

# Lactose Intolerance

Almost everyone is born with the ability to digest dairy products. But most people lose that ability as they age, becoming lactose intolerant.

Overview Scientific Details

Jamie, based on your genetics, you are **not likely** to be lactose intolerant.

Your genetic result suggests that you are able to eat or drink dairy without experiencing digestive problems.



➔ Tell us whether you experience lactose intolerance



## What you can do

If you do experience indigestion when you consume dairy products, consider speaking with a healthcare professional to determine whether your symptoms may be caused by lactose intolerance or another condition.

## Genetics and Lactose Intolerance



### What does it mean to be lactose intolerant?

Dairy products like milk, yogurt, and cheese contain a type of sugar called lactose. Although dairy is a staple of many diets, at least 70% of adults worldwide have trouble digesting lactose.

The severity of lactose intolerance varies from person to person — some people can drink a full glass of milk without experiencing indigestion, while other people will feel uncomfortable after just a bite of cheese. Also, some people's personal experience does not match their genetic result. This is because other factors — including your diet, your digestive system, other genetic variants, and other health conditions — can impact whether you experience symptoms of lactose intolerance.

### Approximate lactose content per serving

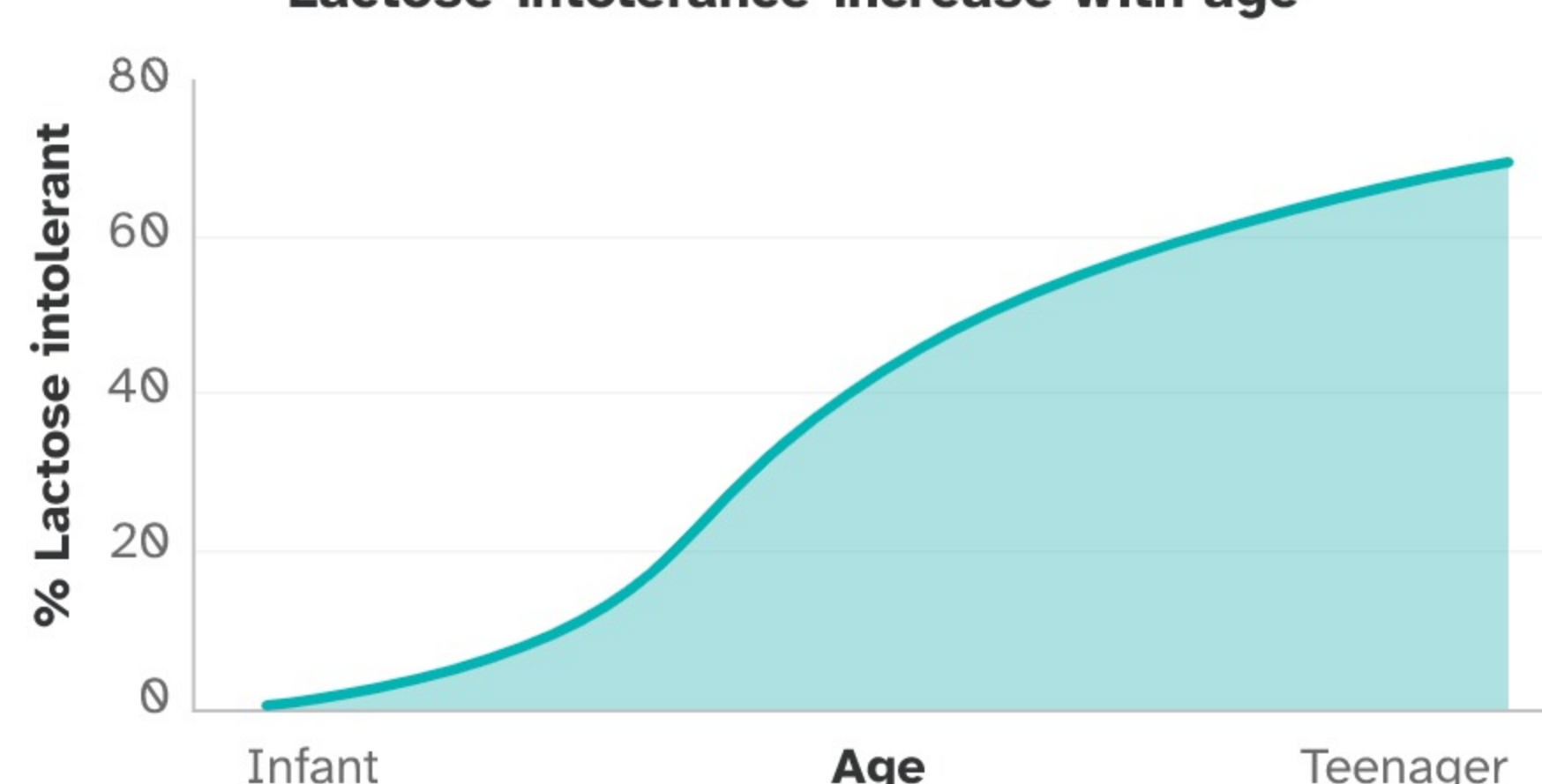
Milk <b>15 g</b> 1 cup	Yogurt <b>6 g</b> 1/2 cup	Butter <b>&lt;0.1 g</b> 1 tbsp	Cheesecake <b>3.4 g</b> 3.5 oz
Cheddar cheese <b>&lt; 0.1 g</b> 1 oz	Ice Cream <b>4 g</b> 1/2 cup	Whipped Cream <b>0.1 g</b> 1 tbsp	Cottage Cheese <b>2.3 g</b> 1/2 cup



### Growing out of milk

Just about everybody is born with the ability to digest lactose, and this allows babies to live and grow by drinking their mothers' milk. But as children grow older and begin to eat different foods, many of them lose that ability. People become lactose intolerant because their bodies stop producing lactase, the enzyme that digests lactose. The ability to continue producing lactase after childhood has evolved multiple times in different populations across the world, whenever a group of people depended on milk and dairy products as important sources of nutrition.

### Lactose intolerance increase with age



### Can people who are lactose intolerant eat cheese?

Not all cheese is created equal — some kinds of cheese contain almost no lactose! Here are a few tips for choosing low-lactose cheeses:

- **Check the label.** Lactose is a kind of sugar. If the nutrition label says a cheese has 0 grams of sugar, then it has very little lactose (according to current FDA standards, less than half a gram per serving).
- **Age is your friend.** Because aging cheese lowers its lactose content, aged cheese (like cheddar) is likely to be low in lactose.
- **Beware of processed products.** Processed cheese products or cheese spreads often have relatively high lactose content because of lactose added during processing.

**Choosing low-lactose cheeses**

Check the label.

Age is your friend.

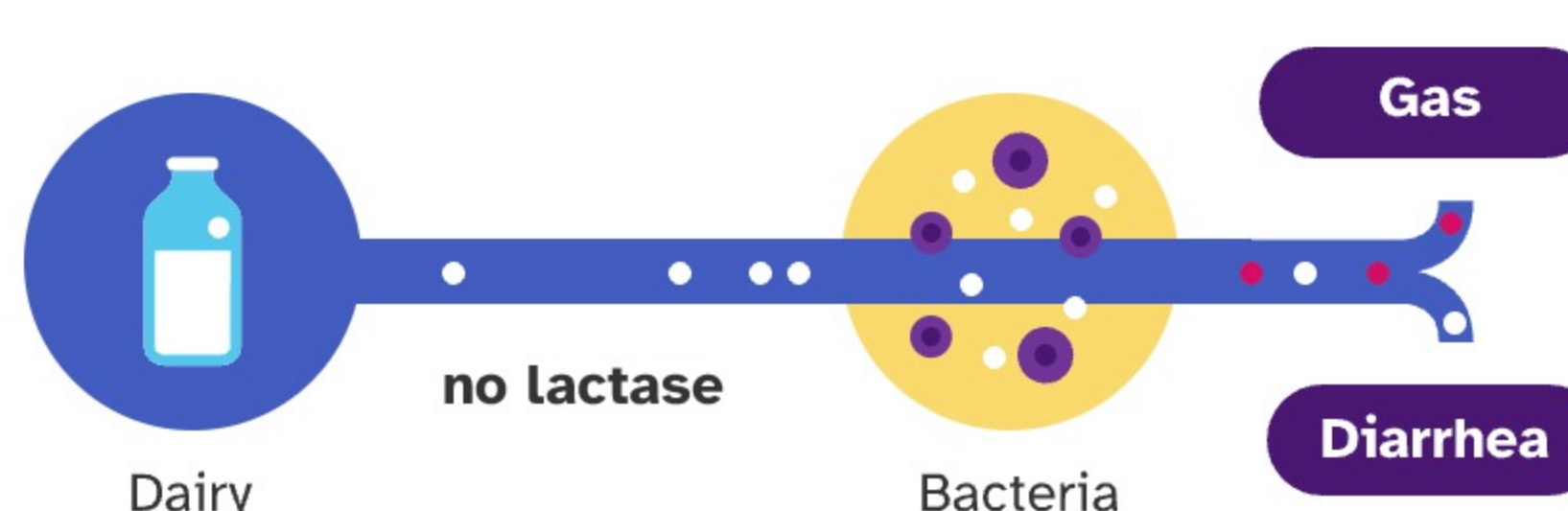
Beware of processed products.



### Digestion and indigestion

People can blame most symptoms of lactose intolerance on the bacteria that live in our intestines. A healthy digestive system is home to trillions of bacteria, which help to digest the food we eat. But when a person who doesn't produce lactase eats or drinks dairy products, intestinal bacteria will start digesting the lactose instead, producing gases that lead to bloating, abdominal pain, and flatulence. Undigested lactose can also lead to diarrhea.

### Digestion with lactose intolerance



### Evolution in action

Your DNA determines whether you can produce lactase after childhood, a trait known as "lactase persistence." Research suggests that ancient humans were lactose intolerant, and different genetic variants associated with lactase persistence evolved at different times in different parts of the world. This report is based on a genetic variant associated with lactase persistence that evolved in Europe within the last 20,000 years.

	Genetic result	What it means
	<b>GG</b>	Likely lactose intolerant
	<b>AG</b>	Likely not lactose intolerant
<b>You</b>	<b>AA</b>	<b>Likely not lactose intolerant</b>

See the percentage of customers with these results



**This report does not diagnose any health conditions or provide medical advice.** Consult with a healthcare professional before making any major lifestyle changes or if you have any other concerns about your results.

## Keep exploring your Wellness results.



### Contribute

Help advance scientific knowledge by participating in research.



### Compare

Compare your results to your family and friends.

Did you find this interesting?

Yes

No



Give the gift of DNA discovery.

Gift a kit

Refer friends, earn rewards.

Get reward

#### ANCESTRY

- Ancestry Overview
- All Ancestry Reports
- Ancestry Composition
- DNA Relatives
- Order Your DNA Book

#### HEALTH & TRAITS

- Health & Traits Overview
- All Health & Traits Reports
- My Health Action Plan
- Health Predisposition
- Pharmacogenetics
- Carrier Status
- Wellness
- Traits

#### RESEARCH

- Research Overview
- Surveys and Studies
- Edit Answers
- Publications

#### FAMILY & FRIENDS

- View all DNA Relatives
- Family Tree
- Your Connections
- GrandTree
- Advanced DNA Comparison

# Lactose Intolerance

Almost everyone is born with the ability to digest dairy products. But most people lose that ability as they age, becoming lactose intolerant.

Overview **Scientific Details**

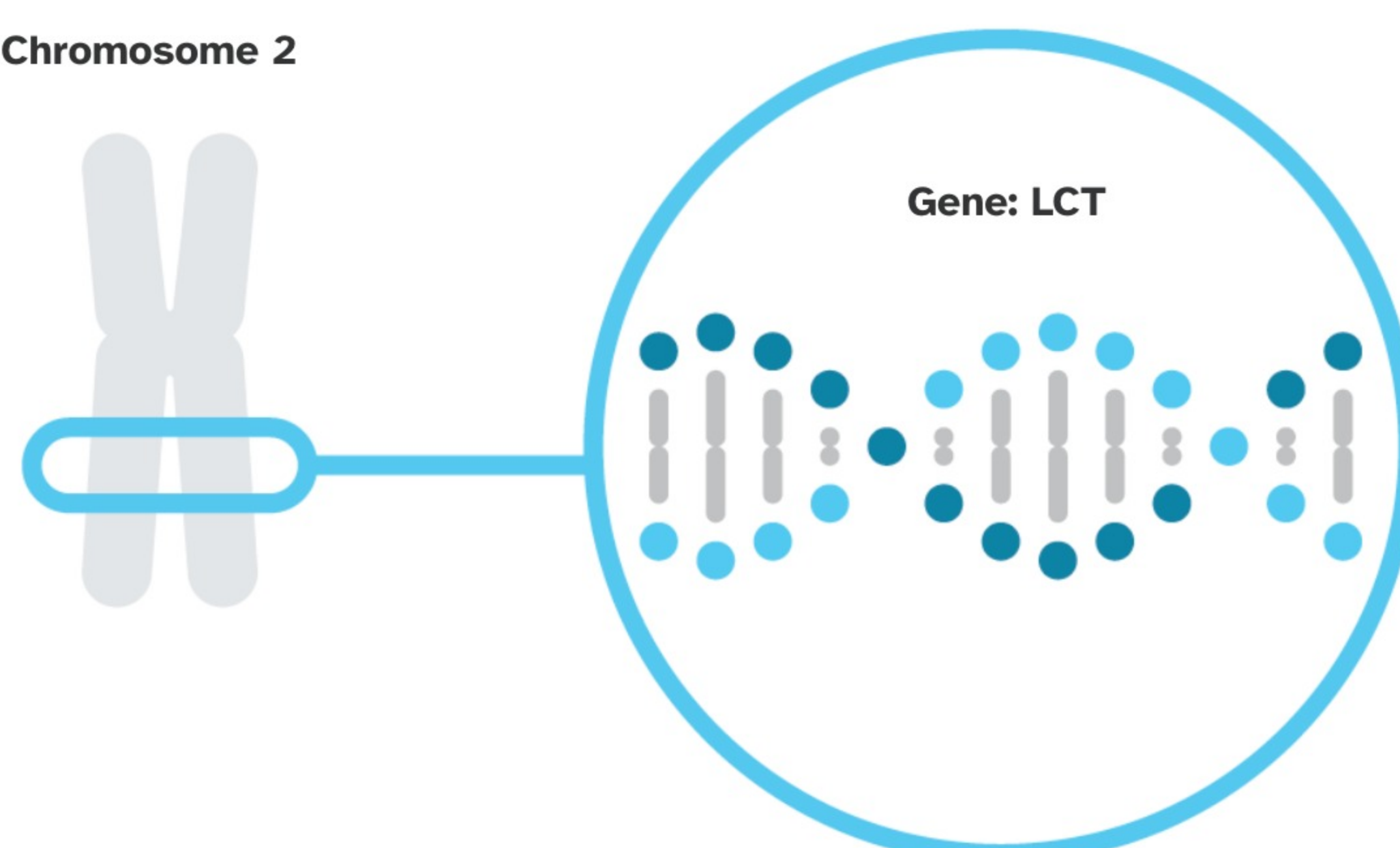
Lactose intolerance is influenced by a genetic marker near the LCT gene.

## LCT

The LCT gene contains instructions for making an enzyme called lactase. This enzyme is made by the digestive system to help break down lactose found in dairy products. If lactase levels in the intestines are low, eating or drinking dairy products can lead to symptoms of lactose intolerance.

Read more at [Genetics Home Reference](#)


### Chromosome 2



You have two copies of the A variant.

Variants Detected

View All Tested Markers

Marker Tested	Your Genotype*	Additional Information
<b>C/T-13910</b> Gene: Near LCT Marker: <b>rs4988235</b>	<b>A</b> Typical copy from one of your parents 	<b>A</b> Typical copy from your other parent <ul style="list-style-type: none"> <li>✓ <b>Biological explanation</b></li> <li>✓ <b>Typical vs. variant DNA sequence(s)</b></li> <li>✓ <b>Percent of 23andMe customers with variant</b></li> <li>✓ <b>References [ 2, 6, 14 ]   ClinVar</b></li> </ul>

\*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.

## References

1. [Cooper GS et al. \(1995\). "Measurement of lactose consumption reliability and comparison of two methods." Ann Epidemiol. 5\(6\):473-7.](#)
2. [Enattah NS et al. \(2002\). "Identification of a variant associated with adult-type hypolactasia." Nat Genet. 30\(2\):233-7.](#)
3. [Heyman MB et al. \(2006\). "Lactose intolerance in infants, children, and adolescents." Pediatrics. 118\(3\):1279-86.](#)
4. [Ingram CJ et al. \(2009\). "Multiple rare variants as a cause of a common phenotype: several different lactase persistence associated alleles in a single ethnic group." J Mol Evol. 69\(6\):579-88.](#)
5. [Kindstedt PS. \(2013\). "The Basics of Cheesemaking." Microbiol Spectr. 1\(1\).](#)
6. [Lewinsky RH et al. \(2005\). "T-13910 DNA variant associated with lactase persistence interacts with Oct-1 and stimulates lactase promoter activity in vitro." Hum Mol Genet. 14\(24\):3945-53.](#)
7. [Lomer MC et al. \(2008\). "Review article: lactose intolerance in clinical practice--myths and realities." Aliment Pharmacol Ther. 27\(2\):93-103.](#)
8. [Mattar R et al. \(2012\). "Lactose intolerance: diagnosis, genetic, and clinical factors." Clin Exp Gastroenterol. 5:113-21.](#)
9. [McSweeney PLH. \(2004\). "Biochemistry of cheese ripening." Int J Dairy Technol. 57\(2/3\).](#)
10. [Mulcare CA et al. \(2004\). "The T allele of a single-nucleotide polymorphism 13.9 kb upstream of the lactase gene \(LCT\) \(C-13.9kbT\) does not predict or cause the lactase-persistence phenotype in Africans." Am J Hum Genet. 74\(6\):1102-10.](#)

See all references

## Change Log

Your report may occasionally be updated based on new information. This Change Log describes updates and revisions to this report.

Date	Change
<b>May 4, 2017</b>	Lactose Intolerance report updated with revised content and design.
<b>Oct. 21, 2015</b>	Lactose Intolerance report created.



Give the gift of DNA discovery.

Gift a kit

Refer friends, earn rewards.

Get reward

### ANCESTRY

- Ancestry Overview
- All Ancestry Reports
- Ancestry Composition
- DNA Relatives
- Order Your DNA Book

### HEALTH & TRAITS

- Health & Traits Overview
- All Health & Traits Reports
- My Health Action Plan
- Health Predisposition
- Pharmacogenetics
- Carrier Status
- Wellness
- Traits

### RESEARCH

- Research Overview
- Surveys and Studies
- Edit Answers
- Publications

### FAMILY & FRIENDS

- View all DNA Relatives
- Family Tree
- Your Connections
- GrandTree
- Advanced DNA Comparison