C1q γ-polypeptide deficiency

GENERAL INFORMATION

Description:

C1q deficiency is a rare genetic 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:

- *120575 Complement component 1, q subcomponent, gamma polypeptide; C1QG

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for C1q alfa-polypeptide deficiency
- IDR factfile for C1q beta-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 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 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: C1QC
Alias(es): C1QG, Complement component 1, q subcomponent, c polypeptide, Complement component 1, q subcomponent, gamma polypeptide, Complement C1q subcomponent, C chain precursor

Localization:

Reference sequences:

DNA: AL158086 (NCBI) , **cDNA:** BC009016 (EMBL) , **Protein:** P02747 (SWISSPROT) Other Sequences

Chromosomal Location:

1p36.3-p34.1

Maps:

C1QG (Map View)

Variations / Mutations:

- C1QCbase; Mutation registry for C1qG deficiency.

Other gene-based resources:

Ensembl: ENSG00000159189, GENATLAS: C1QG, GeneCard: C1QG, UniGene: 467753, Entrez Gene: 714, euGenes: 714

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: 31-112

C1q domain: 113-245

Other features:

Signal peptide: 1-28

Complement c1q subcomponent, c chain: 29-245

Disulfide bond interchain (with other c chain): 32

Other related resourses:

PIR: C1HUQC, InterPro: IPR001073; C1q, InterPro: IPR008160; Collagen, Pfam: PF00386; C1q, Pfam: PF01391; Collagen, SMART: SM00110; C1Q

Expression pattern for human:

Tissue	Exp. (%)	Clones
brain, pituitary	32.13	1:225
thymus	16.10	1:449
colon, 2 pooled adenocarcinomas	9.02	11:8815
osteoarthritic cartilage	7.23	3:2999
ovary (pool of 3)	6.60	4:4380
mixed	4.43	37:60341
human optic nerve	3.28	2:4406
spleen	3.00	3:7229
genitourinary tract	1.90	1:3813
pool, liver+spleen	1.53	13:61327

Animal models:

Mouse:

MGD: ; C1qc

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
- European Society for Immunodeficiencies

Disease specific:

- Lupus Foundation of America
- Lupus Home Page