



Basic and Translational Investigations

Gene expression analyses of grade II gliomas and identification of rPTP β/ζ as a candidate oligodendrogloma marker

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Abstract

Grade II gliomas are morphologically and clinically heterogeneous tumors for which histopathological typing remains the major tool for clinical classification. To what extent the major histological subtypes--astrocytomas, oligodendrogliomas, and oligoastrocytomas--constitute true biological entities is largely unresolved. Furthermore, morphological classification is often ambiguous and would be facilitated by specific subtype markers. In this study, 23 grade II gliomas were expression-profiled and subjected to hierarchical clustering. All six oligodendrogliomas were grouped together in one of two major clusters; a significant correlation was thus observed between gene expression and histopathological subtype. Supervised analyses were performed to identify genes differentiating oligodendrogliomas from other grade II tumors. In a leave-one-out test using 10 features for classification, 20 out of 23 tumors were correctly classified. Among the most differentially expressed genes was *rPTP β/ζ* . The expression of the rPTP β/ζ protein in oligodendrogliomas and astrocytomas was further validated by immunohistochemistry in an independent set of tumors. All 11 oligodendrogliomas of this set displayed strong staining. In contrast, neoplastic astrocytes were mostly negative for rPTP β/ζ staining. In summary, this study demonstrates a correlation between gene expression pattern and histological subtype in grade II gliomas. Furthermore, the results from the immunohistochemical analyses of *rPTP β/ζ* expression should prompt further evaluation of this protein as a novel oligodendrogloma marker.

Key Words: Grade II glioma, histological marker, microarray, oligodendrogloma, rPTP β/ζ