

## The Oligodendroglioma Brain Tumor Research Grant

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Targeted and Global Methylation Analysis of Epigenetic Events in the Progression of Oligodendrogliomas in Serial Biopsies.

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### Abstract

**Introduction and background:** Oligodendrogliomas are currently incurable because these “diffuse” gliomas spread into normal brain tissues. Because these tumors are incurable by surgery or radiation treatment, “targeted therapies” directed against key genetic events involved in the development, progression and spread of oligodendrogliomas will offer the best possibility for treatment in the future. Studying the key molecular genetic events that are responsible for the progression from low grade to more malignant oligodendrogliomas may identify important targets for treatment. We have identified 24 patients (2001-2006) with oligodendrogliomas who have had multiple surgeries and biopsies (2-6). This study material will provide a unique opportunity to identify the molecular genetic events that are involved in tumor progression. By comparing genetic factors that are important in early stage (low grade) oligodendroglioma with those of higher grade or more malignant oligodendrogliomas, suitable targets for treatment to slow or halt the progression of the oligodendroglioma may be found. The best approach is to examine serial biopsies from the same patients, at different stages of their cancer. We propose to search for key genes using highly specialized techniques to look for methylation of genes in the tumour samples. The silencing of gene function by DNA methylation is an important mechanism for the inactivation of tumor suppressor genes. These genes may be very important for the development and progression of oligodendrogliomas. The identification of these key genes can lead to the development of effective targeted therapies. **Goal:** To undertake comprehensive genomic profiling of low and high grade oligodendroglioma samples in serial biopsies from the same patients, to identify new genetic and epigenetic targets for therapy. **Deliverables:** Knowledge of the critical genetic events that are involved in the progression of oligodendrogliomas will provide information that will be useful for the development of new treatments that may stop tumor progression.