

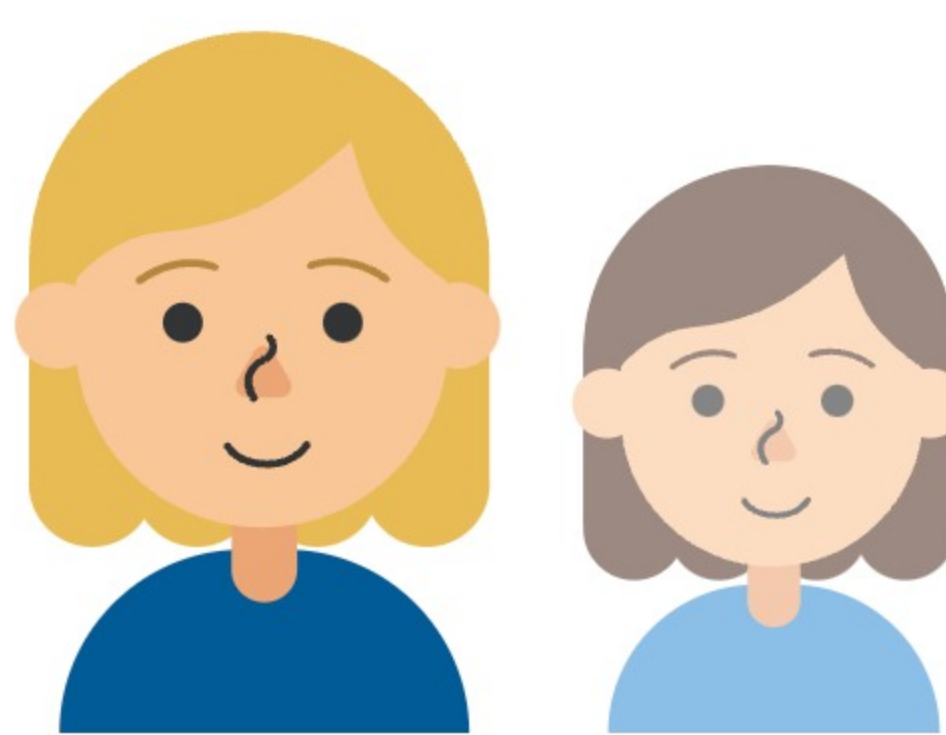
# Light or Dark Hair

Overview Scientific Details



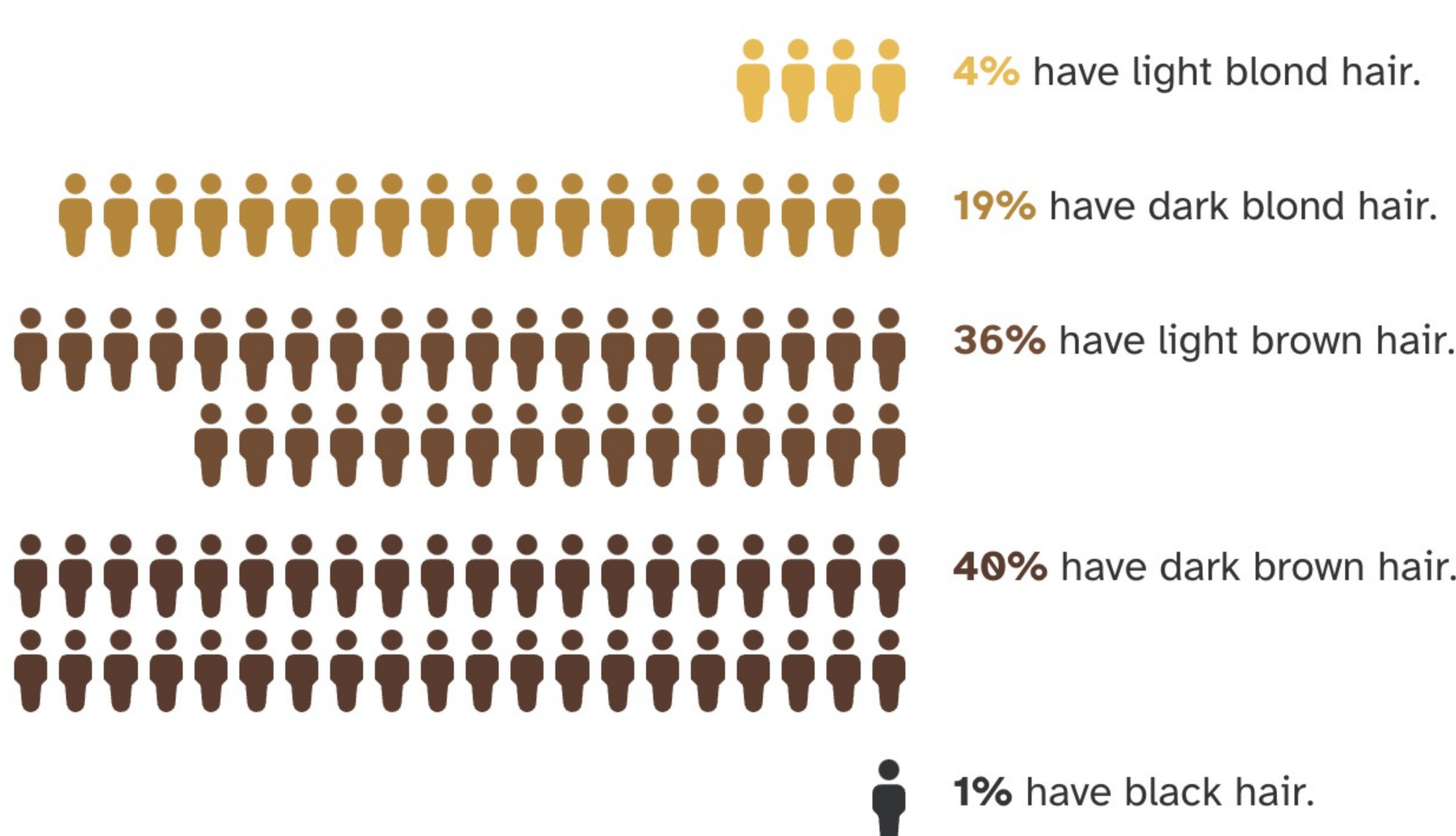
## Pigment factories in your follicles

Deep within your hair follicles, specialized cells manufacture packets of pigment that they hand off to hair cells. More pigment leads to darker hair.



Jamie, the combination of your genetics and other factors make you **more likely to have lighter hair.**

Of 23andMe research participants with results like yours:



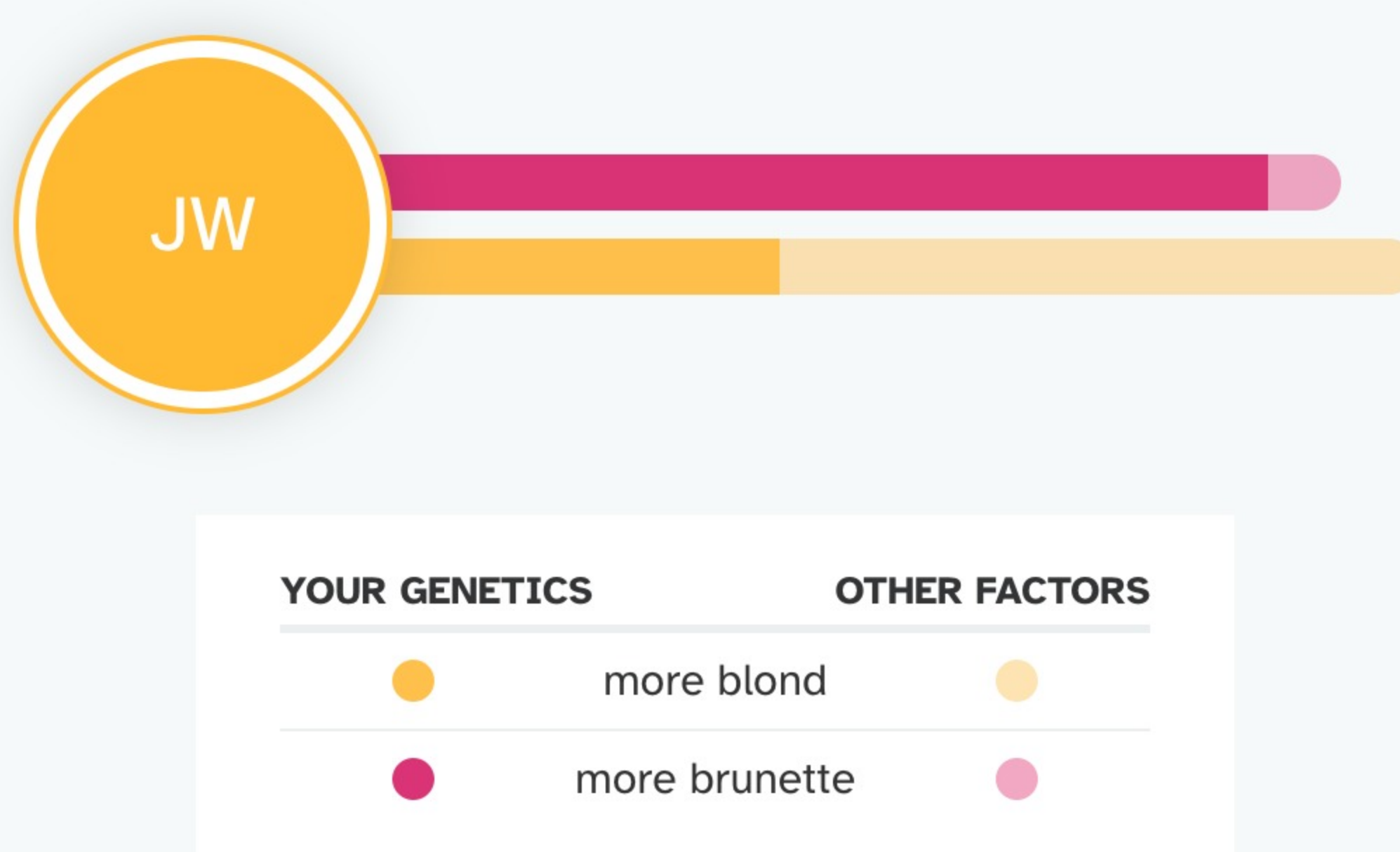
Red hair isn't included in this report because it's determined by different genetic factors. Keep reading to learn more.

What is your natural hair color?

## How did we calculate your result?

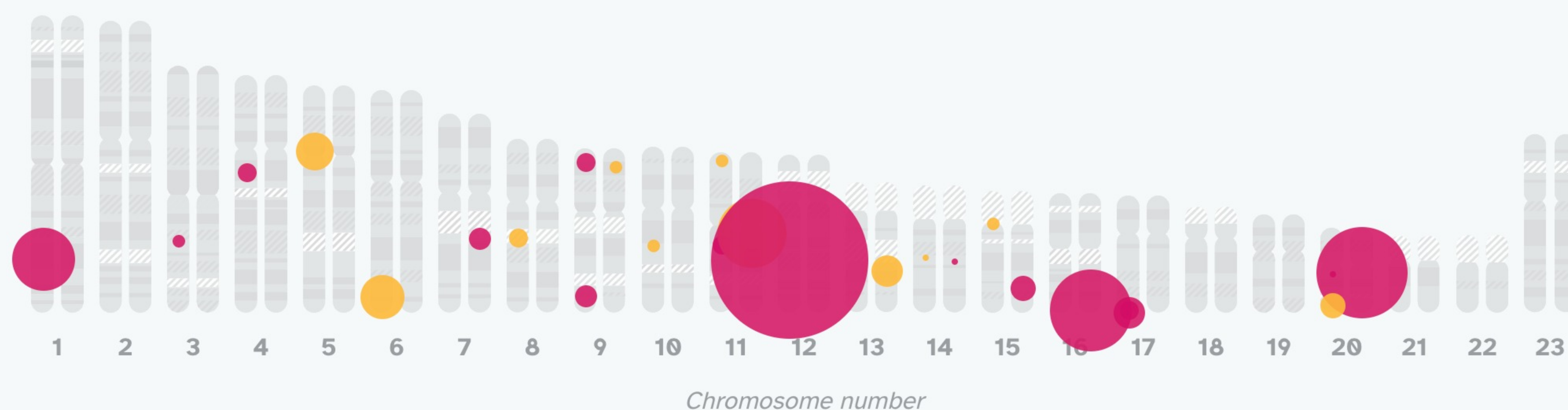
We added up the effect of your genetic variants at 42 places in your DNA (genetic markers) plus the effect of other factors, including your age and sex.

### Total effect of your genetics + other factors



### Breakdown of your genetics

The bigger the circle, the stronger the effect your variants have on your overall chances.



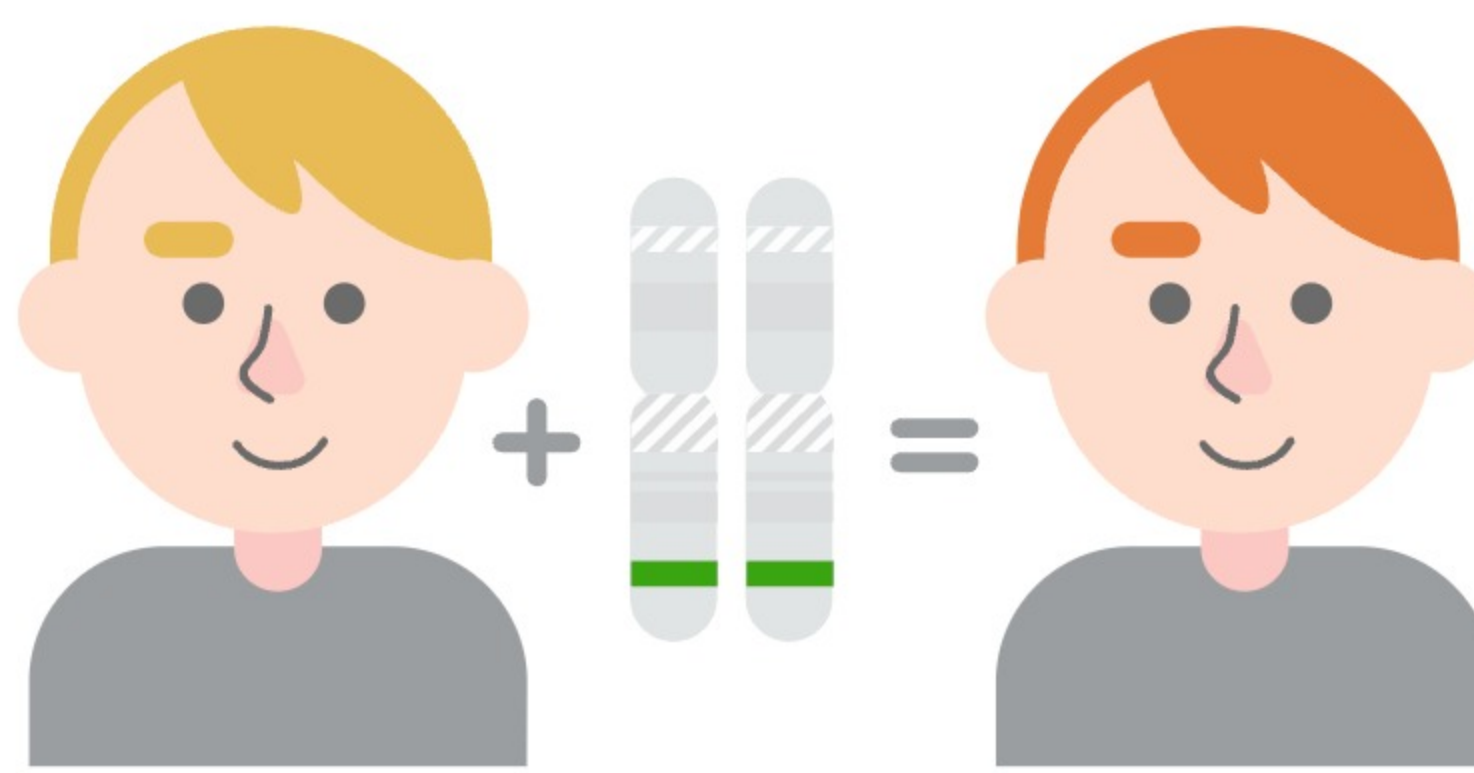
At 11 of the genetic markers we looked at you have variants that make you likely to have lighter hair, and at 16 you have variants that make you likely to have darker hair. At 15 of the markers we looked at, you have variants with no effect either way (not shown).

See Scientific Details

## More about hair color

### What about red hair?

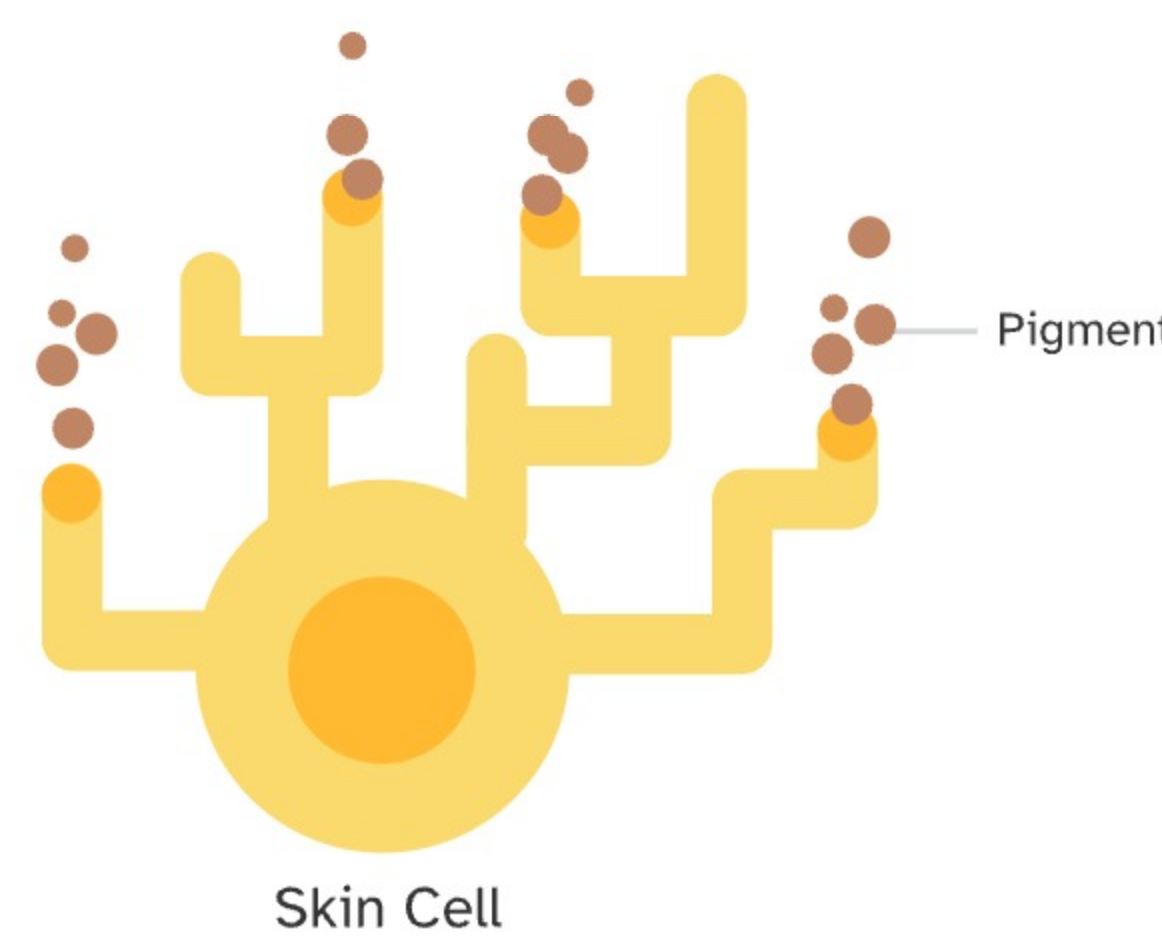
Hair color is not only determined by the amount of pigment you have, but also what kind. The lightness or darkness of your hair depends on your levels of a brown/black pigment called eumelanin. Whether you have red hair depends on your levels of a red/yellow pigment called pheomelanin. Since different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



Different genetic factors contribute to red hair

### How hair gets its color

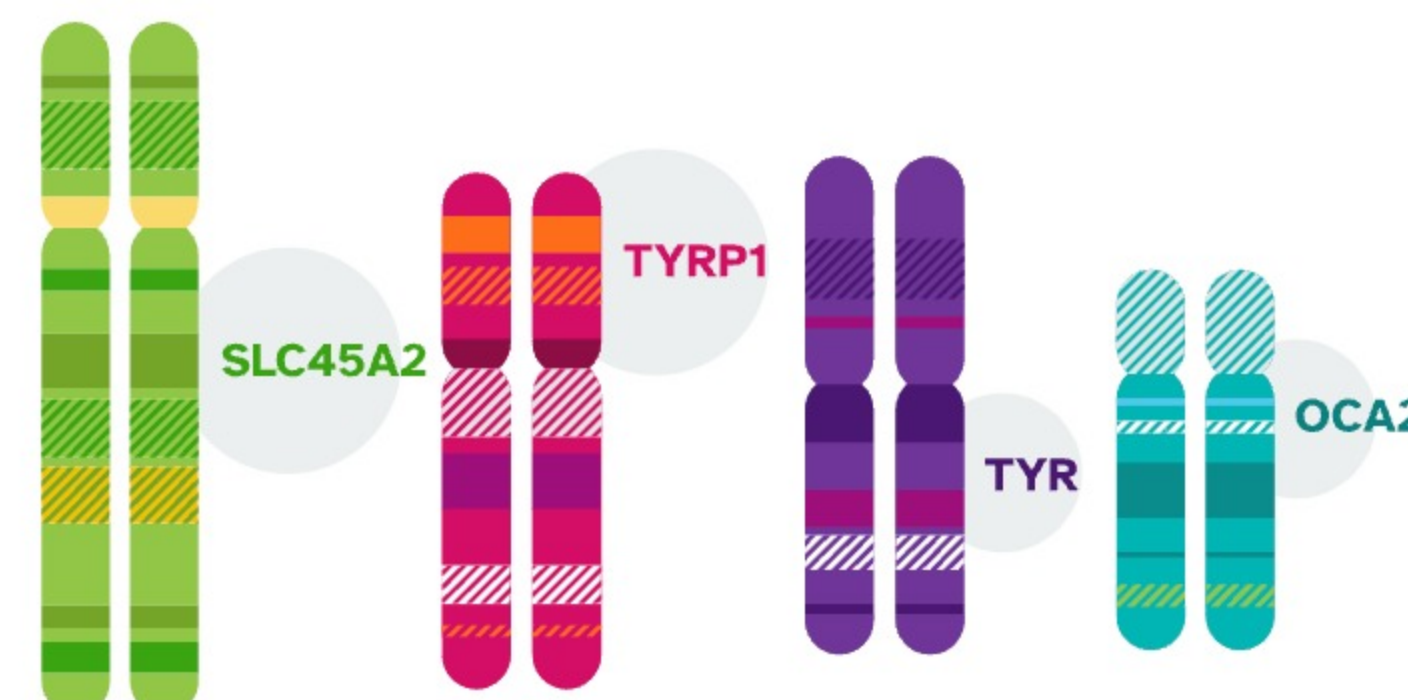
Hair cells don't make their own pigment. Instead, specialized skin cells called melanocytes create pigment. Inside the hair follicle, melanocytes package pigment into bundles and transfer these bundles to developing hair cells. In mid-life, a gradual loss of melanocytes may lead to gray hair.



Skin Cell

### Genetics

Some of the 42 genetic markers in this report are near genes that are thought to play a role in creating melanin, including TYR, TYRP1, OCA2, and SLC45A2. You'll see some of these genes in your Eye Color, Skin Pigmentation, and Freckles reports, too. These partly-overlapping genetics help explain why a person's skin, hair, and eyes are often (but not always) all light or all dark.



Genes involved in melanin production

## 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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# Light or Dark Hair

Overview **Scientific Details**

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 Light or Dark Hair result

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

### About the Light or Dark Hair model

Created based on customers of ethnicity: **European**

Number of customers used to create: **60,000**

Number of markers: **42**

Area Under Curve (AUC): **0.7**

Non-genetic factors: **Age, Sex**

Bin #	Black	Dark brown	Light brown	Dark blond	Light blond
1	0.26%	12.54%	25.43%	45.27%	16.50%
2	0.43%	16.37%	31.72%	39.67%	11.82%
3	0.72%	20.79%	33.29%	35.32%	9.89%
4	0.49%	24.32%	34.89%	33.09%	7.20%
5	0.82%	27.59%	35.38%	29.33%	6.87%
6	0.95%	31.16%	35.84%	26.81%	5.24%
7	1.18%	32.44%	37.15%	24.32%	4.91%
8	0.92%	34.70%	38.23%	21.96%	4.19%
9	1.21%	37.48%	36.50%	20.69%	4.12%
<b>JW 10</b>	<b>1.44%</b>	<b>39.84%</b>	<b>36.17%</b>	<b>18.85%</b>	<b>3.70%</b>
11	1.51%	42.82%	35.22%	17.09%	3.37%
12	2.13%	43.96%	35.32%	16.10%	2.49%
13	2.82%	47.23%	34.08%	13.45%	2.42%
14	2.98%	50.70%	30.64%	13.06%	2.62%
15	3.57%	52.37%	32.08%	9.79%	2.19%
16	3.96%	55.24%	29.54%	9.63%	1.64%
17	5.57%	57.20%	27.77%	7.76%	1.70%
18	6.97%	61.03%	24.72%	6.22%	1.05%
19	8.68%	64.83%	20.89%	4.78%	0.82%
20	15.88%	66.99%	14.47%	2.23%	0.43%
<b>Overall European</b>	<b>3.12%</b>	<b>40.98%</b>	<b>31.47%</b>	<b>19.77%</b>	<b>4.66%</b>

## References

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## 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>Dec. 15, 2017</b>	Light or Dark report updated with revised content and design. Additionally, as part of regular report review and improvements in data analysis, some customers may see an updated result.
<b>June 22, 2017</b>	Light or Dark Hair report separated from the Hair report.
<b>Oct. 21, 2015</b>	Hair report created.



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