MR Imaging-based Structure-Function Modeling of the Normal, Atrophied and Sarcopenic MSK System

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Computer controlled MR-Compatible Foot-Pedal-Device

Spin Tag

Muscle Kinematics

Velocity Encoded Phase Contrast

DTI – Principle Vector

Finite Element Modeling of Aponeurosis
Age related changes, from Chronic Atrophy in triceps surae muscle composition, strength, architecture and dynamics

Connective Tissue, Normal (A), much less in Young (B) vs Old (C)

Changes in Angle between Strain Rate Tensor Principle Value and Fiber

Penetration Angle (F) from DTI, larger in Young (D) vs Old (E)
Acute Atrophy from Unilateral Limb Suspension: Changes in triceps surae muscle composition, strength, architecture and dynamics

Changes in Volume of different Muscle Compartments (~7%)

Changes in Angle between Strain Rate Tensor Principle Value and Fiber

Changes in Torque Pre- and Post-ULLS

Changes in Tendon Compliance
Normal and Injured Rabbit Anal Sphincter Muscle

1: Normal; 2: Myotomy/Injured
- Normal: 3: DTI, 5,7: Fiber– regular
- Necrosed: 4: DTI Spiculated, 6: Fibers interrupted by ECM

Necrosis/ECM can be inhibited by down-regulating Wnt-signalling