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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

A review of musculoskeletal adaptations in individuals following major lower-limb amputation

Finco, M. G., Kim, S., Ngo, W. & Menegaz, R. A., Jun 2022, In: Journal of Musculoskeletal Neuronal Interactions. 22, 2, p. 269-283 15 p.

Skeletal asymmetries in anatomical donors with lower-limb amputations

Finco, M. G. & Menegaz, R. A., Mar 2022, In: PM and R. 14, 3, p. 406-408 3 p.

Novel variant of hepatic and foregut vasculature

Garcia, L. M., Hubbard, D. A., Mebane, N. B., Nguyen, S. M., Ozguc, F. M. & Menegaz, R. A., Sep 2021, In: Translational Research in Anatomy. 24, 100135.

More Challenging Diets Sustain Feeding Performance: Applications Toward the Captive Rearing of Wildlife

Rex Mitchell, D., Wroe, S., Ravosa, M. J. & Menegaz, R. A., 2021, In: Integrative Organismal Biology. 3, 1, obab030.

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.