CD8α deficiency

GENERAL INFORMATION

Description:

CD8 glycoproteins play an important role in maturation and function of MHC class I-restricted T lymphocytes. The disease is transmitted autosomal recessive and it is an immunologic defect characterized by absence of CD8+ cells. Only one deficiency was described until now in a consanguineous family in Spain.

Alternative names:

- CD8A deficiency

Classification:

- Combined B and T cell immunodeficiencies
  - Other

Inheritance:

Autosomal recessive

OMIM:

- *186910 CD8 antigen, alpha polypeptide; CD8A

Cross references:

Phenotype related immunodeficiencies:

- TAP2 deficiency
- TAP1 deficiency
- ZAP-70 deficiency

Incidence:

Incidence is not known yet.

CLINICAL INFORMATION

Description:

The clinical manifestations present in the affected patients are not severe. This syndrome is compatible with life, and it seems to be less aggressive than the HLA class I deficiencies. The patient had repeated bacterial infections, such as bronchitis with productive cough and otitis media from the age of five. Chest x-ray and computed tomography (CT) revealed disseminated bronchiectases. Sputum culture was positive for Haemophilus influenzae. Functional respiratory tests revealed severe mixed ventilatory disturbance. Clinical status improved after intravenous antibiotic therapy. He has required further admissions because of respiratory reinfections.

Diagnosis:

Diagnostic laboratories:

Therapeutic options:

- Use of antibiotic and intravenous immunoglobulins.

Research programs, clinical trials:

- European Initiative for Primary Immunodeficiencies 2001-2004, coord.Edvard Smith.

GENE INFORMATION

Names:

HUGO name: CD8A
Alias(es): CD8, MAL, p32, CD8 antigen, alpha polypeptide, T-cell surface glycoprotein CD8 alpha chain precursor, T-lymphocyte differentiation antigen T8/Leu-2

Localization:

Reference sequences:

DNA: M27161 (EMBL) , **cDNA:** M12828 (EMBL) , **Protein:** P01732 (SWISSPROT) Other Sequences

Chromosomal Location:

2p12

Maps:

CD8A (Map View)

Variations / Mutations:

- CD8Abase; Mutation registry for CD8a deficiency.

Other gene-based resources:

Ensembl: ENSG00000153563, GENATLAS: CD8A, GeneCard: CD8A, UniGene: 85258, Entrez Gene: 925, euGenes: 925, GDB: 120581

PROTEIN INFORMATION

Description:

Protein function:

Identifies cytotoxic/suppressor T-cells that interact with MHC class I bearing targets. CD8 is thought to play a role in the process of T-cell mediated killing. CD8 alpha chains binds to class I MHC molecules alpha-3 domains.

Subunit:

In general heterodimer of an alpha and a beta chain linked by two disulfide bonds. Can also form homodimers.

Subcellular location:

Type I membrane protein

Post-translational modification:

All of the five most carboxyl-terminal cysteines are used to form inter-chain disulfide bonds in dimers and higher multimers, while the four amino-terminal cysteines are not.

Protein function:

Various patterns of differential splicing of CD8 alpha transcripts involve excision of the transmembrane or cytoplasmic domains.

Structures (PDB):

1CD8 Crystal structure of a soluble form of the human T cell coreceptor CD8 at 2.6 A resolution.

Domains:

Extracellular domain: 22-182

Cytoplasmic domain: 204-235

Ig-like v-type domain domain: 22-135

Other features:

Signal peptide: 1-21

T-cell surface glycoprotein cd8 alpha chain: 22-235

Disulfide bonds: 43-115

Other related resourses:

PIR: RWHUT8, InterPro: IPR003006; Ig_MHC, InterPro: IPR003596; Ig_v, Pfam: PF00047; ig, SMART: SM00406; IGv

Expression pattern for human:

Tissue	Exp. (%)	Clones
blood, white cells	38.59	1:910
thymus, pooled	22.16	2:3169
leukocyte	15.64	4:8982
mixed	5.24	9:60341
kidney, pooled	4.74	1:7404
parathyroid	4.11	2:17083
germ cell, pooled	2.94	3:35870
unclassified	2.03	3:51898
prostate	1.39	3:76067
ovary	0.74	1:47578

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