24Genetics

Mike, this is your pharmagenomics report
Index

1. Introduction .............................................................................................................................................................3
   1.1. Frequently Asqued Questions ..............................................................................................................3
2. Summary .................................................................................................................................................................5
3. Genetic Results .......................................................................................................................................................8
   3.1. What information is included in the results? ....................................................................................8
   3.2. Your genetic results ...............................................................................................................................9

This report is not valid for clinical or diagnostic use.
1. Introduction

In this report you will see some of your genetic predispositions related to drugs.

As usual in our studies, in the first pages you will find an iconographic summary of each of the analyzed values, which we develop more broadly in later pages.

We study your genetic predisposition towards certain medications. Depending on the drug, your genetics can affect the level of toxicity, the effectiveness of the dose needed, and more.

This report should never be used without a Medical Doctor supervision. Any decision about drugs has to be taken by a Medical Doctor considering all factors. This report is not valid for clinical use so other diagnostic dna tests may be needed.

The results of this report are personal, and not applicable to studies about other members of your family.

These reports, as well as the scientific research in the genetics field, may vary over time. New mutations are constantly being discovered and we know better the ones we are analyzing today. At 24Genetics we make a great effort to periodically apply the consolidated scientific discoveries to our reports.

We remind you that any changes you want to make regarding your health should be guided by your doctor. From 24Genetics we recommend all our clients to get a Genetic Counseling service to ensure a better understanding of this genetic report.

1.1. Frequently Asqued Questions

Should I make drastic changes in my health management with the data of this test?

No at all, any changes you want to make in your health management should be analyzed by an expert geneticist and the medical specialists. Any doubts you have about any genetic test should be checked by healthcare experts in Genetic Diagnosis.

Does it all depend on my genes?

No at all, our body responds to many conditions. Our genes are certainly an important parameter. Lifestyle, sport, food, and many other circumstances influence our body. Knowing yourself certainly helps to treat our body in the most appropriate way. And this is what these genetic reports are all about: more information.
What is this report based on?

This test is based on different genetic studies internationally consolidated and accepted by the scientific community. There are certain scientific databases where studies are published where there is a certain level of consensus. Our genetic tests are carried out by applying these studies to the genotype of our clients. In each section you will see some of the studies publications on which it is based. There are sections where more studies are used than the ones listed.
2. Summary

Pharmacogenomics: Cardiology

- Pravastatin
- Warfarin
- Hydrochlorothiazide
- Simvastatin
- Phenprocoumon

Caption:
- We have not found anything in your genetics that indicates a predisposition to an abnormal effect of this drug. Other non-analyzed and non-genetic genetic factors may play a role.
- According to your genotype you are more predisposed to have an abnormal effect on you. Other non-analyzed and non-genetic genetic factors may play a role.
- According to your genotype you are more predisposed to have harmful effects on you. Other non-analyzed and non-genetic genetic factors may play a role.
- According to your genotype, you have a greater predisposition to respond positively to this drug. Other non-analyzed and non-genetic genetic factors may play a role.

Pharmacogenomics: Neurology

- Amitriptyline
- Bupropion
- Clomipramine
- Carbamazepine
- Clozapine
- Olanzapine
- Risperidone
- Amisulpride
- Antidepressants
- Citalopram
- Escitalopram
- Aripiprazole
- Haloperidol
- Paliperidone
- Ziprasidone
- Quetiapine

Caption:
- We have not found anything in your genetics that indicates a predisposition to an abnormal effect of this drug. Other non-analyzed and non-genetic genetic factors may play a role.
- According to your genotype you are more predisposed to have an abnormal effect on you. Other non-analyzed and non-genetic genetic factors may play a role.
- According to your genotype you are more predisposed to have harmful effects on you. Other non-analyzed and non-genetic genetic factors may play a role.
- According to your genotype, you have a greater predisposition to respond positively to this drug. Other non-analyzed and non-genetic genetic factors may play a role.

Pharmacogenomics: Pain

- Meperidine
- Pentazocine
- Alfentanil
- Fentanyl
- Tramadol
- Morphine
- Aspirin
- Buprenorphine
- Naltrexone

This report is not valid for clinical or diagnostic use.
We have not found anything in your genetics that indicates a predisposition to an abnormal effect of this drug. Other non-analyzed and non-genetic genetic factors may play a role.

According to your genotype you are more predisposed to have an abnormal effect on you. Other non-analyzed and non-genetic genetic factors may play a role.

According to your genotype you are more predisposed to have harmful effects on you. Other non-analyzed and non-genetic genetic factors may play a role.

According to your genotype, you have a greater predisposition to respond positively to this drug. Other non-analyzed and non-genetic genetic factors may play a role.

Pharmacogenomics: Oncology

- Methotrexate
- Fluorouracil, capecitabine, pyrimidine analogues, tegafur and Neoplasms
- Irinotecan
- Vincristine
- Cisplatin
- Mercaptopurine

Pharmacogenomics: Other

- Tacrolimus
- Viagra (Sildenafil)

This report is not valid for clinical or diagnostic use.
3. Genetic Results

3.1. What information is included in the results?

3.2. Your genetic results
Pharmacogenomics: Cardiology

Phenprocoumon

Phenprocoumon (marketed under the brand names Marcoumar, Marcumar and Falithrom) is a long-acting oral anticoagulant drug, a derivative of coumarin. It is a vitamin K antagonist that inhibits coagulation by blocking synthesis of coagulation factors II, VII, IX and X.

What does your genetics say?

Patients with the TT genotype who are treated with acenocoumarol or phenprocoumon may require a lower dose as compared to patients with the TC or CC genotype. Other genetic and clinical factors may also influence a patient’s acenocoumarol or phenprocoumon maintenance dose requirement.

More information:


This report is not valid for clinical or diagnostic use.
Hydrochlorothiazide (HCTZ or HCT) is a diuretic medication often used to treat high blood pressure and swelling due to fluid build up. Other uses include diabetes insipidus, renal tubular acidosis, and to decrease the risk of kidney stones in those with high calcium level in the urine. For high blood pressure it is often recommended as a first line treatment.

What does your genetics say?

Patients with the CC genotype and hypertension who are treated with hydrochlorothiazide may have an increased response as compared to patients with the TC or TT genotype. Other genetic and clinical factors may also influence a patient’s response to hydrochlorothiazide.

More information:

Pravastatin

Pravastatin is a cholesterol-lowering agent that belongs to a class of medications known as statins. It was derived from microbial transformation of mevastatin, the first statin discovered. It is a ring-opened dihydroxyacid with a 6’-hydroxyl group that does not require in vivo activation. Pravastatin is one of the lower potency statins; however, its increased hydrophilicity is thought to confer advantages such as minimal penetration through lipophilic membranes of peripheral cells, increased selectivity for hepatic tissues, and a reduction in side effects compared with lovastatin and simvastatin.

Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMGCR</td>
<td>rs17244841</td>
<td>AA</td>
</tr>
</tbody>
</table>

What does your genetics say?

Patients with the AA genotype who are treated with statins may be more likely to respond as compared to patients with the AT or TT genotype. Other genetic and clinical factors may also influence a patient’s response when treated with statins.

More information:


This report is not valid for clinical or diagnostic use.
Simvastatin

Simvastatin is a lipid-lowering agent that is derived synthetically from the fermentation of Aspergillus terreus. It is a potent competitive inhibitor of 3-hydroxy-3-methylglutaryl coenzyme A reductase (hydroxymethylglutaryl COA reductases), which is the rate-limiting enzyme in cholesterol biosynthesis. It may also interfere with steroid hormone production. Due to the induction of hepatic LDL receptors, it increases breakdown of LDL cholesterol.

Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLCO1B1</td>
<td>rs4149056</td>
<td>TT</td>
</tr>
</tbody>
</table>

What does your genetics say?

Patients with the TT genotype may have a lower risk of simvastatin-related myopathy as compared to patients with the CT or CC genotype. Other genetic and clinical factors may also influence a patient's risk for toxicity.

More information:

Warfarin

Warfarin is an anticoagulant drug normally used to prevent blood clot formation as well as migration. Although originally marketed as a pesticide (d-Con, Rodex, among others), Warfarin has since become the most frequently prescribed oral anticoagulant in North America. Warfarin has several properties that should be noted when used medicinally, including its ability to cross the placental barrier during pregnancy which can result in fetal bleeding, spontaneous abortion, preterm birth, stillbirth, and neonatal death. Additional adverse effects such as necrosis, purple toe syndrome, osteoporosis, valve and artery calcification, and drug interactions have also been documented with warfarin use. Warfarin does not actually affect blood viscosity, rather, it inhibits vitamin-K dependent synthesis of biologically active forms of various clotting factors in addition to several regulatory factors.

What does your genetics say?

Patients with the TT genotype may require a lower dose of warfarin as compared to patients with the CC or TC genotype. Other genetic and clinical factors may also influence a patient’s warfarin dose requirement.

More information:

Amisulpride

Amisulpride, sold under the brand name Solian among others, is an antipsychotic medication used to treat schizophrenia. It is usually classed with the newer generation of antipsychotics, the so called atypical antipsychotics.

What does your genetics say?

Patients with schizophrenia, schizoaffective disorder, or autism spectrum disorder and genotype AC may have a decreased likelihood of weight gain and hypertriglyceridemia when taking amisulpride, aripiprazole, clozapine, olanzapine, haloperidol, paliperidone, quetiapine, ziprasidone, or risperidone as compared to patients with the AA genotypes, although this is contradicted in one study. Other clinical and genetic factors may also influence.

More information:

Amitriptyline hydrochloride is a dibenzocycloheptene-derivative tricyclic antidepressant (TCA). TCAs are structurally similar to phenothiazines. They contain a tricyclic ring system with an alkyl amine substituent on the central ring. In non-depressed individuals, amitriptyline does not affect mood or arousal, but may cause sedation. In depressed individuals, amitriptyline exerts a positive effect on mood. TCAs are potent inhibitors of serotonin and norepinephrine reuptake. Tertiary amine TCAs, such as amitriptyline, are more potent inhibitors of serotonin reuptake than secondary amine TCAs, such as nortriptyline. TCAs also down-regulate cerebral cortical β-adrenergic receptors and sensitize post-synaptic serotonergic receptors with chronic use. The antidepressant effects of TCAs are thought to be due to an overall increase in serotonergic neurotransmission. TCAs also block histamine-H1 receptor**s, α1-adrenergic receptors and muscarinic receptors, which accounts for their sedative, hypotensive and anticholinergic effects (e.g. blurred vision, dry mouth, constipation, urinary retention), respectively.

What does your genetics say?

Patients with the GG genotype who are treated with amitriptyline may have increased metabolism of amitriptyline (decreased amitriptyline plasma concentrations and increased nortriptyline plasma concentrations) as compared to patients with the AA or AG genotype. Other genetic factors, including other CYP2C19 alleles *17 rs12248560 and *3 rs4986893, along with clinical factors, may also influence.

More information:

Antidepressants

It's thought that antidepressants work by increasing levels of a group of chemicals in the brain called neurotransmitters. Certain neurotransmitters, such as serotonin and noradrenaline, can improve mood and emotion, although this process isn't fully understood. Increasing levels of neurotransmitters can also disrupt pain signals sent by nerves, which may explain why some antidepressants can help relieve long-term pain.

What does your genetics say?

Patients with the TC genotype and Depressive Disorder or Depression may be less likely to respond to antidepressant treatment as compared to patients with the CC genotype. Other genetic and clinical factors may also influence a patient’s response to anti-depressants.

More information:

Aripiprazole, sold under the brand name Abilify among others, is an atypical antipsychotic. It is recommended and primarily used in the treatment of schizophrenia and bipolar disorder. Other uses include as an add-on treatment in major depressive disorder, tic disorders, and irritability associated with autism.

What does your genetics say?

Patients with schizophrenia, schizoaffective disorder, or autism spectrum disorder and genotype AC may have a decreased likelihood of weight gain and hypertriglyceridemia when taking amisulpride, aripiprazole, clozapine, olanzapine, haloperidol, paliperidone, quetiapine, ziprasidone, or risperidone as compared to patients with the AA genotypes, although this is contradicted in one study. Other clinical and genetic factors may also influence.

More information:

Bupropion

A unicyclic, aminoketone antidepressant. The mechanism of its therapeutic actions is not well understood, but it does appear to block dopamine uptake. The hydrochloride is available as an aid to smoking cessation treatment.

Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANKK1</td>
<td>rs1800497</td>
<td>GG</td>
</tr>
</tbody>
</table>

What does your genetics say?

Patients with the GG genotype who are treated with bupropion may be more likely to quit smoking as compared to patients with the AA or AG genotypes, although this has been contradicted in one study. Other genetic and clinical factors may also influence a patient’s chance for quitting smoking.

More information:


This report is not valid for clinical or diagnostic use.
Carbamazepine (CBZ), sold under the tradename Tegretol among others, is a medication used primarily in the treatment of epilepsy and neuropathic pain. It is not effective for absence seizures or myoclonic seizures. It is used in schizophrenia along with other medications and as a second line agent in bipolar disorder.

**Your genetic map**

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPHX1</td>
<td>rs2234922</td>
<td>AG</td>
</tr>
</tbody>
</table>

**What does your genetics say?**

Patients with the AG genotype may require an increased dose of carbamazepine as compared to patients with the AA genotype, although this is contradicted in one study. Other genetic and clinical factors may also influence dose of carbamazepine.

**More information:**

Citalopram (brand names: Celexa, Cipramil and others) is an antidepressant drug of the selective serotonin reuptake inhibitor (SSRI) class.

What does your genetics say?

Patients with the CC genotype may have decreased metabolism of citalopram or escitalopram as compared to patients with the TT or TC genotype. Other genetic factors, including other CYP2C19 alleles *2 rs4244285,*3 rs4986893, and clinical factors may also influence a patient's citalopram or escitalopram metabolism.

More information:

**Clomipramine**

Clomipramine, sold under the brand name Anafraniil among others, is a tricyclic antidepressant (TCA). It is used for the treatment of obsessive–compulsive disorder, panic disorder, major depressive disorder, and chronic pain. It may decrease the risk of suicide in those over the age of 65.

---

**What does your genetics say?**

Patients with the GG genotype may have an increased metabolism of clomipramine as compared to patients with the AG or AA genotype. Other genetic and clinical factors may also influence a patient’s clomipramine metabolism.

---

**More information:**


---

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYP2C19</td>
<td>rs4244285</td>
<td>GG</td>
</tr>
</tbody>
</table>
Clozapine is an atypical antipsychotic medication. It is mainly used for schizophrenia that does not improve following the use of other antipsychotic medications. In those with schizophrenia and schizoaffective disorder it may decrease the rate of suicidal behavior.

**What does your genetics say?**

Patients with the GG genotype may have decreased but not non-existent risk of side effects including hyperprolactinemia and weight gain, but increased risk of tardive dyskinesia, during treatment with antipsychotic drugs as compared to patients with the AA or AG genotype. Other genetic and clinical factors may also influence a patient's risk for side effects.

**More information:**

Escitalopram

Escitalopram, also known by the brand names Lexapro and Cipralex among others, is an antidepressant of the selective serotonin reuptake inhibitor (SSRI) class. It is approved by the U.S. Food and Drug Administration (FDA) for the treatment of adults and children over 12 years of age with major depressive disorder (MDD) or generalized anxiety disorder (GAD).

What does your genetics say?

Patients with the CC genotype may have decreased metabolism of citalopram or escitalopram as compared to patients with the TT or TC genotype. Other genetic factors, including other CYP2C19 alleles *2 rs4244285,*3 rs4986893, and clinical factors may also influence a patient's citalopram or escitalopram metabolism.

More information:

Haloperidol

Haloperidol, marketed under the trade name Haldol among others, is a typical antipsychotic medication. Haloperidol is used in the treatment of schizophrenia, tics in Tourette syndrome, mania in bipolar disorder, nausea and vomiting, delirium, acute psychosis, and hallucinations in alcohol withdrawal.

What does your genetics say?

Patients with schizophrenia, schizoaffective disorder, or autism spectrum disorder and genotype AC may have a decreased likelihood of weight gain and hypertriglyceridemia when taking amisulpride, aripiprazole, clozapine, olanzapine, haloperidol, paliperidone, quetiapine, ziprasidone, or risperidone as compared to patients with the AA genotypes, although this is contradicted in one study. Other clinical and genetic factors may also influence.

More information:

Olanzapine

Olanzapine (originally branded Zyprexa) is an antipsychotic medication used to treat schizophrenia and bipolar disorder. It is usually classed with the atypical antipsychotics, the newer generation of antipsychotics. It appears to have slightly greater effectiveness in treating schizophrenia (especially the negative symptoms) and a lower risk of causing movement disorders than typical antipsychotics.

What does your genetics say?

Patients with the GG genotype may have decreased but not non-existent risk of side effects including hyperprolactinemia and weight gain, but increased risk of tardive dyskinesia, during treatment with antipsychotic drugs as compared to patients with the AA or AG genotype. Other genetic and clinical factors may also influence a patient’s risk for side effects.

More information:


Pharmacogenomics: Neurology

Olanzapine

Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANKK1</td>
<td>rs1800497</td>
<td>GG</td>
</tr>
</tbody>
</table>

This report is not valid for clinical or diagnostic use.
Paliperidone

Paliperidone, sold under the trade name Invega among others, is a dopamine antagonist and 5-HT2A antagonist of the atypical antipsychotic class of medications. Invega is an extended release formulation of paliperidone that uses extended release system to allow for once-daily dosing.

What does your genetics say?

Patients with schizophrenia, schizoaffective disorder, or autism spectrum disorder and genotype AC may have a decreased likelihood of weight gain and hypertriglyceridemia when taking amisulpride, aripiprazole, clozapine, olanzapine, haloperidol, paliperidone, quetiapine, ziprasidone, or risperidone as compared to patients with the AA genotypes, although this is contradicted in one study. Other clinical and genetic factors may also influence.

More information:


Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC4R</td>
<td>rs489693</td>
<td>AC</td>
</tr>
</tbody>
</table>
Quetiapine

Quetiapine, marketed as Seroquel among others, is an atypical antipsychotic used for the treatment of schizophrenia, bipolar disorder, and major depressive disorder.

What does your genetics say?

Patients with schizophrenia, schizoaffective disorder, or autism spectrum disorder and genotype AC may have a decreased likelihood of weight gain and hypertriglyceridemia when taking amisulpride, aripiprazole, clozapine, olanzapine, haloperidol, paliperidone, quetiapine, ziprasidone, or risperidone as compared to patients with the AA genotypes, although this is contradicted in one study. Other clinical and genetic factors may also influence.

More information:


Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC4R</td>
<td>rs489693</td>
<td>AC</td>
</tr>
</tbody>
</table>

This report is not valid for clinical or diagnostic use.
Risperidone

Risperidone, sold under the trade name Risperdal among others, is an antipsychotic medication. It is mainly used to treat schizophrenia, bipolar disorder, and irritability in people with autism. It is taken either by mouth or by injection into a muscle.

What does your genetics say?

Patients with the TT genotype and schizophrenia who are treated with risperidone may be more likely to have improvement in symptoms as compared to patients with the CC genotype. Other genetic and clinical factors may also influence a patient’s response to risperidone.

More information:

Ziprasidone, sold under the brand name Geodon among others, is an atypical antipsychotic which is used for the treatment of schizophrenia as well as acute mania and mixed states associated with bipolar disorder.

What does your genetics say?

Patients with schizophrenia, schizoaffective disorder, or autism spectrum disorder and genotype AC may have a decreased likelihood of weight gain and hypertriglyceridemia when taking amisulpride, aripiprazole, clozapine, olanzapine, haloperidol, paliperidone, quetiapine, ziprasidone, or risperidone as compared to patients with the AA genotypes, although this is contradicted in one study. Other clinical and genetic factors may also influence.

More information:


This report is not valid for clinical or diagnostic use.
Pharmacogenomics: Pain

Alfentanil

Alfentanil (R-39209, trade name Alfenta, Rapifen in Australia) is a potent but short-acting synthetic opioid analgesic drug, used for anaesthesia in surgery.

What does your genetics say?

Individuals with AA genotype may experience increased efficacy of opioids for pain and opioid related drugs to treat addiction, and may require a decreased dose of opioids as compared to individuals with AG and GG genotypes. However this has been contradicted in some studies. In some studies, AA and AG genotypes were found to have a increased efficicy, and to require a decreased dose as compared to GG genotype. Other factors may influence.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/19605407
Aspirin

Aspirin, also known as acetylsalicylic acid (ASA), is a medication used to treat pain, fever, or inflammation. Specific inflammatory conditions in which aspirin is used include Kawasaki disease, pericarditis, and rheumatic fever. Aspirin is a nonsteroidal anti-inflammatory drug (NSAID) and works similar to other NSAIDs but also suppresses the normal functioning of platelets.

What does your genetics say?

Patients with the AA genotype who are treated with aspirin may have a decreased, but not absent, risk for non-response to aspirin as compared to patients with the AG or GG genotype. Other genetic and clinical factors may also influence a patient’s response to aspirin.

More information:

Buprenorphine

Buprenorphine, sold under the brand name Subutex, among others, is an opioid used to treat moderate acute pain and moderate chronic pain.

What does your genetics say?

Patients with the TC genotype may have decreased opioid analgesic requirements after surgery as compared to patients with the CC genotype. Other genetic and clinical factors may influence a patient’s opioid dose requirement.

More information:

Fentanyl

Fentanyl, also known as fentanil, is an opioid pain medication with a rapid onset and short duration of action.

What does your genetics say?

Patients with the TC genotype may have decreased opioid analgesic requirements after surgery as compared to patients with the CC genotype. Other genetic and clinical factors may influence a patient’s opioid dose requirement.

More information:

**Meperidine**

A narcotic analgesic that can be used for the relief of most types of moderate to severe pain, including postoperative pain and the pain of labor. Prolonged use may lead to dependence of the morphine type; withdrawal symptoms appear more rapidly than with morphine and are of shorter duration.

### Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREB1</td>
<td>rs2952768</td>
<td>TC</td>
</tr>
</tbody>
</table>

**What does your genetics say?**

Patients with the TC genotype may have decreased opioid analgesic requirements after surgery. Other genetic and clinical factors may influence.

**More information:**

Pharmacogenomics: Pain

Morphine

The principal alkaloid in opium and the prototype opiate analgesic and narcotic. Morphine has widespread effects in the central nervous system and on smooth muscle. In January, 2017, morphine was approved for the treatment of chronic pain.

What does your genetics say?

Patients with the TC genotype may have decreased opioid analgesic requirements after surgery as compared to patients with the CC genotype. Other genetic and clinical factors may influence a patient’s opioid dose requirement.

More information:


Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREB1</td>
<td>rs2952768</td>
<td>TC</td>
</tr>
</tbody>
</table>
Pharmacogenomics: Pain

Naltrexone

Naltrexone is a medication primarily used in the management of alcohol dependence and opioid dependence. Naltrexone is a pure opioid antagonist and works by blocking the activity of opioids.

What does your genetics say?

Individuals with the AA genotype may experience increased efficacy of opioids for pain and opioid related drugs to treat addiction, and may require a decreased dose of opioids as compared to individuals with the AG and GG genotypes. However this has been contradicted in some studies. In some studies, the AA and AG genotypes were found to have a increased efficacy, and to require a decreased dose as compared to the GG genotype. Other factors may also influence.

More information:

Pentazocine

The first mixed agonist-antagonist analgesic to be marketed. It is an agonist at the kappa and sigma opioid receptors and has a weak antagonist action at the mu receptor.

Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREB1</td>
<td>rs2952768</td>
<td>TC</td>
</tr>
</tbody>
</table>

What does your genetics say?

Patients with the TC genotype may have decreased opioid analgesic requirements after surgery as compared to patients with the CC genotype. Other genetic and clinical factors may influence a patient's opioid dose requirement.

More information:


This report is not valid for clinical or diagnostic use.
Tramadol, sold under the brand name Ultram among others, is an opioid pain medication used to treat moderate to moderately severe pain.

What does your genetics say?

Individuals with the AA genotype may experience increased efficacy of opioids and may require a decreased dose. However this has been contradicted in some studies. Other genetic and clinical factors may also influence.

More information:

Pharmacogenomics: Oncology

Cisplatin

Cisplatin is a chemotherapy medication used to treat a number of cancers. This includes testicular cancer, ovarian cancer, cervical cancer, breast cancer, bladder cancer, head and neck cancer, esophageal cancer, lung cancer, mesothelioma, brain tumors and neuroblastoma.

What does your genetics say?

Patients with the GG genotype may have an increased risk for toxicity with cisplatin treatment, including hearing loss and neutropenia, as compared to patients with the TT genotype. Other genetic and clinical factors may also influence a patient’s risk for toxicity.

More information:

Fluorouracil (5-FU), sold under the brand name Adrucil among others, is a medication used to treat cancer. By injection into a vein it is used for colon cancer, esophageal cancer, stomach cancer, pancreatic cancer, breast cancer, and cervical cancer. As a cream it is used for actinic keratosis and basal cell carcinoma.

It is a potent antimetabolite used in the treatment of cancer. It is a drug that blocks the methylation reaction of deoxyuridic acid to convert it into thymidylic acid by inhibiting an enzyme that is important for the synthesis of thymidine, which being part of the DNA molecule stops its formation. The drug is specific to the cell phase cycle, S phase. 5-Fluorouracil intervenes in the synthesis of DNA and inhibits to a small degree the formation of RNA. Both actions combine to promote a metabolic imbalance that results in cell death. The inhibitory activity of the drug, by its analogy with uracil, has an effect on the rapid growth of the neoplastic cells that preferentially take advantage of the uracil molecule for nucleic acid biosynthesis. The effects of a deprivation of DNA and RNA attack more cells that grow and multiply uncontrollably than normal.

What does your genetics say?

Patients TT genotype treated with fluoropyrimidine-based chemotherapy may have 1) increased clearance of the drug and 2) decreased, but not absent, risk and reduced severity of drug toxicity as compared to patients with the AT genotype. The combination (FOLFOX, FOLFIRI or FEC) and delivery of the drug may influence risk for toxicity. Other genetic and clinical factors may also influence.

More information:


This report is not valid for clinical or diagnostic use.
Irinotecan, sold under the brand name Camptosar among others, is a medication used to treat colon cancer and small cell lung cancer. For colon cancer it is used either alone or with fluorouracil. For small cell lung cancer it is used with cisplatin.

What does your genetics say?

Patients with the GG genotype with cancer who are treated with irinotecan-based regimens may have a decreased risk of neutropenia as compared to patients with the AA genotype. Other genetic and clinical factors may also influence a patient’s risk of neutropenia.

More information:

Mercaptopurine

Mercaptopurine (6-MP), sold under the brand name Purinethol among others, is a medication used for cancer and autoimmune diseases. Specifically it is used to treat acute lymphocytic leukemia (ALL), chronic myeloid leukemia (CML), Crohn’s disease, and ulcerative colitis. For ALL it is generally used with methotrexate.

What does your genetics say?

Patients with CC genotype who are treated with thiopurines for inflammatory bowel diseases (IBD) or acute lymphoblastic leukemia (ALL) may have a reduced, but not absent risk of developing leukopenia, neutropenia or alopecia as compared to TC or TT. Patients may also tolerate higher doses of thiopurines and be less likely to discontinue thiopurine treatment as compared to TC or TT, possibly due to the reduced risk for adverse effects. Other factors may influence.

More information:

Pharmacogenomics: Oncology

Methotrexate

An antineoplastic antimetabolite with immunosuppressant properties. It is an inhibitor of tetrahydrofolate dehydrogenase and prevents the formation of tetrahydrofolate, necessary for synthesis of thymidylate, an essential component of DNA.

What does your genetics say?

Patients with the GG genotype and leukemia or lymphoma who are treated with methotrexate:
1) may have better response to treatment
2) may be at decreased risk of toxicity
3) may require a higher dose of methotrexate, and
4) may be at lower risk of folate deficiency as compared to patients with the AA or AG genotype. This association has been contradicted or not found in multiple studies. Other genetic and clinical factors may also influence.

More information:


Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTHFR</td>
<td>rs1801133</td>
<td>GG</td>
</tr>
</tbody>
</table>

This report is not valid for clinical or diagnostic use.
Vincristine is an antitumor vinca alkaloid isolated from Vinca Rosea. It is marketed under several brand names, many of which have different formulations such as Marqibo (liposomal injection) and Vincasar. Vincristine is indicated for the treatment of acute leukaemia, malignant lymphoma, Hodgkin’s disease, acute erythraemia, and acute panmyelosis. Vincristine sulfate is often chosen as part of polychemotherapy because of lack of significant bone–marrow suppression (at recommended doses) and of unique clinical toxicity (neuropathy).

What does your genetics say?

Patients with the TT genotype may have increased risk of peripheral nervous system diseases when treated with vincristine may have as compared to patients with the CC or TC genotype. Other genetic and clinical factors may also influence a patient’s response to vincristine.

More information:


Your genetic map

<table>
<thead>
<tr>
<th>Gene</th>
<th>SNP</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOC1009</td>
<td>rs924607</td>
<td>TT</td>
</tr>
</tbody>
</table>

This report is not valid for clinical or diagnostic use.
Tacrolimus

Tacrolimus (also FK-506 or Fujimycin) is an immunosuppressive drug whose main use is after organ transplant to reduce the activity of the patient's immune system and so the risk of organ rejection. It is also used in a topical preparation in the treatment of severe atopic dermatitis, severe refractory uveitis after bone marrow transplants, and the skin condition vitiligo. It was discovered in 1984 from the fermentation broth of a Japanese soil sample that contained the bacteria Streptomyces tsukubaensis. Tacrolimus is chemically known as a macrolide. It reduces peptidyl-prolyl isomerase activity by binding to the immunophilin FKBP-12 (FK506 binding protein) creating a new complex. This FKBP12-FK506 complex interacts with and inhibits calcineurin thus inhibiting both T-lymphocyte signal transduction and IL-2 transcription.

What does your genetics say?

Transplant recipients with the TT (CYP3A4 genotype may require a decreased dose of tacrolimus as compared to patients with the TC or CC genotype. Other genetic and clinical factors, such as CYP3A5 (rs776746), may also influence a patient’s dose requirements.
Sildenafil is a vasoactive agent used to treat erectile dysfunction and reduce symptoms in patients with pulmonary arterial hypertension (PAH). Sildenafil elevates levels of the second messenger, cGMP, by inhibiting its breakdown via phosphodiesterase type 5 (PDE5). PDE5 is found in particularly high concentrations in the corpus cavernosum, erectile tissue of the penis. It is also found in the retina and vascular endothelium. Increased cGMP results in vasodilation which facilitates generation and maintenance of an erection.

What does your genetics say?

Patients with the CC genotype and erectile dysfunction who are treated with sildenafil may be less likely to have positive erectile response as compared to patients with the TT genotype. Other genetic and clinical factors may also influence a patient’s response to sildenafil.

More information:

24Genetics

24Genetics Europe HQ
Paseo de la Castellana, 95
Planta 15 A
Madrid 28046
Spain
+34 910 059 099

24Genetics USA HQ
8, Faneuil Hall Marketplace
3rd Floor
Boston 02109
Massachusetts - US
+1 (617) 861-2586

UK Cambridge
+44 1223 931143

24Genetics México
Paseo de la Reforma, 350
Planta 10
Col. Juárez
Ciudad de México 06600
México
+52 (55) 9171 2060

24Genetics.com