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## Functional Morphology of Rat Hands and Feet: Correlation with the Ability to Grip Tree Branches During Locomotion

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# **Functional Morphology of Rat Hands and Feet: Correlation with the Ability to Grip Tree Branches During Locomotion**

College of Sciences and Health Professions

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## **Abstract**

Anatomy and function are usually closely related. Since locomotion on tree branches is common among mammals, we expect to find that the anatomy is well adapted for gripping narrow cylindrical branch-like substrates. We hypothesize that the ability of rats to grip arboreal supports relies on musculature responsible for adducting the first digit (thumb and big toe) and opposing medial-most and lateral-most digits. We dissected the hands and feet of four rat cadavers. There is a substantial muscle believed to be responsible for the flexion/adduction of the thumb in the hands. We believe that this muscle is equivalent to the opponens pollicis and/or adductor pollicis in the human hand. We also found lumbricals as well as dorsal and palmar interossei. These lumbricals are probably responsible for flexing metacarpophalangeal joints as necessary for gripping. The palmar interossei are believed to be responsible for the adduction of the rat digits just as they are responsible for adduction of fingers in humans. Foot anatomy looked very similar to that of the hands. Based on the anatomy alone, rats are built for locomotion across cylindrical branches as well as terrestrial substrates.