Sarcopenia And The Attenuated Response of Muscle to Growth Signals

The aging process is associated with a progressive decline in motor function due largely to sarcopenia, an age-associated loss of muscle mass and strength, that occurs to varying degrees in all individuals. Skeletal muscle is a dynamic tissue; responsive to multiple signals including mechanical load, nutrition, neural activity, hormones, and growth factors. However, the capacity to respond to these growth cues declines with age. Our studies have investigated the effects of aging on load-induced growth following a period of muscle atrophy as occurs following hindlimb unloading in Fisher-Brown Norway rats, a model that simulates bedrest in humans. Periods of enforced bed rest become more common with age, and the poor recovery of muscle mass and function can result in a reduced quality of life and increased mortality making this a very important area of study. In my talk, I will describe changes in protein degradation, endoplasmic reticulum stress and neural activation that may be responsible for the resistance of skeletal muscle to grow in response to increased loading following disuse-induced atrophy.