



HIF-2 α as a prognostic marker for breast cancer progression and patient survival

H.X. Wang^{1*}, C.Qin^{2*}, F.Y. Han², X.H. Wang² and N. Li²

¹Department of Clinical Immunology, Xinxiang Medical University, Xinxiang, China

²Department of Pathology, Xinxiang Medical University, Xinxiang, China

*These authors contributed equally to this study.

Corresponding author: N. Li

E-mail: lina@xxmu.edu.cn

Genet. Mol. Res. 13 (2): 2817-2826 (2014)

Received September 10, 2013

Accepted November 9, 2013

Published January 22, 2014

DOI <http://dx.doi.org/10.4238/2014.January.22.6>

ABSTRACT. Malignant cells show increased invasion potency *in vitro* and *in vivo*. This process is considered to be mediated by matrix-metalloproteases (MMPs). Hypoxia-inducible factor-2 α (HIF-2 α) may upregulate MMP-2 expression; however, little is known about the correlation between HIF-2 α and MMP-2 expressions in breast cancer. The current study investigated this correlation immunohistochemically according to various clinical and pathological features in 102 paraffin-embedded archival tissue block specimens from patients with breast cancer. HIF-2 α and MMP-2 expression was detected in 60.8% (62/102) and 65.7% (67/102) of tumor samples, respectively. HIF-2 α expression was significantly correlated with tumor size (P = 0.019), lymph node involvement (P = 0.035), and metastasis (P = 0.035). MMP-2 expression was significantly associated with lymph node involvement (P = 0.043) and metastasis (P = 0.003). Univariate analyses revealed that HIF-2 α (P = 0.001) and MMP-2 (P = 0.000) expressions were significantly associated with a poorer survival rate, as well as tumor size, lymph node invasion, and distant metastasis. Multivariate analysis revealed that HIF-2 α (P = 0.003) and the T-stage (P = 0.000) were independent

prognostic factors of overall survival. Spearman correlation analysis revealed that HIF-2 α and MMP-2 expressions were significantly correlated ($r = 0.990$; $P = 0.041$). These results suggest that high HIF-2 α expression is associated with poor overall survival in patients with breast cancer, indicating that HIF-2 α could be a valuable marker of breast cancer progression.

Key words: Hypoxia-inducible factor-2 α ; Breast cancer; Prognosis; Clinicopathological characteristics