

## Gene Section

### Short Communication

# MYEOV (myeloma overexpressed (in a subset of t(11;14) positive multiple myelomas))

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## Identity

**Other names:** OCIM

**HGNC (Hugo):** MYEOV

**Location:** 11q13.3

**Local order:** 350 kb centromeric of cyclin D1.

### Note

Detected by application of the NIH/3T3 tumorigenicity assay. However MYEOV cDNA was not positive in NIH/3T3 assay.

## DNA/RNA

### Note

The MYEOV gene was originally isolated by the application of the NIH/3T3 tumorigenicity assay with DNA from a gastric carcinoma. The chromosomal region 11q13 is frequently associated with genetic rearrangements in a large number of human malignancies, including B-cell malignancies and overexpression of MYEOV is frequently observed in breast tumors and oral, esophageal squamous cell carcinomas and multiple myeloma.

The presence of functional domains such as RNP-1 (motif typical of RNA binding protein) and the studies of the short hydrophobic regions and of the C-terminal leucine/isoleucine tail showed that MYEOV might be directed to the membrane. MYEOV small interfering RNA (siRNA) decreased proliferation of gastric cancer cells, colon cancer cell lines and multiple myeloma cells in vitro.

### Description

2 exons; 3,5 kb transcript represents unspliced mRNA.

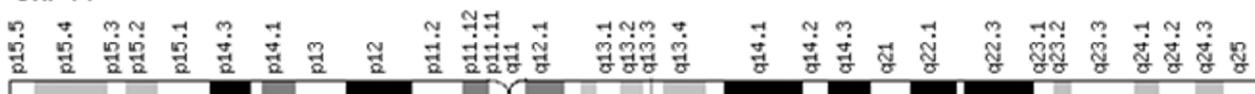
### Transcription

Main transcript 2,8 kb (broad band because of alternative splice products); minor transcript 3,5 kb; coding sequence 313 or 255 amino acids. In normal tissues hardly any expression detectable. High expression in a subset of multiple myeloma cell lines with a t(11;14)(q13;q32) and in breast tumors and esophageal squamous cell carcinomas with or without 11q13 amplification.

### Pseudogene

No pseudogenes have been reported for MYEOV.

Chr 11



## Protein

### Description

313 or 255 amino acids; contains one RNP-1 motif and 6 regions that might function as a transmembrane domain. Leucine-rich stretch at C-terminal.

### Expression

5' UTR inhibits efficient translation of the protein.

### Localisation

In endoplasmic reticulum and mitochondria.

### Homology

No known homology.

## Implicated in

### t(11;14)(q13;q32)

#### Disease

Subset of multiple myeloma cell lines with t(11;14)(q13;q32).

#### Cytogenetics

MYEOV overexpression due to juxtaposition to the 5' enhancer or the most telomeric 3' enhancer of the immunoglobulin heavy chain (IgH).

### 11q13 amplification and/or overexpression

#### Disease

Breast cancer; esophageal squamous cell carcinomas.

#### Prognosis

MYEOV DNA amplification correlated with estrogen and progesterone receptor-positive cancer, invasive lobular carcinoma type and axillary nodal involvement. In contrast to Cyclin D1 amplification, no association with disease outcome could be found.

### Multiple myeloma

#### Prognosis

In a cohort of 171 myeloma patients, patients with MYEOV<sup>absent</sup> MMC have an increased event-free survival compared to patients with MYEOV<sup>present</sup> MMC, after high-dose therapy and stem cell transplantation and a trend for increased overall survival. In a Cox proportional hazard model, MYEOV expression in MMC is predictive for event-free survival for patients independently of International Staging System stage, t(4;14) translocation, albumin, or B2M serum levels. In a second independent cohort of 208 patients (LR-TT3, from the University of Arkansas for Medical Sciences (Little Rock, AR, USA)), MYEOV had a "present" call in MMCs of 73% of patients. Patients with MYEOV<sup>absent</sup> MMCs had a significant better overall survival in the LR-TT3 cohort.

#### Oncogenesis

In a cohort of 171 patients, MMC of 79% of the

patients with newly diagnosed MM express MYEOV gene. A treatment with 5-aza-2'-deoxycytidine of 2 MYEOV<sup>absent</sup> myeloma cell lines induced MYEOV expression without affecting that in the MYEOV<sup>present</sup> myeloma cells. MYEOV siRNA did not significantly induce apoptosis in myeloma cell lines, but it blocked the cell cycle entry into the S-phase.

### Colon cancer

#### Oncogenesis

Knockout of MYEOV RNA (siRNA) has been shown to decrease proliferation of colon cancer cell lines in vitro. Furthermore, in colon cancer, MYEOV stimulates colorectal cancer cell migration in vitro. MYEOV expression is enhanced by PGE2 treatment in colorectal cancer cells.

### Gastric cancer

#### Oncogenesis

Knockout of MYEOV RNA (siRNA) has been shown to decrease proliferation and invasion of gastric cancer cells in vitro.

### Neuroblastoma

#### Oncogenesis

MYEOV is a candidate gene target in neuroblastoma that was identified by chromosomal gain 11q13 through SNP analysis. MYEOV expression was analyzed in 55 neuroblastoma samples including 25 cell lines. MYEOV was shown to be upregulated in 11 out of 25 neuroblastoma cell lines and 7 out of 20 fresh tumors. Knockout of MYEOV RNA (siRNA) has been shown to decrease proliferation of neuroblastoma cell line in vitro.

### Oral squamous cell carcinoma

#### Oncogenesis

Gain of 11q13 was significantly associated with cervical lymph node metastasis in oral squamous cell carcinoma (54 patients included in the study). Copy number amplification of MYEOV is associated with cervical lymph node metastasis in oral squamous cell carcinoma. Lymph node metastasis is associated with a significant decrease of 5-years survival in oral squamous cell carcinoma.

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