

Rachel Menegaz, PhD
Graduate School of Biomedical Sciences
Physiology & Anatomy
Center for Anatomical Sciences
Email: Rachel.Menegaz@unthsc.edu



Area of Expertise

My research explores the growth and function of cranial tissues, particularly the structures involved in feeding. The biomechanical demands imposed by diet are known to affect chewing behavior and joint kinematics and, over time, the growth trajectories of the craniofacial skeleton and its associated soft tissues. By modulating diet, we are able to affect the overall growth of these tissues, bone quality in the jaws, integrity of the jaw joint (TMJ), dental occlusion, and masticatory muscle structure. I am particularly interested in how early life history events (such as weaning and dental eruption/replacement) affect feeding, growth, and adult morphological outcomes.

Current research themes include:

- 1) Variation in maturation rates among tissues of the masticatory complex and how this affects feeding performance and plasticity. What happens during the transition between infant-like suckling and adult-like chewing, and what are the structural and behavioral constraints that limit efficient feeding during early childhood?
- 2) The role of type I collagen in the growth of the craniofacial skeleton. How do collagen disorders, such as osteogenesis imperfecta, affect the facial phenotype? What behavioral and/or pharmaceutical interventions are effective in recovering the phenotype and function in these disorders?

Qualifications

PhD in Anatomy, University of Missouri
BA in Anthropology, University of Texas at Austin

Recent Publications

Craniofacial allometry in the OIM^{-/-} mouse model of osteogenesis imperfecta

Menegaz, R. A., Ladd, S. H. & Organ, J. M., 1 Aug 2020, In : FASEB Journal. 34, 8, p. 10850-10859 10 p.

Ontogenetic and functional modularity in the rodent mandible

Menegaz, R. A. & Ravosa, M. J., Oct 2017, In : Zoology. 124, p. 61-72 12 p.

Limitations of a morphological criterion of adaptive inference in the fossil record

Ravosa, M. J., Menegaz, R. A., Scott, J. E., Daegling, D. J. & McAbee, K. R., 1 Nov 2016, In : Biological Reviews. 91, 4, p. 883-898 16 p.

XROMM analysis of tooth occlusion and temporomandibular joint kinematics during feeding in juvenile miniature pigs

Menegaz, R. A., Baier, D. B., Metzger, K. A., Herring, S. W. & Brainerd, E. L., 1 Aug 2015, In : Journal of Experimental Biology. 218, 16, p. 2573-2584 12 p.

Experimental Approaches to Musculoskeletal Function in Primates

Ravosa, M. J., Congdon, K. A. & Menegaz, R. A., 14 Jan 2013, *A Companion to Paleoanthropology*. Blackwell Publishing Ltd., p. 55-74 20 p.

Evidence for the influence of diet on cranial form and robusticity

Menegaz, R. A., Sublett, S. V., Figueroa, S. D., Hoffman, T. J., Ravosa, M. J. & Aldridge, K., Apr 2010, In : Anatomical Record. 293, 4, p. 630-641 12 p.

Masticatory loading, function, and plasticity: A microanatomical analysis of mammalian circumorbital soft-tissue structures

Jašarević, E., Ning, J., Daniel, A. N., Menegaz, R. A., Johnson, J. J., Stack, M. S. & Ravosa, M. J., Apr 2010, In : Anatomical Record. 293, 4, p. 642-650 9 p.

Septa and processes: convergent evolution of the orbit in haplorhine primates and strigiform birds

Menegaz, R. A. & Christopher Kirk, E., Dec 2009, In : Journal of Human Evolution. 57, 6, p. 672-687 16 p.

Phenotypic plasticity and function of the hard palate in growing rabbits

Menegaz, R. A., Sublett, S. V., Figueroa, S. D., Hoffmann, T. J. & Ravosa, M. J., 17 Feb 2009, In : Anatomical Record. 292, 2, p. 277-284 8 p.

Using "mighty mouse" to understand masticatory plasticity: Myostatin-deficient mice and musculoskeletal function

Ravosa, M. J., Lpez, E. K., Menegaz, R. A., Stock, S. R., Stack, M. S. & Hamrick, M. W., Sep 2008, In : Integrative and Comparative Biology. 48, 3, p. 345-359 15 p.