

## Coffin-Lowry syndrome

### Description

Coffin-Lowry syndrome is a condition that affects many parts of the body. The signs and symptoms are usually more severe in males than in females, although the features of this disorder range from very mild to severe in affected women.

Males with Coffin-Lowry syndrome typically have severe to profound intellectual disability and delayed development. Affected women may be cognitively normal, or they may have intellectual disability ranging from mild to profound. Beginning in childhood or adolescence, some people with this condition experience brief episodes of collapse when excited or startled by a loud noise. These attacks are called stimulus-induced drop episodes (SIDEs).

Most affected males and some affected females have distinctive facial features including a prominent forehead, widely spaced and downward-slanting eyes, a short nose with a wide tip, and a wide mouth with full lips. These features become more pronounced with age. Soft hands with short, tapered fingers are also characteristic of Coffin-Lowry syndrome. Additional features of this condition include short stature, an unusually small head (microcephaly), progressive abnormal curvature of the spine (kyphoscoliosis), and other skeletal abnormalities.

### Frequency

The incidence of this condition is uncertain, but researchers estimate that the disorder affects 1 in 40,000 to 50,000 people.

### Causes

Mutations in the *RPS6KA3* gene cause Coffin-Lowry syndrome. This gene provides instructions for making a protein that is involved in signaling within cells. Researchers believe that this protein helps control the activity of other genes and plays an important role in the brain. The protein is involved in cell signaling pathways that are required for learning, the formation of long-term memories, and the survival of nerve cells. Gene mutations result in the production of little or no *RPS6KA3* protein, but it is unclear how a lack of this protein causes the signs and symptoms of Coffin-Lowry syndrome.

Some people with the features of Coffin-Lowry syndrome do not have identified mutations in the *RPS6KA3* gene. In these cases, the cause of the condition is unknown.

## Learn more about the gene associated with Coffin-Lowry syndrome

- RPS6KA3

## **Inheritance**

This condition is inherited in an X-linked dominant pattern. A condition is considered X-linked if the mutated gene that causes the disorder is located on the X chromosome, one of the two sex chromosomes. The inheritance is dominant if one copy of the altered gene in each cell is sufficient to cause the condition. In most cases, males (who have one X chromosome in each cell) experience more severe signs and symptoms of the disorder than females (who have two X chromosomes in each cell). A characteristic of X-linked inheritance is that fathers cannot pass X-linked traits to their sons.

Between 70 percent and 80 percent of people with Coffin-Lowry syndrome have no history of the condition in their families. These cases are caused by new mutations in the *RPS6KA3* gene. The remaining 20 percent to 30 percent of affected individuals have other family members with Coffin-Lowry syndrome.

## **Other Names for This Condition**

- CLS
- Mental retardation with osteocartilaginous abnormalities

## **Additional Information & Resources**

### Genetic Testing Information

- Genetic Testing Registry: Coffin-Lowry syndrome (<https://www.ncbi.nlm.nih.gov/gtr/conditions/C0265252/>)

### Genetic and Rare Diseases Information Center

- Coffin-Lowry syndrome (<https://rarediseases.info.nih.gov/diseases/6123/index>)

### Patient Support and Advocacy Resources

- National Organization for Rare Disorders (NORD) (<https://rarediseases.org/>)

### Clinical Trials

- ClinicalTrials.gov (<https://clinicaltrials.gov/search?cond=%22Coffin-Lowry syndrome%22>)

## Catalog of Genes and Diseases from OMIM

- COFFIN-LOWRY SYNDROME; CLS (<https://omim.org/entry/303600>)

## Scientific Articles on PubMed

- PubMed (<https://pubmed.ncbi.nlm.nih.gov/?term=%28Coffin-Lowry+syndrome%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D>)

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