23andMe Pharmacogenetics Reports: What you should know

Pharmacogenetics reports tell you about DNA variants that may influence your body's ability to process some medications. For each medication, reports provide information about certain DNA variants that can affect how well specific drug-metabolizing enzymes work.

Having a variant means that your body may process certain medications faster or slower than normal, but most medications aren't be affected by having a variant.

Both genetic and non-genetic factors influence how well your body processes medications. For example, age, weight, liver and kidney function, and other behaviors can all have an impact. It's also possible to have other DNA variants not included in these reports that can affect how your body processes medications.

Talk to a healthcare professional about how DNA variants may influence your ability to process medications. These reports should not be used to make medical decisions, and results should be confirmed in a clinical setting with independent genetic testing before taking any medical action. Do not use these reports to start, stop, or change any course of treatment.

What to know about Pharmacogenetics reports

Possible test results

Variant(s) not detected
This do not have the variant(s) we tested. Keep in mind you may still have other DNA variant(s) not included in this test that could affect how you process some medications.

Variant(s) detected
You have one or more of the variant(s) we tested. The variant(s) may affect how your body processes certain medications. However, since many factors impact how medications are processed, the detected variant(s) may have no noticeable effect.

Result not determined
Your test result could not be determined. This can be caused by random test error or other factors that interfere with the test.

In very rare cases, we may not be able to interpret your genetic result. Talk to a healthcare professional to learn more about how DNA variants may influence your body's ability to process medications.

In some cases, the laboratory may not be able to process your sample. If this happens, we will notify you by email and you may request one free replacement kit.

Other companies offering pharmacogenetic tests may include different DNA variants. This means that it's possible to get different results using a test from a different company.

What to do with the test results

Do not use your results to start, stop, or change any course of treatment.

Talk to a healthcare professional about how DNA variants may influence your ability to process medications, or if you are concerned about your results.

Pharmacogenetic reports are intended to provide you with information that can inform conversations with a healthcare professional. These reports should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Important Warnings and Limitations

Do not use your results to start, stop, or change any course of treatment. Medications should always be taken as directed. Making changes on your own can lead to harmful side effects or reduce the intended benefits of the medication.

Keep in mind that Pharmacogenetic reports

- **Do not** replace discussions with a healthcare professional about the best course of treatment for you and cannot determine whether a medication is indicated for you.
- **Do not** determine how you would respond to a particular medication and do not provide information on associations between specific DNA variants and specific medications.
- **Do not** diagnose any health conditions or tell you anything about your risk of developing any disease or condition.

Results from these tests should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Frequently Asked Questions: Pharmacogenetics reports

What is pharmacogenetics?
Pharmacogenetics is the study of how genes and genetic variants may affect the processing of medications in the body. The term "pharmacogenetics" is sometimes used interchangeably with the term "pharmacogenomics."

What should I do if I'm taking any medication?
You should not use this result to start, stop, or change any course of treatment. Medications should always be taken as directed. Making changes on your own can increase the chance of experiencing harmful side effects or reduce intended benefits of the medication.

If you have questions or concerns about your result, talk to a healthcare professional, such as a doctor or a pharmacist, about the medication(s) you are taking.

Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

What are the advantages of sharing my results with a healthcare professional?
A healthcare professional can help you learn more about how DNA variants may impact the processing of some medications, or if you have concerns about your results. Your healthcare provider could consider both genetic and non-genetic factors when choosing an appropriate course of treatment.

Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Do not use this result to start, stop, or change any course of treatment. Medications should always be taken as directed. Making changes on your own can increase the chance of experiencing harmful side effects or reduce intended benefits of the medication.

You can print a summary of all your Pharmacogenetic reports to share with a healthcare professional.

If you have questions about your results or how they might affect you or your family, a genetic counselor may be able to help. Learn more about genetic counseling: http://aboutgeneticcounselors.com.

What are some non-genetic factors that can affect how the body processes medications?
Both genetic and non-genetic factors affect how the body processes medications.

Non-genetic factors that may influence how the body processes medications include age, body weight, having certain health conditions, treatment adherence, and interactions among different medications or dietary supplements that you may be taking. Learn more about other factors.

What to know about: CYP2C19 Drug Metabolism

The CYP2C19 enzyme, often pronounced "sip-2-see-19", helps the body process (or "metabolize") certain medications. Specific DNA variants can affect how well the CYP2C19 enzyme works.

About this report
This report tests for DNA variants in the CYP2C19 gene that can affect the function of the CYP2C19 enzyme.
Altered CYP2C19 enzyme function may impact how well the body processes certain medications.

Non-genetic factors can also affect how your body processes medications
- Age
- Weight
- Liver and kidney function
- Other medications and dietary supplements
- How well you follow instructions for use, which includes taking the right dose at the right time for the full course of treatment

What do we test?
- We test three variants in the CYP2C19 gene: *2 (c.681G>A), *3 (c.636G>A), and *17 (c.-806C>T).

What do we do?
- We test for two variants in the CYP2C19 gene: *2A (c.1905+1G>A) and DYPW1 (c.2846A>T).
- We do not test for all possible DNA variants that may affect the function of the CYP2C19 enzyme.

Warnings and Limitations
- Do not use your results to start, stop, or change any course of treatment.
- This test does not provide information on associations between specific DNA variants and any specific medications.
- This test does not account for lifestyle or other health factors that may affect individual metabolism of medications.
- Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Test performance summary
- Accuracy was determined by comparing results from this test with results from sequencing. Greater than 99% of test results were correct. While unlikely, this test may provide false positive or false negative results. For more details on the analytical performance of this test, refer to the package insert.
https://www.23andme.com/package-insert/pgx

Frequently Asked Questions: CYP2C19 Drug Metabolism

What does this test do?
This test looks for three DNA variants in the CYP2C19 gene: *2 (c.681G>A), *3 (c.636G>A), and *17 (c.-806C>T). These variants are associated with altered CYP2C19 enzyme function.

What does this test not do?
This test does not diagnose any health conditions, determine drug response, provide medical advice, or determine whether a medication is indicated for you.

This test does not provide information on associations between variants detected and any specific medications.

This test does not include all possible DNA variants that may affect the function of the CYP2C19 enzyme or other proteins involved in the processing of medications.

This test does not account for lifestyle or other health factors that may affect your body's ability to process medications.

Do not use this result to start, stop, or change any course of treatment. Medications should always be taken as directed. Making changes on your own can increase the chance of experiencing harmful side effects or reduce intended benefits of the medication.

Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

What to know about: DPYD Drug Metabolism

The DPYD gene provides instructions for making the DPD enzyme, which helps process (or "metabolize") certain medications. Specific variants in the DPYD gene can affect how well this enzyme works.

About this report
This report tests for DNA variants in the DPYD gene that can affect the function of the DPD enzyme. Altered DPD enzyme function may impact how well the body processes certain medications.

Non-genetic factors can also affect how your body processes medications
- Age
- Weight
- Liver and kidney function
- Other medications and dietary supplements
- How well you follow instructions for use, which includes taking the right dose at the right time for the full course of treatment

What do we test?
- We test for two variants in the DPYD gene: *2A (c.1905+1G>A) and DYPW1(c.2846A>T).
- We do not test for all possible DNA variants that may affect the function of the DPD enzyme.

Warnings and Limitations
- Do not use your results to start, stop, or change any course of treatment.
- This test does not provide information on associations between specific DNA variants and any specific medications.
- This test does not account for lifestyle or other health factors that may affect individual metabolism of medications.
- Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Test performance summary
- Accuracy was determined by comparing results from this test with results from sequencing. Greater than 99% of test results were correct. While unlikely, this test may provide false positive or false negative results. For more details on the analytical performance of this test, refer to the package insert.
https://www.23andme.com/package-insert/pgx

Frequently Asked Questions: DPYD Drug Metabolism

What does this test do?
This test looks for two DNA variants in the DPYD gene: *2A (c.1905+1G>A) and DYPW1 (c.2846A>T). These variants are associated with reduced DPD enzyme function.

What does this test not do?
This test does not diagnose any health conditions, determine drug response, provide medical advice, or determine whether a medication is indicated for you.

This test does not provide information on associations between variants detected and any specific medications.

This test does not include all possible DNA variants that may affect the function of the DPD enzyme or other proteins involved in the processing of medications.

This test does not account for lifestyle or other health factors that may affect your body's ability to process medications.

Do not use this result to start, stop, or change any course of treatment. Medications should always be taken as directed. Making changes on your own can increase the chance of experiencing harmful side effects or reduce intended benefits of the medication.

Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

What to know about: SLCO1B1 Drug Transport

The SLCO1B1 protein helps transport certain medications from the blood into the liver, where they are processed for removal from the body. Specific DNA variants can affect how well this transporter protein works.

About this report
This report tests for a DNA variant in the SLCO1B1 gene that can affect the function of the SLCO1B1 transporter protein. Altered SLCO1B1 transporter function may impact how well the body processes certain medications.

Non-genetic factors can also affect how your body processes medications
- Age
- Weight
- Liver and kidney function
- Other medications and dietary supplements
- How well you follow instructions for use, which includes taking the right dose at the right time for the full course of treatment

What do we test?
- We test for one variant in the SLCO1B1 gene: c.521T>C (found in the *5, *15, and *17 haplotypes).
- We do not test for all possible DNA variants that may affect the function of the SLCO1B1 transporter protein.

Warnings and Limitations
- Do not use your results to start, stop, or change any course of treatment.
- This test does not provide information on associations between specific DNA variants and any specific medications.
- Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Test performance summary
- Accuracy was determined by comparing results from this test with results from sequencing. Greater than 99% of test results were correct. While unlikely, this test may provide false positive or false negative results. For more details on the analytical performance of this test, refer to the package insert.
https://www.23andme.com/package-insert/pgx

Frequently Asked Questions: SLCO1B1 Drug Transport

What does this test do?
This test looks for one DNA variant in the SLCO1B1 gene: c.521T>C (found in the *5, *15, and *17 haplotypes). This variant is associated with reduced SLCO1B1 transporter protein function.

This test provides information about how this specific DNA variant may affect the function of the SLCO1B1 transporter protein.

What does this test not do?
This test does not diagnose any health conditions, determine drug response, provide medical advice, or determine whether a medication is indicated for you.

This test does not provide information on associations between a variant detected and any specific medications.

This test does not include all possible DNA variants that may affect the function of the SLCO1B1 transporter protein or other proteins involved in the processing of medications.

This test does not account for lifestyle or other health factors that may affect your body's ability to process medications.

Do not use this result to start, stop, or change any course of treatment. Medications should always be taken as directed. Making changes on your own can increase the chance experiencing harmful side effects or reduce intended benefits of the medication.

Results from this test should not be used to make medical decisions. Results should be confirmed in a clinical setting with independent genetic testing before taking any medical action.

Why doesn't this report include example of medications processed by SLCO1B1?
The Food and Drug Administration (FDA) has not authorized the inclusion of specific medication information in the SLCO1B1 Drug Transport report. However, there are some medications that are processed in part by the SLCO1B1 transporter protein. You can print a summary of all your Pharmacogenetic reports to share with a healthcare professional, who can help you better understand your genetic result and the processing of some medications by SLCO1B1.