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Gene Section
Mini Review

NF2 (neurofibromatosis type 2)

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Identity

Other names: SCH

HGNC (Hugo): NF2

Location: 22q12.1-12.2

Local order: 22q12.1-12.2 junction, incidentally not far from EWS.

DNA/RNA

Description

Axons 17 exons (1-15, 17 constitutive, 16 alternatively spliced); spans 120 kb; open reading frame: 1.8 kb.

Transcription

Alternate splicing, in particular after exon 15.

Protein

Description

Called merlin, schwannomin, or SCH; isoform 1 595 amino acids, isoform 2 590 amino acids (due to inclusion of exon 16 in transcript) ; 66 KDa; NH2 -- FERM domain -- large a helix domain – COOH.

Expression

Wide: in lung, kidney, ovary, breast, placenta, neuroblasts; high in fetal brain.

Localisation

Membrane associated interacts with integral membrane proteins and actin-cytoskeleton.

Function

Membrane-cytoskeleton anchor (as APC also appears to be); role in the development of extraembryonic structures before gastrulation; has characteristics of a tumour suppressor, as has been found in sporadic as well as neurofibromatosis type 2 induced schwannomas and meningiomas.

Homology

Ezrin, radixin, moesin, members of the erythrocytes band 4.1 family, especially in the N-terminal FERM domain.

Mutations

Germinal

Inborn condition of neurofibromatosis type 2 patients: protein truncations due to various frameshift deletions or insertions or nonsense mutations; splice-site or missense mutations are also found; phenotype-genotype correlations are observed (i.e. that severe phenotype are found in cases with protein truncations rather than those with amino acid substitution).

Somatic

Mutation and allele loss events in tumours in neurofibromatosis type 2 and in sporadic schwannomas and meningiomas are in accordance with the two-hit model for neoplasia, as is found in retinoblastoma.

Implicated in

Neurofibromatosis type 2

Disease

Autosomal dominant tumor prone disease; neurofibromatosis type 2 (NF2: the same symbol is used for the disease neurofibromatosis type 2 and the gene) is an hamartoneoplastic syndrome.

Prognosis

Hamartomas have a potential towards neoplasia; those, in NF2, are the tumors of NF2 are slow-growing benign schwannomas which do not progress to malignancy and meningiomas.

Sporadic meningioma

Sporadic schwannoma

Other tumours: ependymoma; mesothelioma

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