Southwest Research Institute® (SwRI®) offers expertise in a diverse range of biomechanical testing and material characterization techniques with state-of-the-art laboratories and instrumentation. Numerous servo-hydraulic and servo-electric materials testing systems are employed to characterize the material and mechanical properties of biological materials and biomaterials. By applying a unique suite of advanced characterization techniques at multiple length scales, SwRI engineers gain new insights into the effects of aging, drug treatment, and genetic background on musculoskeletal health and medical device performance.

**Capabilities**

**Biomechanical Testing**
- Tension
- Compression
- Creep, relaxation
- Fatigue
- Fracture toughness
- Whole bone strength testing

**Advanced Materials Characterization**
- Atomic force microscopy
- Nanoindentation
- Raman spectroscopy
- Nuclear magnetic resonance spectroscopy
- Environmental scanning electron microscopy
- X-ray diffraction
- MicroCT analysis
Applications

SwRI’s biomechanics engineers develop and apply advanced computational and unique experimental techniques to address a variety of musculoskeletal biomechanics-related problems, including:

- Osteoporosis
- Osteoarthritis
- Bone fracture risk
- Musculoskeletal injury risk
- Musculoskeletal implant failure risk

SwRI pioneered the use of advanced microscopy-based biomechanical testing and analysis to investigate the micromechanical basis of bone fracture.

We welcome your inquiries.
For more information, please contact:

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