Tyk2 deficiency

GENERAL INFORMATION

Description:

TYK2 deficiency display the phenotype of the autosomal recessive HIES accompanied by susceptibility to intracellular bacterial infection and unique role of TYK2 in the innate and acquired immune responses in humans.

Alternative names:

- TYK2D
- AR-HIES
- Autosomal recessive Tyk2 deficiency

Classification:

- Other well-defined immunodeficiency syndromes

Inheritance:

Autosomal recessive

OMIM:

- *176941 Protein-tyrosine kinase 2; TYK2
- %147060 Hyper-IgE syndrome
- 243700 Job syndrome

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for Hyper-IgE recurrent infection syndrome
- IDR factfile for STAT3 deficiency

Incidence:

Incidence is not known.

CLINICAL INFORMATION

Description:

Patient with TYK2 deficiency had a history of atopic dermatitis, recurrent infections, such as otitis media, sinusitis, pneumonias, skin abcesses, BCG lymphadenitis, viral and fungal infections, oral candidiasis. The immunological workup revealed mild eosinophilia, high serum, IgE (2100 IU/ml) with normal Ig classes and subclasses.

Diagnosis:

Diagnostic laboratories:

Clinical:

- Job syndrome, ORPHANET
- Job Syndrome, eMedicine
- Hyperimmunoglobulinemia E, eMedicine

Genetic:

- IDdiagnostics

Therapeutic options:

- Intravenous immunoglobulins should be used for the antibody deficiency. Antibiotic therapy (10-14 days) together with physiotherapy and postural drainage in case of lung damage. Ciprofloxacin is a valuable antibiotic but is not licensed for small children. Oral poliovaccine should not be given because there is risk of paralytic disease.
- Hyperimmunoglobulinemia E (Job) Syndrome, eMedicine
- Job Syndrome, eMedicine

Research programs, clinical trials:

- European Initiative for Primary Immunodeficiencies.

GENE INFORMATION

Names:

HUGO name: TYK2

Localization:

Reference sequences:

DNA: D0118 (IDRefSeq) , **cDNA:** X54637 (EMBL) , **Protein:** P29597 (SWISSPROT) Other Sequences

Chromosomal Location:

19p13.2

Maps:

TYK2 (Map View)

Variations / Mutations:

- TYK2base; Mutation registry for Tyk2 deficiency

Other gene-based resources:

Ensembl: ENSG00000105397, GENATLAS: TYK2, GeneCard: TYK2, UniGene: , Entrez Gene: , euGenes: , GDB: , HomoloGene: 20712

PROTEIN INFORMATION

Description:

Protein function:

Probably involved in intracellular signal transduction by being involved in the initiation of type I IFN signaling. Phosphorylates the interferon-alpha/beta receptor alpha chain

Catalytic activity:

ATP + a [protein]-l-tyrosine = ADP + a [protein]-l-tyrosine phosphate

Tissue specificity:

Observed in all cell lines analyzed. Expressed in a variety of lymphoid and non-lymphoid cell lines

Similarity:

Belongs to the protein kinase superfamily. Tyr protein kinase family. Jak subfamily

Domains:

FERM domain: 26-431

SH2; atypical domain: 450-529

Protein kinase 1 domain: 589-875

Protein kinase 2 domain: 897-1176

Other features:

Non-receptor tyrosine-protein kinase tyk2: 1-1187

ATP nucleotide phosphate-binding region: 903-911

Atp binding site: 930

Other related resourses:

PIR: TVHUY2, InterPro: IPR000299; Band_4.1_N, InterPro: IPR009127; JAK, InterPro: IPR009131; Non_rcpt_TYK2, InterPro: IPR000719; Prot_kinase, InterPro: IPR000980; SH2, InterPro: IPR001245; Tyr_pkinase, InterPro: IPR008266; Tyr_pkinase_AS, Pfam: PF07714; Pkinase_Tyr, PRINTS: PR01823; JANUSKINASE, PRINTS: PR00109; TYRKINASE, PRINTS: PR01827; YKINASETYK2, ProDom: PD000001; Prot_kinase, SMART: SM00295; B41, SMART: SM00252; SH2, SMART: SM00219; TyrKc, PROSITE: PS00660; FERM_1, PROSITE: PS00661; FERM_2, PROSITE: PS50057; FERM_3, PROSITE: PS00107; PROTEIN_KINASE_ATP, PROSITE: PS50011; PROTEIN_KINASE_DOM, PROSITE: PS00109; PROTEIN_KINASE_TYR, PROSITE: PS50001; SH2

Expression pattern for human:

Tissue	Exp. (%)	Clones
9591		
9591		

Animal models:

Mouse:

MGD: ; Tyk2

OTHER RESOURCES

Societies:

General:

- International Patient Organization for Primary Immunodeficiencies
- Immune Deficiency Foundation
- European Society for Immunodeficiencies
- NIH/National Institute of Allergy and Infectious Diseases

Other information sources:

- Immunodeficiencies+TYK2