

## POSTER 119

### **ANATOMY, HISTOLOGY, AND ONTOGENY OF THE SESAMOID CARTILAGE IN THE JAW MUSCLES OF THE AMERICAN ALLIGATOR (*ALLIGATOR MISSISSIPPIENSIS*)**

Henry P. Tsai (Life Sciences Fellow)

(Casey M. Holliday, PhD)

Department of Pathology and Anatomical Sciences

The cartilago transiliens is a characteristic cartilaginous nodule inside crocodylian jaw muscles. Encased by a fibrous sheath, the cartilago transiliens lies between the pterygoid buttress and the mandible, providing attachment sites for *m. pseudotemporalis superficialis* dorsally, and *m. intramandibularis*, ventrally. Previous research showed that the cartilago transiliens functions as a jaw-locking mechanism and bears sesamoid-like features, rather than those of a novel structure. Fibrocartilages often form inside portions of tendons that wrap around bone. These organized, incompressible sesamoid tissues prevent tendon flattening, increase mechanical advantage, and tend to ossify in mammals and reptile limbs, but not in most other instances. Here we investigate the gross anatomy and microstructure of the cartilago transiliens in the American alligator (*Alligator mississippiensis*). Approximately 6 specimens ranging from pre-hatching to adult individuals were used. Specimens were imaged using CT, microCT, MRI, and microMRI, dissected, and processed for histomorphology. MicroCT specimens were stained with Lugol's Iodine to enhance visualization of muscle fiber orientations. The cartilago transiliens connects to numerous jaw muscles as well as the mandible. There are no noticeable topological changes in the cartilage and its neighbors through ontogeny. Histological data indicate that the cartilage is largely composed of fibrocartilage interlaced with collagen fibers, many of which are continuous with the attaching muscles. These data suggest that the cartilago transiliens is a sesamoid, rather than a novel soft-tissue structure. These data offer new insights into homology, evolution, and functional morphology of the crocodylian and reptilian feeding apparatus as well as the biology of fibrocartilaginous sesamoids.