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Thioredoxin1, a novel serum marker for human breast carcinoma

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Thioredoxin1 (Trx1) is known to contain an active site with a redox-active disulfideand to be secreted extracellularly. Function of Trx1 has been implicated in regulating cell proliferation, differentiation, and apoptosis.We investigated whether serum Trx1 levels are elevated in patients with various carcinomas (breast, lung, colon, kidney, ovarian, prostatic, and gastric cancers).In previous study, we demonstrated that the mRNA and protein levels of Trx1 in breast carcinoma are much higher than those of the normal controls. The aim of this study was to assess the clinical significance of serum Trx1 level in patients with breast carcinoma. To clarify whether serum levels of Trx1 could be a serum marker for breast carcinoma, we measured the serum levels in patients with breast carcinoma using an ELISA, and investigated its associations with the tumor grading from I to III. We have found that the plasma Trx1 level of the cancer patients was significantly higher than those of normal subjects. The serum level was correlated with the progress of carcinoma. At the cut-off point 73.68ng/ml on the receiver operating characteristic curve, Trx1 could well discriminate breast carcinoma from normal controls with a sensitivity of 94.9%, specificity 88.0%, and area under curve (AUC) 0.970+/-0.013. We also investigated the serum level of Trx1 in various patients with lung, colon, kidney, ovarian, prostatic, and gastric carcinomas. Analysis of the corresponding ROC curve indicated that Trx1 could be most potential biomarker for breast carcinoma. Taken together, we concluded that serum Trx1 level is a new biomarker for breast carcinoma. *This work was financially supported by Regional Research and Development Cluster Project (B0009735) funded by the Ministry of Knowledge Economy (MKE) of Korea.*