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Material Properties of Kangaroo and Lab Rat Tail Tendons

Tendons are primarily composed of collagen fibers that stretch and release elastic energy from muscle contractions to bones during locomotion. Utilization of these elastic mechanisms vary between species, but the translation from variation to function is still being explored. We use variation in tail function to better understand variation in mechanical properties of tendons. We compare tendon properties of two rodent species: lab rats (*Rattus* sp. BNx344) and kangaroo rats (*Dipodomys deserti*). Kangaroo rats have been observed to swing their tail while airborne during escape jumps to stabilize their bodies. To assess tendon materials properties, we conducted cyclic-loading, stress-relaxation, and ramp-to-failure tests on isolated tail tendon fascicles. Preliminary results show that kangaroo rats reach failure at higher strains compared to lab rats. Additionally, lab rats generally have a higher stress-relaxation than kangaroo rats highlighting differences in viscoelastic properties. The results of this study aim to reveal the changes in the mechanical properties of tendons associated with changes in function.