

Cute features caused by gene mutations

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Dimples are most prominent when a person smiles. Photo by: Natashi Jay/Flickr. Natashi Jay/Flickr.

Our genes determine our physical characteristics such as height, weight and skin color. These genes sometimes experience mutations that alter the physical traits observed. Gene mutations are changes that occur in the segments of DNA that compose a gene. These changes can be inherited from our parents through sexual reproduction or acquired throughout our lifetime. While

some mutations can lead to diseases or death, others may have no negative impact on or may even benefit an individual. Still, other mutations can produce traits that are just downright cute. Discover four cute features caused by gene mutations.

Dimples

Dimples are a genetic trait that causes the skin and muscles to form indentations in the cheeks. Dimples can occur in either one or both cheeks. Dimples are typically an inherited trait passed down from parents to their children. The mutated genes that cause dimples are found within the sex cells of each parent and are inherited by the offspring when these cells unite at fertilization.

If both parents have dimples, it is likely that their children will have them, too. If neither parent has dimples, then their children are not likely to have dimples. It is possible for parents with dimples to have children without dimples and parents without dimples to have children with dimples.

Multicolored Eyes

Some individuals have eyes with irises that are different colors. This is known as heterochromia and it can be complete, sectoral or central. In complete heterochromia, one eye is a different color than the other eye. In sectoral heterochromia, part of one iris is a different color than the rest of the iris. In central heterochromia, the iris contains an inner ring around the pupil that is a different color than the rest of the iris.



Eye color is a polygenic trait that is thought to be influenced by up to 16 different genes. Eye color is determined by the amount of the brown color pigment melanin that a person has in the front part of the iris. Heterochromia results from a gene mutation that influences eye color and is inherited through sexual reproduction. Individuals that inherit this trait from birth typically have normal, healthy eyes. Heterochromia may also develop later in life. Acquired heterochromia typically develops as a result of disease or following eye surgery.

Freckles



Freckles are the result of a mutation in skin cells known as melanocytes. Melanocytes are located in the epidermis layer of the skin and produce a pigment known as melanin. Melanin helps to protect the skin from harmful ultraviolet solar radiation by giving it a brown hue. A mutation in melanocytes can cause them to accumulate and produce an increased amount of melanin. This results in the formation of brown or reddish spots on the skin due to an uneven distribution of melanin.

Freckles develop as a result of two main factors: genetic inheritance and ultraviolet radiation exposure. Individuals with fair skin and blond or red hair tend to have freckles most commonly. Freckles tend to appear most often on the face (cheeks and nose), arms and shoulders.

Cleft Chin



A cleft chin or dimple chin is the result of a gene mutation that causes the bones or muscles in the lower jaw not to fuse together completely during embryonic development. This results in the development of an indentation in the chin. A cleft chin is an inherited trait passed down from parents to their children. It is a dominant trait that is commonly inherited in individuals whose parents have cleft chins. Although a dominant trait, individuals inheriting the cleft chin gene may not always express the cleft chin phenotype. Environmental factors in the womb or the presence of modifier genes (genes that influence other genes) can cause an individual with the cleft chin genotype not to exhibit the physical trait.

Quiz

- 1 Read the following selection from the introduction [paragraph 1].

Gene mutations are changes that occur in the segments of DNA that compose a gene. These changes can be inherited from our parents through sexual reproduction or acquired throughout our lifetime.

Which sentence from the section "Freckles" BEST supports this idea?

- (A) Freckles are the result of a mutation in skin cells known as melanocytes.
 - (B) A mutation in melanocytes can cause them to accumulate and produce an increased amount of melanin.
 - (C) Freckles develop as a result of two main factors: genetic inheritance and ultraviolet radiation exposure.
 - (D) Freckles tend to appear most often on the face (cheeks and nose), arms and shoulders.
- 2 Read the following selection from the section "Dimples."

If both parents have dimples, it is likely that their children will have them, too. If neither parent has dimples, then their children are not likely to have dimples. It is possible for parents with dimples to have children without dimples and parents without dimples to have children with dimples.

Which of the following conclusions can be drawn from the selection above?

- (A) The children of parents with genetic mutations like dimples always manifest those mutation.
- (B) Children may or may not manifest all of the genetic mutations passed down to them by their parents.
- (C) Dimples are primarily formed by environmental factors that affect children after birth.
- (D) Parents with genetic mutations will only pass down those traits to their children if they are dominant traits.

3 "Mutation" is a key term in the article.

HOW does the author refine the meaning of this term over the course of the article?

- (A) By defining the term and expanding the reader's understanding through the use of specific real-world examples.
- (B) By contrasting the term with more familiar biological processes and providing specific examples of how this term impacts a person's appearance.
- (C) By defining the term and then providing statistics that challenge the dominant understanding of this topic.
- (D) By comparing the term to equivalent, more familiar processes and citing the opinions of experts.

4 Read the sentence from the section "Freckles."

Melanin helps to protect the skin from harmful ultraviolet solar radiation by giving it a brown hue.

Which sentence BEST emphasizes what the author means by "hue"?

- (A) A mutation in melanocytes can cause them to accumulate and produce an increased amount of melanin.
- (B) This results in the formation of brown or reddish spots on the skin due to an uneven distribution of melanin.
- (C) Individuals with fair skin and blond or red hair tend to have freckles most commonly.
- (D) Freckles tend to appear most often on the face (cheeks and nose), arms and shoulders.