Transcobalamin II deficiency

GENERAL INFORMATION

Description:

Defects in TCN22, a vitamin B 12-binding protein essential for transport of B12, are the cause of transcobalamin II deficiency. This disease is marked by defective intestinal absorption of vitamin B12.

Alternative names:

- TC II deficiency
- Tc2 deficiency

Classification:

- Other well-defined immunodeficiency syndromes? Immunodeficiency with dermatological defects

Inheritance:

Autosomal recessive

OMIM:

- *275350 Transcobalamin II deficiency

Cross references:

Incidence:

Incidence unknown.

CLINICAL INFORMATION

Description:

The main symptom is megaloblastic anemia. The patients may present vomiting, poor growth and infections due to an immune deficiency (hypogammaglobulinemia), failure to thrive, lymphopenia, neutropenia, and thrombocytopenia. Patients can have also neurological signs and abnormal neutrophil function.

Diagnosis:

Diagnostic laboratories:

Clinical:

- Transcobalamin II deficiency, ORPHANET

Therapeutic options:

- Intake of vitamin B12 per os or parenteral. Symptoms disappear completely, except when the diagnosis is delayed and neurological signs have become permanent.
- Transcobalamin II deficiency, ORPHANET

Research programs, clinical trials:

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

GENE INFORMATION

Names:

HUGO name: TCN2
Alias(es): D22S676 , D22S750, TC2, Transcobalamin II precursor

Localization:

Reference sequences:

DNA: M60396 (EMBL) L02647 (EMBL) L02648 (EMBL) AF047576 (EMBL) AC005006 (EMBL) BC001176 (EMBL) , **cDNA:** X58957 (EMBL) , **Protein:** P20062 (SWISSPROT)

Chromosomal Location:

22q11.2-qter

Maps:

TCN2 (Map View)

Markers:

D22S750, SHGC-12522, STS-L02648, RH27837

Variations / Mutations:

- TCN2base; Mutation registry for Transcobalamin II deficiency

Other gene-based resources:

Ensembl: ENSG00000185339, GENATLAS: TCN2, GeneCard: TCN2, UniGene: 417948, Entrez Gene: 6948, euGenes: 6948, GDB: 119608, HomoloGene: 303

PROTEIN INFORMATION

Description:

Protein function:

Primary vitamin B12-binding and transport protein. Delivers cobalamin to cells.

Subcellular location:

Secreted

Polymorphism:

Pro/arg-259 polymorphism affects tcn2 plasma concentration and may interfere in vitamin B(12) cellular availability and homocysteine metabolism.

Similarity:

Belongs to the eukaryotic cobalamin transport proteins family.

Other features:

Signal peptide: 1-18

Transcobalamin ii: 19-427

Disulfide bonds: 21-267, 116-309, 165-205

Other related resourses:

PIR: A39744, InterPro: IPR002157; Cobalamin_bind, InterPro: IPR008930; Terp_cyc_toroid, Pfam: PF01122; Cobalamin_bind, PROSITE: PS00468; COBALAMIN_BINDING

Expression pattern for human:

Tissue	Exp. (%)	Clones
spleen	14.56	2:12346
bone_Marrow	12.24	4:29369
blood	9.76	5:46017
pancreas	7.98	6:67592
mixed	7.15	25:314320
colon	6.55	6:82275
eye	5.57	8:128990
ovary	5.02	4:71634
brain	4.78	17:319574
kidney	3.94	5:113979

Animal models:

Mouse:

MGD: ; Tcn2, NCBI Gene: ; 21452 (73.54 % aminoacid similarity to human)

Rat:

NCBI Gene: ; 64365 (74.64 % aminoacid similarity to human)

OTHER RESOURCES

Societies:

General:

- International Patient Organization for Primary Immunodeficiencies
- Immune Deficiency Foundation
- European Society for Immunodeficiencies