

Gene Section

Mini Review

MVP (major vault protein)

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Identity

Other names: LRP (lung resistance-related protein)

HGNC (Hugo): MVP

Location: 16p11.2

Note: Drug resistance gene, codes for a "lung resistance-related protein" (LRP) originally detected in a lung carcinoma cell line resistant to chemotherapy.

DNA/RNA

Transcription

Coding sequence, corresponding to full mRNA, is 2840 bp long.

Protein

Description

110 kD protein, 896 amino acids; major cytoplasmic vault protein; vaults are nucleoproteic complexes composed of the MVP associated with two high-molecular weight proteins p240 and p193 which surround a small 140 nucleotides RNA species.

Expression

Expressed in a variety of human tumor cell lines, the major part being multidrug resistant; expressed also in primary solid tumors, mainly colon carcinoma or ovarian carcinoma, as well as in hematopoietic cancers (myelodysplastic syndrome, acute myeloid or lymphoid leukemia, multiple myeloma); in normal tissues, LRP expression has a wide distribution, with particularly high levels in epithelial cells of the digestive tract.

Localisation

Cytoplasmic, in the cytosol, with a little fraction (approximately 5%) located in the nuclear membrane and nuclear pores.

Function

Vault are cytoplasmic organelles which mediate bidirectional nucleocytoplasmic transport of a wide range of substrates, including cytotoxic drugs; vaults would be involved both in vesicle and cytosolic transport of molecules.

Homology

104 kD rat MVP.

Implicated in

Implicated in induced multidrug-resistance to anticancer chemotherapy

Disease

It includes resistance to doxorubicin, vinca alkaloids, mitoxantrone and etoposide; the role of LRP by itself in multidrug-resistance is not completely clear because it is only a part of a nucleo-proteic complex involved in macromolecules transport; the introduction and expression of the LRP gene in cells by transfection does not confer a multidrug-resistance phenotype; overexpression of LRP has been associated with poor response to chemotherapy in various types of leukemia and in ovarian carcinoma, however the role of LRP as pronostic factor remains controversial; in multi-resistant cell lines, LRP amplification within a homogeneous staining region is exceptional.

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