Ataxia-telangiectasia-like disorder

GENERAL INFORMATION

Description:

Defects in MRE11A are a cause of ataxia-telangiectasia-like disorder (ATLD). ATLD is a disease with the same clinical feature as ataxia-telangiectasia but with a milder clinical course.

Alternative names:

- ATLD
- A-TLD
- A-T like disease

Classification:

- DNA breakage associated syndromes and DNA epigenetic modification syndromes
  - DNA-breakage-associated syndromes

Inheritance:

Autosomal recessive

OMIM:

- #604391 Ataxia-Telangiectasia-like disorder; ATLD
- *600814 MRE11A

Cross references:

Phenotype related immunodeficiencies:

- IDR factfile for Ataxia-telengiectasia

Incidence:

Incidence is not known.

CLINICAL INFORMATION

Description:

Patients have progressive cerebellar ataxia, dilation of the blood vessels in the conjunctiva and eyeballs, immunodeficiency, growth retardation and sexual immaturity. Patients have a strong predisposition to cancer; about 30% of patients develop tumors, particularly lymphomas and leukemias. Cells from affected individuals are highly sensitive to damage by ionizing radiation and resistant to inhibition of DNA synthesis following irradiation. AT-like disease has a milder course.

Diagnosis:

Diagnostic laboratories:

Clinical:

- Ataxia telangiectasia, ORPHANET
- Ataxia telangiectasia, eMedicine

Genetic:

- SCDU Genetica Medica - Azienda Ospidaliera San Giovanni Battista di Torino, Italy, EDDNAL
- Ulleval University Hospital - Department of Medical Genetics (Oslo), Norway, EDDNAL
- Ulleval University Hospital - Department of Medical Genetics (Oslo), Norway, EDDNAL

Therapeutic options:

- Ataxia Telangiectasia, eMedicine, USA

Research programs, clinical trials:

- Ataxia Telangiectasia Children's Project, USA
- Ataxia Telangiectasia Children's Project, USA
- European Initiative for Primary Immunodeficiencies

GENE INFORMATION

Names:

HUGO name: MRE11A
Alias(es): ATLD, HNGS1, MRE11, MRE11B, DNA recombination and repair protein, MRE11 meiotic recombination 11 homolog A (S. cerevisiae), Double-strand break repair protein MRE11A, Endo/exonuclease Mre11, Meiotic recombination (S. cerevisiae) 11 homolog, Meiotic recombination (S. cerevisiae) 11 homolog A, Double-strand break repair protein MRE11A

Localization:

Reference sequences:

DNA: U37359 (EMBL) AF022778 (EMBL) AF073362 (EMBL) AF303395 (EMBL) , **cDNA:** X58957 (EMBL) , **Protein:** P49959 (SWISSPROT) Other Sequences

Chromosomal Location:

11q21

Maps:

MRE11A (Map View)

Markers:

WI-17886, MRE11

Variations / Mutations:

- MRE11Abase; Mutation registry for Ataxia-telangiectasia-like disorder (ATLD)

Other gene-based resources:

Ensembl: ENSG00000020922, GENATLAS: MRE11A, GeneCard: MRE11A, UniGene: 192649, Entrez Gene: 4361, euGenes: 4361, GDB: 568485, HomoloGene: 4083

PROTEIN INFORMATION

Description:

Protein function:

Involved in DNA double-strand break repair (dsbr). Possesses single-strand endonuclease activity and double-strand-specific 3'-5' exonuclease activity. Also involved in meiotic dsb processing.

Subunit:

Forms a complex with rad50.

Subcellular location:

Nuclear

Cofactor:

Manganese

Similarity:

Belongs to the mre11/rad32 family.

Other features:

Other related resourses:

InterPro: IPR003701; DNA_repair, InterPro: IPR004843; M-ppestrase, InterPro: IPR007281; Mre11_DNA_bind, Pfam: PF00149; Metallophos, Pfam: PF04152; Mre11_DNA_bind

Expression pattern for human:

Tissue	Exp. (%)	Clones
embryonic stem cells	5.71	2:4803
bone marrow stroma	5.42	2:5056
moderately differentiated adenocarcinoma	4.93	1:2782
neuroblastoma cot 50-normalized	4.90	1:2799
neuroepithelial cells	4.50	1:3043
whole embryo, mainly head	4.05	1:3384
glioblastoma	3.88	2:7072
enchondroma cell line	3.64	1:3767
cell line	3.48	1:3934
placenta	3.32	2:8261
embryonic stem cells	5.71	2:4803
bone marrow stroma	5.42	2:5056
moderately differentiated adenocarcinoma	4.93	1:2782
neuroblastoma cot 50-normalized	4.90	1:2799
neuroepithelial cells	4.50	1:3043
whole embryo, mainly head	4.05	1:3384
glioblastoma	3.88	2:7072
enchondroma cell line	3.64	1:3767
cell line	3.48	1:3934
placenta	3.32	2:8261

Animal models:

Mouse:

MGD: ; Mre11a

OTHER RESOURCES

Societies:

General:

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

Disease specific:

- Ataxia-Telangiectasia, A-T Children's Project, Florida, USA
- National Ataxia Foundation, USA
- The Ataxia-Telangiectasia Medical Research Foundation, USA
- National Ataxia Foundation to treat A-T, USA
- The A-T project, USA
- Ataxia Telangiectasia Research Foundation, USA
- European Federation of Hereditary Ataxias, Overyse, Belgium