

Activation of Spermidine/Spermine N1-Acetyltransferase 1 (SSAT-1) as Biomarker in Breast Cancer

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Abstract : Background: Cancer is a leading cause of death worldwide, with breast cancer being the most common cancer in women. Pakistan has the highest rate of breast cancer cases among Asian countries. Early and accurate diagnosis is crucial for treatment outcomes and quality of life. Method: It is a case-control study with a sample size of 150. There were 100 suspected cancer cases, 25 healthy controls, and 25 diagnosed cancer cases. To analyze SSAT-1 mRNA expression in whole blood, Zymo Research Quick-RNA Miniprep and Innu SCRIPT—One Step RT-PCR Syber Green kits were used. Patients were divided into three groups: 100 suspected cancer cases, 25 controls, and 25 confirmed breast cancer cases. Result: The total mRNA was isolated, and the expression of SSAT-1 was measured using RT-qPCR. The threshold cycle (Ct) values were used to determine the amount of each mRNA. Ct values were then calculated by taking the difference between the CtSSAT-1 and Ct GAPDH, and further Ct values were calculated with the median absolute deviation for all the samples within the same experimental group. Samples that did not correlate with the results were taken as outliers and excluded from the analysis. The relative fold change is shown as 2^{-Ct} values. Suspected cases showed a maximum fold change of 32.24, with a control fold change of 1.31. Conclusion: The study reveals an overexpression of SSAT-1 in breast cancer. Furthermore, we can use SSAT-1 as a diagnostic, prognostic, and therapeutic marker for early diagnosis of cancer.

Keywords : breast cancer, spermidine/spermine, qPCR, mRNA

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