DNAhealthControl

Depression Sensor

Max Mustermann
DEMO_LOTH

novogenia

COVER LETTER

Dear Ms. Mustermann,

Your sample for the analysis arrived on in the laboratory and was evaluated according to the highest laboratory quality standards. The results were evaluated and released by two independent geneticists and molecular biologists. After obtaining the results, your personal report was compiled. We hereby convey the results to you in the format of your choice.

We would like to thank you for your trust and hope that you are satisfied with our service. We are always open to questions and suggestions. Please do not hesitate to contact us. We value your feedback. This is the only way we can continuously improve our services.

We hope the analysis meets your expectations.

Kind regards,

Dr. Daniel Wallerstorfer BSc.
Laboratory Director

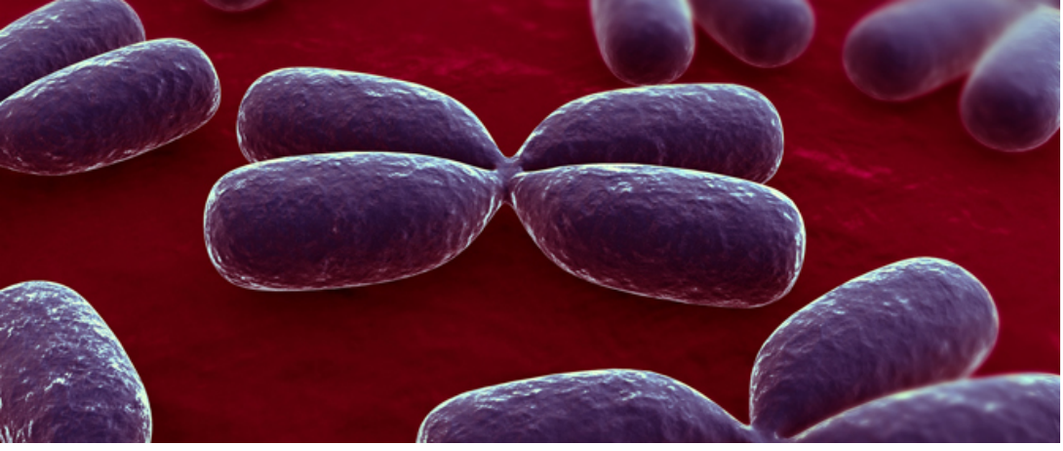
René Rohrmanstorfer, MSc.
Laboratory Manager

Depression Sensor

Personal analysis results for:
Max Mustermann | Date of birth: 01/01/1990

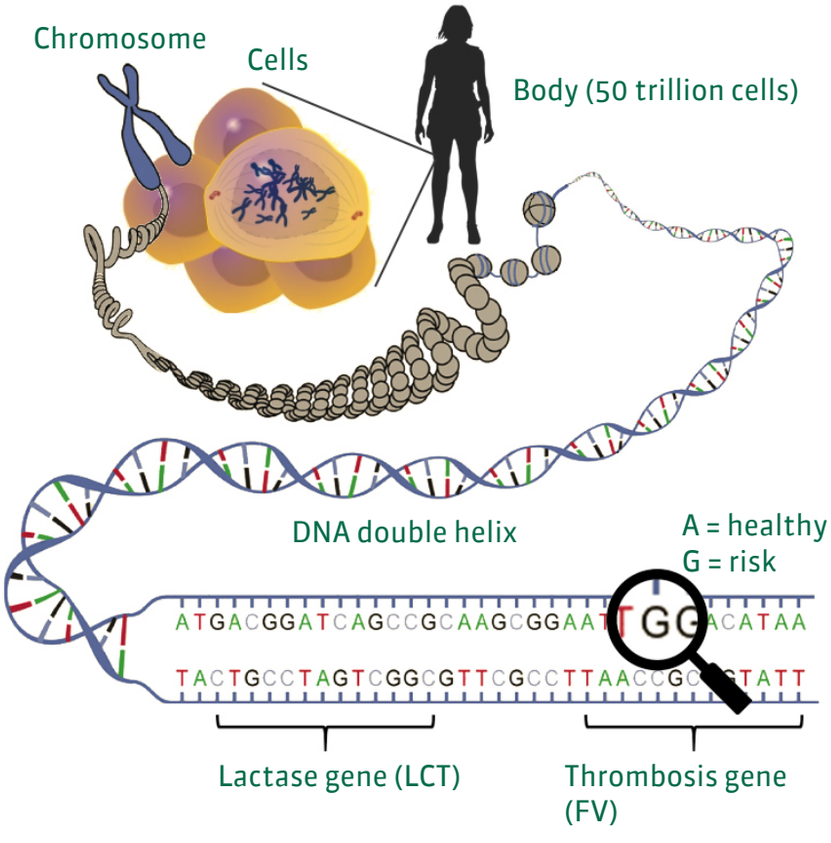
Order number:
DEMO_LOTH

This report contains personal medical information that is highly confidential. Data protection must be ensured.



How genes influence our health

The human body consists of about 50 trillion individual cells. Most of these cells have a nucleus, which contains 46 chromosomes. A chromosome consists of a very closely wound thread, the DNA "double helix."



DNA, the genetic code, is the blueprint of the human body. This genetic code consists of approximately 3.1 billion molecules, which are each represented by a letter. About 1% of this code makes up the genes. Each gene is an instruction for the body, usually with a single function. For example, some genes tell the body how to colour the iris and differences in these genes produce different eye colors. Every function of the body is controlled by one or more genes, including the way we break down food or medication.

Our genes are not completely error-free. The genes of each person are altered slightly by environmental effects. Most of these changes have no effect but a small number have a harmful effect. An even tinier number can produce a beneficial effect. Parents pass these changes, including defects, to their children. Thus most of our genetic defects are inherited from our parents.

In addition, our genes evolved to help us live in a completely different world, and some of our genetic traits can interact with our modern environment to create negative effects on the body. For example, the genetic predisposition to store dietary fat quickly and lose it slowly is beneficial for people who go through times when food is scarce: they have a better chance of surviving because their bodies use fat efficiently and store it for later. However, in the modern world, this trait is harmful because it programs the body to gain weight quickly and lose weight slowly. Genes increase our risk of heart attacks, trigger asthma and allergies, cause lactose

intolerance, and many other disorders.

Genetic traits can affect our health. While some genetic defects cause disease in all cases, most genetic traits just increase our risk of developing a disease. For example, a person may have genes that increase their risk for diabetes. However, not everyone at risk for diabetes actually develops the disease. Furthermore, even people with a high risk of diabetes can lower their risk with the right diet and exercise plan. Other genetic traits only cause illness when they are triggered by a specific environmental feature. For example, lactose intolerance is a genetic condition that causes a person who drinks milk to have digestive issues. A lactose-intolerant person who never drinks milk will not have any symptoms.

Thanks to the latest technologies, it is now possible to test specific genes to determine if you have genetic traits that are linked to various diseases. Based on the results of the analysis, we can develop a prevention program that significantly reduces your personal disease risk and helps you stay healthy.

A healthy lifestyle will decrease your risk of many diseases whether or not you have specific information about your genetic traits. However, we provide you with additional information that may point out other changes to your lifestyle that are not part of the standard medical advice. There are many examples, but one of the traits we test for is a gene that increases your body's ability to absorb iron. If you have this trait, you must not take iron supplements as the iron would accumulate and cause a life-threatening disease called haemochromatosis.

Experts estimate that every person carries about 2,000 genetic defects, which may affect their health, and in some cases, cause illnesses. A variety of factors can cause changes in our genes (also called mutations). In a few cases, these mutations can benefit us. However, the vast majority either have no effect or have a negative impact on our health. The best-known cause of mutations is radioactivity. Radioactive rays and particles actually impact the DNA in our cells and physically alter our genes. They mostly go unnoticed or cause deadly diseases, such as cancer, or congenital abnormality in newborns. Mutations are also caused by substances in burned food. The substances enter the cells and damage our genes, which can lead to colon cancer, among other forms of cancer. UV radiation from the sun can also damage our genes and cause diseases, such as skin cancer.

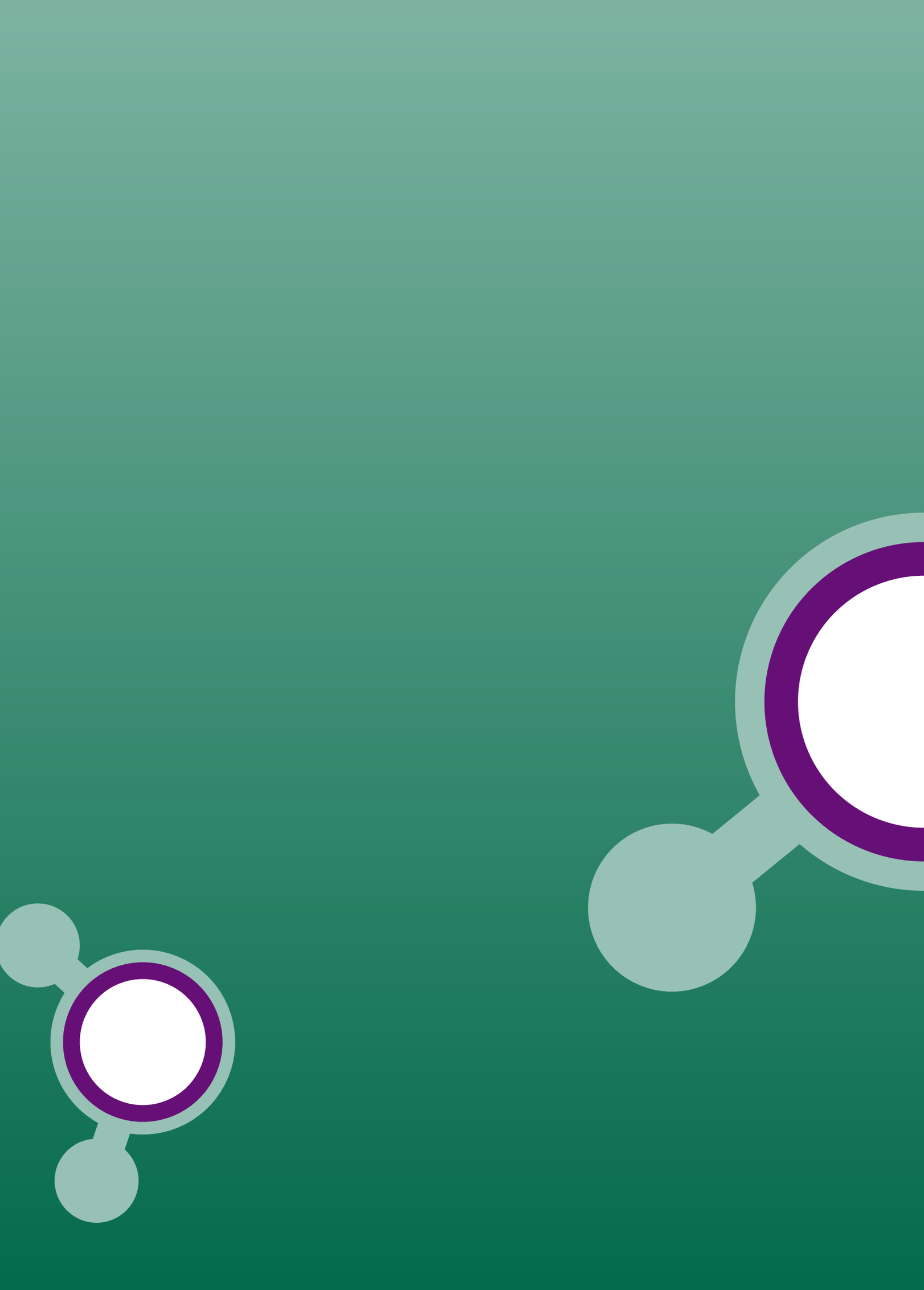
External influences can affect individual genes and disrupt their function, but the majority of our defective genes are inherited from our parents. Each embryo receives half of its genes from the father and half from the mother, resulting in a new human being with some characteristics of each parent. Whether a genetic defect is passed on, is determined randomly, and it may be that some of the children carry the defective gene and others do not.

Each person is the unique product of generations of accumulation and combination of different genetic traits. Some of those traits have negative effects on our health. With the latest technology, it is now finally possible to examine genes and determine personal health risks and strengths. In many cases, taking advantage of this knowledge, and following some precautionary measures, the diseases may be prevented. This is the next step in preventive medicine and a new generation of health care.

Action index

Discuss risks marked in orange or red with your doctor. All other results do not require any further attention assuming there are no current medical conditions.

Depression Sensor



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SCIENCE

ADDITIONAL INFORMATION

Depression Sensor

Effective prevention, risk assessment and treatment of depression

Depression (major depressive disorder)

Depression is one of the most common mental illnesses affecting around 7% of adults. It affects how people feel, think, sleep, eat, work and handle social activities and relationships. Depression comes in many different forms and may vary widely from patient to patient. Episodes can last from a few days to several years, can be triggered after pregnancy, can include psychosis and delusions or be seasonally triggered.

A number of genetic variations have been identified that increase the likelihood that a person will develop major depressive disorder. The disease is believed to be caused by a combination of genetic, environmental and psychological factors.

The following symptoms are common for depression and should be investigated by a specialist if they occur collectively and for an extended time:

- persistent feelings of sadness, anxiety or emptiness
- hopelessness or pessimism
- irritability
- feelings of guilt, worthlessness or helplessness
- loss of interest in hobbies
- fatigue
- slow movement or speech
- restlessness
- mental impairment in concentration, memory or decision-making
- difficulty falling asleep
- weight gain
- pains, headaches or digestive problems without obvious cause

Genes relevant to depression

Several genes and polymorphisms associated with a risk of developing depression have already been scientifically identified. An analysis of these polymorphisms reveals the disease risk, as well as other genetic characteristics relevant to this disease.

Genetic traits

SYMBOL	rs NCBI	POLYMORPH	GENOTYPE
BDNF	rs6265	G>A	G/G
BDNF	rs10835210	C>A	A/C
FKBP5	rs1360780	C>T	C/C
FKBP5	rs9470080	C>T	C/C
FKBP5	rs4713916	G>A	G/G
FKBP5	rs9296158	G>A	G/G
MTHFR	rs1801133	C>T	C/C
NR3C1	rs6198	A>G	A/A

LEGEND: SYMBOL = Name of investigated genetic variation, rsNCBI = description of investigated genetic variation, GENOTYPE = result.

Summary of effects

Here is a summary of the impact genetic variations have on your health:

- Your risk of developing depression is not higher than the population average

Risk of developing depression

LOW AVERAGE RISK HIGHER

Effects for sufferers only:

- No increased risk of developing chronic depression
- Normal response to antidepressants

Risk of developing chronic depression

NORMAL ELEVATED

Response to antidepressants

NORMAL BETTER

Prevention

Since people without any genetic predisposition can also develop depression, it is generally recommended to adhere to the following lifestyle recommendations to reduce the probability of developing the disease:

- EXERCISE: regular exercise improves and stabilizes your mood
- GOALS: set realistic goals in your private life and career
- SOCIAL CONTACT: be socially active and interact with people that are close to you and present a positive influence.
- AVOID ISOLATION: avoid isolation and maintain an active social life
- TIMING: if you're feeling low, postpone important decisions such as relationships, moving or career until you feel better.

Should you ever experience symptoms of depression, do not hesitate to contact a specialist for a proper diagnosis and treatment.

Treatment

Treatment is vitally important for people suffering from depression and can greatly improve the patient's quality of life. There are a number of treatments but not every treatment is equally effective for every individual. As someone who is suffering from depression, you should be under specialist medical supervision who can choose the right treatment for you.

Medication

There are a number of antidepressants that may be used to treat depression. Unfortunately, it usually takes 2 to 4 weeks for an antidepressant to show its effect. Side effects sometimes include symptoms such as sleep, appetite and concentration problems, which sometimes negatively impacts patient compliance. Should you experience any adverse effects from the medication you're taking, discuss this with your specialist, however, give the medication time before judging if the drug helps you or not.

Today we know more about how drugs are metabolized and how certain genetic variations can influence the side effects of medication. A genetic test can help to choose the right antidepressants in the correct dosage.

Psychotherapy

Psychological counseling and talk therapy can help people with depression. Talk to your specialist about the potential benefits of psychotherapy to better deal with symptoms.

Electroconvulsive therapy

This type of treatment uses electrical currents to stimulate the brain. The therapy is done under anaesthesia with a muscle relaxant and is painless for the patient. A number of studies have shown it to be effective in cases where acute treatment was required or where other

treatment methods have not shown to be effective. Should you wish to explore this therapy, talk to your specialist about the potential benefits of this treatment.

Drug compatibility

DRUGS	139	310	107	262	221	276	524	371	12
GENES	CYP2E1	CYP2D6	CYP2B6	CYP1A2	CYP2C19	CYP2C9	CYP3A4	CYP3A5	NAT2
DEGRADATION	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NONE	NORMAL	NORMAL	SLOW

Effect on relevant medication

	Effect	Breakdown	Dose
Agomelatine	✓	✓	✓
Amoxapine	✓	✓	✓
Buspirone	✓	↑	↑
Clobazam	✓	↑	↑
Clozapine	✓	✓	✓
Desvenlafaxine	✓	✓	✓
Duloxetine	✓	✓	✓
Fluvoxamine	✓	✓	✓
Imipramine	✓	✓	✓
Levetiracetam	✓	✓	✓
Mianserin	✓	✓	✓
Moclobemide	✓	✓	✓
Olanzapine	✓	✓	✓
Perphenazine	✓	✓	✓
Protriptyline	✓	✓	✓
Remoxipride	✓	✓	✓
Sertraline	✓	✓	✓

	Effect	Breakdown	Dose
Alprazolam	✓	↑	↑
Aripiprazole	✓	↑	✓
Chlorpromazine	✓	✓	✓
Clomipramine	↑	✓	✓
Cyclobenzaprine	✓	✓	✓
Diazepam	✓	↑	↑
Escitalopram	✓	↑	✓
Haloperidol	✓	↑	✓
Isocarboxazid	✓	✓	✓
Lithium	✓	✓	✓
Minaprine	✓	✓	✓
Nefazodone	✓	↑	↑
Paliperidone	✓	✓	✓
Phenelzine	✓	↑	↑
Quetiapine	✓	↑	↑
Risperidone	✓	✓	✓
Thioridazine	✓	✓	✓

	Effect	Breakdown	Dose
Amitriptyline	✓	✓	✓
Bupropion	✓	✓	✓
Citalopram	✓	↑	✓
Clonazepam	✓	↑	↑
Desipramine	✓	✓	✓
Doxepin	✓	✓	✓
Fluoxetine	✓	✗	✗
Iloperidone	✓	✓	✓
Lamotrigine	✓	✓	✓
Maprotiline	✓	✓	✓
Mirtazapine	✓	✓	✓
Nortriptyline	✓	✓	✓
Paroxetine	✓	✓	✓
Pimozide	✓	↑	↑
Reboxetine	✓	↑	↑
Selegiline	✓	✗	✗
Topiramate	✓	✓	✓

	Effect	Breakdown	Dose
Tranylcypromine	✓	✓	✓
Valproic Acid	✓	↓	↓
Ziprasidone	✓	↑	↑

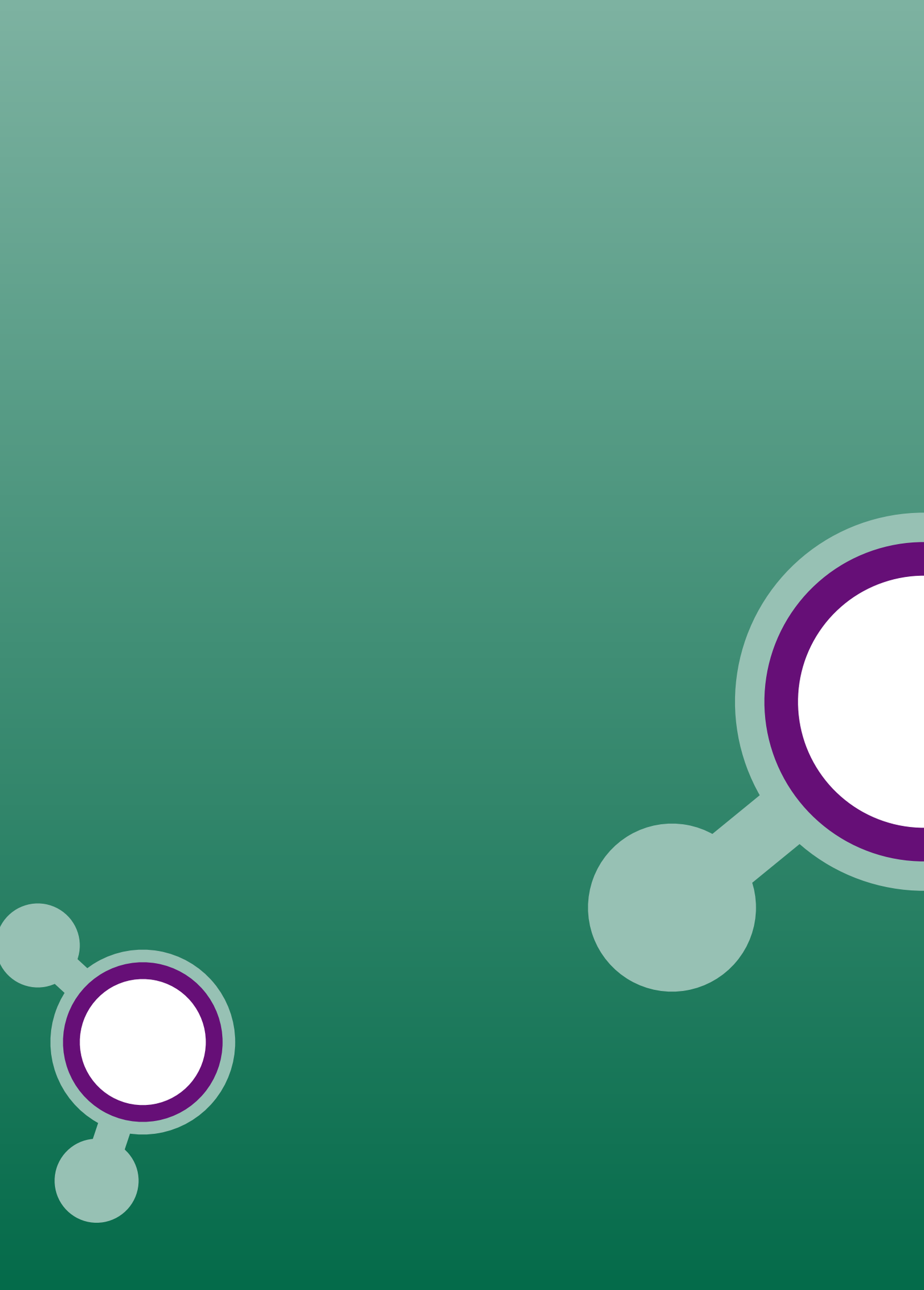
	Effect	Breakdown	Dose
Trazodone	✓	↑	↑
Venlafaxine	✓	✓	✓
Zuclopenthixol	✓	✓	✓

	Effect	Breakdown	Dose
Trimipramine	✓	✓	✓
Vilazodone	✓	✓	✓

Please note: The right choice and dose of medication is always the responsibility of the doctor. Never make your own decision on whether to stop taking a medication or changing its dose!

Legend:

- ✓ ✓ ✓ Effect: Normal. Degredation: Normal. Recommendation: Normal dosage.
- ✓ ↓ ↓ Effect: Normal. Degradation: Slower. Recommendation: Reduce the dosage.
- ✓ ✕ ✕ Effect: Normal. Degradation: None. Recommendation: Alternative drug.
- ↓ ✓ ✓ Effect: Lower. Degradation: Normal. Recommendation: Normal dosage.
- ↓ ↓ ↓ Effect: Lower. Breakdown: Lower. Recommendation: Reduce the dosage.
- ↑ ↑ ✓ Effect: Stronger. Degradation: Stronger. Recommendation: Normal dosage.



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SCIENCE

ADDITIONAL INFORMATION

SCIENCE

This chapter shows the science behind the test.

Depression

BDNF - Brain derived neurotrophic factor (rs6265)

The growth factor BDNF is a protein from the group of neurotrophins and is closely related to nerve growth factors. The protein acts on various neurons in the nervous system and is involved in the growth and protection of neurons and synapses. A deficiency or excess of BDNF is associated with, amongst others, various mental disorders.

RES	Genotype	POP	Possible results
	A/A	7%	Increased risk of depression Increased risk of chronic depression
	A/G	26%	Increased risk of depression Increased risk of chronic depression
X	G/G	67%	No increased risk of depression No increased risk of chronic depression

Pubmed-ID

32116853 / 30988377 / 26967918 / 27409526 / 26795846 / 26285129 / 24745471 / 23482723 / 21880305 / 20172611

BDNF - Brain derived neurotrophic factor (rs10835210)

The growth factor BDNF is a protein from the group of neurotrophins and is closely related to nerve growth factors. The protein acts on various neurons in the nervous system and is involved in the growth and protection of neurons and synapses. A deficiency or excess of BDNF is associated with, amongst others, various mental disorders.

RES	Genotype	POP	Possible results
	A/A	8%	Increased risk of depression Better response for antidepressants
X	A/C	33%	Increased risk of depression Better response for antidepressants
	C/C	59%	No increased risk of depression

Pubmed-ID

21300407 / 20193311

FKBP5 - FK506 binding protein 5 (rs1360780)

FK506 binding protein 5 plays a role in immunoregulation and basic cellular processes involving protein folding and trafficking. Genetic studies have identified a role for FK506 in post-traumatic stress disorder, depression and anxiety.

RES	Genotype	POP	Possible results
X	C/C	45%	No increased risk of depression Normal response to antidepressants
	C/T	44%	Increased risk of depression Better response to antidepressants
	T/T	1%	Increased risk of depression Better response to antidepressants

Pubmed-ID

32056869 / 28850857 / 27601205 / 26645208 / 25751398 / 24856550 / 23861224 / 20226536 / 18597649 / 15565110

FKBP5 - FK506 binding protein 5 (rs9470080)

FK506 binding protein 5 plays a role in immunoregulation and basic cellular processes involving protein folding and trafficking. Genetic studies have identified a role for FK506 in post-traumatic stress disorder, depression and anxiety.

RES	Genotype	POP	Possible results
X	C/C	40%	No increased risk of depression
	C/T	46%	Increased risk of depression Better response for antidepressants
	T/T	14%	Increased risk of depression Better response for antidepressants

Pubmed-ID

31927265 / 31510784 / 30711865 / 28850857 / 24856550 / 22459275 / 22134958 / 21316860

FKBP5 - FK506 binding protein 5 (rs4713916)

FK506 binding protein 5 plays a role in immunoregulation and basic cellular processes involving protein folding and trafficking. Genetic studies have identified a role for FK506 in post-traumatic stress disorder, depression and anxiety.

RES	Genotype	POP	Possible results
X	G/G	61%	No increased risk of depression
	A/G	33%	Increased risk of depression Better response to antidepressants
	A/A	6%	Increased risk of depression Better response to antidepressants

Pubmed-ID

33742763 / 30791339 / 24856550 / 23429203 / 20709156 / 18191112 / 15565110

FKBP5 - FK506 binding protein 5 (rs9296158)

FK506 binding protein 5 plays a role in immunoregulation and basic cellular processes involving protein folding and trafficking. Genetic studies have identified a role for FK506 in post-traumatic stress disorder, depression and anxiety.

RES	Genotype	POP	Possible results
X	G/G	41%	No increased risk of depression
	A/G	46%	Increased risk of depression Better response for antidepressants
	A/A	13%	Increased risk of depression Better response for antidepressants

Pubmed-ID

31510784 / 26100613 / 24856550 / 23429203 / 22459275 / 22134958

MTHFR - Methylenetetrahydrofolate reductase (NAD(P)H) (rs1801133)

The methylenetetrahydrofolate reductase (MTHFR) is involved in many metabolic pathways in the human body. In homocysteine metabolism, it is responsible for the degradation of homocysteine to methionine. The rs1801133 polymorphism leads to a reduced enzymatic activity of methylenetetrahydrofolate reductase, and thus to an increased homocysteine level.

RES	Genotype	POP	Possible results
X	G/G	59%	No increased risk of depression
	G/A	33%	Increased risk of depression Better response for antidepressants
	A/A	8%	Increased risk of depression Better response for antidepressants

Pubmed-ID

26681493 / 27478487 / 23900311 / 21185933 / 16402130 / 12796225

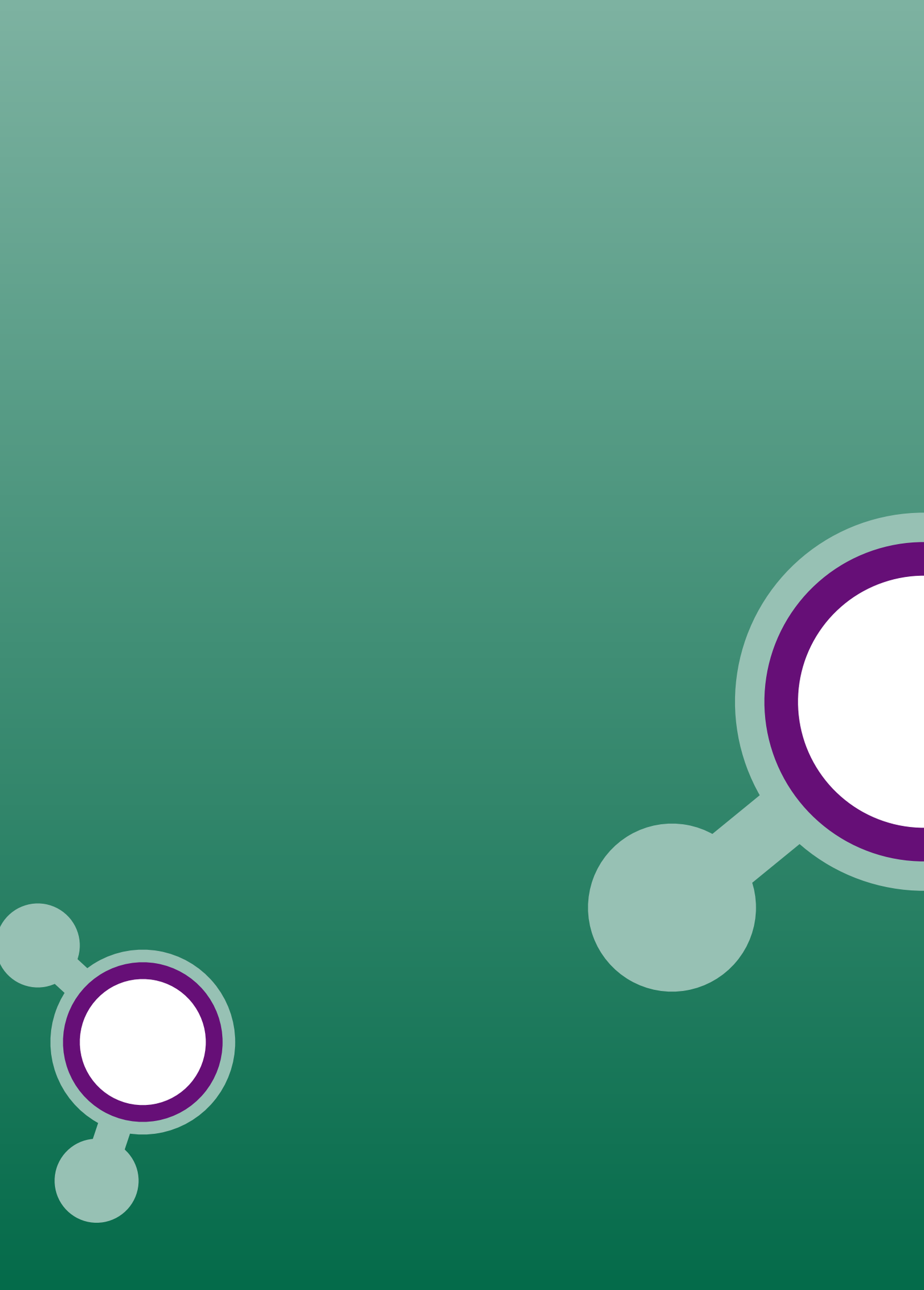
NR3C1 - nuclear receptor subfamily 3 group C member 1 (rs6198)

The glucocorticoid receptor (GR or GCR) also known as NR3C1 (nuclear receptor subfamily 3, group C, member 1) is the receptor to which cortisol and other glucocorticoids bind. It can function both as a transcription factor that binds to glucocorticoid response elements in the promoters of glucocorticoid responsive genes to activate their transcription, and as a regulator of other transcription factors.

RES	Genotype	POP	Possible results
X	A/A	85%	No increased risk of depression
	A/G	13%	Increased risk of depression Better response for antidepressants
	G/G	2%	Increased risk of depression Better response for antidepressants

Pubmed-ID
33562675 / 21764460 / 17716631

LEGEND: RES = your personal analysis result (marked with an X), GENOTYPE = different variations of the gene (called alleles),
POP = percent of the general population that have this genetic result,
POSSIBLE RESULTS = influence of the genetic variation.



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SCIENCE

ADDITIONAL INFORMATION

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In this chapter you will receive useful information

Customer Service

Questions or comments about our service?

Our customer service team is happy to help with any enquiries or problems. You can contact us in the following ways:

- service@novogenia.com

Our team is looking forward to your call. Customer satisfaction is our first priority. If you are not fully satisfied with our service, please let us know. We will do our best to help find a satisfactory solution to your problem.

Contact | Impressum
Novogenia GmbH
Strass 19
5301 Eugendorf, Österreich

Technical details

Order number
DEMO_LOTH

Date of birth
01/01/1990

Established analysis methods
qRT-PCR, DNA sequencing, fragment length analysis, CNV assay, GC-MS, Immunoassay, Cytolisa

Report generated
22/05/2023 17:03:44

Product codes
M5DEP

Current version
V538

Ordering company
Novogenia GmbH
Strass 19
5301 Eugendorf, Österreich

Analyzing company
DNA Plus - Zentrum für Humangenetik
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Laboratory Director

Dr. Daniel Wallerstorfer Bsc.

Laboratory Manager

René Rohrmanstorfer, MSc.

NOTES:


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DNAhealthControl

Depression Sensor

Max Mustermann
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