

Red Hair

Overview

Scientific Details



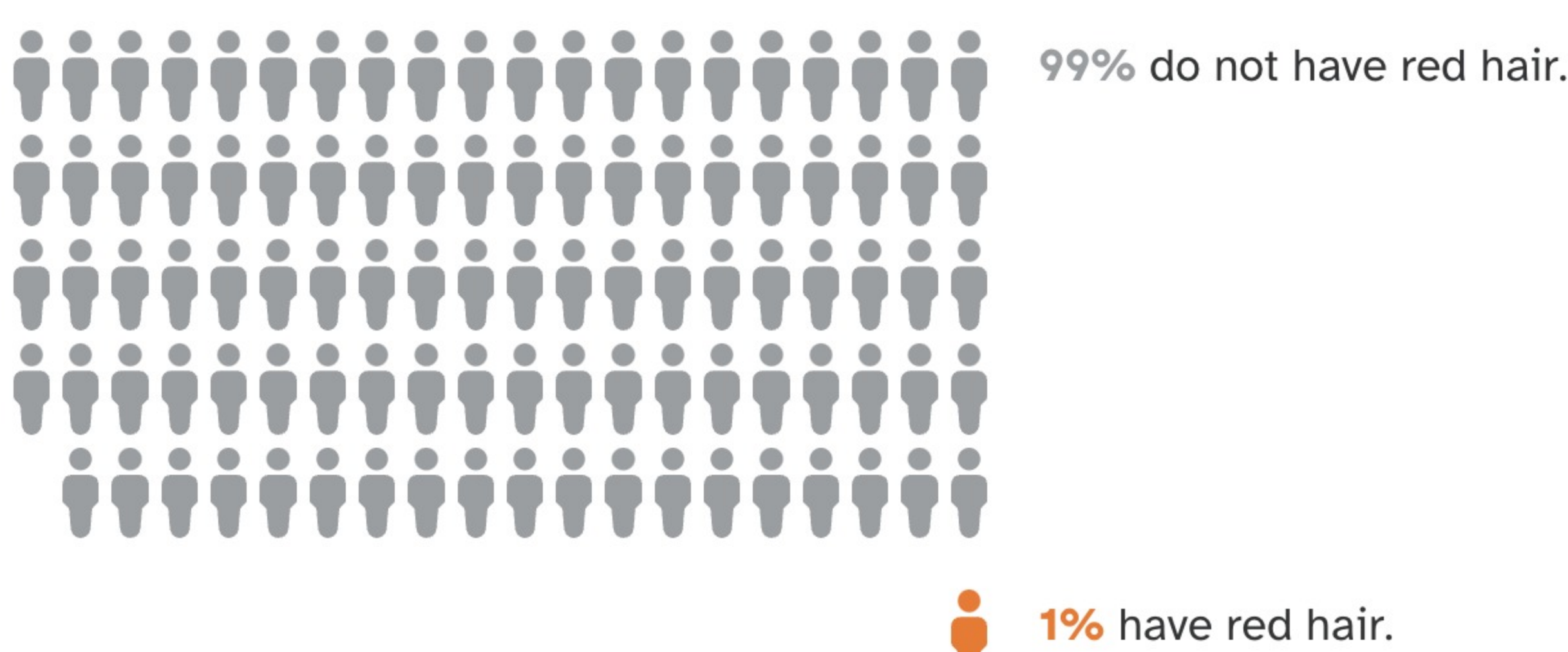
Redheads in ancient history

The red hair variants in this report likely first appeared in ancient humans ~30,000-80,000 years ago, around the time of early migrations out of Africa.



Jamie, your genetics make you unlikely to have red hair.

Of 23andMe research participants with genetics like yours:

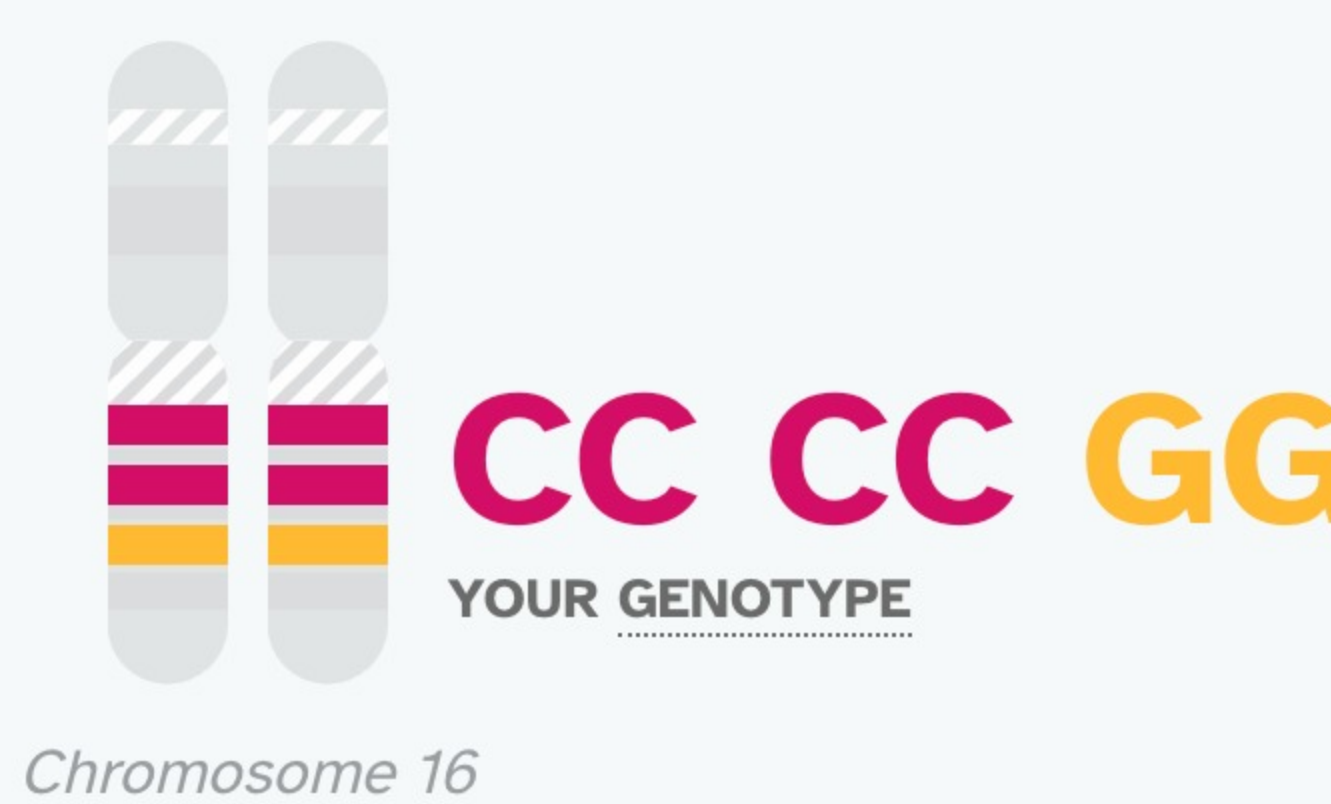


Blond, brown, and black hair aren't included in this report because they are determined by different genetic factors. Keep reading to learn more.

Do you have red hair?

How did we calculate your result?

We looked at three places in your DNA (genetic markers) that affect your chances of having red hair. Your combination of variants at these markers is usually found in people who don't have red hair.

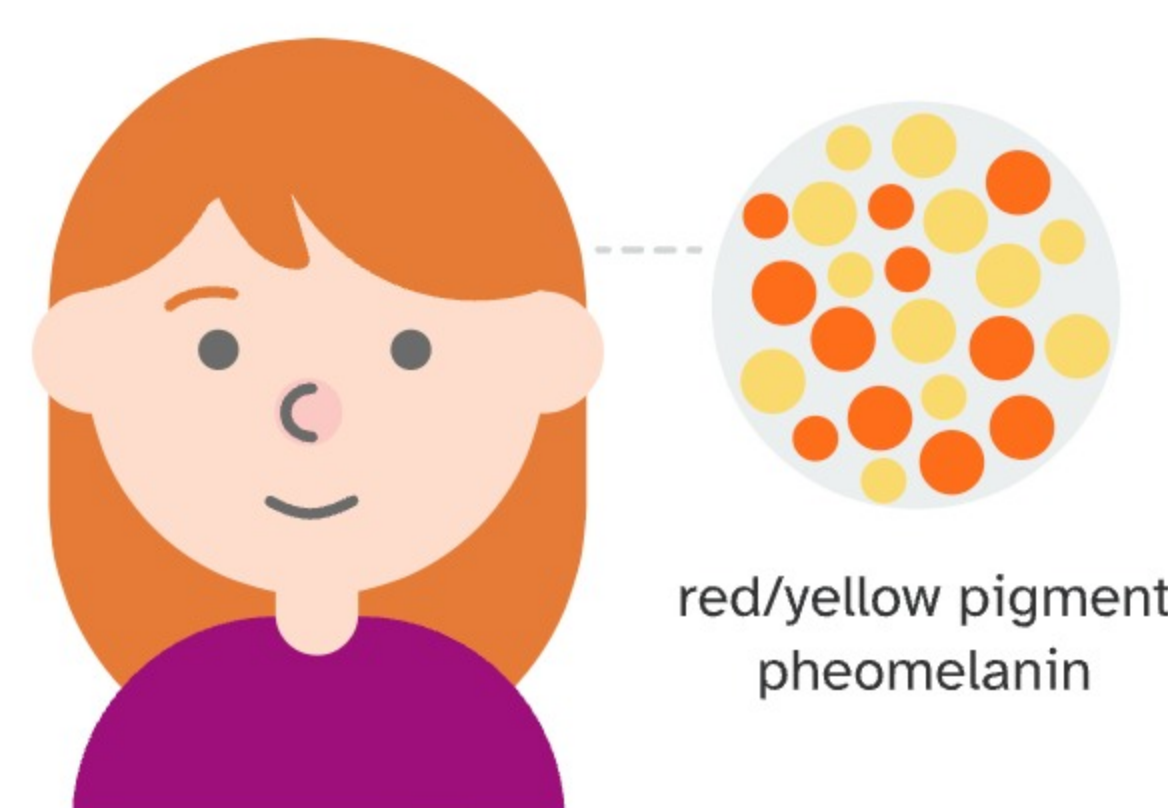


See Scientific Details

More about red hair

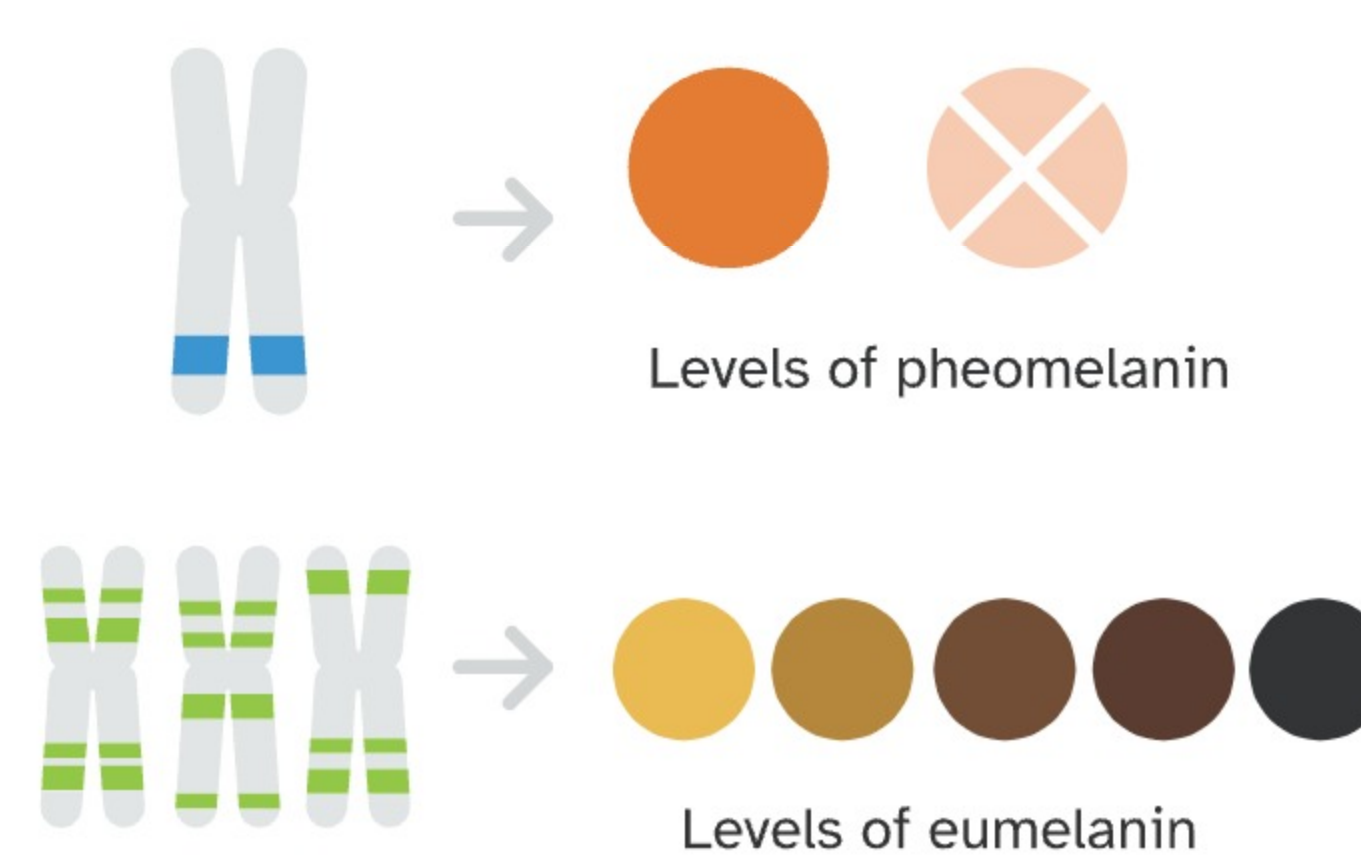
The genetics of red hair

Hair gets its color from pigment molecules. People with red hair have high levels of a red/yellow pigment called pheomelanin. Several variants in a single gene, MC1R, can cause red hair by increasing the amount of pheomelanin in your hair.



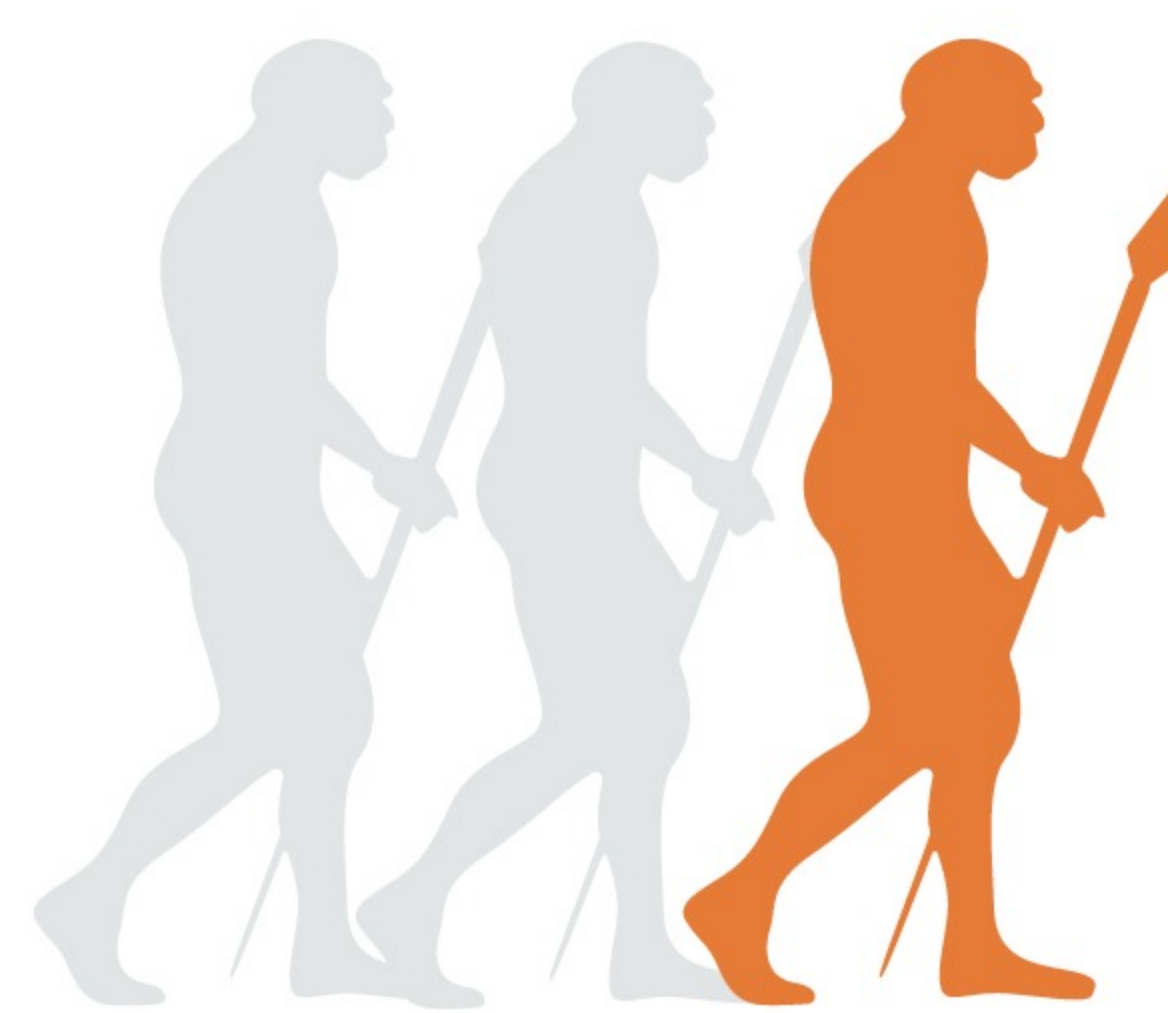
What about blond, brown, and black hair?

Hair color is determined by not just how much pigment you have, but also what kind. Whether you have red hair depends on your levels of red/yellow pigment (pheomelanin). But the lightness or darkness of your hair depends on your levels of a brown/black pigment called eumelanin. Since different genetic factors control how much of these two pigments you have, we split them into two different reports. See your Light or Dark Hair report to learn more.



Red-headed Neanderthals?

Red hair may have appeared in Neanderthals even earlier than other ancient humans. Scientists sequenced the genes of Neanderthal remains found in Italy and Spain, and discovered a variant in the MC1R gene that is predicted to cause red hair. While different from the red hair variants in this report, this Neanderthal variant also affects how pigment is produced.



Keep exploring your Traits results.



Contribute

Join the research effort and contribute to new discoveries.



Compare

Compare your results to your family and friends.



Discuss

Join the discussion with other 23andMe customers interested in Traits.

Did you find this interesting?

Yes

No



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We use one of two different methods to calculate your trait results.

Statistical Model

Most traits are influenced by many different factors, including genetics, lifestyle, and environment. Usually, a statistical model using many factors provides better predictions than looking at single factors by themselves. To develop our models, we first identify genetic markers associated with a trait using data from tens of thousands of 23andMe customers who have consented to research. Then, we use statistical methods to generate a "score" for that trait using your genotype at the relevant genetic markers as well as your age and sex. We predict your likelihood of having different versions of the trait based on the survey responses of 23andMe customers with similar scores. These predictions apply best to customers who are of the same ethnicity as the people whose data contributed to the model. The accuracy of these predictions varies from trait to trait.

[Read more about our statistical methodology](#)




Curated Model

For some traits, just a few genetic markers can strongly predict whether a person will have a particular version of the trait. For curated models, we first evaluate published scientific studies to identify genetic markers with well-established associations with the trait. Then, we look at genetic and survey data from tens of thousands of 23andMe customers who have consented to research. We estimate your likelihood of having different versions of the trait based on survey responses from customers who are genetically similar to you at those markers. These results apply best to customers who are of the same ethnicity as the people whose data contributed to the predictions.

About your Red Hair result

Your result for this trait was calculated using a **curated model**.

[Variants Detected](#)
[View All Tested Markers](#)

Marker Tested	Your Genotype*		Additional Information
R151C Gene: MC1R Marker: rs1805007	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, 7, 8, 9]
R160W Gene: MC1R Marker: rs1805008	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, 7, 8, 9]
D294H Gene: MC1R Marker: i3002507	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, 7, 8, 10]

*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

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- [Harding RM et al. \(2000\). "Evidence for variable selective pressures at MC1R." Am J Hum Genet. 66\(4\):1351-61. ↗](#)
- [Healy E et al. \(2001\). "Functional variation of MC1R alleles from red-haired individuals." Hum Mol Genet. 10\(21\):2397-402. ↗](#)
- [Ito S and Wakamatsu K. \(2011\). "Diversity of human hair pigmentation as studied by chemical analysis of eumelanin and pheomelanin." J Eur Acad Dermatol Venereol. 25\(12\):1369-80. ↗](#)
- [Lalueza-Fox C et al. \(2007\). "A melanocortin 1 receptor allele suggests varying pigmentation among Neanderthals." Science. 318\(5855\):1453-5. ↗](#)
- [Schlöth HB et al. \(1999\). "Loss of function mutations of the human melanocortin 1 receptor are common and are associated with red hair." Biochem Biophys Res Commun. 260\(2\):488-91. ↗](#)
- [Smith R et al. \(1998\). "Melanocortin 1 receptor variants in an Irish population." J Invest Dermatol. 111\(1\):119-22. ↗](#)
- [Sulem P et al. \(2007\). "Genetic determinants of hair, eye and skin pigmentation in Europeans." Nat Genet. 39\(12\):1443-52. ↗](#)
- [Valverde P et al. \(1995\). "Variants of the melanocyte-stimulating hormone receptor gene are associated with red hair and fair skin in humans." Nat Genet. 11\(3\):328-30. ↗](#)

Change Log

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

Date	Change
Dec. 15, 2017	Red Hair report updated with revised content and design.
June 22, 2017	Red Hair report separated from the Hair report.
May 12, 2016	Customers with a "Not Determined" genotype for a genetic marker used for Red Hair previously received a result based on the typical genotype for that marker. These customers may now receive a "Not Determined" result.
Oct. 21, 2015	Hair report created.



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