



New Directions in the Study of Fossil Endocasts: a Symposium in Honor of Harry J. Jerison,  
Thursday 9:00

**NEW INFORMATION ON THE CRANIAL ANATOMY OF *AVIMIMUS PORTENTOSUS* (DINOSAURIA: THEROPODA) INCLUDING VIRTUAL ENDOCASTS OF THE BRAIN AND INNER EAR**

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In the past decade, the Hayashibara Museum of Natural Sciences - Mongolian Paleontological Center expeditions have collected several new specimens of the oviraptorosaur *Avimimus portentosus*, known for its avian-like skeletal features, from Upper Cretaceous localities in Mongolia. All skull material was micro-CT scanned. Discovery of two braincases and such previously unknown elements as the nasals and maxilla provide new information on the skull and, for the first time, the facial skeleton of this enigmatic theropod. The nasals are fused to each other, as in oviraptorids, comprising a wing-like, postnarial plate and a median, internarial process that bifurcates anteriorly to clasp the nasal processes of the premaxilla. Unlike in most oviraptorids, the dorsal surface of the postnarial plate is rather smooth and bears no pneumatic fossa. Instead, a pair of large, presumably pneumatic openings lies posterior to this plate, bounded posteriorly by anterior concavities on the frontals. The putative maxillary fragment is thin and edentulous. Cranial endocasts were digitally reconstructed for both braincases, and their overall morphology is similar to those previously described in other oviraptorosaurs. Derived features are shared with avialans and other derived maniraptorans, such as a large flocculus, laterally positioned optic lobes, and two rami of the trigeminal nerves separately exiting the braincase. One of the prominent cranial characteristics of the *Avimimus* skull is its dome-like, inflated roof of the frontals, and it is here confirmed that this reflects the strong development of the cerebral hemispheres. The endosseous labyrinth of the inner ear also shows derived ornithurine-like characteristics, such as the caudal semicircular canal extending well below the plane of the horizontal canal. The new findings on *Avimimus* potentially clarify its position within Oviraptorosauria. More broadly, the position of oviraptorosaurs has been controversial, particularly relative to Avialae. These new data are relevant to that controversy, but caution is prudent pending the analysis of similar endocranial data from relevant avian and nonavian maniraptorans.