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psiTPTE22-HERV functions as a tumor suppressor and is epigenetically down-regulated in gastric cancer

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The novel gene *psiTPTE22-HERV* identified by us previously is a human-specific gene containing a human endogenous retrovirus (HERV) element and located adjacent to the gene *psiTPTE22*. *psiTPTE22-HERV* is ubiquitously expressed in normal adult tissues including stomach, but is frequently silenced/down-regulated in gastric cancer samples and cell lines. Ectopic expression of *psiTPTE22-HERV* significantly suppressed cell viability, clonogenicity and cell cycle progression, induced apoptosis, and inhibited migration and invasion of SGC7901 and MKN45 gastric cancer cells. *psiTPTE22-HERV* also significantly suppressed subcutaneous tumorigenicity of SGC7901 cells in nude mice and metastasis in tail vein injection models. In contrast, knock-down of *psiTPTE22-HERV* in the gastric cancer MKN1 cells significantly increased cell growth and migration ability, promoted cell cycle progress and inhibited cell apoptosis. Bisulfite genomic sequencing results indicated that *psiTPTE22-HERV* was silenced in gastric cancers by promoter DNA methylation, and its expression could be restored by DNA methylation and histone deacetylase inhibitors. Quantification results demonstrated that the promoter methylation level of *psiTPTE22-HERV* in primary gastric tumors are significantly associated with shortened survival in gastric cancer patients from two independent Chinese cohorts (both $P < 0.05$) as shown by Cox regression and Kaplan-Meier survival analyses. *psiTPTE22-HERV* is a novel tumor suppressor that is commonly down-regulated by promoter methylation in gastric cancer, which may serve as a prognostic biomarker for gastric cancer patients.

Biography

Jessie Qiaoyi Liang has been involved in the identification and characterization of cancer-related genes since 2004. Whilst completing her PhD in Oncology at the Cancer Institute of Zhejiang University, she identified and designated three novel cancer-related genes, including *HERV-HX*, *HERV-H4p15* and *psiTPTE22-HERV*. He is currently a Research Assistant Professor in State Key Laboratory of Digestive Disease, Department of Medicine and Therapeutics, The Chinese University of Hong Kong. Her work has resulted in publication of 30 peer-reviewed research articles, of which 14 are as first/co-first or corresponding author, 3 patents, 19 conference abstracts and 13 research awards (AACR travel award, UEGW Oral Free Paper Prize, ICG Women Scientists Award, CUHK Research Excellence Award, etc.). She has delivered speeches at 8 international and 5 national conferences in recent 3 years.

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