RFX-5, MHCII promoter X box regulatory factor 5 deficiency

GENERAL INFORMATION

Description:

Defects in RFX5 are a cause of hereditary MHC class II deficiency, also known as Bare lymphocyte syndrome (BLS) or HLA class II-deficient combined immunodeficiency); a form of Severe combined immunodeficiency disease (SCID) transmitted autosomal recessive. RFX5 is linked with BLS complementation groups C. The disease is very rare; only approximately 70 patients from 57 unrelated families have been reported worldwide.

Alternative names:

- RFX5
- Bare lymphocyte syndrome (BLS)
- RFX5 (complementation group C)

Classification:

- Combined B and T cell immunodeficiencies
  - Major histocompatibility complex class II deficiency

Inheritance:

Autosomal recessive

OMIM:

- #209920 Bare lymphocyte syndrome, type II
- *601863 Regulatory factor X, 5; RFX5

Cross references:

Incidence:

Incidence is not known yet.

CLINICAL INFORMATION

Description:

Presentation similar to SCID. The children have extreme susceptibility to bacterial, viral, and fungal infections in the first year of life and usually results in death by age of four. Liver diseases associated with chronic Cryptosporidium infection often develops. Recurrent bronchopulmonary infections have been observed in all patients. The infectious agents include viruses (CMV, respiratory syncytial virus, enterovirus), bacteria (Steptococcus, Haemophilus, Proteus, Pseudomonas), Pneumocystis carinii, and Candida albicans. Neurological manifestation due to viral infections have been diagnosed in a number of patients. Hematologic manifestations are characterized by neutropenia and severe autoimmune cytopenia.

Diagnosis:

Diagnostic laboratories:

Clinical:

- Defective expression of HLA class 2, ORPHANET

Genetic:

- RFX5, IDdiagnostics

Therapeutic options:

- Patients can be cured with bone marrow transplantations of haematopoietic stem cells. Other recommendations include treatment of infections with antibacterials, antifungals, and antivirals, intravenous gamma-globulin infusion, irradiation of all blood products.
- Stem Cell Transplant, The National Marrow Donor Program (NMDP)

Research programs, clinical trials:

- Pilot Study of Allogeneic Bone Marrow Transplantation Plus Cyclosporine and Mycophenolate Mofetil to Induce Mixed Hematopoietic Chimerism in Patients With Primary T-Cell Immunodeficiency Disorders, ClinicalTrial.gov
- Presentation of Self and Foreign Antigens by MHC Class II Molecules, Beckman Research Institute, Division of Immunology
- Molecular basis of immune regulation, Leiden University Medical Center
- Immunogenetics of Bare lymphocyte syndrome(BLS), ORPHANET

GENE INFORMATION

Names:

HUGO name: RFX5
Alias(es): regulatory factor X, 5, DNA-binding protein RFX5, Regulatory factor X subunit 5

Localization:

Reference sequences:

DNA: RFX5_DNA (IDRefSeq) , **cDNA:** X85786 (EMBL) , **Protein:** P48382 (SWISSPROT)

Chromosomal Location:

1q21

Maps:

RFX5 (Map View)

Variations / Mutations:

- RFX5base; Mutation registry for MHCII promoter X box regulatory factor 5 deficiency

Other gene-based resources:

Ensembl: ENSG00000143390, GENATLAS: RFX5, GeneCard: RFX5, UniGene: 166891, Entrez Gene: 5993, euGenes: 5993, GDB: 6288464

PROTEIN INFORMATION

Description:

Protein function:

Activates transcription from class II MHC promoters. Recognizes X-boxes. Mediates cooperative binding between RFX and nf-y. RFX binds the X1 box of MHC-II promoters.

Subunit:

RFX consists of at least three different subunits; RFXAP, RFX5 and RFX-B/ RFXANK; with each subunit representing a separate complementation group. RFX forms cooperative DNA binding complexes with x2bp and cbf/nf-y. RFX associates with CIITA to form an active transcriptional complex.

Subcellular location:

Nuclear

Post-translational modification:

Phosphorylated

Other features:

DNA-binding region: 92-168

Other related resourses:

InterPro: IPR003150; RFX_DNA_binding, Pfam: PF02257; RFX_DNA_binding

Expression pattern for human:

Tissue	Exp. (%)	Clones
dorsal root ganglia	12.05	1:1021
colonic mucosa with ulcerative colitus	10.10	1:1218
foveal and macular retina	9.13	3:4045
uterus, endometrium	6.87	1:1790
leukopheresis	5.40	2:4557
esophagus	4.17	1:2949
thymus, pooled	3.88	1:3169
bone	2.95	3:12499
lymph	2.87	15:64395
germ cell	2.45	4:20077

Animal models:

Mouse:

MGD: ; Rfx5

Fly:

euGenes: ; Rfx

C. elegans:

euGenes: ; daf-19

OTHER RESOURCES

Societies:

General:

- IPOPI, International Patient Organization for Primary Immunodeficiencies
- The Jeffrey Modell Foundation (JMF)
- Immune Deficiency Foundation
- National Center for Biotechnology Information
- NIH/National Institute of Allergy and Infectious Diseases
- European Society for Immunodeficiencies

Other information sources:

- Bare Lymphocyte Syndrome, Birth disorders information directory