ELEVATED EXPRESSION OF LARGE TMJ PROTEOGLYCANS IN RESPONSE TO MECHANICAL STIMULUS. *Mao, J. J.[1], Rahemtulla, F.[2] and Scott, P. G.[3] [1]University of Pittsburgh, PA, USA; [2]University of Alabama, Birmingham, USA; [3]University of Alberta, Edmonton, Canada*

Vertebrate articular tissue consists of collagen fibers embedded in a ground substance. Collagen resists tensile forces, while proteoglycans in the ground substance provide resilience and resistance to compression. The temporomandibular joint (TMJ) contains both small dermatan sulfate proteoglycans (decorin and biglycan) and large chondroitin sulfate proteoglycans (versican and aggrecan). Expression of large TMJ proteoglycans was hypothesized to increase in response to increasing mechanical stimuli. Unilateral bite raise was applied to the dental occlusion of Sprague-Dawley rats and then removed. Proliferation of chondroblast-like cells was apparent in TMJ para-sagittal sections on the treated side. Aggrecan-like proteoglycans were identified by safranin O in the condylar cartilage where cell proliferation was evident. Expression of versican-like proteoglycans was abundant in the surface fibrous layer of the mandibular condyle and moderate in the disc of the treated specimens in reaction to a monoclonal antibody against a large chondroitin sulfate proteoglycan. The above staining intensities were quantified and found to be significantly higher in treated specimens than their corresponding sham-operated controls and not significantly different between sham-operated controls and specimens harvested after stimulus removal. Thus, the TMJ appears to respond to mechanical stimuli by increasing the expression of large proteoglycans.

TERRESTRIAL FEEDING IN *XENOPUS LAEVIS*. *Measey, J. University of Bristol, UK*

Previous studies of the kinematics of amphibian feeding have included terrestrial anurans and terrestrial and aquatic urodeles. *Xenopus* are aglossan aquatic anurans that are believed to prey principally upon aquatic invertebrates by a hyobranchial pump. However, field studies on diet of six species of *Xenopus* have revealed large amounts of terrestrial prey items. This study records for the first time the mechanism by which *X. laevis* preys on terrestrial invertebrates. Observations and filming of terrestrial feeding with high speed video have identified preparatory, fast opening, closing and recovery phases that have parallels with the feeding behaviour of other amphibians.

SHAPES OF CERVICAL VERTEBRAL ENDPLATES AND THEIR RELATIONSHIP TO CERVICAL FUNCTION. *Milne, N. University of Western Australia, Nedlands, Australia*

Among mammals, three kinds of cervical vertebral endplate can be found. Ungulates have opisthocoelous cervical vertebrae, carnivores have acoelous cervical vertebrae, while primates and marsupials have uncinate processes. This study asks why do these species have these different shapes of their cervical endplates? Post-mortem motion studies of the cervical spines of horses (opisthcoelous), dogs (acoelous) and kangaroos (with uncinate processes) were conducted by using biplanar X-rays to examine both sagittal and lateral motions. For motion in all planes there were no consistent differences in the range of motion, or the pattern of sagittal motion, that could be related to the shapes of the vertebral endplate. However, the position of the axis of rotation during lateral motion showed consistent differences. The axis of rotation passes through the vertebra caudal to the moving segment in horses, through the intervertebral disc in dogs, and through the moving vertebra in kangaroos. Carnivores and ungulates use their necks to position their heads, whereas species with uncinate processes have a claviculate forelimb that is used for grasping and manipulating. The results support an hypothesis that species with uncinate processes are adapted for head stability, while the head-neck-shoulder muscles position the forelimb.

EVERTED FOREBRAIN OF ACTINOPTERYGIAN FISH: A PARTICULAR TYPE OF THE VERTEBRATE TELENCEPHALON. *Obukhov, D. K. St. Petersburg State University, Russia*

Two types of telencephalon have been formed in the evolution of vertebrates: the inverted telencephalon, characteristic of most animals, and the everted one, occurring only in actinopterygians. The cytoarchitecture and neuron composition has been studied in representatives of the main fish orders Chondrostei, Holostei and Teleostei by using automated video complexes for image analysis. The neuron composition is rather conservative, while the hemisphere cytoarchitecture is significantly variable at the interspecies and intergroup levels. Neurons are mainly of lepto- and allodendritic type; idiodendritic neurons are absent, providing evidence for divergence of telencephalon evolution in Actinopterygia. Supported by Russian Scientific Grant 9–04–49001.