SLC34A2 as a Novel Marker for Diagnosis and Targeted Therapy of Breast Cancer

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Abstract. *The purpose of this study was to estimate the role of the SLC34A2 gene in breast cancer. A total of 146 samples were collected from breast cancer tissues and their adjacent normal breast tissues. Reverse transcription and real-time polymerase chain reaction were used to estimate gene expression levels. There was a significantly increased gene expression of SLC34A2 (normal tissues: 6.71±0.77; tumour tissues: 10.29±0.80) among breast cancer tissues compared with normal tissues. However, there was no significant association between overall survival and the gene expression level of SLC34A2. Moreover, a significant overexpression of CA125 (normal tissues: 7.26±0.62; tumour tissues: 10.51±0.58) in breast cancer tissues and a significant correlation between SLC34A2 and CA125 gene expressions were found. Our results suggested SLC34A2 to be involved in the development of breast cancer; this gene may therefore be a novel marker for the detection of breast cancer and act as a target gene in therapeutic strategies.*

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Breast cancer is an epithelial tumour with highly invasive and metastatic potential and is one of the most frequently occurring malignant neoplasms worldwide (1, 2), as well as the fourth leading cause of cancer death among Taiwanese people in Taiwan (3). Thus, there is a demand for novel treatment modalities in breast cancer, such as approaches to targeted therapies. Recently, hormone-related factors, such as estrogen receptor (ER), progesterone receptor (PR), and human epidermal receptor 2 (HER2) (4-7), and screening of gene expression, such as *CA125* (8-11), have been considered to be associated with the development and prognosis of breast cancer and suggested to be used as predictors of, or in the targeted treatment of, breast cancer. However, the lack of a specific biomarker for CA125 (10, 12-17), and the controversial role of hormone-related receptors (4-7) for breast cancer have limited application in breast cancer prediction or targeted therapy. Therefore, additional biological and clinical studies on their significance in the diagnosis and therapy of breast cancer are required.

The *SLC34A2* gene, located on chromosome 4p15.2, is a member of the solute carrier gene family, which encodes for a multi-pass membrane protein of 690 amino acids. SLC34A2 is expressed on cell surfaces as a heavily glycosylated plasma membrane protein for mediating the transport of inorganic phosphate into epithelial cells *via* sodium ion co-transport (18-20), and is suggested to be associated with calcification in several tissues (18, 19, 21). Increased inorganic polyphosphate has been reported to promote the proliferation of human fibroblasts and human dental pulp cells (22), and calcium-phosphate calcifications

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