



## RESEARCH PROGRESS REPORT SUMMARY

**Grant 02912:** Adoptive Natural Killer (NK) Cell Immunotherapy for Canine Lymphoma

**Principal Investigator:** William Kisseberth, DVM, MS, PhD, DACVIM

**Research Institution:** The Ohio State University

**Grant Amount:** \$149,979.00

**Start Date:** 9/1/2021      **End Date:** 3/31/2027

**Progress Report:** End-Year 5

**Report Due:** 3/31/2026

---

*(The content of this report is not confidential and may be used in communications with your organization.)*

### Original Project Description:

Natural killer (NK) cells are immune cells whose function are to eliminate virus infected and cancer cells from the body. In this clinical trial investigators will test the feasibility, safety and immunologic and biologic activity of adoptive NK cell therapy combined with chemotherapy to treat dogs with lymphoma. NK cells from healthy dogs will be isolated from their normal blood donations, expanded in the laboratory and cultured under conditions that enhance their function. These cells will then be given to dogs with lymphoma in combination with chemotherapy. Concentrations of NK cells in blood and lymph nodes and immunologic effects in treated dogs will be assessed using correlative assays. Successful completion of this trial will inform the development of future clinical trials using adoptive NK cell therapies for the treatment of lymphoma and other cancers and diseases.

**Publications:** None at this time.

**Presentations:** None at this time.

### Report to Grant Sponsor from Investigator:

Successful treatment for canine lymphoma is limited by the inability of current chemotherapy protocols to eliminate microscopic/minimal residual disease in most affected dogs. Thus, current chemotherapy protocols, such as CHOP, generally achieve transient remissions, but not cures. In this



clinical trial, doxorubicin monotherapy, a common chemotherapy induction protocol for canine lymphoma, will be combined with adoptive immunotherapy using ex vivo expanded Allogeneic TGF $\beta$ -Resistant Natural Killer (AT-NK) cells that have been modified by a unique culture and expansion technique to increase their function in the immunosuppressive tumor microenvironment. This clinical trial will enroll nine dogs with WHO clinical stage III-V intermediate/high grade B-cell lymphoma. To better understand the biologic effects of this treatment approach, correlative assays will be performed characterizing adoptive NK cell kinetics, trafficking of NK cells to lymph nodes, and systemic immune effects. This study will demonstrate the safety and feasibility of this therapeutic approach and lay the groundwork for future studies of adoptive NK cell therapies. It is expected that combined doxorubicin and adoptive NK cell therapy will be well tolerated and will have an adverse event profile similar to doxorubicin given alone. The first dog (patient) has been enrolled in this trial and is currently receiving therapy. This patient has received AT-NK cell infusions to date without any AT-NK cell toxicity and is currently doing well with a strong partial response to treatment. We anticipate this trial will now accrue relatively rapidly compared to most other investigational therapeutic trials as all enrolled patients will receive a commonly used effective chemotherapy treatment for lymphoma (doxorubicin) plus a well-tolerated experimental immunotherapy treatment (adoptive AT-NK cells).