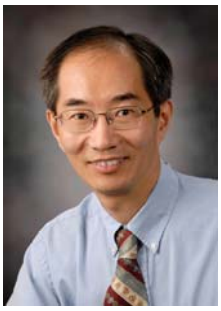
LuZhe Sun, Ph.D.



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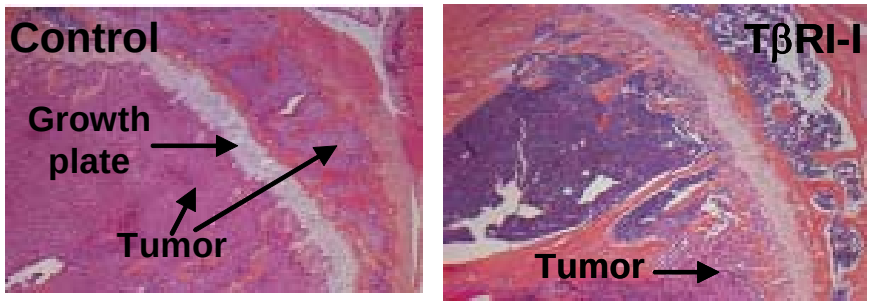
Research interests:
Cancer biology, Signal transduction, Stem cell, Experimental therapeutics

My laboratory studies molecular mechanisms that regulate carcinogenesis and cancer cell growth, invasion, and metastasis using molecular and cellular biology techniques and animal model systems. One of the molecules we are currently studying is called transforming growth factor beta (TGFβ). This growth factor has been shown to inhibit tumorigenesis and growth of some early-stage adenocarcinoma cells, yet stimulate cancer survival, stem cell phenotype, and metastasis in late-stage carcinoma cells. We are investigating molecular mechanisms that switch TGFβ from tumor-suppressing to tumor-promoting and the role of TGFβ signaling in tumor microenvironment in driving tumor progression. We are also developing therapeutic approaches involving TGF beta antagonists to block cancer metastasis.

Other projects in the laboratory include the role of estrogen and androgen signaling in promoting tumorigenesis and progression in the mammary gland and prostate gland, respectively. More recently, we have started to investigate the effect of aging on the function, genomic integrity, and susceptibility to transformation of mammary stem cells. Our approaches to study regulation of gene expression include transcriptional and posttranscriptional analyses with techniques such as DNA microarray, promoter activity measurements, polymerase chain reaction, quantitative real-time RT-PCR, receptor cross-linking, immunoprecipitation and Western blotting analyses. To study gene functions, we use gene transfection, RNA interference, and viral transduction techniques to regulate gene expression and study the effects of altered gene expression on malignant phenotypes of cancer cells in tissue culture and in mice.



Inhibition of breast cancer-induced bone metastasis in the tibiae of nude mice by systemic administration of a TGF-beta inhibitor (TβRI-I).