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Effect of microRNA-206 on cytoskeleton remodelling by downregulating Cdc42 in MDA-MB-231 cells

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ABSTRACT

Aims and background. MicroRNAs are small, noncoding, single-stranded RNAs that regulate gene expression post-transcriptionally. miR-206 is known to play an important role in breast cancer metastasis. When we sought to predict the target of miR-206 by Targetscan, Pictar and miRanda, we found Cdc42 was a potential one. In this study, we transfected miR-206 into MDA-MB-231 cells and examined Cdc42 protein expression as well as MMP-2 and MMP-9, which are also associated with metastasis of breast cancer. Since Cdc42 is involved in filopodia and invadopodia formation, we examined the morphological changes of MDA-MB-231 cells.

Methods and study design. miR-206 mimics were transfected into MDA-MB-231 cells using Lipofectamine™ 2000. Protein expression was detected by Western blot. Cells were stained with FITC-phalloidin to visualize F-actin. Invasive ability and migratory ability were examined by invasion assay and migration assay *in vitro*.

Results. Cdc42, MMP-2 and MMP-9 were downregulated on the protein level. The formation of filopodia, which requires Cdc42, was inhibited in miR-206 transfected cells, even under the stimulation of EGF. The invasion and migration of MDA-MB-231 cells *in vitro* was inhibited by miR-206 too.

Conclusions. The results suggest that miR-206 may suppress invasion and migration of MDA-MB-231 cells *in vitro* partly via regulating actin cytoskeleton remodelling such as filopodia formation. Free full text available at www.tumorionline.it

Key words: Breast tumor, miR-206, Cdc42, cytoskeleton.

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