

LIMK1 Gene

Subjects: **Genetics & Heredity**

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LIM domain kinase 1

genes

1. Introduction

The *LIMK1* gene provides instructions for making a protein that is highly active in the brain, where it is thought to be involved in the development of nerve cells. Studies suggest that this protein may play an important role in areas of the brain that are responsible for processing visual-spatial information (visuospatial constructive cognition). These parts of the brain are important for visualizing an object as a set of parts and performing tasks such as writing, drawing, constructing models, and assembling puzzles.

Within cells, the LIMK1 protein likely regulates aspects of the cytoskeleton, the structural framework that helps to determine cell shape, size, and movement. The LIMK1 protein helps control the organization of actin filaments, which are long, thin fibers that make up a significant part of the cytoskeleton. Actin filaments are necessary for several normal cellular functions, such as cell division, cell movement (motility), maintenance of cell shape, transport of proteins and other molecules within cells, and chemical signaling between cells.

2. Health Conditions Related to Genetic Changes

2.1. Williams Syndrome

The *LIMK1* gene is located in a region of chromosome 7 that is deleted in people with Williams syndrome. As a result of this deletion, people with this condition are missing one copy of the *LIMK1* gene in each cell. Some studies suggest that a loss of this gene contributes to the characteristic problems with visual-spatial tasks (such as writing and drawing) seen in Williams syndrome; however, other studies have not found this connection. Although a deletion of this gene probably affects the development and function of nerve cells in the brain, researchers have not determined how a reduction in the amount of LIMK1 protein could be related to the specific impairments seen in Williams syndrome.

2.2. Cancers

The LIMK1 protein is produced at unusually high levels (overexpressed) in some cancerous tumors. For example, increased amounts of this protein have been found in a form of skin cancer called melanoma and in cancers of the

ovary, lung, breast, and prostate. Researchers believe that high levels of the LIMK1 protein may be associated with changes in the organization of actin filaments and an increased chance that a tumor will invade other tissues.

3. Other Names for This Gene

- LIM kinase
- LIM kinase 1
- LIM motif-containing protein kinase
- LIMK
- LIMK-1
- LIMK1_HUMAN

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