



## Association of chemotactic factor receptor 5 gene with breast cancer

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**ABSTRACT.** We designed a 2-stage study to investigate chemotactic factor receptor 5 (CCR5) gene expression in breast cancer tissues and axillary lymph nodes and analyze the association between the *CCR5-Δ32* gene polymorphism and the clinical features and prognosis of breast cancer patients. The first stage examined 72 cases of invasive ductal carcinoma and axillary lymph node tissue, 50 cases of breast fibroadenoma tissue, and 40 cases of normal breast tissue. The tissues specimens were embedded in paraffin, and CCR5 expression was detected using immunohistochemical methods. C-erbB-2, p53, Ki-67, estrogen receptor, and progesterone receptor expression were also detected in the breast cancer tissues. The second stage examined 35 cases of surgically removed tissue. Relative expression levels of CCR5 messenger RNA (mRNA) in primary foci, axillary lymph node, and cancer-adjacent tissues of the breast cancer and breast fibroadenoma samples were detected using real-time quantitative reverse transcription-polymerase chain reaction assay. We found that 1) CCR5 mRNA relative expression levels in breast cancer tissue were significantly higher than those in adjacent normal tissue ( $P < 0.01$ ) and benign

tumors ( $P < 0.05$ ). The relative CCR5 mRNA relative expression level between phase II and phase III breast cancer tissues was statistically significant ( $P < 0.05$ ). The CCR5 mRNA relative expression level between adjacent normal tissues and fibroadenoma tissues was not significantly different ( $P > 0.05$ ). 2) Relative CCR5 mRNA expression level was significantly higher in metastatic lymph node tissues than that in non-metastatic lymph nodes ( $P < 0.05$ ), and 3) CCR5 expression in breast cancer tissue was positively correlated with axillary lymph node metastasis (chi-square = 4.982,  $P = 0.026$ ,  $r = 0.305$ ). CCR5 expression was mildly and positively correlated with the oncogene C-erbB-2 ( $P < 0.05$ ,  $r = 0.291$ ). 4) CCR5 expression in breast cancer tissue was not correlated with age, menopause, maximum tumor size, tumor phase, p53, Ki-67, estrogen receptor, progesterone receptor, or other clinical features ( $P > 0.05$ ). We concluded that CCR5 expression significantly increases in breast cancer tissues and metastatic lymph nodes. CCR5 plays a role in breast cancer development and axillary lymph node metastasis. It can be used indirectly as an indicator of axillary lymph node metastasis and prognosis.

**Key words:** Breast cancer; CCR5; C-erbB-2; Ki-67; Prognostic indicator; Immunohistochemistry