Landry et al found that low grade astrocytomas contained a high number of proteolipid protein (PLP) mRNA-positive cells and that the number of PLP-stained cells decreased markedly with increasing tumor grade. Interestingly, the ratio of PLP mRNA-stained cells:myelin basic protein (MBP) mRNA-stained cells in normal white matter and low-grade astrocytoma was about 2:1 but approached 1:1 with increasing tumor grade. This parameter appeared to be a good indicator of tumor infiltration in astrocytomas, so we tested this in the analysis of other gliomas. Unlike astrocytomas, oligodendrogliomas were found consistently to contain few PLP mRNA- or MBP mRNA-expressing cells. In contrast, gemistocytic astrocytomas, typically highly invasive tumors, contained high numbers of PLP-positive cells and a ratio of PLP mRNA:MBP mRNA-stained cells of about 1.5:1, similar to low-grade astrocytomas. Nonradioactive in situ hybridization also enabled the morphological identification of specific cells. For example, gemistocytic astrocytes, which were found to be strongly vimentin mRNA positive, contained little glial fibrillary acidic protein mRNA and did not stain for PLP or MBP mRNAs. Neuronal mRNAs, such as neurofilament 68, were observed in small numbers of entrapped neurons within gliomas but were uninformative with respect to predicting tumor grade. Our results suggest that oligodendrocytes survive low-grade tumor infiltration and that glial tumor cells, unlike cell lines derived from them, do not express oligodendrocyte or neuronal mRNAs. In addition, the expression of mRNAs for the two major myelin protein genes, PLP and MBP, could be used to predict the grade and extent of tumor infiltration in astrocytomas [1].

Myelin basic protein (MBP) and proteolipid protein (PLP) were highly expressed in all oligodendrogliomas and minimally expressed in glioblastoma multiforme. MBP was highly expressed in mixed oligoastrocytomas, whereas PLP expression was minimal. The association between tumor classification and expression of the MBP and PLP genes was statistically significant. Expression of these genes may serve as a useful molecular marker for some subtypes of human gliomas [2].

1)
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2)
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