Transfection of the tumor metastasis suppressor gene nm23-H1 can targetly suppress the activity of extracellular signal-regulated protein kinase ERK in human high-metastasis large cell lung cancer cell line L9981

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Abstract Objective To investigate the influence of the tumor metastasis suppressor gene nm23-H1 on the activity of extracellular signal-regulated protein kinase ERK in human high-metastasis large cell lung cancer cell line L9981. Methods The levels of total ERK1/2 and phospho-ERK1/2 were determined with p44/42 MAP kinase antibody and dual phosphospecific p44/42 MAP kinase antibody in human high-metastasis large cell lung cancer cell lines L9981 cell line with nm23-H1 gene deletion L9981-nm23-H1 cell line with nm23-H1 transfection L9981-PLXSN cell line with vector transfected by Western blot method respectively. The activity of phospho-ERK1/2 was determined with an ERK1/2 assay kit by immunoprecipitation and Western blot analysis. Results The expression levels of phospho-ERK1/2 kinase and the activity of phospho-ERK1/2 in the lung cancer cell line L9981-nm23-H1 were remarkably higher than those of the L9981 cell line and L9981-PLXSN cell line P < 0.01 but no significant difference in both the phospho-ERK1/2 expression and phospho-ERK1/2 activity was observed between the L9981 and L9981-PLXSN cell line P > 0.05. There was no significant difference in the total ERK1/2 level among the three cell lines. Conclusion nm23-H1 gene can obviously targetly suppress the activity of ERK1/2 in human high-metastasis large cell lung cancer cell line L9981. This suggest that the mechanisms of nm23-H1 gene as a tumor metastasis suppressor gene may be related to its suppression to the MAPK/ERK signal transduction pathway.

Key words Human high-metastasis large cell lung cancer cell line L9981 nm23-H1 Signal transduction Extracellular signal-regulated protein kinase ERK

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1.4 Western blot

1.5 400 μl 15 μl 30 s 50 μl 100°C

1.6 $ P < 0.05$
Comparison of phospho-ERK1/2 activity among human high metastatic large cell lung cancer cell lines L9981, L9981-PLXSN and L9981-nm23-H1

Western blot results of phosphorylated Elk-1 in human high metastatic large cell lung cancer cell lines L9981, L9981-PLXSN and L9981-nm23-H1

Discussion

Cell signal transmission pathways control all cellular activities. Many oncogenes and tumor suppressor genes are located at different sites in the signal transmission pathway and participate in important cellular processes [1]. Currently, research on the role of oncogenes in the regulation of tumor invasion and metastasis signal transmission pathway is still in progress.

Extracellular signal-regulated protein kinase (ERK) signaling is a critical signaling system in eukaryotic cells, which can regulate cellular growth, differentiation, proliferation, death and cell-to-cell communication. In humans, 9 ERK signaling pathways have been identified, including the Ras-Raf-MEK-ERK pathway, the JNK pathway, the SAPK pathway, the p38 MAPK pathway and the MAPKKK-MAPKK-MAPK pathway. In the course of evolution, the ERK signaling pathway is highly conserved and highly conserved, and increases ERK1/2 phosphorylation. After cells are stimulated, the ERK pathway is activated, which is critical for cellular responses to various stimuli.
K KK KK KK Raf MAPK MAPK MEK MAPK ERK T202 Y204 MAPK ERK1/2 MEK1/2 ras/raf MK/ERK MAPK PLXSN-nm23-H1 EGFP I9981 mm23-H1 ERK1/2 ERK1/2 I9981 mm23-H1 ERK1/2 I9981 mm23-H1 ERK1/2 I9981 mm23-H1 ERK1/2 I9981 mm23-H1 cross-talk


