MBL2 gene
mannose binding lectin 2

Normal Function

The MBL2 gene provides instructions for making a protein that assembles into a protein complex called mannose-binding lectin. Functional mannose-binding lectins are made up of two to six protein groups called trimers, which are each composed of three of the protein pieces (subunits) produced from the MBL2 gene. This protein complex plays an important role in the immune system's response to foreign invaders (pathogens).

Mannose-binding lectin recognizes and attaches (binds) to sugars, such as mannose, fucose, and glucose, that are found on the surface of bacteria, viruses, and yeast. This binding turns on (activates) the complement system, which is a group of immune system proteins that work together to destroy pathogens, trigger inflammation, and remove debris from cells and tissues. Attachment of mannose-binding lectin also targets the pathogen to be engulfed and broken down by special immune cells. Recognition of foreign invaders by mannose-binding lectin provides one of the body's first lines of defense against infection.

Health Conditions Related to Genetic Changes

Mannose-binding lectin deficiency

Several common mutations of the MBL2 gene can lead to a condition called mannose-binding lectin deficiency. People with this condition have low levels of mannose-binding lectin and may be susceptible to recurrent infections. Several of the disease-associated mutations occur in a region of the MBL2 gene known as exon 1 and result in a change to single protein building blocks (amino acids) in the mannose-binding lectin subunit. Other mutations occur in an area of DNA near the MBL2 gene called the promoter region, which helps control the production of the mannose-binding lectin subunit.

The change of a single amino acid in the mannose-binding lectin subunit eliminates its ability to assemble into the functional mannose-binding lectin. Similarly, certain mutations in the promoter region of the MBL2 gene reduce production of the mannose-binding lectin subunit, leading to a decreased number of subunits available for protein assembly and a reduction in the amount of functional protein. With decreased levels of mannose-binding lectin, the body does not recognize and fight foreign invaders efficiently. Consequently, infections can be more common in people with this condition. However, researchers believe that a number of factors, including other genetic and environmental factors, are involved in the development of mannose-binding lectin deficiency.
Chromosomal Location

Cytogenetic Location: 10q21.1, which is the long (q) arm of chromosome 10 at position 21.1

Molecular Location: base pairs 52,764,977 to 52,772,847 on chromosome 10 (Homo sapiens Updated Annotation Release 109.20190607, GRCh38.p13) (NCBI)

Credit: Genome Decoration Page/NCBI

Other Names for This Gene

- COLEC1
- collectin-1
- HSMBPC
- mannan-binding lectin
- mannos-binding lectin (protein C) 2, soluble
- mannos-binding lectin (protein C) 2, soluble (opsonic defect)
- mannos-binding lectin 2, soluble (opsonic defect)
- mannos-binding protein C
- mannos-binding protein C precursor
- MBL
- MBL2_HUMAN
- MBL2D
- MBP
- MBP-C
- MBP1
Additional Information & Resources

Educational Resources

  https://www.ncbi.nlm.nih.gov/books/NBK27129/figure/A196/

  https://www.ncbi.nlm.nih.gov/books/NBK26846/#A4679

Scientific Articles on PubMed

• PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28MBL2%5BTIAB%5D%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D

Catalog of Genes and Diseases from OMIM

• LECTIN, MANNOSE-BINDING, SOLUBLE, 2
  http://omim.org/entry/154545

Research Resources

• Atlas of Genetics and Cytogenetics in Oncology and Haematology
  http://atlasgeneticsoncology.org/Genes/GC_MBL2.html

• ClinVar

• HGNC Gene Symbol Report

• Monarch Initiative
  https://monarchinitiative.org/gene/NCBIGene:4153

• NCBI Gene

• UniProt
  https://www.uniprot.org/uniprot/P11226
Sources for This Summary

- OMIM: LECTIN, MANNOSE-BINDING, SOLUBLE, 2 http://omim.org/entry/154545


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