GEORGE MASON UNIVERSITY
COLLEGE OF SCIENCE
DEPARTMENT OF BIOLOGY SEMINAR

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"Finding a 'Cure' for Aging?"

The ramifications of aging are a major public health concern. With the growing population and increases in healthcare costs, it is important to identify effective treatments for aging-related conditions. However, since aging is a unique process for each individual, it presents several complications to deciphering its mechanisms and combatting its symptoms. Moreover, the human body is a complex system comprised of many different organ systems that age differently. To illustrate the complexity of aging and the hindrance of identifying effective treatments, we will focus on sarcopenia, the aging of skeletal muscle. The molecular mechanisms underlying sarcopenia are poorly understood, but recent evidence suggests that increased TGF-β signaling contributes to impaired satellite cell function and muscle repair in aged skeletal muscle. We therefore evaluated whether antagonism of TGF-β signaling via losartan, an angiotensin II receptor antagonist commonly used to treat high blood pressure, had a beneficial impact on the progression of sarcopenia, impaired muscle remodeling, and exaggerated response to disuse atrophy in aging mice. We demonstrate that the benefits of losartan were condition-specific: blockade of the AT1 receptor modestly affected the progression of sarcopenia yet it significantly improved muscle remodeling and protected against disuse atrophy. Additionally, the effects of losartan differentially regulated the TGF-β and IGF-1/Akt/mTOR signaling cascades, two pathways critical for skeletal muscle homeostasis. The differential effects of losartan on various aging skeletal muscle conditions highlight the difficulty of identifying a general cure for the physiological process of aging.

TUESDAY November 14, 2017
3:00-4:15 PM
Innovation Hall Room 207