Ki-67 is associated with progression-free survival in patients with glioblastoma

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BACKGROUND

- **Glioblastoma (GBM)** is the most common malignant primary brain tumor, are heterogenous, and deadly in the vast majority of cases.
- **New predictive and prognostic markers** are an intense area of investigation. The marker **Ki-67** has yielded mixed results.
- **We created a tissue microarray** of 70 patients treated for GBM between 2002-2007 at our institution to allow for multiplexed histological analysis.

METHODS

- **We created a tissue microarray** of 70 patients treated for GBM at our institution, to allow for multiplexed histological analysis, and measured Ki-67% using IHC.
- **Overall survival and progression-free survival** were calculated using the Kaplan-Meier method.
- **Univariate and multivariable analysis** was performed using Cox proportional hazards modeling.

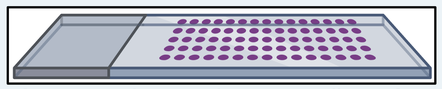
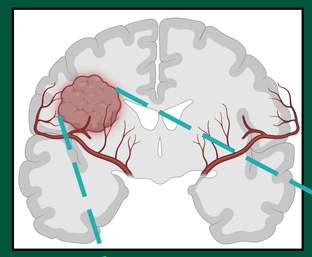


Figure 1. Tissue microarray allows for multiplex histological analysis.

RESULTS

Table 1. Sample Characteristics

Variable	Subjects (N = 70)
Sex N (%)	
Female	24 (34.3)
Male	46 (65.7)
Age mean (SD)	60.87 (14.19)
KPS mean (SD)	74.15 (14.35)
Resection N (%)	
Gross total	17 (24.3)
Near total	8 (11.4)
Subtotal	38 (54.3)
Biopsy	7 (10)
Radiation Dose N (%)	
≥50 Gy	35 (50)
<50 Gy	6 (8.6)
Unknown dose	12 (17.1)
No RT	17 (24.3)
Chemotherapy N (%)	
TMZ	45 (64.3)
Other	4 (5.7)
No chemo	21 (30)
Tumor Location N (%)	
Temporal	28 (40)
Frontal	17 (24.3)
Parietal	12 (17.1)
Occipital	2 (2.9)
Other	11 (15.7)



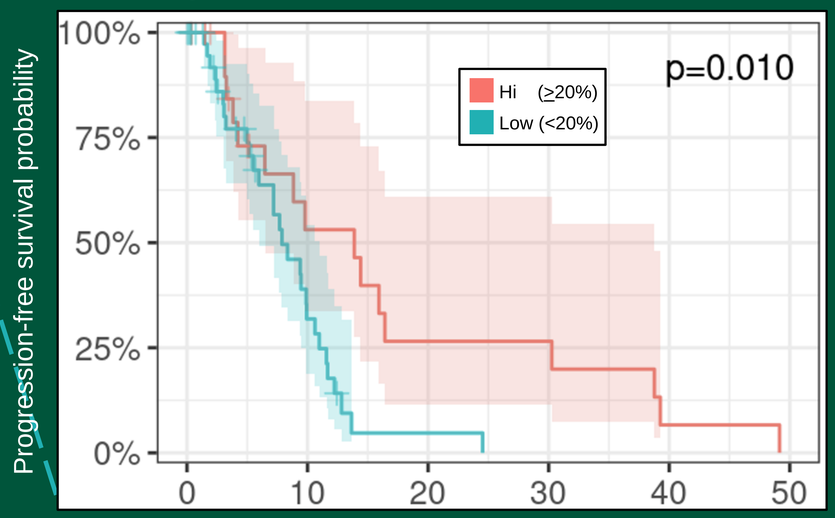
Key Point

Higher Ki-67 levels correlated with improved PFS, without an OS benefit in this cohort.

Table 2. Summary of prognostic effects of Ki-67

Survival (≥20% vs <20% Ki-67)	**HR** (95% CI)	***P*-value**, Cox
Overall	0.96 (0.47-1.97)	0.91
Progression-Free	**3.46 (1.17-10.27**	**0.03**

PFS by Ki-67



RESULTS

OS by Ki-67

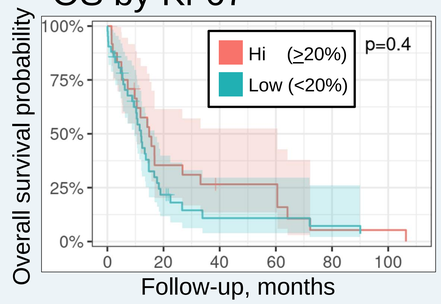
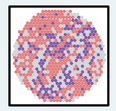


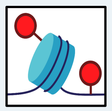
Figure 2. Ki-67 levels are not correlated with overall survival.

FUTURE DIRECTIONS

- **Further investigation**:
  - To determine whether Ki-67 is useful in predicting recurrence risk or impactful in changing treatment strategy.
  - Mechanism behind the associated improvement seen with higher Ki-67 levels.



  - **Additional markers**, including MGMT, IDH.



- **Transcriptomic and methylation analysis** before and after GBM recurrence.

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