMBOLISM

APPENDIX

Venous thromboembolism is a condition caused by the formation of a blood clot in a deep vein of the body. It mainly affects large veins in the lower part of the leg and thigh, making pulmonary embolism its most severe complication.

PREVENTIVE HEALTH CARE GUIDELINES

- ✓ Talk to you doctor about your genetic risk before taking any treatment involving estrogens (e.g. contraceptives).
- ✓ Maintain a healthy weight range in relation to your height (BMI between 18.5 – 24.9)
- ✓ Avoid exposure to tobacco smoke.
- ✓ Engage in physical activity for 25 minutes daily, doing aerobic activities like swimming.
- ✓ In case of suffering from varicose veins in the legs, get treatment from a medical specialist as soon as possible.
- ✓ Do not remain in the same position/posture for long periods at a time. For instance: if your work requires sitting, try to get up and walk around for 10 minutes for every hour sitting.
- ✓ Take necessary precautions during pregnancy (compression tights, etc.).
- ✓ In case that you have to go under major surgery, talk to your doctor about this risk factor and let them decide whether or not to use low-molecular-weight heparin as a prophylactic.

RECOMMENDATIONS TO REDUCE RISK OF VENOUS THROMBOEMBOLISM

APPENDIX

PREVENTIVE NUTRITIONAL GUIDELINES

- ✓ Reduce consumption, but don't avoid entirely, of foods rich in Vitamin K such as green leaves, sprouts (broccoli, cauliflower, Brussels sprouts, etc.) and chestnuts.
- ✓ Follow a low sodium diet (<2400mg/day).
- ✓ Drink 2 liters of water a day.
- ✓ Eat 5 servings of fruits and vegetables every day of the week.
- ✓ Supplements:
  - Vitamin C - 500 mg
  - Vitamin E - 400 IU
  - Vitamin A - 10,000 IU
  - Zinc oxide - 80 mg

LOWER RISK (Fiber, Folates, Omega, Antioxidants)	HIGHER RISK (Saturated fats, Simple Sugars, Sodium)
• Lentils, fava beans, soy, beans, peas, chickpeas. • **Vegetables:** eggplant, carrots, squash, bell peppers, nopal, garlic, and onions. • **Fruits in a variety of colors:** berries, apples, grapes, mamey, mango, oranges, and kiwi. • Dairy (skimmed, 0% fat) • Soybean, olive and canola oil. Nuts and seeds (peanuts, walnuts, chia, flax). • Fish (tuna, salmon) twice a week.	• Heavy cream, butter, margarine, bacon, pork rinds. • Fried, battered, and breaded foods. • Alcoholic, caffeinated, sugary, and soft drinks. • Red, smoked, salted, and marinated meats, and cold cuts. • White bread, pasta, or rice, without fiber. • Sweets • Canned, microwave, or pre-cooked foods. • Pickled foods. • Whole dairy and milk products.

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RECOMMENDATIONS TO REDUCE BLADDER CANCER RISK

PREVENTIVE HEALTH CARE GUIDELINES

- ✓ The relevant medical specialist is an Urologist.
- ✓ If you work with a type of chemicals called aromatic amines, take adequate work safety measures. This may include use of work gloves and face protection with safety glasses and respirators. Industries that commonly work with these compounds are rubber, leather, textiles, paint products, and printing materials. Aromatic amines can also be found in hair dye products. Therefore, it is important for hairdressers to handle these products safely.
- ✓ Avoid tobacco consumption because it is directly associated with increased risk of bladder cancer. We recommend these patients increasing their Vitamin B6 intake as well.
- ✓ You need to contact a specialist immediately If you find blood in your urine (hematuria) or if you go through changes in your urinary patterns such as urinating more frequently, pain or burning sensation when urinating, or feeling the urge to urinate when the bladder isn't full. You would also need to see a specialist if you experience inability to urinate, pain on one side of the lower back, loss of appetite, weight loss, swollen feet, or joint pain.

EARLY DETECTION GUIDELINES

- ✓ Visit your medical specialist at least once a year.
- ✓ Take a complete urinalysis at least once a year.
- ✓ There are no specific screenings for bladder cancer, but patients at high risk could benefit from a urine cytology exam if showing any abnormalities.

RECOMMENDATIONS TO REDUCE BLADDER CANCER RISK

NUTRITIONAL GUIDELINES

- ✓ Consume at least 2 liters of fluids, preferably plain water, on a daily basis. Water can dilute toxins in your urine and flush them out so they remain in your bladder for a shorter time.
- ✓ Selenium is a mineral with antioxidant properties that may interfere with cancer development. We recommend including foods with high levels of selenium in your diet. For example:
  - Fish (tuna, salmon, sardines)
  - Nuts, almonds, and sunflower seeds
  - Eggs (do not consume excessively; 4 eggs per week at most).
  - Edible mushrooms (shiitake, white)
  - Poultry: chicken and turkey (eat skinless)
  - Onions
  - Whole grains: oats, brown rice, wheat, and barley.

- ✓ Consider taking selenium supplements (100mcg/d) if serum tests indicate that your selenium levels are lower than 70 ng/mL.
- ✓ Follow a diet rich in fruits and vegetables. We suggest consuming at least 5 servings per day (2.5 cups approximately). Try to make these servings as colorful as possible; more color means more nutrients.
- ✓ Consume foods containing high levels of fiber, favoring whole grains and cereals, and legumes. We recommend fiber intake of 25 – 35 grams per day.

RECOMMENDATIONS TO REDUCE RISK OF TYPE 2 DIABETES

PREVENTIVE HEALTH CARE GUIDELINES

- ✓ Visit a medical professional for a general health check-up at least every 6 months and let them know about your high genetic risk. The medical specialists for diabetes treatment are endocrinologists and internists.
- ✓ Have the following lab tests performed at least once a year: Comprehensive Metabolic Panel, Hemogram (CBC), Urinalysis, and Glycated Hemoglobin (A1C) Test or Oral Glucose Tolerance Test.
- ✓ Engage in physical activity regularly: 150 minutes/week.
- ✓ Avoid tobacco completely.
- ✓ Stay within a safe weight range depending on your height (BMI between 18.5 - 24.9) or check with your physician if you experience a 7% weight loss from your total bodyweight.
- ✓ Maintain a waist circumference smaller than 88 cm in women and 102 cm in men.

Reference: American Diabetes Association 2014.

PREVENTIVE NUTRITIONAL GUIDELINES

- ✓ Include chia seeds in your regular diet: prepare some lemonade and add 2 tbsp. of chia seeds three times a week. You may also include nopal or cactus pads: 100 gr of roasted nopal three times a week.
- ✓ Favor consumption of vegetable fats (nuts and vegetable oils) and avoid saturated fats (from animal origin). Keep total fat consumption to no more than 30% of your total caloric intake.
- ✓ Increase your fiber consumption (30-40 grams per day).
- ✓ Limit consumption of red meats to only once a week. Avoid smoked, salted, and cured meats.
- ✓ Eat three meals per day. Do NOT skip breakfast!

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- ✓ Favor food consumption patterns similar to the Mediterranean Diet:
  - Daily consumption of complex carbohydrates: whole grains and legumes (beans, lentils, peas, and chickpeas). Avoid eating candy and simple sugars.
  - Eat fruits and vegetables daily (2.5 cups or 400g a day).
  - Choose fish (twice a week) over red meat (no more than once a week). Moderate your food portions.
  - Use vegetable oils (olive, soy, sunflower seed) as a source of fat, but do not exceed three teaspoons a day. Eat 1-2 tablespoons of nuts daily: peanuts, walnuts, almonds, pistachios, etc.
  - Consume yogurt or skimmed milk with no added sugar, 2-3 times per week.
  - Avoid alcoholic beverages and soft drinks. Choose natural juices or water as your fluid intake.

LOWER RISK (Calcium, Selenium, Vitamin C and E, Fiber, Omega)
•Lentils, beans, soybeans, peas, chickpeas. •**Vegetables:** artichokes, cabbage, nopal, turnips, greens. •**Fruits:** blueberries, prunes, figs, dates, apples, pears, oranges, strawberries. •Dairy (skimmed, 0% fat). •Soy/olive oil. •Walnuts, almonds, chia seeds, flax seeds. •Fish (tuna/salmon) twice a week.

HIGHER RISK
•Heavy cream •Fried and breaded foods •Pork rinds, bacon, and chorizo •Candy •Sodas / sugary drinks •Alcoholic beverages •Red meats, entrails •Microwave meals •Refined bread/pasta, without fiber •Snacks

GENOTYPING RESULTS

APPENDIX

ID	Gene	Disease	Allele	Conclusion
rs1799724	TNF	Alzheimer	CC	LOW
rs429358	APOE	Alzheimer	TT	LOW
rs700651	BOLL	Aneurysm	AA	LOW
rs1333040	CDKN2B-AS1	Aneurysm	TT	HIGH
rs10958409	INTERGENIC	Aneurysm	AG	MODERATE
rs2383207	CDKN2B-AS1	Aneurysm	AG	MODERATE
rs10488631	TNPO3	Rheumatoid arthritis	TT	LOW
rs2476601	PTPN22	Rheumatoid arthritis	GG	LOW
rs3087243	CTLA4	Rheumatoid arthritis	GG	LOW
rs4112788	LCE3D	Rheumatoid arthritis	AA	LOW
rs7574865	STAT4	Rheumatoid arthritis	GG	LOW
rs1800629	TNF	Rheumatoid arthritis	AG	HIGH
rs6457617	MHC	Rheumatoid arthritis	CT	HIGH
rs37618 47	TRAF1	Rheumatoid arthritis	GG	MODERATE
rs3890745	MMEL1	Rheumatoid arthritis	TT	MODERATE
rs6822844	IL21	Rheumatoid arthritis	GT	MODERATE
rs4939827	SMAD7	Colorectal Cancer	CT	LOW
rs16892766	EIF3H	Colorectal Cancer	AA	LOW
rs6983267	CCAT2	Colorectal Cancer	GG	HIGH
rs4464148	SMAD7	Colorectal Cancer	CT	MODERATE
rs4680	COMT	Breast cancer	AG	LOW
rs4633	COMT	Breast cancer	CT	LOW
rs1048943	CYP1A1	Breast cancer	TT	LOW
rs1800440	CYP1B1	Breast cancer	TT	LOW
rs2740574	CYP3A4	Breast cancer	TT	LOW
rs4147565	GSTM1	Breast cancer	CT	LOW
rs1042522	TP53	Breast cancer	CC	LOW
rs2266633	GSTT1	Breast cancer	INS	MODERATE
rs1056836	CYP1B1	Breast cancer	CG	MODERATE
rs1138272	GSTP1	Breast cancer	CT	MODERATE
rs1695	GSTP1	Breast cancer	AG	MODERATE
rs4818	COMT	Breast cancer	CG	MODERATE
rs4880	MnSOD	Breast cancer	AG	MODERATE
rs6269	COMT	Breast cancer	GA	MODERATE
rs801114	INTERGENIC	Skin cancer	GT	LOW
rs401681	CLPTM1L	Skin cancer	TT	LOW
rs7538876	PADI6	Skin cancer	AA	MODERATE
rs1859962	CASC17	Prostate cancer	GT	LOW
rs1447295	FUNDC2P2	Prostate cancer	CC	LOW
rs16901979	INTERGENIC	Prostate cancer	CC	LOW
rs1800896	IL10	Prostate cancer	TT	HIGH
rs6983267	CCAT2	Prostate cancer	GG	HIGH
rs1051730	CHRNA3	Lung cancer	AG	MODERATE
rs951266	CHRNA5	Lung cancer	AG	MODERATE
rs710521	TP63	Bladder cancer	TT	MODERATE
rs9642880	CASC11	Bladder cancer	TT	MODERATE
rs1801133	MTHFR	Gastric cancer	GA	MODERATE
rs1061170	CFH	Macular Degeneration	GA	MODERATE
rs800292	C2/CFH	Macular Degeneration	GG	MODERATE
rs2476601	PTPN22	Diabetes Mellitus Type 1	GG	LOW
rs3087243	CTLA4	Diabetes Mellitus Type 1	GG	LOW
rs7574865	STAT4	Diabetes Mellitus Type 1	GG	LOW
rs6897932	IL7R	Diabetes Mellitus Type 1	CC	MODERATE
rs6822844	IL21	Diabetes Mellitus Type 1	GT	MODERATE
rs725613	CLEC16A	Diabetes Mellitus Type 1	GT	MODERATE
rs1111875	HHEX	Diabetes mellitus type 2	CC	HIGH
rs9300039	INTERGENIC	Diabetes mellitus type 2	CC	HIGH
rs10811661	CDKN2A/B	Diabetes mellitus type 2	TT	MODERATE
rs13266634	SLC30A8	Diabetes mellitus type 2	CC	MODERATE
rs10946398	CDKAL1	Diabetes mellitus type 2	AC	MODERATE
rs4402960	IGF2BP2	Diabetes mellitus type 2	GT	MODERATE
rs7903146	TCF7L2	Diabetes mellitus type 2	CT	MODERATE
rs1051730	CHRNA3	Peripheral vascular disease	AG	MODERATE
rs951266	CHRNA5	Peripheral vascular disease	AG	MODERATE
rs2187668	HLA-DQA1	Celiac Disease	CC	LOW
rs2476601	PTPN22	Celiac Disease	GG	LOW
rs3890745	MMEL1	Celiac Disease	TT	MODERATE
rs6822844	IL21	Celiac Disease	GT	MODERATE
rs7574865	STAT4	Celiac Disease	GG	LOW
rs1801133	MTHFR	Coronary heart disease	GA	LOW
rs429358	APOE	Coronary heart disease	TT	LOW
rs7903146	TCF7L2	Coronary heart disease	CT	HIGH
rs10757274	CDKN2B-AS1	Coronary heart disease	AG	MODERATE
rs10757278	Intergenic	Coronary heart disease	AG	MODERATE
rs2383206	CDKN2B-AS1	Coronary heart disease	AG	MODERATE
rs2383207	CDKN2B-AS1	Coronary heart disease	AG	MODERATE
rs1800629	TNF	Crohn's disease	AG	HIGH
rs12722489	IL2RA	Crohn's disease	CC	HIGH
rs1799964	LTA-TNF	Crohn's disease	CT	MODERATE
rs1799964	LTA-TNF	Graves disease	CT	MODERATE
rs1800629	TNF	Graves disease	AG	MODERATE
rs3135388	HLA-DRA	Multiple sclerosis	CC	LOW
rs12722489	IL2RA	Multiple sclerosis	CC	MODERATE
rs6897932	IL7R	Multiple sclerosis	CC	MODERATE
rs725613	CLEC16A	Multiple sclerosis	GT	MODERATE
rs10033464	Intergenic/PITX2,ENPEP	Atrial fibrillation	GG	LOW
rs2200733	LOC729065	Atrial fibrillation	CC	LOW
rs1085019	KCDT10	Hypercholesterolemia	CG	LOW
rs1801282	PPARG	Hypercholesterolemia	CG	LOW
rs2241201	MMAB	Hypercholesterolemia	CG	LOW
rs1800588	LIPC	Hypercholesterolemia	CC	MODERATE
rs2016520	PPARD	Hypercholesterolemia	TT	MODERATE
rs6311	HTR2A	Hypercholesterolemia	CT	MODERATE
rs429358	APOE	Hypercholesterolemia	TT	LOW
rs5370	EDN1	Hypertension	GG	LOW
rs10488631	TNPO3	Lupus	TT	LOW
rs1800629	TNF	Lupus	AG	HIGH
rs9888739	ITGAM	Lupus	TC	HIGH
rs2187668	HLA-DQA1	Lupus	CC	LOW
rs3087243	CTLA4	Lupus	GG	LOW
rs3135388	HLA-DRA	Lupus	CC	LOW
rs7574865	STAT4	Lupus	GG	LOW
rs3890745	MMEL1	Lupus	TT	MODERATE
rs1801133	MTHFR	Migraine	GA	MODERATE
rs3764220	SCG3	Obesity	AA	LOW
rs7799039	LEP	Obesity	AG	LOW
rs10913469	SEC16B	Obesity	TT	LOW
rs17366568	ADIPOQ	Obesity	GG	LOW
rs2844479	NCR3_AIF1	Obesity	CC	LOW
rs4788102	SH2B1	Obesity	GG	LOW
rs5082	APOA2	Obesity	AA	LOW
rs6265	BDNF	Obesity	CC	LOW
rs7138803	FAIM2	Obesity	GG	LOW
rs7566605	INSIG2	Obesity	GG	LOW
rs12970134	MC4R	Obesity	AA	LOW
rs7561317	TMEM18	Obesity	GG	MODERATE
rs1121980	FTO	Obesity	AG	MODERATE
rs17782313	MC4R	Obesity	CT	MODERATE
rs1805094	LEPR	Obesity	CG	MODERATE
rs2568958	NERG1	Obesity	AG	MODERATE
rs29941	NEAR-KCTD15	Obesity	AG	MODERATE
rs3751812	FTO	Obesity	GT	MODERATE
rs4680	COMT	Obesity	AG	MODERATE
rs6235	PCSK1_2	Obesity	CG	MODERATE
rs9939609	FTO	Obesity	AT	MODERATE
rs4140564	PTGS2-PLA2G4A	Osteoarthritis	AG	MODERATE
rs1265159	POU5F1	Psoriasis	GG	LOW
rs4112788	LCE3D	Psoriasis	AA	LOW
rs6822844	IL21	Psoriasis	GT	MODERATE
rs10757274	CDKN2B-AS1	Thromboembolism	AG	MODERATE
rs1801133	MTHFR	Thromboembolism	GA	MODERATE
rs2383207	CDKN2B-AS1	Thromboembolism	AG	MODERATE

GENOTYPING RESULTS

ID	Gene	Evaluated in	Allele	Functional Observation
rs1726866	TAS2R38	Behavior	AA	You carry a genetic risk of developing compulsive eating behaviors due to a decreased food reward response.
rs4680	COMT	Behavior	AG	You carry a genetic risk of developing compulsive eating behaviors.
rs5400	SLCA2	Behavior	GG	You do not carry a genetic risk of developing carbohydrate addiction.
rs6265	BDNF	Behavior	CC	You do not carry a genetic risk of developing compulsive eating behaviors or carbohydrate addiction.
rs9939609	FTO	Behavior	AT	You carry a genetic risk of developing compulsive eating behaviors due to a decreased food reward response.
rs10850219	KCDT10	Diet	CG	High carbohydrate diet is not linked to changes in cholesterol levels.
rs1726866	TAS2R38	Diet	AA	Your genotype is associated with a lower ability to taste bitterness in food products.
rs17300539	ADIPOQ	Diet	GG	This genotype is not associated to changes in adiponectine levels.
rs1800588	LIPC	Diet	CC	Your genotype is associated with a higher body mass index and lower HDL cholesterol levels when your total fat intake exceeds the recommended range.
rs1801282	PPARG	Diet	CG	Your genotype is associated with a lower body mass index when monounsaturated fatty acids contribute 15% of your total energy value from fats.
rs2241201	MMAB	Diet	CG	High carbohydrate diet (> 0.5 pounds per day) is not linked to LDL or HDL cholesterol levels.
rs35744813	TAS1R3	Diet	AG	Your genotype is associated with a possible reduced ability to taste sweetness in food products.
rs4988235	MCM6	Diet	AG	You carry a lower genetic risk of developing adult lactose intolerance.
rs5082	APOA2	Diet	AA	This genotype is not associated to an increased total fat intake.
rs5370	EDN1	Diet	GG	Genotype not associated with high blood pressure risk.
rs6265	BDNF	Diet	CC	Your genotype is associated with a lower body mass index and waist circumference with a polyunsaturated fatty acids rich diet; higher than 8.76% of total fat intake.
rs6311	HTR2A	Diet	CT	Your genotype is associated with a significantly higher dietary intake of total fats.
rs671	ALDH2	Diet	GG	Genotype associated with a normal tolerance towards alcoholic beverages.
rs713598	TAS2R38	Diet	CG	Your genotype is associated with a higher ability to taste bitterness from foods.
rs762551	CYP1A2	Diet	AA	You do metabolize caffeine well.
rs1800588	LIPC	Exercise	CC	Aerobic exercise (resistance training and stamina) may significantly help improve cholesterol parameters for this genotype.
rs1805094	LEPR	Exercise	CG	Your genotype is associated with a normal ability to use fats as an energy source with a possible increased response to physical activity.
rs1815739	ACTN3	Exercise	TC	Your genotype is associated with improved performance in exercises that require muscle contraction: speed and strength.
rs2016520	PPARD	Exercise	TT	Follow exercise recommendations
rs4680	COMT	Exercise	AG	Your genotype is associated with a higher risk of developing obesity when living a sedentary lifestyle.
rs5370	EDN1	Exercise	GG	Follow exercise recommendations
rs7566605	INSIG2	Exercise	GG	Weight lifting is not associated with increments in subcutaneous fat for this genotype.
rs7799039	LEP	Exercise	AG	Follow exercise recommendations
rs9939609	FTO	Exercise	AT	Exercise can lower the obesity risk and regulate appetite in this genotype.
rs1801133	MTHFR	Folate	AG	Genotype associated with a 35% reduced capacity to metabolize folates.
rs12934922	BCMO1	Vitamin A	AT	Genotype associated with a reduced capacity to metabolize Vitamin A (beta-carotene) in its active form.
rs7501331	BCMO1	Vitamin A	CT	Genotype associated with a reduced capacity to metabolize Vitamin A (beta-carotene) in its active form.
rs602662	FUT2	Vitamin B12	AA	Genotype associated with higher levels of Vitamin B12.
rs4654748	NBPF3	Vitamin B6	CC	Genotype associated with a possible Vitamin B6 deficiency.
rs10741657	NEAR-CYP2R1	Vitamin D	GG	Your genotype is associated with a possible Vitamin D deficiency.
rs12785878	NEAR-DHCR7	Vitamin D	GT	Your genotype is associated with a possible Vitamin D deficiency.
rs2282679	GC	Vitamin D	GT	Your genotype is associated with a possible Vitamin D deficiency.
rs12272004	INTERGENIC	Vitamin E	CA	Your genotype is associated with normal levels of Vitamin E.

1. Almen, M. S., et al. (2010). "The obesity gene, TMEM18, is of ancient origin, found in majority of neuronal cells in all major brain regions and associated with obesity in severely obese children." BMC Med Genet **11**: 58.
2. Clifford, A. J., et al. (2013). "Single nucleotide polymorphisms in CETP, SLC46A1, SLC19A1, CD36, BCMO1, APOA5, and ABCA1 are significant predictors of plasma HDL in healthy adults." Lipids Health Dis **12**: 66.
3. Corella, D., et al. (2007). "The -256T>C polymorphism in the apolipoprotein A-II gene promoter is associated with body mass index and food intake in the genetics of lipid lowering drugs and diet network study." Clin Chem **53**(6): 1144-1152.
4. Davis, C., et al. (2008). "Reward sensitivity and the D2 dopamine receptor gene: A case-control study of binge eating disorder." Prog Neuropsychopharmacol Biol Psychiatry **32**(3): 620-628.
5. Den Hoed, M., et al. (2009). "Postprandial responses in hunger and satiety are associated with the rs9939609 single nucleotide polymorphism in FTO." Am J Clin Nutr **90**(5): 1426-1432.
6. Dotson, C. D., et al. (2008). "Bitter taste receptors influence glucose homeostasis." PLoS One **3**(12): e3974.
7. Dotson, C. D., et al. (2010). "Variation in the gene TAS2R38 is associated with the eating behavior disinhibition in Old Order Amish women." Appetite **54**(1): 93-99.
8. Eny, K. M., et al. (2008). "Genetic variant in the glucose transporter type 2 is associated with higher intakes of sugars in two distinct populations." Physiol Genomics **33**(3): 355-360.
9. Eynon, N., et al. (2013). "The FTO A/T polymorphism and elite athletic performance: a study involving three groups of European athletes." PLoS One **8**(4): e60570.
10. Ferrucci, L., et al. (2009). "Common variation in the beta-carotene 15,15'-monooxygenase 1 gene affects circulating levels of carotenoids: a genome-wide association study." Am J Hum Genet **84**(2): 123-133.
11. Fogarty, M. P., et al. (2010). "Allelic expression imbalance at high-density lipoprotein cholesterol locus MMABMVK." Hum Mol Genet **19**(10): 1921-1929.
12. Frayling, T. M., et al. (2007). "A common variant in the FTO gene is associated with body mass index and predisposes to childhood and adult obesity." Science **316**(5826): 889-894.
13. Gallicchio, L., et al. (2008). "Genetic polymorphisms of peroxisome proliferator-activated receptors and the risk of cardiovascular morbidity and mortality in a community-based cohort in washington county, Maryland." PPAR Res **2008**: 276581.
14. Gjesing, A. P., et al. (2011). "The effect of PCSK1 variants on waist, waist-hip ratio and glucose metabolism is modified by sex and glucose tolerance status." PLoS One **6**(9): e23907.
15. Goodyer, I. M., et al. (2010). "Polymorphisms in BDNF (Val66Met) and 5-HTTLPR, morning cortisol and subsequent depression in at-risk adolescents." Br J Psychiatry **197**(5): 365-371.
16. Hazra, A., et al. (2008). "Common variants of FUT2 are associated with plasma vitamin B12 levels." Nat Genet **40**(10): 1160-1162.
17. Henneman, P., et al. (2010). "Genetic architecture of plasma adiponectin overlaps with the genetics of metabolic syndrome-related traits." Diabetes Care **33**(4): 908-913.
18. Hernandez-Guerrero, C., et al. (2013). "Prevalence of metilentetrahidrofolate reductase C677T polymorphism, consumption of vitamins B6, B9, B12 and determination of lipidic hydroperoxides in obese and normal weight Mexican population." Nutr Hosp **28**(6): 2142-2150.
19. Hinney, A., et al. (2010). "From monogenic to polygenic obesity: recent advances." Eur Child Adolesc Psychiatry **19**(3): 297-310.
20. Hisatome I. Sweet preference, obesity and genetic polymorphism of leptin and the leptin receptor. Hypertension research : official journal of the Japanese Society of Hypertension. 2008;31(6):1055-6.
21. Hivert, M. F., et al. (2008). "Common variants in the adiponectin gene (ADIPOQ) associated with plasma adiponectin levels, type 2 diabetes, and diabetes-related quantitative traits: the Framingham Offspring Study." Diabetes **57**(12): 3353-3359.
22. Junyent, M., et al. (2009). "Novel variants at KCTD10, MVK, and MMAB genes interact with dietary carbohydrates to modulate HDL-cholesterol concentrations in the Genetics of Lipid Lowering Drugs and Diet Network Study." Am J Clin Nutr **90**(3): 686-694

23. Junyent, M., et al. (2009). "Novel variants at KCTD10, MVK, and MMAB genes interact with dietary carbohydrates to modulate HDL-cholesterol concentrations in the Genetics of Lipid Lowering Drugs and Diet Network Study." Am J Clin Nutr **90**(3): 686-694.
24. Kilpelainen, T. O., et al. (2009). "Association of variants in the PCSK1 gene with obesity in the EPIC-Norfolk study." Hum Mol Genet **18**(18): 3496-3501.
25. Kring, S. I., et al. (2009). "Polymorphisms of serotonin receptor 2A and 2C genes and COMT in relation to obesity and type 2 diabetes." PLoS One **4**(8): e6696.
26. Leung, W. C., et al. (2009). "Two common single nucleotide polymorphisms in the gene encoding beta-carotene 15,15'-monoxygenase alter beta-carotene metabolism in female volunteers." FASEB J **23**(4): 1041-1053.
27. Li S, Zhao JH, Luan J, Ekelund U, Luben RN, Khaw KT, et al. Physical activity attenuates the genetic predisposition to obesity in 20,000 men and women from EPIC-Norfolk prospective population study. PLoS medicine. 2010;7(8).
28. Lietz, G., et al. (2012). "Single nucleotide polymorphisms upstream from the beta-carotene 15,15'- monoxygenase gene influence provitamin A conversion efficiency in female volunteers." J Nutr **142**(1): 161S- 165S.
29. Ma, X. Y., et al. (2012). "Association between BDNF rs6265 and obesity in the Boston Puerto Rican Health Study." J Obes **2012**: 102942.
30. Miao L, Yin RX, Wu DF, Cao XL, Li Q, Hu XJ, et al. Peroxisome proliferator-activated receptor delta +294T > C polymorphism and serum lipid levels in the Guangxi Bai Ku Yao and Han populations. Lipids in health and disease. 2010;9:145
31. Muindi, J. R., et al. (2013). "Serum vitamin D metabolites in colorectal cancer patients receiving cholecalciferol supplementation: correlation with polymorphisms in the vitamin D genes." Horm Cancer **4**(4): 242-250.
32. Ooi, S. X., et al. (2010). "Bitter receptor gene (TAS2R38) P49A genotypes and their associations with aversion to vegetables and sweet/fat foods in Malaysian subjects." Asia Pac J Clin Nutr **19**(4): 491-498.
33. Orkunoglu-Suer, F. E., et al. (2008). "INSIG2 gene polymorphism is associated with increased subcutaneous fat in
34. Prudente, S., et al. (2011). "The SH2B1 obesity locus is associated with myocardial infarction in diabetic patients and with NO synthase activity in endothelial cells." Atherosclerosis **219**(2): 667-672.
35. Regieli, J. J., et al. (2009). "PPAR gamma variant influences angiographic outcome and 10-year cardiovascular risk in male symptomatic coronary artery disease patients." Diabetes Care **32**(5): 839-844
36. Roffman, J. L., et al. (2013). "Genetic variation throughout the folate metabolic pathway influences negative symptom severity in schizophrenia." Schizophr Bull **39**(2): 330-338.
37. Sacerdote, C., et al. (2007). "Lactase persistence and bitter taste response: instrumental variables and mendelian randomization in epidemiologic studies of dietary factors and cancer risk." Am J Epidemiol **166**(5): 576-581.
38. Sandell, M. A. and P. A. Breslin (2006). "Variability in a taste-receptor gene determines whether we taste toxins in food." Curr Biol **16**(18): R792-794.
39. Siitonen, N., et al. (2011). "Association of ADIPOQ gene variants with body weight, type 2 diabetes and serum adiponectin concentrations: the Finnish Diabetes Prevention Study." BMC Med Genet **12**: 5.
40. Siitonen, N., et al. (2011). "Association of ADIPOQ gene variants with body weight, type 2 diabetes and serum adiponectin concentrations: the Finnish Diabetes Prevention Study." BMC Med Genet **12**: 5.
41. Simon, K. C., et al. (2011). "Genetic predictors of 25-hydroxyvitamin D levels and risk of multiple sclerosis." J Neurol **258**(9): 1676-1682.
42. Stice, E., et al. (2008). "Relation between obesity and blunted striatal response to food is moderated by TaqIA A1 allele." Science **322**(5900): 449-452.
43. Stice, E., et al. (2009). "Relation of obesity to consummatory and anticipatory food reward." Physiol Behav **97**(5):551-560.
44. Stice, E., et al. (2010). "Weight gain is associated with reduced striatal response to palatable food." J Neurosci **30**(39): 13105-13109.

45. Tanaka T, Scheet P, Giusti B, Bandinelli S, Piras MG, Usala G, et al. Genome-wide association study of vitamin B6, vitamin B12, folate, and homocysteine blood concentrations. American journal of human genetics. 2009;84(4):477-82
46. Tanaka, T., et al. (2009). "Genome-wide association study of vitamin B6, vitamin B12, folate, and homocysteine blood concentrations." Am J Hum Genet **84**(4): 477-482.
47. Tepper BJ, Koelliker Y, Zhao L, Ullrich NV, Lanzara C, d'Adamo P, et al. Variation in the bitter-taste receptor gene TAS2R38, and adiposity in a genetically isolated population in Southern Italy. Obesity. 2008;16(10):2289- 95.
48. Teran-Garcia, M., et al. (2005). "Hepatic lipase gene variant -514C>T is associated with lipoprotein and insulin sensitivity response to regular exercise: the HERITAGE Family Study." Diabetes **54**(7): 2251-2255.
49. Terracciano, A., et al. (2010). "BDNF Val66Met is associated with introversion and interacts with 5-HTTLPR to influence neuroticism." Neuropsychopharmacology **35**(5): 1083-1089.
50. Traurig, M. T., et al. (2012). "Variants in the LEPR gene are nominally associated with higher BMI and lower 24-h energy expenditure in Pima Indians." Obesity (Silver Spring) **20**(12): 2426-2430.
51. Trummer, O., et al. (2012). "Allelic determinants of vitamin d insufficiency, bone mineral density, and bone fractures." J Clin Endocrinol Metab **97**(7): E1234-1240.
52. Van Hoek, M., et al. (2009). "Diagnostic value of post-heparin lipase testing in detecting common genetic variants in the LPL and LIPC genes." Eur J Hum Genet **17**(11): 1386-1393.
53. Vieth, R., et al. (2004). "Randomized comparison of the effects of the vitamin D3 adequate intake versus 100 mcg (4000 IU) per day on biochemical responses and the wellbeing of patients." Nutr J **3**: 8.
54. Villalobos-Comparan, M., et al. (2012). "PCSK1 rs6232 is associated with childhood and adult class III obesity in the Mexican population." PLoS One **7**(6): e39037.
55. Wang, T. J., et al. (2010). "Common genetic determinants of vitamin D insufficiency: a genome-wide association study." Lancet **376**(9736): 180-188.
56. Wei, X. L., et al. (2011). "The peroxisome proliferator-activated receptor delta +294T > C polymorphism and alcohol consumption on serum lipid levels." Lipids Health Dis **10**: 242.
57. Wing, M. R., et al. (2009). "Analysis of FTO gene variants with measures of obesity and glucose homeostasis in the IRAS Family Study." Hum Genet **125**(5-6): 615-626.
58. women and poor response to resistance training in men." BMC Med Genet **9**: 117.
59. Wu, Y., et al. (2010). "Genome-wide association study for adiponectin levels in Filipino women identifies CDH13 and a novel uncommon haplotype at KNG1-ADIPOQ." Hum Mol Genet **19**(24): 4955-4964.
60. Yang, N., et al. (2003). "ACTN3 genotype is associated with human elite athletic performance." Am J Hum Genet **73**(3): 627-631.
61. Young, S. N. (2007). "How to increase serotonin in the human brain without drugs." J Psychiatry Neurosci 32(6):394-399.
62. Zavattari P, Loche A, Civolani P, Pilia S, Moi L, Casini MR, et al. An INSIG2 polymorphism affects glucose homeostasis in Sardinian obese children and adolescents. Annals of human genetics. 2010;74(5):381-61.
63. Zhao, J., et al. (2009). "The role of obesity-associated loci identified in genome-wide association studies in the determination of pediatric BMI." Obesity (Silver Spring) 17(12): 2254-2257.
64. Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010.
65. A. Catharine Ross, JoAnn E. Manson, Steven A. Abrams, John F. Aloia, Patsy M. Brannon, et al. The 2011 Report on Dietary Reference Intakes for Calcium and Vitamin D from the Institute of Medicine: What Clinicians Need to Know J Clin Endocrinol Metab. 2011 January; 96(1): 53–58. Published online 2010 November 30. doi: 10.1210/jc.2010-2704
66. Wang, T. J., et al. (2010). "Common genetic determinants of vitamin D insufficiency: a genome-wide association study." Lancet **376**(9736): 180-188.

67. Wimalawansa, SJ. Vitamin D in the New Millennium. Curr Osteoporos Rep (2012) 10:4–15
68. Ball GFM: Vitamins: their role in the human body. Oxford, Blackwell Publishing, 2004, pp 133-187, 234-255
69. Ross AC: Vitamin A and Carotenoids. In Modern Nutrition in Health and Disease. 10th edition. Edited by ME Shils, M Shike, AC Ross, et al. Philadelphia, Lippincott Williams and Wilkins, 2006, pp 351-375
70. Traber MG: Vitamin E. In Modern Nutrition in Health and Disease.10th edition. Edited by ME Shils, M Shike, AC Ross, et al. Philadelphia, Lippincott Williams and Wilkins, 2006, pp 434-441
71. Institute of Medicine. Food and Nutrition Board. Dietary Reference Intakes: Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington, DC: National Academy Press, 1998.
72. Tan DX1, Manchester LC, Fuentes-Broto L, Paredes SD, Reiter RJ: Significance and application of melatonin in the regulation of brown adipose tissue metabolism: relation to human obesity. Obes Rev. 2011 Mar;12(3):167-88. doi: 10.1111/j.1467-789X.2010.00756.x.
73. Lander ES, Linton LM, Birren B, Nusbaum C, Zody MC, Baldwin J, et al. Initial sequencing and analysis of the human genome. Nature. 2001;409(6822):860-921.
74. Julián Ramírez-Bello GV-A, Carlos Tovilla-Zárate, José Manuel Fragoso. Polimorfismos de un solo nucleótido (SNP): implicaciones funcionales de los SNP reguladores (rSNP) y de los SNP- ARN estructurales (srSNP) en enfermedades complejas. Gaceta Médica de México. 2013;149:220- 8.
75. Jordan DM, Ramensky VE, Sunyaev SR. Human allelic variation: perspective from protein function, structure, and evolution. Current opinion in structural biology. 2010;20(3):342-50.
76. Zhu Y, Spitz MR, Amos CI, Lin J, Schabath MB, Wu X. An evolutionary perspective on single- nucleotide polymorphism screening in molecular cancer epidemiology. Cancer research. 2004;64(6):2251-7.
77. MacMahon B. TD. Epidemiology: Principles and Methods. . . 2nd ed. Wilkins. LW, editor. Boston: 1996.
78. Kiezun A, Pulit SL, Francioli LC, van Dijk F, Swertz M, Boomsma DI, et al. Deleterious alleles in the human genome are on average younger than neutral alleles of the same frequency. PLoS genetics.2013;9(2):e1003301.
79. Bonassi S, Taioli E, Vermeulen R. Omics in population studies: A molecular epidemiology perspective. Environmental and molecular mutagenesis.2013;54(7):455-60.
80. Dubben HH. Re: Assessing the probability that a positive report is false: an approach for molecular epidemiology studies. Journal of the National Cancer Institute. 2004;96(22):1722; author reply -3.
81. Reichenheim ME, Coutinho ES. Measures and models for causal inference in cross-sectional studies: arguments for the appropriateness of the prevalence odds ratio and related logistic regression. BMC medical research methodology. 2010;10:66.
82. Johansen P, Andersen JD, Borsting C, Morling N. Evaluation of the iPLEX((R)) Sample ID Plus Panel designed for the Sequenom MassARRAY((R)) system. A SNP typing assay developed for human identification and sample tracking based on the SNPforID panel. Forensic science international Genetics.2013;7(5):482-7.
83. Klotz, U. "The role of pharmacogenetics in the metabolism of antiepileptic drugs: pharmacokinetic and therapeutic implications.". *Clin Pharmacokinet. 2007,* 46 (4): 271–9.
84. Roses AD (June 2000). "Pharmacogenetics and the practice of medicine". *Nature*. 2000, 405 (6788): 857–65.
85. Shuldiner AR, O'Connell JR, Bliden KP, Gandhi A, Ryan K, Horenstein RB, Damcott CM, Pakyz R, Tantry US, Gibson Q, Pollin TI, Post W, Parsa A, Mitchell BD, Faraday N, Herzog W, Gurbel PA . "Association of cytochrome P450 2C19 genotype with the antiplatelet effect and clinical efficacy of clopidogrel therapy". *JAMA*. 2009, 302 (8): 849–57.
86. Farbstein D, Blum S, Pollak M, Asaf R, Viener HL, Lache O, Asleh R, Miller-Lotan R, Barkay I, Star M, Schwartz A, Kalet-Littman S, Ozeri D, Vaya J, Tavori H, Vardi M, Laor A, Bucher SE, Anbinder Y, Moskovich D, Abbas N, Perry N, Levy Y, Levy AP. "Vitamin E therapy results in a reduction in HDL function in individuals with diabetes and the haptoglobin 2-1 genotype". *Atherosclerosis* 2011, 219 (1): 240–4.
87. Yang CG, Ciccolini J, Blesius A, Dahan L, Bagarry-Liegey D, Brunet C, Varoquaux A, Frances N, Marouani H, Giovanni A, Ferri-Dessens RM, Chefrour M, Favre R, Duffaud F, Seitz JF, Zanaret M, Lacarelle B, Mercier C . "DPD-based adaptive dosing of 5-FU in patients with head and neck cancer: impact on treatment efficacy and toxicity". *Cancer Chemother. Pharmacol.* 2011, 67 (1): 49–56.
88. Gardiner SJ, Begg EJ. "Pharmacogenetics, drug-metabolizing enzymes, and clinical practice". *Pharmacol. Rev.* 2006, 58 (3): 521–90.

89. Frueh FW, Amur S, Mummaneni P, Epstein RS, Aubert RE, DeLuca TM, Verbrugge RR, Burckart GJ, Lesko LJ. "Pharmacogenomic biomarker information in drug labels approved by the United States food and drug administration: prevalence of related drug use".*Pharmacotherapy*, 2008, 28 (8): 992–8.

90. Paul NW, Fangerau H. "Why should we bother? Ethical and social issues in individualized medicine". *Curr Drug Targets* 2006, 7 (12): 1721–7.

91. Gryn Steven E, et al. Profound reduction in the tamoxifen active metabolite endoxifen in a patient on phenytoin for epilepsy compared with a CYP2D6 genotype matched cohort. *Pharmacogenetics and genomics.* 2014.

92. Canestaro William J, et al. Genetic factors affecting statin concentrations and subsequent myopathy: a HuGENet systematic review. *Genetics in medicine : official journal of the American College of Medical Genetics.* 2014.

93. Hodgson Karen, et al. Genetic differences in cytochrome P450 enzymes and antidepressant treatment response. *Journal of psychopharmacology (Oxford, England).* 2013.

94. Province Michael A, et al. CYP2D6 Genotype and Adjuvant Tamoxifen: Meta-analysis of Heterogeneous Study Populations. *Clinical pharmacology and therapeutics.* 2013.

95. Cresci Sharon, et al. Cytochrome P450 Gene Variants, Race, and Mortality Among Clopidogrel Treated Patients Following Acute Myocardial Infarction. *Circulation. Cardiovascular genetics.* 2014.

96. Mizobe Michio, et al. Impact of CYP2C19 polymorphism on clinical outcome following coronary stenting is more important in non-diabetic than diabetic patients. *Thrombosis research.* 2014.

97. Shetkar Sudhir S, et al. CYP 450 2C19 polymorphisms in Indian patients with coronary artery disease. *Indian heart journal.* 2014.

98. Scott Stuart A, et al. Clinical Pharmacogenetics Implementation Consortium (CPIC) guidelines for cytochrome P450-2C19 (CYP2C19) genotype and clopidogrel therapy: 2013 Update. *Clinical pharmacology and therapeutics.* 2013.

99. Viviani Anselmi Chiara, et al. Routine assessment of on-clopidogrel platelet reactivity and gene polymorphisms in predicting clinical outcome following drug-eluting stent implantation in patients with stable coronary artery disease. *JACC. Cardiovascular interventions.* 2013.

100. Helldén Anders, et al. Pregnancy and pharmacogenomics in the context of drug metabolism and response. *Pharmacogenomics.* 2013.

101. Hall-Flavin Daniel K, et al. Utility of integrated pharmacogenomic testing to support the treatment of major depressive disorder in a psychiatric outpatient setting. *Pharmacogenetics and genomics.* 2013.

102. Sadee W, et al. Pharmacogenomics of the RNA world: structural RNA polymorphisms in drug therapy. *Clinical pharmacology and therapeutics.* 2011.