



A service of the [U.S. National Library of Medicine](#)
and the [National Institutes of Health](#)

Select 19353526

1: [Stem Cells](#). 2009 Apr;27(4):980-7.



Neurosphere formation is an independent predictor of clinical outcome in malignant glioma.

[Laks DR](#), [Masterman-Smith M](#), [Visnyei K](#), [Angenieux B](#), [Orozco NM](#), [Foran I](#), [Yong WH](#), [Vinters HV](#), [Liau LM](#), [Lazareff JA](#), [Mischel PS](#), [Cloughesy TF](#), [Horvath S](#), [Kornblum HI](#).

Department of Molecular and Medical Pharmacology, David Geffen School of Medicine at UCLA, Los Angeles, California 90095, USA.

Renewable neurosphere formation in culture is a defining characteristic of certain brain tumor initiating cells. This retrospective study was designed to assess the relationship among neurosphere formation in cultured human glioma, tumorigenic capacity, and patient clinical outcome. Tumor samples were cultured in neurosphere conditions from 32 patients with glioma, including a subpopulation of 15 patients with primary glioblastoma. A subsample of renewable neurosphere cultures was xenografted into mouse brain to determine if they were tumorigenic. Our study shows that both renewable neurosphere formation and tumorigenic capacity are significantly associated with clinical outcome measures. Renewable neurosphere formation in cultured human glioma significantly predicted an increased hazard of patient death and more rapid tumor progression. These results pertained to both the full population of glioma and the subpopulation of primary glioblastoma. Similarly, there was a significant hazard of progression for patients whose glioma had tumorigenic capacity. Multivariate analysis demonstrated that neurosphere formation remained a significant predictor of clinical outcome independent of Ki67 proliferation index. In addition, multivariate analysis of neurosphere formation, tumor grade and patient age, demonstrated that neurosphere formation was a robust, independent predictor of glioma tumor progression. Although the lengthy duration of this assay may preclude direct clinical application, these results exemplify how neurosphere culture serves as a clinically relevant model for the study of malignant glioma. Furthermore, this study suggests that the ability to propagate brain tumor stem cells in vitro is associated with clinical outcome.

Publication Types:

- [Research Support, N.I.H., Extramural](#)
- [Research Support, Non-U.S. Gov't](#)

PMID: 19353526 [PubMed - in process]
