# Non-coding RNA LIVE1 plays a role in Glioblastoma angiogenesis

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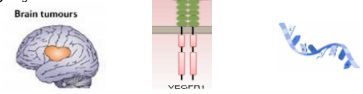
## Background

Glioblastoma Multiforme (GBM) is a devastating brain tumour with high vasculature. Aggressive treatment results in immediate disease control, however relapse is invariable. The Das lab has identified a VEGF-A-responsive lincRNA near the VEGFR1 gene (LIVE1). LIVE1 was found to exert transcriptional control over the VEGFR1 gene and direct angiogenesis *in vitro*. Furthermore, LIVE1 is highly expressed in GliNS1 GBM cells and *in vivo* studies showed that LIVE1 plays a role in the endothelial cell fate and maintenance of vascular integrity.




## Objective

To elucidate the relationship between LIVE1 and the anti-angiogenesis agent, Bevacizumab.

## Materials and Methods

1. Primary GSCs were cultured as spheres in stem cell media at 37°C in a 5% $CO_2$ atmosphere.

2. RNA was extracted using TRIzol, transcribed into cDNA using High-Capacity cDNA RT Kit, and q-RT PCR was performed for LIVE1 expression.

3. Human VEGF Quantikine ELISA Kit was used to measure VEGF secretion levels in supernatant.

## Results

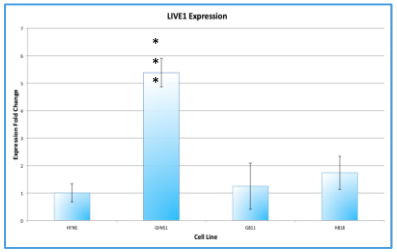
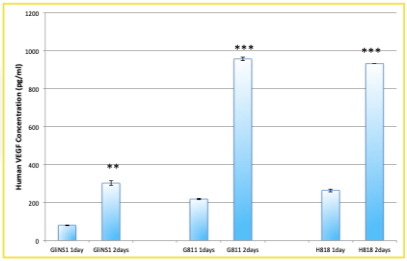



**Figure 1:** qPCR analysis showing LIVE1 expression in GSCs. GliNS1 cell line has greatest expression.

**Figure 2:** VEGF secretion levels in GSCs nutrient starved for 1 or 2 days. All show increased secretion on day 2, above 300pg/ml.



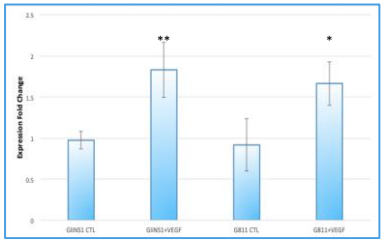
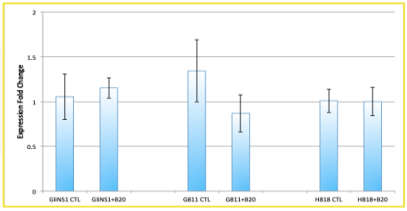




**Figure 3:** LIVE1 expression levels increased after treating GSCs with 50ng/ml of VEGF for 2 days.

**Figure 4:** LIVE1 expression levels showed no significant change after GSCs were treated with 1ug/ml B20-4.1.1 (Bevacizumab) for 2 days.




## Conclusions

VEGF increases LIVE1 expression, as expected due to being a VEGF-A-responsive lincRNA. Bevacizumab targets angiogenesis by blocking VEGF-A from binding to its receptor. If Bevacizumab limited angiogenesis by interacting with LIVE1, LIVE1 expression should have changed. The no significant change suggests that LIVE1 and Bevacizumab control on angiogenesis function by separate mechanisms.


## Future Experiments

Further investigate the LIVE1 and Bevacizumab relationship and whether there is a common interaction point. Moreover, can treat LIVE1 knockdown mouse model with Bevacizumab to determine if survival is improved.

## Acknowledgements

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