C1q α-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:

- *120550 Complement component 1, q subcomponent, alpha polypeptide; C1QA

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for C1q beta-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 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

GENE INFORMATION

Names:

HUGO name: C1QA
Alias(es): Complement component 1, q subcomponent, alpha polypeptide, Complement C1q subcomponent, A chain precursor

Localization:

Reference sequences:

DNA: C1QA_DNA (C1QAbase) , **cDNA:** AF135157 (EMBL) , **Protein:** P02745 (SWISSPROT)

Chromosomal Location:

1p36.3-p34.1

Maps:

C1QA (Map View)

Variations / Mutations:

- C1QAbase; Mutation registry for C1qA deficiency.

Other gene-based resources:

Ensembl: ENSG00000173372, GENATLAS: C1QA, GeneCard: C1QA, UniGene: 9641, Entrez Gene: 712, euGenes: 712

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. The 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 glycan consists of glc-gal disaccharide.

Domains:

Collagen-like domain: 31-109

C1q domain: 110-245

Other features:

Signal peptide: 1-22

Complement C1q subcomponent, a chain: 23-245

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

Other related resourses:

PIR: C1HUQA, InterPro: IPR001073; C1q, InterPro: IPR000087; Collagen, Pfam: PF00386; C1q, Pfam: PF01391; Collagen

Expression pattern for human:

Tissue	Exp. (%)	Clones
skin, melanocyte	16.46	1:520
lung with fibrosis	11.57	2:1479
esophagus	8.71	3:2949
normal head/neck tissue	6.62	1:1292
ovary, pooled	5.86	4:5846
spleen	4.74	4:7229
mixed	4.40	31:60341
human eye anterior segment	4.33	1:1978
germ cell	4.26	10:20077
rpe and choroid	4.05	5:10565

Animal models:

Mouse:

MGD: ; C1qa

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