MiR-221/-222 differentiate prognostic groups in advanced breast cancers and influence cell invasion.

Abstract:
Background: MiR-221/-222 are frequently overexpressed in breast cancer and are associated with increased malignancy. The specific modification of microRNAs (miRNAs) expression could be a promising strategy in breast cancer therapy, leading to the suppression of tumourigenic processes in tumour cells. Methods: MiR-221/-222 expressions were analysed in 86 breast cancer tissues by quantitative RT-PCR and tested for correlation with immunohistochemistry data and clinical follow-up. In vitro assays were conducted using human breast cancer cell lines with lentiviral overexpression of miR-221/-222. Results: In tumour tissues, miR-221/-222 were associated with the occurrence of distant metastases. In particular, high levels of miR-221 were revealed to have a high prognostic impact for the identification of significantly different groups with advanced tumours. MiR-221/-222 overexpression strongly increased cell proliferation and invasion in vitro. Following miR-221/-222 overexpression an increased uPAR expression and cell invasion were observed. Conclusion: This study demonstrates a significant role for highly expressed miR-221/-222 in advanced breast cancers allowing for the identification of significantly different prognostic groups, particularly for HER2-positive and lymph-node-positive breast cancers.
Considering that miR-221/-222 are strongly involved in cell invasion, these miRNAs may be promising markers for breast cancer prognosis and therapy.