Leukocyte adhesion deficiency II

GENERAL INFORMATION

Description:

Rare leukocyte adhesion deficiency type II (LAD II) is due to an inborn error in fucose metabolism caused by mutations in the guanosine diphosphate-fucose transporter gene. There is a failure to express the ligand for E and P selectin, sialyl Lewis-X (CD15s), which is expressed on leukocytes. The patients are unable to fucosylate other glycoproteins, including the H blood group polysaccharide, so they are Bombay phenotype, ie, negative for the O and H blood group antigens and capable of making anti-H antibody. The immunoglobulin M (IgM) and immunoglobulin G (IgG) heavy chains also are not fucosylated, although IgM and IgG are present in normal amounts.

Alternative names:

- LAD2
- Congenital disorder of glycosylation type IIc (CDG-IIc)
- Leukocyte adhesion deficiency type 2, GDP-fucose transporter
- Rambam-Hasharon syndrome; RHS

Classification:

- Defects of phagocyte function
  - Leukocyte adhesion defects

Inheritance:

Autosomal recessive

OMIM:

- #266265 Congenital disorder of glycosylation, type IIc
- 605881 GDP-fucose transporter 1

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for Leukocyte adhesion deficiency I

Incidence:

CLINICAL INFORMATION

Description:

Patients have an increased incidence of bacterial infections, persistent leukocytosis, poor pus formation and a number of neurological, developmental and physical abnormalities, typical dysmorphic features, the Bombay (hh) blood phenotype and severe growth and psychomotor retardation. Infections of the skin, lungs, and gums resemble those seen in the moderate type of LAD-1, but the frequency and severity of infections tend to decrease with age.

Diagnosis:

Diagnostic laboratories:

Clinical:

- Leukocyte adhesion deficiency, ORPHANET
- Leukocyte adhesion deficiency, eMedicine

Genetic:

- Laboratorio di Genetica Pediatrica Angelo Nocivelli - University of Brescia, EDDNAL
- Leukocyte Adhesion Deficiency, Type 1, GeneTest

Therapeutic options:

- Treatment with oral fucose has reduced the frequency of infections and fevers.
- Leukocyte adhesion deficiency, eMedicine

Research programs, clinical trials:

- Modified Stem Cell Transplantation Procedure for Treating Chronic Granulomatous Disease
- Stem Cell Transplantation to Treat Leukocyte Adhesion Deficiency
- European Initiative for Primary Immunodeficiencies

GENE INFORMATION

Names:

HUGO name: SLC35C1
Alias(es): FUCT1, FLJ11320

Localization:

Reference sequences:

DNA: IDRefSeq: SLC35C1_DNA (EMBL) , **cDNA:** AF323970 (EMBL) , **Protein:** Q96A29 (SWISSPROT) Other Sequences

Chromosomal Location:

11p11.2

Maps:

SLC35C1 (Map View)

Variations / Mutations:

- SLC35C1base; Mutation registry for Leukocyte adhesion deficiency II (LAD-II)

Other gene-based resources:

Ensembl: ENSG00000181830, GENATLAS: SLC35C1, GeneCard: FUCT1, UniGene: 12211, Entrez Gene: 55343, euGenes: 55343

PROTEIN INFORMATION

Description:

Protein function:

Involved in GDP-fucose import from the cytoplasm into the Golgi lumen.

Subcellular location:

Integral membrane protein.

Other features:

Other related resourses:

InterPro: IPR000620; DUF6, Pfam: PF00892; DUF6

Expression pattern for human:

Tissue	Exp. (%)	Clones
colonic mucosa with ulcerative colitus	18.10	1:1224
human lung epithelial cell lines untreated lps 6hr to lps	10.58	3:6284
whole blood	9.05	1:2449
thyroid	8.82	2:5024
human lens	5.49	1:4037
leukocyte	4.92	2:9008
small intestine	3.84	2:11527
pancreas, exocrine	3.10	3:21458
B cells germinal	2.92	1:7591
colon	2.83	11:85968

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:

- Leukocytes deficiency website