C1q β-polypeptide deficiency

GENERAL INFORMATION

Description:

C1q deficiency is a rare disorder which is associated with recurrent infections and a high prevalence of lupus erythematosus-like symptoms. It is characterized by a loss of activation of the complement classical pathway.

Classification:

- Defects of the classical complement cascade proteins
  - C1q deficiency

Inheritance:

Autosomal recessive

OMIM:

- +120570 Complement component 1, q subcomponent, beta polypeptide; C1QB

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for C1q alfa-polypeptide deficiency
- IDR factfile for C1q gamma-polypeptide deficiency

Incidence:

Incidence is not known.

CLINICAL INFORMATION

Description:

The most common clinical presentation of C1q deficiency is systemic lupus erythematosus (SLE) like syndrome. This deficiency is the strongest known genetic risk factor for systemic lupus erythematosus (SLE). The age of onset is earlier and the disease can be very severe, with significant central nervous system (CNS) involvement and nephritis. The cutaneous manifestations are typically prominent, and skin biopsies demonstrate IgG, IgM, and C3 deposition, characteristic for systemic lupus erythematosus (SLE). There is also an increased frequency of infections with pyogenic organisms.

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
- Complement deficiency, eMedicine

Research programs, clinical trials:

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

GENE INFORMATION

Names:

HUGO name: C1QB
Alias(es): Complement component 1, q subcomponent, beta polypeptide, Complement C1q subcomponent, B chain precursor

Localization:

Reference sequences:

DNA: AL158086 (NCBI) , **cDNA:** NM_000491 (GenBank) , **Protein:** P02746 (SWISSPROT) Other Sequences

Chromosomal Location:

1p36.3-p34.1

Maps:

C1QB (Map View)

Variations / Mutations:

- C1QBbase; Mutation registry for C1q #-polypeptide deficiency

Other gene-based resources:

Ensembl: ENSG00000173369, GENATLAS: C1QB, GeneCard: C1QB, UniGene: 8986, Entrez Gene: 713, euGenes: 713

PROTEIN INFORMATION

Description:

Protein function:

C1q associates with the proenzymes C1r and C1s to yield C1, the first component of the serum complement system. The collagen-like regions of C1q interact with the Ca(2+)-dependent C1r(2)C1s(2) proenzyme complex, and efficient activation of C1 takes place on interaction of the globular heads of C1q with the Fc regions of IgG or IgM antibody present in immune complexes.

Subunit:

C1 is a calcium-dependent trimolecular complex of C1q, r and s in the molar ration of 1:2:2. C1q subcomponent is composed of nine subunits, six of which are disulfide-linked dimers of the a and b chains, and three of which are disulfide-linked dimers of the c chain.

Post-translational modification:

O-linked glycans consist of glc-gal disaccharides.

Domains:

Collagen-like domain: 29-112

C1Q domain: 113-251

Other features:

Signal peptide: 1-25

Disulfide bond interchain (with c-26 in chain a): 29

Other related resourses:

PIR: C1HUQB, InterPro: IPR001073; C1q, Pfam: PF00386; C1q, Pfam: PF01391; Collagen, SMART: SM00110; C1Q

Expression pattern for human:

Tissue	Exp. (%)	Clones
well-differentiated invasive carcinoma, floor of mouth	46.05	1:100
thymus	10.26	1:449
head/neck	8.82	1:522
nasopharynx	7.13	1:646
subchondral bone	3.46	1:1332
pheochromocytoma	2.95	1:1560
mixed	2.14	28:60341
spleen	1.91	3:7229
rpe and choroid	1.74	4:10565
lung, 2 pooled	1.67	6:16549
neuroendocrine lung carcinoids		

Animal models:

Mouse:

MGD: ; C1qb

Fly:

euGenes: ; CG6807

C. elegans:

euGenes: ; Y48G9A.4

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

Disease specific:

- Lupus Foundation of America
- Lupus Home Page