

Tumor/Stromal interactions in a bone marrow precursor derived bone model of metastatic spinal disease

PI: James M. Schuster

A novel human osteoblast derived SCID mouse model of bone/spine metastasis.

Study Design: Experimental Animal Model

Object: One of the major difficulties in conducting bone metastasis research is the lack of adequate models for studying the bone/tumor micro-environment. Limitations of current *in vivo* models include: nonhuman tumor or bone, variable reproducibility, limited supply, and an inability to be easily manipulated. Our objective was to develop a uniform and reproducible model of bone/spine metastasis utilizing bone derived from human osteoblasts grown subcutaneously in SCID mice with subsequent introduction of human carcinoma cell lines.

Methods: Human osteoblast were serially passed in culture and induced to differentiate into mature osteoblasts. They were subsequently loaded on hydroxyapatite-coated collagen sponges (Healos) and implanted subcutaneously in SCID. After allowing the bone to mature for eight weeks, tumor cell suspensions were implanted percutaneously into the bone. The bone/tumor complexes were subsequently harvested, decalcified and prepared for histologic examination.

Result/Conclusions: We have developed a novel, reproducible SCID mouse model of bone/spine metastasis utilizing bone derived from human osteoblasts with subsequent introduction of human tumor lines. We feel this model will be useful for studying the basic biology of metastasis to bone.