**POSTER PRESENTER**

**POSTER #6**

**SERUM LONG NONCODING RNA HOTAIR AS NOVEL DIAGNOSTIC AND PROGNOSTIC BIOMARKER IN GLIOBLASTOMA MULTIFORME**

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**BACKGROUND:** Glioblastoma multiforme (GBM) is the most common malignant adult brain tumor. Therefore, there is an urgent need to develop a peripheral biomarker for GBM. Long noncoding RNAs (lncRNAs) have emerged as new players in cancer paradigm, demonstrating potential roles in both oncogenic and tumor-suppressive pathways. Utilizing single molecule sequencing, we have previously demonstrated that hundreds of lncRNAs, including HOTAIR, are strongly dysregulated in GBM and HOTAIR is critical in GBM cells proliferation. The purpose of this study was to investigate the prognostic and diagnostic values of serum HOTAIR in GBM.

**METHODS:** HOTAIR expressions were measured in 43 GBM serums and 40 healthy controls using qRT-PCR. The PCR products were subsequently subcloned into pCRTM4-TOPO®TA vectors for DNA sequencing. A ROC curve was generated to examine HOTAIR's prognostic value and correlations of serum HOTAIR levels with clinicopathological features were analyzed. Serum exosomes were also isolated and validated by Western blot and NanoSight analysis. We further detected HOTAIR levels in serum of mice with GBM PDX-39 tumors implanted intracranially.

**RESULTS:** GBM patients had a significantly higher serum HOTAIR expression than those of healthy controls (*P*<0.0001, Mann-Whitney test). The area under the ROC curve distinguishing GBM patients from controls was 0.913 (95% CI: 0.845–0.982, *P*<0.0001), with 86.1% sensitivity and 87.5% specificity at the cut-off value of 10.8. In addition, *Pearson* correlation analysis indicated a medium correlation of serum HOTAIR levels and the corresponding tumor HOTAIR levels (r=0.734, *P*<0.01). Clinical data also indicated that HOTAIR was correlated with higher WHO grades of glioma. HOTAIR was enriched in exosome fraction of GBM serum. Moreover, the presence of GBM tumor in mice lead to significant increase in serum HOTAIR expression. A longitudinal study also showed HOTAIR reduction after surgery.

**CONCLUSIONS:** Our results, for the first time, demonstrated that the serum HOTAIR could be used as a novel biomarker for diagnosis and prognosis in GBM. The development of this “liquid biopsy” is significant for monitoring disease progression, treatment response, and predict tumor recurrence.

**CONTENT CATEGORY:** Basic and transitional science.

**KEYWORDS:** *Glioblastoma****,*** *long noncoding RNA****,*** *HOTAIR****,*** *biomarker****,*** *cancer*