



## RESEARCH PROGRESS REPORT SUMMARY

**Grant 02215:** A Cancer Vaccine for Canine Osteosarcoma

**Principal Investigator:** Dr. Rowan J Milner, BVSc

**Research Institution:** University of Florida

**Grant Amount:** \$80,974.00

**Start Date:** 1/1/2016                      **End Date:** 12/31/2017

**Progress Report:** Mid-Year 1

**Report Due:** 6/30/2016                      **Report Received:** 7/4/2016

### **Recommended for Approval:**

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*(Content of this report is not confidential. A grant sponsor's CHF Health Liaison may request the confidential scientific report submitted by the investigator by contacting the CHF office. The below Report to Grant Sponsors from Investigator can be used in communications with your club members.)*

### **Original Project Description:**

Osteosarcoma is malignant cancer with very poor prognosis in most large breeds of dogs. The standard of care with osteosarcoma is surgery followed by chemotherapy. Unfortunately, a large number of these osteosarcomas undergo early metastasis (spread) following surgery. This occurs even when surgery is done early and the tumor is removed in its entirety and chemotherapy is given. Infections of the osteosarcoma surgery site, especially when limb-sparing surgery is used, have been known to stimulate the immune system in dogs resulting improved survival. Since overall survival is bleak in patients with osteosarcoma, developing an osteosarcoma cancer vaccine holds promise as an adjunct treatment to surgery and chemotherapy. In a previous study of 400 dogs with melanoma we showed that a vaccine containing the ganglioside (GD3) causes a measurable immune response in normal dogs and dogs with melanoma and prolonged survival. With owners signed consent and IACUC approval, we propose to vaccinate 20 dogs using a ganglioside-based cancer vaccine in dogs with osteosarcoma presented to the UF Small Animal Hospital. We will compare the outcome of these 20 dogs receiving the vaccine plus standard of care to another 20 dogs entered into the study who will receive only standard of care. The dogs will be vaccinated monthly for 4 treatments and then monitored every 3-6 months for life or until lost to followup. The outcome of this study will help us understand the immune process associated with cancer vaccines for osteosarcoma and hopefully improve survival



## **Publications:**

None at this time.

## **Report to Grant Sponsor from Investigator:**

The investigators wish to thank the AKC Canine Health Foundation for supporting our research. Since the start of the study we have enrolled 8 dogs from various breeds with osteosarcoma. Seven dogs were able to complete the full course of the vaccine and chemotherapy. Unfortunately one dogs had such a malignant osteosarcoma that she was only able to complete two cycles of chemotherapy and one vaccine. Of the seven dogs that completed the chemotherapy cycles and four vaccines, two were subsequently euthanized due to early metastases. Owners were gracious in granting permission for a full necropsy of these two dogs. The results were very insightful. While the two dogs did show progression of their osteosarcoma because of metastases, no evidence of lung metastases was found on necropsy. One dog had small (1cm in diameter) nodules both kidney and the other had a similar small number of metastases in bone. While the results are still very early they seem to indicate that the vaccination plus the chemotherapy may have a modifying effect on the metastatic process of osteosarcoma. While the other five dogs are still alive their survival time is still too early to draw conclusion. We are also pleased that we were able to add value to the study by developing flow cytometer panels monitoring the dog's immune cells as the vaccine and the chemotherapy are given. Early data shows that some of the immune cells that either support the immune system to fight osteosarcoma or allow the cancer to hide by making the body tolerant to the cancer are changed as we vaccinate and give chemotherapy. Indeed, all dogs on entry to the study have shown higher numbers of these cells compared to normal dogs. The cell numbers changed overtime and increased when the cancer came back. While all of these findings are early we are nevertheless excited by the results and look forward to enrolling new cases.