steep, icy, mountainous terrain. An unarticulated bony clavicle, greatly reduced compared to other pantherines, may provide greater flexibility to the pectoral girdle. Extra muscular heads and insertions around the elbow provide stability and power to the joint. Intrinsic muscles of the palmar manus are broad and fleshy, creating an enlarged surface area to evenly distribute body weight while walking on soft snow. Tendinous connections between the plantar digital flexors and extensors in the pes may coordinate fine pedal movements. Expanded hip adductors and extensors likely facilitate climbing and head-first descent down cliffs. The attachment sites of several key stifle flexors suggest an increased need for propulsion during running and leaping. Enlarged plantar flexors facilitate rapid, powerful ankle extension, as is required during jumping. P. uncia displays some adaptive parallels with arboreal climbing pantherines, such as the clouded leopard, while also showing adaptations for terrestrial running.

25-6 Smith, SM*; Angielczyk, KD; Field Museum of Natural History, Negaunee Integrative Research Center; *smsmith@fieldmuseum.org*

Adventures inside shrew vertebrae: trabecular bone morphology and regionalization in Soricidae

The regionalized vertebral column is a hallmark of mammalian morphology and reflects functional differentiation of the vertebral regions. Mammalian vertebrae are serially homologous and morphologically patterened by *Hox* expression, but also vary in number and gross morphology across species. The trabecular bone inside vertebral centra is more plastic than gross vertebral bone, and structurally adapts to better withstand forces it experiences during life. However, the functional regionalization of vertebral trabecular bone is poorly examined. Are there trabecular "regions" reflecting the differing functions and *in-vivo* stress patterns of gross morphological vertebral regions? Or is trabecular morphology homogeneous throughout the spine, suggesting that differences in functional demands are borne exclusively by external characteristics? To address these questions, we collected µCT scans and linear measurements of cervical, thoracic, and lumbar vertebrae in four species of large shrews, including two species of the hero shrew *Scutisorex*, which has a highly modified vertebral column. We compared linear measurements and trabecular bone characteristics of

the cranial and caudal ends of each centrum across species. To detect unique vertebral regions, we executed principal coordinates analysis and segmented regression on three versions of our data set: trabecular bone data only, external measurements only, and the two combined. We found that some regionalization is recovered using only trabecular bone data, but trabecular bone regions do not correspond exactly to gross vertebral regions. This reflects divergence between the functional signals of internal and external vertebral bone morphology, which should be further examined in a kinematic context.

BSP-11-6 Smith Paredes, D*; Vergara, ME; Stundl, J; Moses, MM; Behringer, RR; Cerny, R; Bhullar, BAS; Yale University, CalTech, University of Texas, Charles University, Prague; *Dsmithparedes@yale.edu*

Exploring the evolution of the tetrapod limb musculature by studying its embryology

The pattern of cleavage of the shoulder and arm muscles has been described only in a handful of taxa (urodeles, lizards, turtles, marsupials and birds); although the information from these seminal investigations has been used as a tool for understanding homologies across amniotes, that understanding is limited by restricted taxonomic scope and by the imaging technologies then available. Half a century later, we have new tools for studying and visualizing developing anatomy. We studied the development of closely spaced embryonic series of mammals, archosaurs, lizards and turtles – a sample comprising all major amniote clades – and studied the embryology of forelimb muscles, along with the nerves and skeleton, by using fluorescent immunostaining and confocal microscopy. Our data reveal that muscle division is much more conserved across amniotes than previously described. We tracked and followed the embryonic origin of each adult muscle, comparing it to supposed homologues across clades. Based on our results, we propose a reconsideration of some assumed homologies and provide new information regarding the development and evolution of amniote forelimb musculature. In addition, we compare this developmental pattern with that of amphibians and non-tetrapods, revealing drastically different modes of development at the origin of