The role of miRNAs in drug resistance and prognosis of breast cancer formalin-fixed paraffin-embedded tissues

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Running title: MiRNAs in drug resistance of breast cancer

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Abstract Purpose: Chemoresistance mediated by miRNAs in breast cancer have been already validated by previous studies *in vitro*, while little is known concerning the expression of them *in vivo*. The aim of this study was to investigate the role of miR-222, miR-29a, miR-34a, miR-130a, miR-90b, miR-200b, miR-452, miR-197, miR-138, miR-210, miR-423, miR-4298, miR-4644, miR-139, miR-1246, miR-1268a, miR-140, miR-149, miR-3178, miR-3613, miR-4258, miR-574, miR-671, miR-6780b, miR-7107, miR-744 and miR-7847 linked to drug resistance in breast cancer formalin-fixed paraffin-embedded tissues and the association of prognosis with miRNAs, thus providing effective targets in chemotherapy, as well as potential biomarkers for guiding effective treatments of breast cancer. Methods: The relationship between the expression of diverse miRNAs and drug resistance was detected by RT-qPCR using 55 breast cancer FFPE tissues containing 26 paired FFPE specimens. Results: MiR-222, miR-29a, miR-34a, miR-423, miR-140, miR-3178, miR-574, miR-6780b and miR-744 exhibited significantly higher expression levels in surgically-resected specimens compared with pre-neoadjuvant chemotherapy biopsies. Evidently high expression of miR-222, miR-29a, miR-140, miR-574, miR-6780b, miR-7107 and miR-744 were found in ineffective group comparing with effective group. Further investigations revealed the significant association between several miRNAs in breast cancer patients. Conclusions: This study highlights the role of numerous miRNAs in prediction of therapeutic responses and suggests that specific miRNAs could serve as valuable sources for biomarker detections and optimal chemotherapeutic choices for breast cancer patients.

Abbreviations

FFPE: Formalin-Fixed, Paraffin-Embedded

RECIST: Response Evaluation Criteria in Solid Tumors Group

HE: hematoxylin and eosin

PR: partial remission