Investigator:	**Dr. Sreedhara Sangadala Ph.D** Phone: (404) 321-6111 ext. 2539 Email: ssangad@emory.edu
Primary Research Interest:	Biochemistry
Description of Research:	One of the greatest surgical challenges in Orthopaedics is to generate bone for spinal fusion and large defect reconstruction. Osteoblast differentiation involves many factors but is especially dependent on bone morphogenetic proteins (BMPs), several of which have the unique ability to initiate the entire osteoblast differentiation cascade. Despite FDA approval for interbody spine fusion, the unexpectedly high dose requirement in humans compared with rodents has limited routine use of recombinant human (rh)BMP-2 due to local side effects including swelling, inflammation, and bone resorption. An early burst-release phase of high dose BMP leaching off the scaffold in the first 2-4 days is related to most of these local side effects. This clinical translational barrier drives our ongoing research to examine novel state-of-art strategies to improve efficacy of BMP-2 thereby reducing dose, cost, and local side effects.
Relevance to VA:	There is an increasing need to regenerate or heal bone in the Veteran population when treating both traumatic war injuries and age-related spinal disorders. Traumatic long bone fractures and spine fusions are among the most difficult bone healing challenges and the greatest causes of chronic disability and lost productivity. Bone graft taken from the patient's pelvis, may fail to heal in up to 40% of patients with chronic donor site pain in 25%. A recent advance with great potential is the use of bone inducing proteins, such as rhBMP-2, to result in more consistent and faster bone healing than the patient's own bone. Unfortunately, the large doses required for success make the use of BMP-2 costly and often with local side effects. We seek to develop novel strategies to enhance BMP-2 induced bone formation so the BMP-2 dose can be lowered, thereby reducing the cost and associated local side effects. This knowledge could make bone growth factors more available and safer for millions of Veterans suffering from Orthopaedic extremity injuries or spinal disorders, including back pain.