C4 binding protein β deficiency

GENERAL INFORMATION

Description:

Complement component 4-binding protein (C4BP) is one of the two polypeptides that in humans compose the plasma glycoprotein C4b-binding protein. C4BP binds the anticoagulant vitamin K-dependent protein S. It can play a role in the control of the protein C anticoagulatory pathway. Mutations in C4BP are associated with high risk for thromboembolic disorders.

Alternative names:

- Complement component 4-binding protein beta deficiency

Classification:

- Defects of complement regulatory proteins
  - C4-binding protein deficiency

Inheritance:

Autosomal recessive

OMIM:

- *120831 Complement component 4-binding protein, beta chain; C4BPB

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for C4 binding protein α deficiency

Incidence:

Incidence is not known.

CLINICAL INFORMATION

Description:

Elevated plasma levels of C4BP are associated with increased risk for thromboembolic disorders, due to an inactivation of the protein C anticoagulatory pathway.

Diagnosis:

Diagnostic laboratories:

Clinical:

- Complement deficiency, eMedicine

Therapeutic options:

- Fresh frozen plasma is used for emergent replacement of complements components. Supportive therapy is used for complement deficiencies. Prophylactic antibiotics for the infections.
- Complement deficiency, eMedicine

Research programs, clinical trials:

- European Initiative for Primary Immunodeficiencies.
- Molecular and Clinical Studies of Primary Immunodeficiency diseases, ClinicalTrials.gov

GENE INFORMATION

Names:

HUGO name: C4BPB
Alias(es): C4BP, complement component 4 binding protein, beta, complement component 4-binding protein, beta, C4b-binding protein beta chain precursor

Localization:

Reference sequences:

DNA: AL44549 (GenBank) , **cDNA:** L11244 (EMBL) , **Protein:** P20851 (SWISSPROT) Other Sequences

Chromosomal Location:

1q32

Maps:

C4BPB (Map View)

Other gene-based resources:

Ensembl: ENSG00000123843, GENATLAS: C4BPB, GeneCard: C4BPB, UniGene: 1012, Entrez Gene: 725, euGenes: 725

PROTEIN INFORMATION

Description:

Protein function:

C4BP controls the classical pathway of complement activation. It binds as a cofactor to C3b/C4b inactivator (C3bina), which then hydrolyzes the complement fragment C4b. It also accelerates the degradation of the C4bc2a complex (C3 convertase) by dissociating the complement fragment C2a. It also interacts with anticoagulant Protein S and with Serum Amyloid P component. The beta chain binds Protein S.

Subunit:

Disulfide-linked complex of C4bp alpha and beta chains of 3 possible sorts: a 570 kda complex of 7 alpha chains and 1 beta chain, a 530 kda homoheptamer of alpha chains or a 500 kda complex of 6 alpha chains and 1 beta chain. The central body of the alpha chain homopolymer supports tentacles, each with the binding site for C4b at the end.

Domains:

Sushi 1 domain: 22-77

Sushi 2 domain: 80-135

Sushi 3 domain: 138-192

Other features:

Signal peptide: 1-17

C4b-binding protein beta chain: 18-252

Expression pattern for human:

Tissue	Exp. (%)	Clones
corresponding non cancerous liver tissue	30.78	14:13909
colonic mucosa with ulcerative colitus	25.11	1:1218
liver	22.32	19:26031
pool, liver+spleen	7.48	15:61327
pool, placenta	5.19	2:11794
muscle (skeletal)	3.20	1:9571
cervix	2.41	2:25325
pancreas, exocrine	1.43	1:21418
colon	1.07	3:85835
pool, lung+testis+B-cell	0.55	1:55714

Animal models:

Mouse:

MGD: ; C4bp-ps1

Fly:

euGenes: ; fw

C. elegans:

euGenes: ; T07H6.5

OTHER RESOURCES

Societies:

General:

- International Patient Organization for Primary Immunodeficiencies
- Immune Deficiency Foundation
- March of Dimes Birth Defects Foundation
- NIH/National Institute of Allergy and Infectious Diseases
- European Society for Immunodeficiencies