

Evaluation of the use of long noncoding RNAs as biomarkers for diagnosis of breast cancer

Nahla El-Ashmawy¹, Fatma Zakaria², Ghada Al-Ashmawy¹ and Sara Hamouda¹

¹ Department of Biochemistry, Faculty of Pharmacy, Tanta University, Tanta, Egypt

² Oncology Department, Faculty of Medicine, Tanta University, Tanta, Egypt

Background: FAM83H antisense RNA 1 (FAM83H-AS1) and long noncoding RNA activated by TGF β (lncRNA-ATB) are two lncRNAs that have tumor promoting functions in breast cancer (BC). Matrix metalloproteinase-9 (MMP-9) is another tumor marker that exerts an oncogenic role in BC and facilitate cancer invasion and metastasis. **Aims:** Our study aimed to 1) analyze serum levels of FAM83H-AS1, lncRNA-ATB, and MMP-9 in BC patients, 2) compare their diagnostic role with that of CA15-3 in BC patients with different stages (I-II, III, and IV), and 3) correlate the levels of the measured lncRNAs, MMP-9, and CA15-3 with the clinicopathological features of BC. **Materials and Methods:** Serum FAM83H-AS1 and lncRNA-ATB levels were analyzed in 90 BC patients and 30 healthy controls using RT-PCR. While serum levels of MMP-9 and CA15-3 were measured in the same studied groups by ELISA. **Results:** FAM83H-AS1, lncRNA-ATB, MMP-9, and CA15-3 levels were significantly elevated in sera of BC patients. ROC curve analysis showed that lncRNA-ATB and MMP-9 had higher AUC values than CA15-3 in diagnosis of stage I-II patients (AUC: 0.844 and 0.898, $p=0.000$ for lncRNA-ATB and MMP-9, respectively versus 0.738, $p=0.002$ for CA15-3). FAM83H-AS1 level was significantly correlated with higher stage, larger tumor size, positive lymph node metastasis, and distant metastasis. FAM83H-AS1 level was also significantly increased in PR-negative and ki67-rich tumors. **Conclusion:** Our study demonstrated that circulating lncRNA-ATB and MMP-9 could be used as diagnostic biomarkers for early BC. FAM83H-AS1 could also be a potential candidate for staging BC and monitoring disease progression.

Keywords: Breast cancer diagnosis; FAM83H-AS1; lncRNA-ATB; Long non-coding RNA; MMP-9

Editor-in-Chief: Prof. M.L. Salem, PhD - Article DOI: 10.21608/jcbr.2021.60072.1153
