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Bone is the most common site of metastases for solid tumors such as breast, prostate and bladder cancers. These metastases contribute significantly to the morbidity and mortality of these cancers. Significant progress has been made in the understanding of the molecular mechanisms underlying osteolytic bone metastases particularly from breast cancer. However, in advanced prostate cancer and to some degree bladder cancer, patients tend to present with osteoblastic lesions or mixed osteolytic-osteoblastic bone metastases. Much less is known about the mechanisms leading to these types of bone metastases. Our initial studies have lead to the development of reliable animal models of prostate cancer metastases to bone and bladder cancer metastases to bone. We have also shown that androgen deprivation, a common treatment for advanced prostate cancer, can increase the incidence of bone metastases. Our focus now is to utilize these models of bone metastasis to dissect the pathophysiology of prostate cancer and bladder cancer metastases to bone as well as for use in pre-clinical testing of therapeutics. Identification of specific molecular targets for the development of therapeutics is a key goal in this work.

Two of the major projects currently underway in the lab are an investigation of the role of hyaluronic acid (HA) in the progression of prostate cancer and the study of the relationship between diabetes, obesity and prostate cancer. Using our animal models of prostate cancer, we are testing a naturally-occurring compound for the ability to inhibit the growth and metastasis of prostate cancer through inhibition of hyaluronic acid synthase (HAS). In addition, in collaboration with other labs at the health science center, we are also studying the relationship between diabetes, obesity and prostate cancer. We are using both in vitro and in vivo techniques to study the interaction between these three disease states.

Research techniques utilized in our laboratory include:
Mammalian tissue culture
Bone Cell culture
Bone Histomorphometry
Radiographic analysis of skeletal lesions in Mice
Analysis of Bone Mineral Density in Mice
Nuclear Imaging in Mice
Molecular Genetics

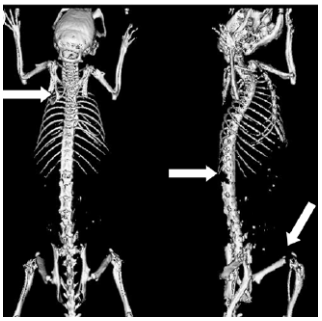

Figure Legend: Volume-rendered microCT images of mice bearing osteolytic bone metastases following intra-cardiac inoculation of human tumor cells.