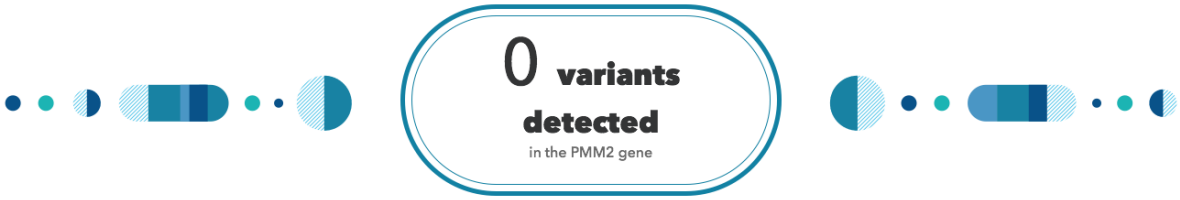
Congenital Disorder of Glycosylation Type 1a (PMM2-CDG)

PMM2-CDG is a rare genetic disorder that affects the nervous system and other parts of the body. It is characterized by developmental delay, muscle weakness, and failure to gain weight. A person must have two variants in the PMM2 gene in order to have this condition.

Erin, you **do not have the variants** we tested.

You could still have a variant not covered by this test.



How To Use This Test

This test does not diagnose any health conditions.

Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

Review the Carrier Status tutorial

See Scientific Details

Intended Uses

- Tests for **multiple variants** in the PMM2 gene.
- To identify carrier status for PMM2-CDG.

Limitations

- Does **not test** for all possible variants for the condition.
- Does **not report** if someone has two copies of a tested variant.
- Does **not cover** other subtypes of CDG.

Important Ethnicities

- This test is most relevant for people of **Danish** descent.
- This test does **not** include a large fraction of PMM2 variants that cause PMM2-CDG in people of Dutch descent.

You are likely not a carrier.

This result is relevant for you because you have **Danish** ancestry.

We ruled out the most common variants for PMM2-CDG in people of Danish descent.

You still have a chance of being a carrier for PMM2-CDG.

You may still have up to a **1 in 450 chance** of carrying a variant not covered by this test.

See Scientific Details

About Congenital Disorder of Glycosylation Type 1a (PMM2-CDG)

Also known as: Carbohydrate-Deficient Glycoprotein Syndrome Type 1a, Jaeken Syndrome, Phosphomannomutase 2 Deficiency, CDG1a

When symptoms develop

Symptoms typically develop in infancy.

How it's treated

There is currently no known cure. Treatment focuses on nutritional, occupational, speech, and physical therapy.

Typical signs and symptoms

- Developmental delay
- Muscle weakness
- Failure to gain weight
- Small head size and distinct facial features

Ethnicities most affected

This condition is most common in people of European descent, particularly of Danish and Dutch descent.

Read more at

Genetics Home Reference

GeneReviews

National Organization for Rare Disorders

Consider talking to a healthcare professional if you are concerned about your results.

If you're starting a family, a genetic counselor can help you and your partner understand if additional testing might be appropriate.

Connect with a GC

Share your results with a healthcare professional.

Print report

Learn more about this condition and connect with support groups.

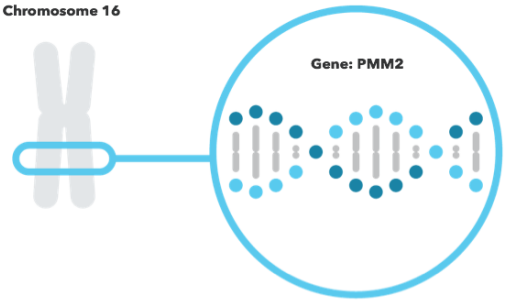
Learn more

PMM2-CDG is caused by variants in the PMM2 gene.

PMM2

The PMM2 gene contains instructions for making an enzyme called phosphomannomutase (PMM). PMM plays a role in the process of attaching sugar molecules to proteins. This modification is necessary for the stability and proper function of many proteins. Certain variants in the PMM2 gene lead to lower activity of the PMM enzyme.

Read more at Genetics Home Reference



You have no variants detected by this test.

Variants Detected	View All Tested Markers
0	2

Marker Tested	Your Genotype*		Additional Information
R141H Gene: PMM2 Marker: i5012680	**G** Typical copy from one of your parents	**G** Typical copy from your other parent	> **Biological explanation** > **Typical vs. variant DNA sequence(s)** > **Percent of 23andMe customers with variant** > **References** [2 , 3 , 4 , 8] | ClinVar
F119L Gene: PMM2 Marker: i5012679	**C** Typical copy from one of your parents	**C** Typical copy from your other parent	> **Biological explanation** > **Typical vs. variant DNA sequence(s)** > **Percent of 23andMe customers with variant** > **References** [1 , 2 , 4 , 5] | ClinVar

*This test cannot distinguish which copy you received from which parent. This test also cannot determine whether multiple variants, if detected, were inherited from only one parent or from both parents. This may impact how these variants are passed down.

23andMe always reports genotypes based on the 'positive' strand of the human genome reference sequence (build 37). Other sources sometimes report genotypes using the opposite strand.

Test Interpretation

This report provides an estimate of the chances of still being a carrier for people who do not have the variant(s) tested. This is known as the **post-test carrier risk** .

Post-test carrier risk is based on the average chance of being a carrier for a given ethnicity and the carrier detection rate of the test for a given ethnicity.

View technical article on estimating post-test carrier risk.

Post-Test Carrier Risk

This report provides an estimate of the post-test carrier risk for people of Danish and Dutch descent only.

- For people with partial ethnicity from one or more groups mentioned above, post-test carrier risk depends on the exact mixture in the person's background.
- Post-test risk for other ethnicities cannot be provided because sufficient data is not available.

Post-test carrier risk for relevant ethnicities

Danish	1 in 450	[6]
Dutch	1 in 137	[6]

Test Details

Indications for Use

The 23andMe PGS Carrier Status Test for Congenital Disorder of Glycosylation Type 1a (PMM2-CDG) is indicated for the detection of two variants in the PMM2 gene. This test is intended to be used to determine carrier status for PMM2-CDG in adults, but cannot determine if a person has two copies of a tested variant. The test is most relevant for people of Danish descent.

Special Considerations

- Severity of symptoms can vary in people with this disorder, even when the same variants are involved.
- There are currently no professional guidelines in the U.S. for carrier testing for this condition.

Test Performance Summary

Carrier Detection Rate & Relevant Ethnicities

The "carrier detection rate" is an estimate of the percentage of carriers for this condition that would be identified by this test. Carrier detection rate differs by ethnicity and is provided only where sufficient data is available.

Danish	89%	[6]
Dutch	55%	[6]

Analytical Performance

Accuracy was determined by comparing results from this test with results from sequencing for 100 samples with known variant status. 100 out of 100 genotype results were correct. Fewer than 1 in 100,000 samples may receive a **Not Determined** result for one or more variants included in this test. This can be caused by random test error or unexpected DNA sequences that interfere with the test. It can also be caused by having two copies of a variant tested.

Warnings and Limitations

- This test does not cover all variants that could cause this condition.*
- This test does not diagnose any health conditions.
- Positive results in individuals whose ethnicities are not commonly associated with this condition may be incorrect. Individuals in this situation should consider genetic counseling and follow-up testing.
- Share results with your healthcare professional for any medical purposes.
- If you are concerned about your results, consult with a healthcare professional.

See the Package Insert for more details on use and performance of this test.

* Variants not included in this test may be very rare, may not be available on our genotyping platform, or may not pass our testing standards.

References

1. Andreotti G et al. (2013). "Biochemical phenotype of a common disease-causing mutation and a possible therapeutic approach for the phosphomannomutase 2-associated disorder of glycosylation." Mol Genet Genomic Med. 1(1):32-44.
2. Bjursell C et al. (2000). "PMM2 mutation spectrum, including 10 novel mutations, in a large CDG type 1A family material with a focus on Scandinavian families." Hum Mutat. 16(5):395-400.
3. Kjaergaard S et al. (1998). "Absence of homozygosity for predominant mutations in PMM2 in Danish patients with carbohydrate-deficient glycoprotein syndrome type 1." Eur J Hum Genet. 6(4):331-6.
4. Kjaergaard S et al. (2001). "Congenital disorder of glycosylation type Ia (CDG-Ia): phenotypic spectrum of the R141H/F119L genotype." Arch Dis Child. 85(3):236-9.
5. Matthijs G et al. (2000). "Mutations in PMM2 that cause congenital disorders of glycosylation, type Ia (CDG-Ia)." Hum Mutat. 16(5):386-94.
6. Schollen E et al. (2000). "Lack of Hardy-Weinberg equilibrium for the most prevalent PMM2 mutation in CDG-Ia (congenital disorders of glycosylation type Ia)." Eur J Hum Genet. 8(5):367-71.
7. Sparks SE et al. (1993). "PMM2-CDG (*CDG-Ia*)"
8. Vega AI et al. (2011). "Expression analysis revealing destabilizing mutations in phosphomannomutase 2 deficiency (PMM2-CDG): expression analysis of PMM2-CDG mutations." J Inherit Metab Dis. 34(4):929-39.