

Jane Doe
DOB: 1985-01-05

Sample ID: CL-4194-DM

Hello Jane,

Thank you for ordering your Kailos test for Pain Medication. Kailos Genetics is committed to making gene-based healthcare available to YOU. We're thankful for your business and we're here to help. If you have any questions, please contact a Kailos Test Consultant at 1-866-833-6865. You can also contact us through our website at www.KailosGenetics.com.

Your Kailos Test



You ordered the Kailos test for Pain Medication. Below, you will find your detailed results. Discuss these results with your doctor, who has also received a copy. Your doctor can help you understand how your body responds to pain medications so you can get the most from your treatment.

Possible Results

Many different genes contribute to how you respond to pain medications. Kailos looks very carefully at all of those genes in order to help you understand how you may respond to the following medicines:

NSAIDs	Opioids	Muscle Relaxants
Celebrex® (celecoxib)	Tylenol® #3 (codiene)	Soma® (carisoprodol)
Voltaren® (diclofenac)	Lortab® (hydrocodone)	Valium® (diazepam)
Cataflam® (diclofenac)	Vicodin® (hydrocodone)	
	Oxycontin® (oxycodone)	
	Percocet® (oxycodone)	
	Ultram® (tramadol)	

Your Results for Nonsteroidal Anti-Inflammatory Drugs(NSAIDs)

Your body uses Celebrex (celecoxib) & Cataflam (diclofenac) normally.

Your Results for Opioids

Possible Results

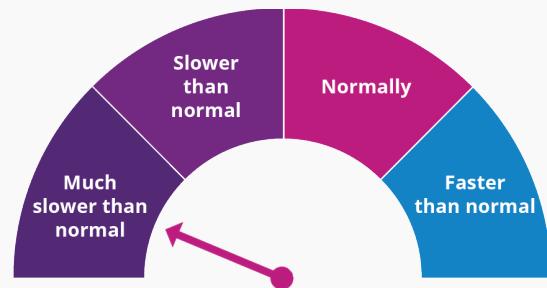
There are 4 different responses your body can have when you take NSAIDS. Your body may convert and use these drugs:

- Normally
- Faster than normal
- Slower than normal
- Much slower than normal

Your genes cause you to have 1 of these types of responses to these medicines. How quickly your body changes these drugs into their active forms may have an impact on your health.

Your Results

Your body uses codeine, oxycodone, hydrocodone and tramadol much slower than normal. This often results in you feeling little to no relief from pain.



Your Results for Muscle Relaxers

Your body processes Valium (diazepam) normally.

It is known that your body has a high rate of metabolism for Soma (carisoprodol) however these effects have not been well studied. No recommendations are available at this time.

Pain Medication and Your Health: Understanding Your Results

Special Considerations:



NSAIDs: There are no additional concerns.



Opioids: Your body uses codeine, oxycodone, hydrocodone & tramadol very slowly and this can lead to a lack of pain relief. To control your symptoms, your doctor may want you to take a different type of pain medication. Alternative medications include acetaminophen, NSAID and morphine (not tramadol or oxycodone).



Muscle Relaxers: There are no additional concerns.



Only a doctor can decide what pain medications are right for you. Don't stop, start, or change your medicine without talking to your doctor.

Your Genotype Revealed

Now that you know your results and what they mean, you may also want to know *your genotype* results: the actual forms of genes you have that makes your body break down and use Pain Medication the way it does. It's important to know this because children inherit genes from both their parents, and your parents, siblings, children, and other relatives may also have similar results as you. However, the only way to know if people in your family share the same results is for them to get tested.

Gene Summary

Gene	Your Genotype			More Information
CYP2D6	*4/*4			Poor Metabolizer
rs16947: G/G	rs5030655: A/A	rs5030865: C/C	rs28371696: C/C	
rs1135840: G/G	rs5030867: T/T	rs72549357: A/A	rs1135822: A/A	
rs35742686: T/T	rs5030865: C/C	rs28371706:	rs1135823: C/C	
rs1135824: T/T	rs5030656: CTT/CTT	rs59421388: C/C		
rs1065852: A/A	rs5030863:	rs769258: C/C		
rs3892097: T/T	rs5030862: C/C	rs28371725: C/C		
CYP2C9	*1/*1			Extensive Metabolizer
rs1799853: C/C	rs28371686: C/C	rs7900194: G/G		
rs1057910: A/A	rs9332131: A/A	rs28371685: C/C		
CYP2C19	*1/*17			Rapid Metabolizer
rs4244285: G/G	rs56337013: C/C	rs41291556: T/T	rs55640102: A/A	
rs4986893: G/G	rs72552267: G/G	rs17884712: G/G	rs12248560: C/T	
rs28399504: A/A	rs72558186: T/T	rs6413438: C/C		

You may choose to research more about your genotype results, but remember to always discuss your concerns with your doctor. If you would like to learn more about your genotype, you may find the following websites helpful*:

- **PharmGKB: The Pharmacogenomics Knowledgebase**

<https://www.pharmgkb.org/index.jsp>

The PharmGKB is an online library that includes information such as medicine dosing guidelines, drug labels, possible gene-drug associations, and genotype-phenotype relationships. This library is free and available to the public.

- **National Center for Biotechnology Information (NCBI): ClinVar**

<http://www.ncbi.nlm.nih.gov/clinvar>

The NCBI allows people to have access to ClinVar to learn more about their genetic health. ClinVar is a free, public library of information and reports about the relationships among human gene changes.

- **Johns Hopkins University: OMIM**

<http://www.omim.org/>

The Johns Hopkins-owned OMIM® tool is a free, online catalog of human genes and genetic disorders. People can search OMIM to learn about their genotypes and how those genotypes may physically appear or present themselves.

- **DrugBank**

<http://www.drugbank.com/>

DrugBank is a free, publicly available database that people can search to learn about specific medicines and how their genes and body may metabolize or react to them.

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***DISCLAIMER: These websites and are not controlled by, endorsed by, or affiliated with Kailos Genetics, Inc. The list is meant for informational purposes only and is not intended to replace your healthcare professional's medical advice. Ask your doctor or nurse any questions you may have about your results, treatment, or health.**

Legal Notices



This Kailos test can be used by your treating physicians to direct your medical care. That means this test was performed in a CLIA-certified genetic testing facility as follows:

Kailos Genetics CLIA facility (CLIA#: 01D2016114)

601 Genome Way, Suite 2005

Huntsville, AL 35806

CLIA Lab Manager & Supervisor: Michele R. Erickson-Johnson, PhD, MB (ASCP)CM

Medical Director: Ronald McGlennen, MD, FCAP, FACMG, ABMG

All tests designed and implemented by the Kailos Genetics team are of the highest possible quality. Your Kailos test has been validated and performed using quality laboratory processes:

- Primary methodology: Next Generation Sequencing (NGS) enriched by OD-PCR.
- Sequencing methodology: Patient samples and positive and negative controls are sequenced using a MiSeq (Illumina). Sequences are analyzed with Kailos Blue Software. The analysis utilizes the latest DNA alignment, base calling and variant reporting algorithms such as BWA and GATK. When needed, LR-PCR is utilized for confirmation of results.

Clinical Pharmacology & Therapeutics (2011) 89(3): 464-467.
Clinical Pharmacology & Therapeutics (2011) 89(5): 662-673.
Genome Research (2008) 18: 1844-1850.
Clinical Pharmacology & Therapeutics (2012) 92(4):414-417.

This report is intended for research and educational purposes only. This statement has not been evaluated by the Food and Drug Administration and is not intended to diagnose, treat, cure or prevent any disease.

For Your Physician



This report has been designed to explain how your genes can affect your health and treatment. You should not stop taking your medication or change your dosage. Instead, talk with your doctor about the report findings. Kailos Genetics has created a detailed report for your doctor, who can access it using the information on your patient card. If you do not have your patient card when you visit your doctor, he or she can access the detailed report by visiting: <https://www.kailosgenetics.com/provider>.

Take Control of Your Health



Now that you've received your results for your Kailos test for Pain Medication you may be interested in other tests Kailos Genetics has to offer. Also, remember that your family members can share similar genes. The only way to know for sure how their bodies use certain medications is to get tested. Existing Kailos customers may qualify for discounts on other tests — speak with a Kailos Test Consultant at 1-866-833-6865 to learn how.

Available tests to help you take control of your health include:

STOMACH ACID REDUCERS

Millions of people take medicines like Prevacid® (lansoprazole), Prilosec® (omeprazole), and Protonix® (pantoprazole)—known as proton pump inhibitors—to treat conditions caused by too much stomach acid. These medicines don't work the same way for everyone and some people can't seem to find relief from their symptoms. That's why it's important to find out how your body uses stomach acid reducers.

If you are currently using or about to start using a proton pump inhibitor, the Kailos test can tell you if you may need a higher dose of the medicine to get the relief you need. Visit www.KailosGenetics.com/acid-reducers to learn about and order the Kailos test for proton pump inhibitors.

BIRTH CONTROL PILLS

Some women have genes that increase their risk of certain types of blood clots. Birth control pills, commonly prescribed to women for preventing pregnancy, carry a slight risk of blood clots (deep vein thrombosis) for any woman who takes them. But for some women, this risk increases. That's why it's important to learn how birth control pills work in your body.

If you or a female family member is currently using or about to start using birth control pills, the Kailos test can tell you if you may be at risk for life-threatening blood clots. Visit www.KailosGenetics.com/birth-control to learn about and order the Kailos test for birth control pills and deep vein thrombosis.

 **TAMOXIFEN**

Some women have a changed form of a gene that won't allow their bodies get the full benefit of tamoxifen. Also known as Nolvadex® or Soltamox®, tamoxifen is used to prevent the return (recurrence) of ER+ breast cancer, a common type of breast cancer. Unfortunately, it's not rare for a breast cancer patient to have a changed form of this gene—putting them at risk of recurring ER+ cancer and earlier death, as well as side effects like deep vein thrombosis. That's why it's important for you to learn what genes you have and how your body uses tamoxifen.

If you are currently using or about to start using tamoxifen, the Kailos test can tell you if you will benefit from taking tamoxifen and if you may be at higher risk of life-threatening blood clots. Visit www.KailosGenetics.com/tamoxifen to learn about and order the Kailos test for tamoxifen.

 **PLAVIX® (CLOPIDOGREL)**

Plavix is taken to help prevent heart attacks, strokes, and certain types of serious blood clots (thrombosis). It is also used to reduce the symptoms of severe chest pain (angina). However, it's important to know that Plavix doesn't work well for everyone. More than 3 out of 10 people taking Plavix have the gene that prevents it from working the way it should. That can put you at serious risk for heart attack, stroke, or other complications. That's why it's important to find out if you have the gene that changes how Plavix works in your body.

If you are currently using or about to start using Plavix (clopidogrel), the Kailos test can tell you if you will benefit from taking Plavix. It can also tell you if you are at risk of complications from Plavix treatment, such as bleeding or cardiovascular events. Visit www.KailosGenetics.com/plavix to learn about and order the Kailos test for Plavix (clopidogrel).

A horizontal header bar with a light blue background. On the left side, there is a small graphic consisting of a blue triangle pointing right and a pink triangle pointing left, overlapping each other. To the right of this graphic, the word "ANTIDEPRESSANTS" is written in a bold, black, sans-serif font.

ANTIDEPRESSANTS

Many people struggle to find an antidepressant that works for them. Antidepressants are one of the most commonly prescribed medicines, with about 30 million Americans taking them each year for depression, anxiety, and other conditions. There are many different types of antidepressants, yet you may struggle to find an antidepressant that works for you. The reason might be because you have certain genes that break down and use these medicines differently.

If your doctor prescribes an antidepressant, or if they haven't worked for you in the past, it's important to learn how your body uses antidepressants so you can find one at a dose that works for you.

The Kailos test can help you understand what medicines you may respond to best and if you need to take more or less of those medicines in order to get symptom relief. Visit www.KailosGenetics.com/antidepressants to learn about and order the Kailos test for antidepressants.