Gain of 1q Is a Potential Univariate Negative Prognostic Marker for Survival in Medulloblastoma

Ken C. Lo, Changxing Ma, Brian N. Bundy, Scott L. Pomeroy, Charles G. Eberhart and John K. Cowell

Authors' Affiliations: Departments of Cancer Genetics and Biostatistics, Roswell Park Cancer Institute, Elm and Carlton Streets, Buffalo, New York; Department of Neurology, Children's Hospital Boston, Harvard Medical School, Boston, Massachusetts; and Department of Pathology and Oncology, School of Medicine, Johns Hopkins University, Baltimore, Maryland

Requests for reprints: John K. Cowell, Department of Cancer Genetics, Roswell Park Cancer Institute, Elm and Carlton Streets, Buffalo, NY 14263. Phone: 716-845-5714; Fax: 716-845-1698; E-mail: John.Cowell@RoswellPark.org

Purpose: Tumor risk stratification during diagnosis is paramount for children with medulloblastomas, primarily because very young patients (<3 years) suffer cognitive deficits from radio- and chemotherapy sequelae. Thus, distinguishing tumors that are biologically more aggressive is essential for medulloblastoma management to maximize the delay in radiation treatment without adversely affecting survival outcome. In this context, current strategies for risk assessment, which are based on clinical parameters, remain unsatisfactory.

Experimental Design: Array-based comparative genomic hybridization (aCGH) was used to identify chromosomal copy number abnormalities in a cohort of 49 medulloblastoma tumors. Based on the karyotypes generated from aCGH analysis, each tumor was scored for copy number abnormalities, and the log-rank test was used to evaluate whether any cytogenetic events were associated with survival.

Results: A single copy gain of 1q was shown to be a negative prognostic marker for survival in medulloblastomas with high statistical significance ($P < 0.0001$, log-rank test).

Conclusion: A gain of 1q provides a potential means of predicting overall survival in medulloblastoma.