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Screening of miRNAs associated with lymph node metastasis in Her-2-positive breast cancer and their relationship with prognosis

Key words: Breast cancer, Her-2 positive, Lymphatic metastasis, miRNA, MALAT1

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Research Summary

This article analyzed correlations between miRNAs and the prognosis of patients with breast cancer based on data collected from the cancer genome atlas (TCGA) database and conclude that miR-455 may be a useful potential biomarker for forecasting lymph node metastasis and the prognosis of Her-2 positive breast cancer patients.

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Part of Tables

Table 5 Analysis of the correlation between the expression of microRNAs and prognostic factors in Her-2 positive breast cancer samples

Clinical Index	miR-143		miR-455		miR-99a	
	R Value	*P* Value	R Value	*P* Value	R Value	*P* Value
OS	0.3246	0.3032	0.6394	0.0252	0.4399	0.1524
RFS	0.3515	0.2625	0.7151	0.0089	0.4072	0.1890
Number of lymph node metastases	-0.5554	0.0608	-0.5769	0.0495	-0.3548	0.2578
Pathological stage	-0.0067	0.9836	-0.0981	0.7616	-0.5649	0.0556

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Part of Figures

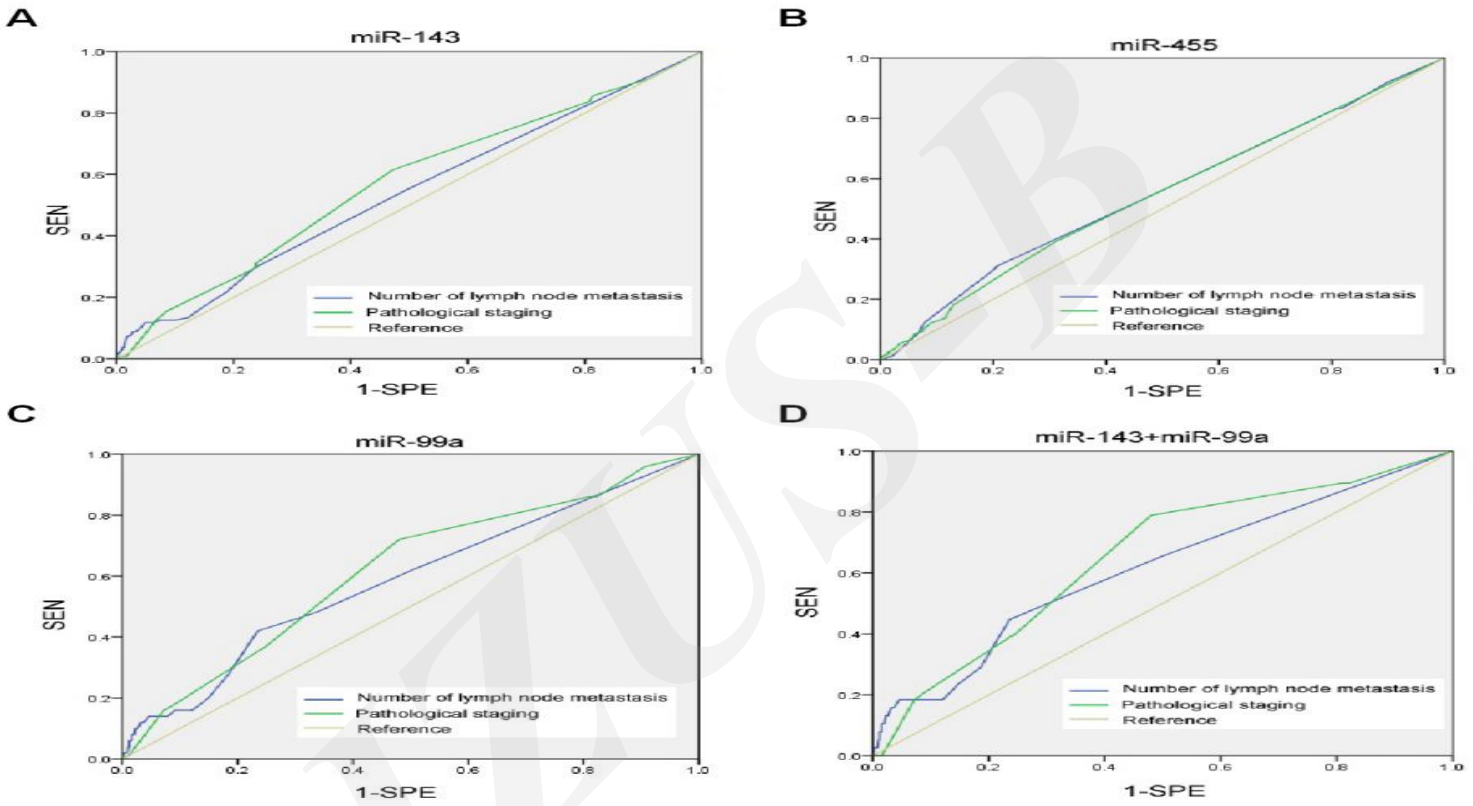


Figure 1 ROC for Distinguishing Lymph Node Metastasis and Pathological Stage by the Expression Level of MiRNA.

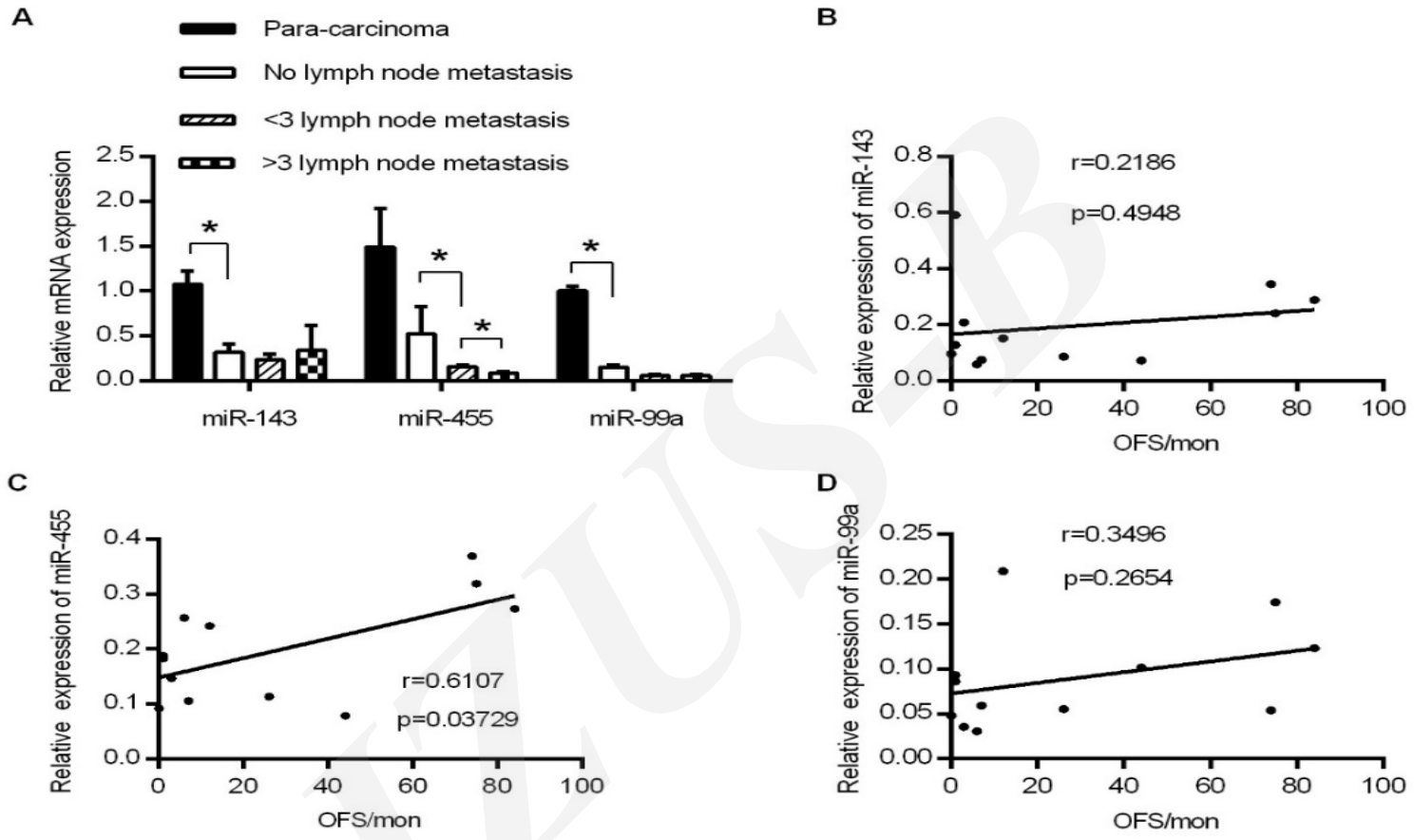


Figure 3 Correlation Analysis between MiRNA Expression and Prognostic Survival in Her-2 positive

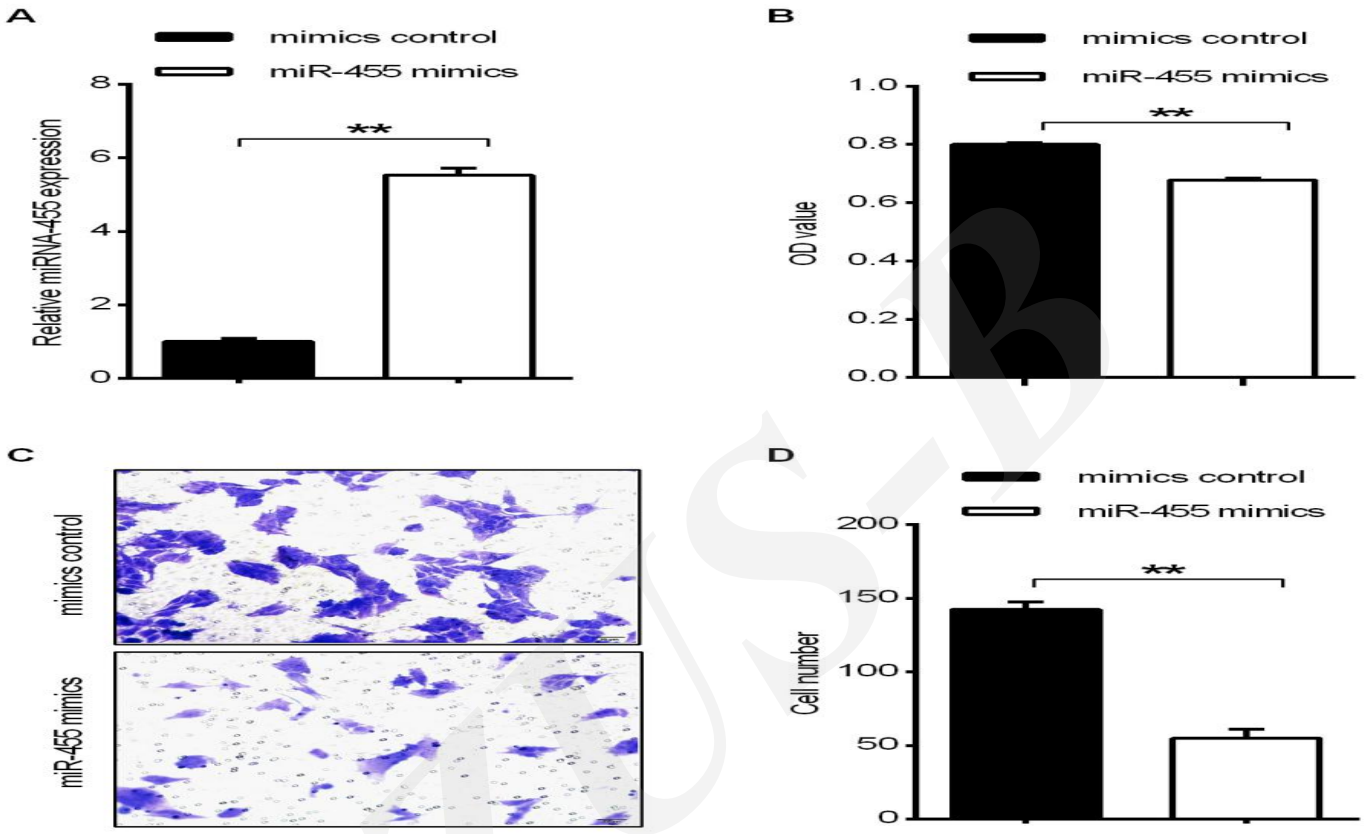


Figure 4 Effects of Overexpressed MiR-455 on MDA-MB-453 cell Proliferation and Invasion. (A) Overexpression of miR-455 in MDA-MB-453 cells after their transfection into MiR-455 mimics; (B) changes to cell proliferation detected by CCK-8 after MDA-MB-453 cell transfection into miR-455 mimics; (C-D) changes to cell invasiveness by Transwell assays after MDA-MB-453 cell transfection into miR-455 mimics. The results are represented by the mean±standard deviation. *, $P<0.05$; **, $P<0.01$. The scale is 20 μm, which has a magnification of X40 under an objective length.

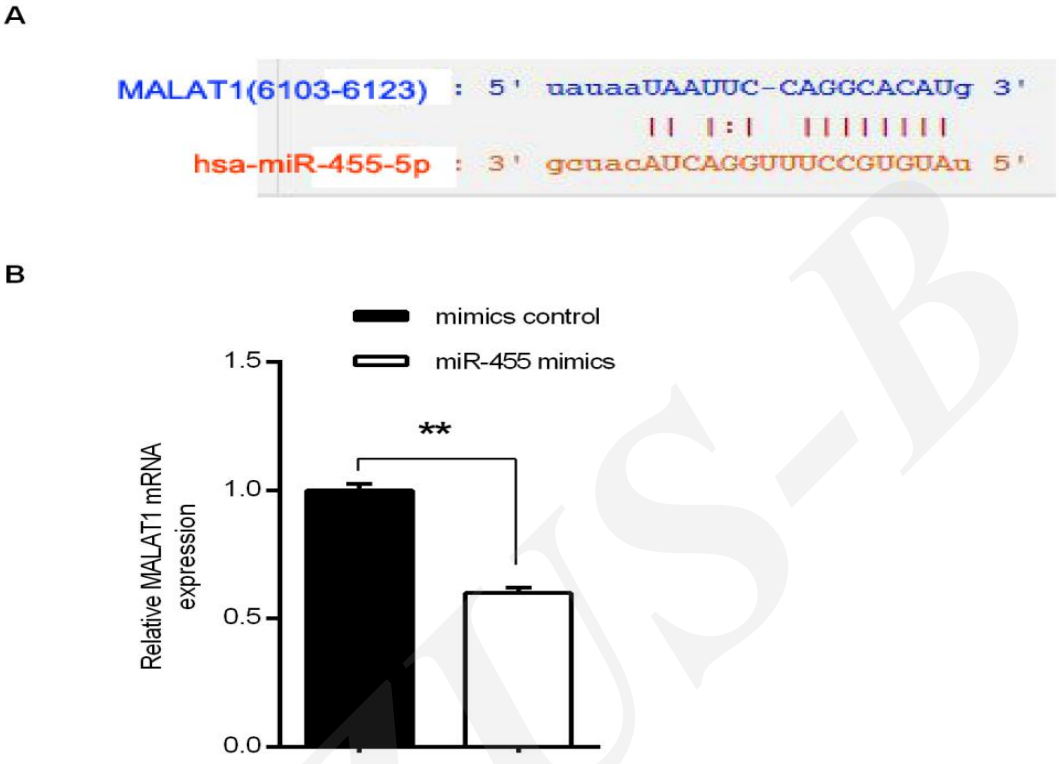


Figure 5 Effects of Overexpressed MiR-455 upon the Expression Level of MALAT1 in MDA-MB-453 cells

Binding sites between MALAT1 and miR-455-5p forecast by Starbase; (B) the expression level of MALAT1 measured by qRT-PCR assay after MDA-MB-453 cell transfection into miR-455 mimics. The results are represented by the mean ± standard deviation. *, $P<0.05$; **, $P<0.01$.

Main Results

- The expression of miR-455 was significantly and positively correlated to the prognosis and overall survival (OS) of the breast cancer (P=0.028), according to TCGA information.
- The expression level of miR-455 was positively correlated with OS and relapse-free survival (RFS) of patients with Her-2 positive breast cancer, and was negatively correlated with the number of metastatic lymph nodes (P<0.05).

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Main Results

- Transwell assay suggested that MDA-MB-453 cells became much less invasive ($P<0.01$) after being transfected with miR-455 mimics. During the qRT-PCR, the expression level of MALAT1 declined significantly after transfection ($P<0.01$).
- Overexpressed miR-455 significantly inhibited the proliferation and migration of MDA-MB-453 cells, and the expression of MALAT1.

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