

**Funded Study:** Treatment of canine soft tissue sarcoma as a model of a more precise radiotherapeutic approach in glioblastoma.

**Study Title:** Use of preclinical models for the implementation of more precise radiotherapeutic approaches in glioblastoma – leveraging dogs with soft tissue sarcomas to study intracranial tumors.

**Purpose of Study/Background/Objectives:** Glioblastoma (GBM) brain tumors are characterized by aggressive invasion into the surrounding brain, resulting in short median survival time for patients. These tumors are difficult to cure because they are very locally invasive and usually regrow after surgical removal. Soft tissue sarcomas (STS) arise from connective tissue as do most brain tumors and have a similar behavior with aggressive local invasion and high rates of regrowth despite surgical removal. Radiation therapy can reduce the risk of regrowth by treating the surrounding tissue and arresting or eliminating microscopic residual tumor cells. Some radiation therapy protocols focus on delivering a high dose at each of a small number of treatments to the primary tumor which can lead to tumor control without excessive normal tissue irradiation. Unlike brain tumors, STS often occur in easily accessible locations along the torso and limbs. We will enroll dogs with STS to collect tissue from tumors that are being treated with radiation therapy for the study of the tumor microenvironment. Our goal is to explore the effects of radiation in canine STS as a model for GBM.

**Inclusion Criteria:**

- Canine patients with cytologic, histologic of soft tissue sarcoma
- No metastatic disease
- Tumor must be at least 4 cm in diameter and accessible for biopsy.
- Dogs must be in adequate general health to undergo serial anesthetic events and have no uncontrolled comorbidities.

**Exclusion Criteria:**

- Dogs with any serious systemic disorder that would preclude safe anesthesia.
- Tumor less than 4 cm in diameter or not accessible for biopsy
- Metastatic disease

**Eligibility Diagnostics:**

- CBC, Chemistry Panel, UA
- FNA of regional lymph node
- 3 view chest x-rays
- Histologic confirmation of primary mass

**Treatment/Protocol:** Dogs with measurable STS will undergo radiation therapy in 3 fractions of 10 Gy (total dose 30 Gy). Patients will be randomized into two groups: standard (6 Gy/min) or low (0.4 Gy/min) dose rate for the treatments. Punch biopsy samples (6 mm diameter) will be collected from the center and periphery/margin prior to the first treatment, at the time of the last

treatment and 3 months later when dogs return for imaging to assess response to treatment over time. Biopsies will be performed at times when dogs are under anesthesia for other purposes related to the study and planned treatment. The pre-radiation sample will be collected at the time of the planning CT scan, the immediate post-radiation sample will be collected after the last dose of radiation on day 3 while the dogs is still anesthetized for radiation treatment, and the third set of biopsies will be collected at the time of a 3-month post radiation recheck CT scan to quantify response.

**Compensation:** The cost of radiation therapy and the associated planning fees, as well as the recheck CT scan will be covered. Owners are responsible for any examination fees, the cost of initial assessment, including CT scan needed for radiation therapy planning, and any needed laboratory evaluation or medications. Owners will be responsible for any costs associated with the normal course of treatment, the treatment of any complications that may arise, and unrelated medical conditions.

**Contact Information:** Please feel free to contact our Clinical Trials Coordinator, Rebecca Kameron, at (217) 300-6453 or [rmoss81@illinois.edu](mailto:rmoss81@illinois.edu) to refer a patient or for any additional information. Referring veterinarian and client calls are welcome.

