



**PROJECT: Assessing the Efficacy of IL-11 Targeted Treatment for the Treatment of Osteosarcoma**

**Lay Summary:**

Osteosarcoma is the most common primary bone tumor of bone. Historically, the prognosis for patients with osteosarcoma was bleak. Surgery alone, which in most cases was amputation, resulted in a 5-year survival of 20%. With the advent and implementation of modern chemotherapy, the 5-year survival has improved to 60-70%. However, the toxicities and side effects of systemic chemotherapy are significant; hearing loss, cardiomyopathy, renal failure and neuropathies are common, debilitating and potentially fatal side effects. In addition, as dosage is often cumulative, there are many patients who, despite persistent disease, exhaust their chemotherapeutic options. Death from pulmonary failure, secondary to progression of pulmonary metastatic disease, remains a significant problem. The initial hope that those patients who did not respond to the neoadjuvant chemotherapy could benefit from receiving new chemotherapeutic agents has not been realized. New treatment options must be explored.

Our research proposal is aimed at creating site-specific therapy that is directed toward the tumor while sparing normal organs. Linking chemotherapeutic agents to molecules that home to the tumor, and the tumor alone, has the potential to deliver therapy without the systemic side effects now seen with chemotherapy. Targeted therapy has the potential to not only increase the therapeutic options but make those options more tolerable.

We have identified the IL-11R $\infty$  as a potential target for the selective treatment of osteosarcoma. We have confirmed the presence of the receptor in human osteosarcoma and have developed a peptide that selectively homes to the receptor on the osteosarcoma tumors. The research described in this proposal seeks to confirm that targeting IL-11R $\infty$  with this homing peptide, coupled with a chemotherapeutic agent, will result in the selective inhibition of tumor growth while sparing the normal organs in the body. Thus providing a treatment option for osteosarcoma.