

**Bhart-Anjan Singh Bhullar**  
Curriculum Vitae  
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**Positions**

- **Assistant Professor** of Earth & Planetary Sciences, **Yale University**, 2015-present.
- **Assistant Curator** of Vertebrate Paleontology and Vertebrate Zoology, **Yale Peabody Museum of Natural History**, 2015-present.
- Postdoctoral Scholar, **University of Chicago**, 2014-2015.

**Education**

- **Ph.D.** in Organismic and Evolutionary Biology at **Harvard University** received May 2014; advisor Prof. Arhat Abzhanov.
- **M.S.** in Geological Sciences at **The University of Texas at Austin** received December 2008; advisor Prof. Christopher Bell.
- Completed full cadaver-based medical gross anatomy class (eight weeks, five days per week) as summer student at **New York University School of Medicine** in summer 2008.
- **B.S.** in Biology, magna cum laude, Phi Beta Kappa; **Yale University**, May 2005.

**Research Interests**

- Origins of the land vertebrate radiations, especially reptiles, birds, and mammals, approached using paleontology, comparative morphology and embryology. Head and skull evolution, including the evolution of feeding and the co-evolution of the brain and other cranial components. Major anatomical transitions and their developmental underpinnings.

**Current Research**

- Anatomy, development, and phylogeny of amniotes, in particular stem reptiles and archosaurs.
- The origin and evolution of the unique reptilian, avian, and mammalian modes of feeding.
- The integrated development and co-evolution of the brain, sensory organs, and skull.
- The evolution and development of the reptilian (including avian) head and body.

- Evolution and development of vertebrate jaw musculature and mammalian facial musculature.
- Locomotor evolution in amniotes and associated neurosensory and developmental innovations.

**Publications; \* indicates Bhullar Lab student or postdoc**

1. Hanson M\*, Hoffman EA, Norell MA, **Bhullar B-AS**. (2021). The early origin of a birdlike inner ear and the evolution of dinosaurian movement and vocalization. *Science* 372(6542): 601-609.
2. Fabbri M\*, Navalon G, Mongiardino Koch N, Hanson M\*, Petermann H, **Bhullar B-AS**. 2021. A shift in ontogenetic timing produced the unique sauropod skull. *Evolution* 75(4): 819-831.
3. Smith-Paredes D\*, Lord A\*, Meyer D\*, **Bhullar B-AS**. 2021. A developmental staging system and musculoskeletal development sequence of the Common Musk Turtle (*Sternotherus odoratus*). *Developmental Dynamics* 250(1): 111-127.
4. Smith-Paredes D\*, Griffith O., Fabbri M\*, Yohe L\*, Blackburn DG, Siler CD, **Bhullar B-A.S.**, Wagner GP. 2021. Hidden limbs in the “limbless skink” *Brachymeles lukbani*: developmental observations. *Journal of Anatomy* (Online Early View).
5. Navalón G, Nebreda SM, Bright JA, Fabbri M\*, Benson RBJ, **Bhullar B.-A.S.** 2021. Craniofacial development illuminates the evolution of nightbirds (Strisores). *Proceedings of the Royal Society B* 288(1948): 20210181.
6. Blackburn DG, Barnes MS, Reimers CD, Appiah FA, Lestz LL, Bonneau LJ, Hanson M\*, Smith-Paredes D.\*, **Bhullar B-AS**. 2021. How do crocodylian embryos process yolk? Morphological evidence from the American alligator, *Alligator mississippiensis*. *Journal of Morphology* 282(7): 953-958.
7. Louchart A, **Bhullar B-AS**, Riamon S, Field DJ\*. 2021. The true identity of putative tooth alveoli in a Cenozoic crown bird, the gastornithid *Omorhamphus*. *Frontiers in Earth Science* 9: 333.
8. **Bhullar B-AS**, Manafzadeh AR, Miyamae JA\*, Hoffman EA, Brainerd EL, Musinsky C, Crompton AW. 2020. Reply to: Jaw roll and jaw yaw in early mammals. *Nature* 582(7812): E9-E12.
9. Yohe LR\*, Fabbri M\*, Hanson M\*, **Bhullar B-AS**. 2020. Olfactory receptor gene evolution is unusually rapid across Tetrapoda and outpaces chemosensory phenotypic change. *Current Zoology*.
10. Ksepka DT, Balanoff AM, Smith NA, Bever GS, **Bhullar B-AS** et al. 2020. Tempo and pattern of avian brain size evolution. *Current Biology*.
11. Felice RN, Watanabe A., Cuff AR, Hanson M.\*, **Bhullar B-AS**, Rayfield ER, Witmer LM, Norell MA, Goswami A. 2020. Decelerated dinosaur skull evolution with the origin of birds. *PloS Biology* 18(18): e3000801.
12. Sookias RB, Dilkes D, Sobral G, Smith RMH, Wolvaardt FP, Arcucci AB, **Bhullar B-AS**, Werneburg I. 2020. The craniomandibular anatomy of the early archosauriform *Euparkeria capensis* and the dawn of the archosaur skull. *Royal Society Open Science* 7(7): 200116.
13. Brown EE, Butler RJ, Ezcurra MD, **Bhullar B-AS**, Lautenschlager S. 2020. Endocranial anatomy and life habits of the Early Triassic archosauriform *Proterosuchus fergusi*. *Palaeontology* 63(2): 255-282.
14. **Bhullar B-AS**, Manafzadeh A, Miyamae JA\*, Hoffman E, Brainerd EL, Musinsky C, Crompton AW. 2019. Rolling of the jaw is essential for mammalian chewing and tribosphenic molar function. *Nature* 566: 528-532.
15. Zhou C.-F., **Bhullar B-AS (co-first)**, Neander AI, Martin T, Luo Z-X. 2019. New Jurassic mammaliaform sheds light on early evolution of mammal-like hyoid bones. *Science* 365(6450): 276-279.

16. Smith-Paredes D\*, **Bhullar B-AS**. 2019. The skull and head muscles of Archosauria. In: Ziermann JM, Diaz RE Jr., Diogo R. *Heads, Jaws, and Muscles*, Springer: 229-251.
17. Camacho J, Heyde A, **Bhullar B-AS**, Haelwaters D, Simmons N, Abzhanov A. 2019. Peramorphosis, an evolutionary developmental mechanism in neotropical bat skull diversity. *Developmental Dynamics* 248(11): 1129-1143.
18. Brown EE, Butler RJ, Ezcurra MD, **Bhullar B-AS**, Lautenschlager S. 2019. Endocranial anatomy and life habits of the Early Triassic archosauriform *Proterosuchus fergusi*. *Palaeontology*.
19. Field DJ\*, Hanson M\*, Burnham D, Wilson LE, Super K, Ehret D, Ebersole JA, **Bhullar B-AS**. 2018. Complete *Ichthyornis* skull illuminates mosaic assembly of the avian head. *Nature* 557: 96-100.
20. Pritchard AC\*, Gauthier JA, Hanson M\*, Bever GS, **Bhullar B-AS**. 2018. A tiny Triassic saurian from Connecticut and the early evolution of the diapsid feeding apparatus. *Nature Communications* 9(1): 1213.
21. Smith KT, **Bhullar B-AS**, Köhler G, Habersetzer J. 2018. The only known jawed vertebrate with four eyes and the bauplan of the pineal complex. *Current Biology* 28(7): 1101-1107.
22. Wagner GP, Griffith OW, Bergmann PJ, Bello-Hellegouarch, G., Kohlsdorf T, **Bhullar A**, Siler CD. 2018. Are there general laws for digit evolution in squamates? The loss and re-evolution of digits in a clade of fossorial lizards (*Brachymeles*, Scincinae). *Journal of Morphology* 279(8): 1104-1119.
23. Crompton AW, Musinsky C, Rougier GW, **Bhullar B-AS**, Miyamae J\*. 2018. Origin of the lateral wall of the mammalian skull: fossils, monotremes and therians revisited. *Journal of Mammalian Evolution*: 1-13.
24. Rodrigues HG, Cornette R, Clavel J, Cassini G, **Bhullar B-AS**, Monesillo MF, Moreno K, Herrel A, Billet G. 2018. Differential influences of allometry, phylogeny and environment on the rostral shape diversity of extinct South American notoungulates. *Royal Society Open Science* 5(1): 171816.
25. Fabbri M\*, Mongiardino Koch N, Pritchard AC\*, Hanson M\*, Hoffman E, Bever GS, Balanoff AM, Morris ZS\*, Field DJ\*, Camacho J, Rowe TB, Norell MA, Smith RM, Abzhanov A, **Bhullar B-AS**. 2017. The skull roof tracks the brain during the evolution and development of reptiles including birds. *Nature Ecology & Evolution* 1(10): 1543.
26. **Bhullar B-AS**. 2017. Catastrophe triggers diversification. *Nature* 542: 304-305.
27. Schultz JA, **Bhullar B-AS**, Luo Z-X. 2017. Re-examination of the Jurassic mammaliaform *Docodon victor* by computed tomography and occlusal functional analysis. *Journal of Mammalian Evolution*. 1-30.
28. Clark EG, **Bhullar B-AS**, Darroch SAF, Briggs DEG. 2017. Water vascular system architecture in an Ordovician ophiuroid. *Biology Letters*. 13(12): 635.
29. Crompton AW, Owerkowicz T, **Bhullar B-AS**, Musinsky C. 2017. Structure of the nasal region of non-mammalian cynodonts and mammaliaforms: Speculations on the evolution of mammalian endothermy. *Journal of Vertebrate Paleontology* 37(1).
30. **Bhullar B-AS**, Hanson M\*, Fabbri M\*, Pritchard A\*, Bever GS, Hoffman E. 2016. How to make a bird skull: Major transitions in the evolution of the avian cranium, paedomorphosis, and the beak as a surrogate hand. *Integrative and Comparative Biology* 56(3): 389-403.
31. Sefton EM, **Bhullar B-AS**, Mohaddes Z, Hanken J. 2016. Evolution of the head-trunk interface in tetrapod vertebrates. *eLife* 5: e09972.
32. Chavan AR, **Bhullar B-AS**, Wagner GP. 2016. What was the ancestral function of decidual stromal cells? A model for the evolution of eutherian pregnancy. *Placenta* 40: 40-51.
33. Sobral G, Sookias RB, **Bhullar B-AS**, Smith R, Butler RJ, Müller J. 2016. New information on the braincase and inner ear of *Euparkeria capensis* Broom: implications for diapsid and archosaur evolution. *Royal Society Open Science* 3(7): 160072.

34. Bever GS, Lyson TR, Field DJ\*, **Bhullar B-AS**. 2016. The amniote temporal roof and the diapsid origin of the turtle skull. *Zoology*.
35. Dumont M, Tafforeau P, Bertin T, **Bhullar BA**, Field D\*, Schulp A, Strilisky B, Thivichon-Prince B, Viriot L, Louchart A. 2016. Synchrotron imaging of dentition provides insights into the biology of *Hesperornis* and *Ichthyornis*, the “last” toothed birds. *BMC Evolutionary Biology* 16(1): 1-178.
36. **Bhullar B-AS**, Morris ZS\*, Sefton EM, Tok A, Tokita M, Namkoong B, Camacho J, Burnham DA, Abzhanov A. 2015. A molecular mechanism for the origin of a key evolutionary innovation, the bird beak and palate, revealed by an integrative approach to major transitions in vertebrate history. *Evolution* 69(7): 1665-1677.
37. Bever GS, Lyson T, Field DJ\*, **Bhullar B-AS**. 2015. Evolutionary origin of the turtle skull. *Nature* 525: 239-242.
38. Molnar J, Pierce S, **Bhullar B-AS**, Turner A, Hutchinson J. 2015. Morphological and functional changes in the vertebral column with increasing aquatic adaptation in crocodylomorphs. *Royal Society Open Science* 2(11).
39. Scanferla CA, **Bhullar B-AS**. 2014. Postnatal development of the skull of *Dinilysia patagonica* (Squamata-stem Serpentes). *The Anatomical Record* 297(3): 560-573.
40. Kirk EC, Daghighi P, Macrini TE, **Bhullar B-AS**, Rowe TB. 2014. Cranial anatomy of the Duchesnean primate *Rooneyia viejaensis*: New insights from high-resolution computed tomography. *Journal of Human Evolution* 74: 82-95.
41. Roček Z, Wuttke M, Gardner JD, **Bhullar B-AS**. 2014. The Euro-American genus *Eopelobates*, and a re-definition of the family Pelobatidae (Amphibia, Anura). *Palaeobiodiversity and Palaeoenvironments*: 1-39.
42. Weeks O, **Bhullar B-AS**, Abzhanov A. 2013. Molecular characterization of dental development in a toothed archosaur, the American alligator *Alligator mississippiensis*. *Evolution and Development* 15(6): 393-405.
43. Lyson TR, **Bhullar B-AS**, Bever GS, Joyce WG, de Queiroz K, Abzhanov A, Gauthier JA. 2013. Homology of the enigmatic nuchal reveals the novel reorganization of the shoulder girdle in the evolution of the turtle shell. *Evolution and Development* 15(5): 317-325.
44. **Bhullar B-AS**, Marugán-Lobón J, Racimo F, Bever GS, Norell MA, Rowe TB, Abzhanov A. 2012. Birds have paedomorphic dinosaur skulls. *Nature* 487: 223-226.
45. Longrich NR, **Bhullar B-AS**, Gauthier JA. 2012. A transitional snake from the Late Cretaceous of North America. *Nature* 488: 205-208.
46. Longrich NR, **Bhullar B-AS**, Gauthier JA. 2012. Mass extinction of lizards and snakes at the Cretaceous-Paleogene boundary. *Proceedings of the National Academy of Sciences, USA* 109(52): 21396-21401.
47. **Bhullar B-AS**. 2012. A phylogenetic approach to ontogeny and heterochrony in the fossil record: Cranial evolution and development in anguimorphan lizards (Reptilia: Squamata). *Journal of Experimental Zoology, Part B: Molecular and Developmental Evolution* 318b: 521-530.
48. Kennedy AM, **Bhullar B-AS**, Lewis PJ. In press. Preliminary analysis of the fossil herpetofauna from the Koanaka Hills site, Ngamiland, Northwestern Botswana. *Palaeontologia Africana*.
49. Ortiz D, Lewis PJ, Kennedy AM, **Bhullar B-AS**, Hancox J. In press. Preliminary analysis of Dipnoi (lungfish) fossils from Driefontein, South Africa. *Palaeontologia Africana*.
50. **Bhullar B-AS**. 2011. The power and utility of morphological characters in systematics: A fully resolved phylogeny of *Xenosaurus* and its fossil relatives (Squamata: Anguimorpha). *Bulletin of the Museum of Comparative Zoology* 160(3): 65-181.
51. **Bhullar B-AS**. 2010. Cranial osteology of *Exostinus serratus*, fossil sister taxon to the enigmatic clade *Xenosaurus*. *Zoological Journal of the Linnean Society* 159: 921-953.

52. Lyson, TR, Bever BS, **Bhullar B-AS**, Joyce WG, Gauthier JA. 2010. Transitional fossils and the origin of turtles. *Biology Letters* 6: 830-833.
53. **Bhullar B-AS**, Bever GS. 2009. An archosaur-like laterosphenoid in early turtles (Reptilia: Pantestudines). *Breviora of the Museum of Comparative Zoology* 518: 1-11.
54. **Bhullar B-AS**. 2009. A reevaluation of the unusual abdominal musculature of squamate reptiles (Reptilia: Squamata). *The Anatomical Record* 292(8): 1154-1161.
55. **Bhullar B-AS**, Bell CJ. 2008. Osteoderms of the California legless lizard *Anniella* (Squamata: Anguillidae) and their relevance for considerations of miniaturization. *Copeia* 2008(4): 785-793.
56. **Bhullar B-AS**, Smith KT. 2008. Helodermatid lizard from the Miocene of Florida, the evolution of the dentary in Helodermatidae, and comments on dentary morphology in Varanoidea. *Journal of Herpetology* 42(2): 286-302.
57. Smith KT, **Bhullar B-AS**, Holroyd PA. 2008. Earliest record of the *Varanus* stem-clade (Squamata: Varanidae) from the Early Oligocene of Egypt. *Journal of Vertebrate Paleontology* 28(3): 909-913.

**Manuscripts in Review; \* indicates Bhullar Lab student or postdoc**

1. Paredes DS\*, Vergara ME\*, Lord A\*, Moses MM, Behringer RR, **Bhullar, B.-A.S.** In review. Embryonic muscle splitting patterns reveal homologies of amniote forelimb muscles.
2. Griffin CT\*, Botelho JF\*, Hanson M\*, Fabbri M\*, Carney RM, Norell MA, Egawa S\*, Gatesy SM, Rowe TB, Elsey RM, Nesbitt SJ, **Bhullar B-A.S.** In review. The developing bird pelvis passes through ancestral archosaurian and dinosaurian conditions.

**Selected Conference Abstracts; \* indicates Bhullar Lab student or postdoc.**

1. Egawa, S.\*, Bishop, P.J., Pintore, R., Griffin, C.T.\*, Tsai, H.P., Botelho, J.F.\*, Smith-Paredes, D.\*, Kuratani, S., Norell, M.A., Nesbitt, S.J., Hutchinson, J.R., and **Bhullar, B.-A.S.** 2021, March. The evolutionary change of morphogenesis of dinosaur-type femoral head 111-3. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 61, pp. E224-E224). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.
2. Jenkins, K.M.\* and **Bhullar, B.A.S.**, 2021, March. The role of the stapes in the evolution of reptilian hearing. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 61, pp. E414-E415). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.
3. Paredes, S.D.\*, Vergara, M.E.\*, Stundl, J., Moses, M.M., Behringer, R.R., Cerny, R. and **Bhullar, B.A.S.**, 2021. Exploring the evolution of the tetrapod limb musculature by studying its embryology. *Integrative and Comparative Biology*, 61(S1), pp.E838-E839.
4. **Bhullar, B.A.S.**, Manafzadeh, A.R., Miyamae, J.A.\*, Hoffman, E.A., Brainerd, E.L., Musinsky, C. and Crompton, A.W., 2020, March. The origin of chewing in mammals required rolling of the jaw and involved broad continuity in molar form and function. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 60, pp. E17-E17). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.
5. Fabbri, M.\*, Smith-Paredes, D.\* and **Bhullar, B.A.S.**, 2019, June. Development of the Embryonic Anatomy of the Madagascar Ground Gecko. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S234-S234). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
6. Hanson, M.\*, Burnham, D., Bright, J., Carney, R. and **Bhullar, B.A.**, 2019, March. The First Three-Dimensional Reconstruction of the Skull and Musculature of a Cretaceous Toothed Bird, *Hesperornis regalis*. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 59, pp.

- E93-E93). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.
7. Griffin, C.T.\*, Botelho, J.\*, Hanson, M.\*, Fabbri, M.\*, Nesbitt, S.J. and **Bhullar, B.A.**, 2019, June. The Evolution of the Avian Sacrum, and the Transition from Tail-to Hip-Centered Locomotion during the Evolution of Birds. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S47-S48). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  8. **Bhullar, B.A.** and Hanson, M.\*, 2019, June. Constraint and Convergence in the Evolution of Beaks. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S58-S59). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  9. Smith-Paredes, D.\* and **Bhullar, B.A.S.**, 2019, June. Exploring the Evolution of the Amniote Forelimb Musculature by Studying its Embryology. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S220-S221). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  10. Sookias, R.B., Dilkes, D., Arcucci, A.B. and **Bhullar, B.A.**, 2019, June. Redescription and Novel Information on the Cranium of the Triassic Archosauromorph *Euparkeria capensis*. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S221-S222). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  11. Egawa, S.\*, Botelho, J.F.\* and **Bhullar, B.A.S.**, 2019, June. On the Morphogenetic Historiography of the Archosaur Femur. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S114-S114). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  12. Field, D.J.\*, Hanson, M. \*, Burnham, D.A., Wilson, L.E., Super, K.J., Ebersole, J.A. and **Bhullar, B.A.S.**, 2019, June. Exceptional Mesozoic Fossils Reveal the Mosaic Assembly of the Crown Bird Skull. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S121-S121). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  13. Molnar, J.L., **Bhullar, B.A.**, Turner, A.H. and Hutchinson, J.R., 2019, June. Hindlimb Posture and Muscle Actions in Stem Crocodylia. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S183-S183). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  14. Cereghino, V., Fabbri, M. \*, Smith-Paredes, D. \* and **Bhullar, B.A.S.**, 2019, June. Development of the Embryonic Anatomy of the Madagascar Ground Gecko. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S234-S234). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  15. Fabbri, M. \*, Paredes, S.D. \*, Vergara, M. \*, Faunes, M. \*, Botelho, J.F. \* and **Bhullar, B.A.**, 2019, June. Cracking the Evolutionary and Developmental Link between Brain and Skull in Archosauria. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S117-S117). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  16. Crompton, A.W., Musinsky, C.A., **Bhullar, B.A.** and Owerkowicz, T., 2019, June. Origin of Suckling in Therian Mammals. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S102-S102). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  17. Navalon, G., Nebreda, S.M., Bright, J.A., Marugan-Lobon, J., Fabbri, M. \*, **Bhullar, B.A.** and Rayfield, E.J., 2019, June. Differences in Post-hatching Ontogeny Shaped the Diverse Cranial Evolution of Strisoran Birds. In *JOURNAL OF MORPHOLOGY* (Vol. 280, pp. S189-S189). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
  18. Miyamae, J.A. \* and **Bhullar, B.A.**, 2019, March. Starting to Smile: Comparative Ontogeny of Mammalian Facial Muscle. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 59, pp. E372-E372). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.
  19. Fitch, A. \*, Pritchard, A. \*, Hartman, S., Bevitt, J., Lovelace, D.M. and **Bhullar, B.A.** 2019, September. Origin of Pterosauria and stepwise evolution of the pterosaurian flight apparatus. In *GSA Annual Meeting in Phoenix, Arizona, USA-2019*. GSA.
  20. **B. S. Bhullar**, M. Hanson\*, J. Botelho\*, D. Smith\*, M. Faunes\*, D. Field\*, M. Fabbri\*, D. A. Burnham, L. E. Wilson. 2017. Iterative evolutionary and developmental appearance of the

- avian beak revealed by new fossil and embryological data. Society of Vertebrate Paleontology Annual Meeting 2017.
21. J. K. Spear\*, E. Hoffman\*, **B. S. Bhullar**. 2017. The reconstructed braincase of *Adelobasileus* and implications for early mammaliaform diversity. Society of Vertebrate Paleontology Annual Meeting 2017.
  22. M. Hanson\*, A. C. Pritchard\*, D. A. Burnham, **B. S. Bhullar**. 2017. Reconstructing the feeding apparatus of a stem bird: a comparative study identifying osteological correlates to muscles in the skulls living archosaurs and applying them to a fossil taxon. Society of Vertebrate Paleontology Annual Meeting 2017.
  23. J. A. Miyamae\*, **B. S. Bhullar**. 2017. Comparative morphology of the trigeminal canal and a scenario for the evolution of facial musculature in mammals. Society of Vertebrate Paleontology Annual Meeting 2017.
  24. A. C. Pritchard\*, **B. S. Bhullar**, J. A. Gauthier. 2017. A tiny, early pan-archosaur from the upper triassic of connecticut and the diversity of the early saurian feeding apparatus. Society of Vertebrate Paleontology Annual Meeting 2017.
  25. J.F. Botelho\* and B.-A.S. Bhullar. 2017. Clarity on skeletal evolution. Pan-American Society of Evolutionary Developmental Biologists meeting 2017.
  26. D. Smith-Paredes\*, M. Vergara Cereghino\*, J.F. Botelho\*, B.-A.S. Bhullar. 2017. Comparative development of archosaur pectoral musculature. Pan-American Society of Evolutionary Developmental Biologists meeting 2017.
  27. **Bhullar B-AS**. 2016. The vertebrate neck is old and some of it is made of head. Society of Vertebrate Paleontology Annual Meeting 2016.
  28. Hanson M\*, Burnham DA, **Bhullar BS**. 2016. Reconstructing the skull of *Hesperornis regalis*: The first three-dimensional model of a Cretaceous stem bird with insights into early avian functional morphology, plesiomorphy, and convergence. Society of Vertebrate Paleontology Annual Meeting 2016.
  29. Hoffman E\*, Upham N, Fabbri M\*, Field D\*, Hanson M\*, Mongiardino Koch N, Leiss A, Miyamae JA\*, Whalen CD, **Bhullar BS**. 2016. Reconstructing the behavior and ecology of the ancestral primate and fossil taxa using comparative phylogenetic techniques. Society of Vertebrate Paleontology Annual Meeting 2016.
  30. Fabbri M\*, Pritchard A\*, Hanson M\*, Mongiardino NK, Hoffman E\*, Balanoff A, Bever G, Norell MA, Abzhanov A, **Bhullar BS**. 2016. Skull roof and brain interrelationship: macroevolutionary and developmental perspectives. Society of Vertebrate Paleontology Annual Meeting 2016.
  31. Crompton AW, Owerkowicz T, **Bhullar BS**, Musinsky C. 2016. Origin of the dual function of respiratory turbinates in mammals. Society of Vertebrate Paleontology Annual Meeting 2016.
  32. **Bhullar B-AS**. 2016. Cranial roof anatomy tracks brain structure in development and evolution. International Congress of Vertebrate Morphology annual meeting 2016.
  33. **Bhullar B-AS**. 2015. Paleontological, embryological, and molecular insight into the developmental basis of the distinctive maxillary reduction of birds (Reptilia, Aves) and experimental restoration of a large maxillary region in chickens. Society of Vertebrate Paleontology annual meeting 2015.
  34. Sobral G. et al. 2015. New information on the braincase of *Euparkeria capensis*. Society of Vertebrate Paleontology annual meeting 2015.
  35. Viola PA et al. 2015. Vestibular sensitive in extant monotremes and in Mesozoic mammalian morphs. Society of Vertebrate Paleontology annual meeting 2015.
  36. **Bhullar B-AS**, Gauthier JA, Abzhanov A. 2014. A simple molecular mechanism for the origin of the avian rostral and palatal skeleton. Society of Vertebrate Paleontology annual meeting 2014.

37. Crompton A, **Bhullar B-AS**, Musinsky C. 2014. Origin of mammalian pharyngeal musculature.
38. Bever G, Lyson T, **Bhullar B-AS**. Fossil evidence for a diapsid origin of the anapsid turtle skull. Society of Vertebrate Paleontology annual meeting 2014.
39. **Bhullar B-AS**, Marugán-Lobón J, Racimo F, Bever GS, Norell MA, Rowe TB, Abzhanov A. 2013. Frontiers in the evolution and development of the reptilian skull. International Congress of Vertebrate Morphology 2013.
40. **Bhullar B-AS**, Marugán-Lobón J, Racimo F, Bever GS, Norell MA, Rowe TB, Abzhanov A. 2013. The evolution and development of the archosaurian head and the origin of the bird skull. Society of Integrative and Comparative Biology annual meeting 2013.
41. **Bhullar B-AS**, Bever GS, Merck JW, Lyson TR, Gauthier JA. 2011. Uniting microevolution and macroevolution in deep time: The zone of variability in Archosauromorpha. Society of Vertebrate Paleontology annual meeting 2011.
42. Roach B, Fox M, **Bhullar B-AS**. 2011. The preparation of a complete sphenosuchian skeleton, YPM 57103: A case study. Society of Vertebrate Paleontology annual meeting 2011.
43. Lyson TR, **Bhullar B-AS**, Bever GS, Joyce WG, Gauthier JA. 2010. Vertical split of the turtle shoulder girdle into the upper and lower shell. Presented at the Ninth Meeting of the International Congress of Vertebrate Morphology, Punta del Este, Uruguay.
44. Lyson T, **Bhullar B-A**, Bever G, Joyce W, Gauthier J. 2010. Vertical split of the turtle shoulder girdle pushes the limits of muscular scaffold homology. *Journal of Vertebrate Paleontology* October 2010: 126A.
45. Kirk E, Daghighi P, Macrini T, **Bhullar B-A**, Rowe T. 2010. Virtual endocast of *Rooneyia viejaensis* (Mammalia, Primates). *Journal of Vertebrate Paleontology* October 2010: 116A.
46. Ortiz D, Lewis P, Kennedy A, **Bhullar B-A**, Hancox J. 2010. Preliminary analysis of Dipnoi (Osteichthyes: Sarcopterygii) fossils from Driefontein, South Africa. *Journal of Vertebrate Paleontology* October 2010: 142A.
47. **Bhullar B-AS**, Pauly GB, Scanferla A, Bever G, Smith K. 2009. The first fossil sunbeam snake and the antiquity of modern snake clades. *Journal of Vertebrate Paleontology* 29: 63A.
48. **Bhullar B-AS**, Scanferla A, Bever G, Smith K. 2008. A nearly complete macrostomatan snake from the Eocene of Texas. *Journal of Vertebrate Paleontology* 28: 52A.
49. Kennedy AM, **Bhullar B-AS**. 2008. An apomorphy-based identification of a fossil herpetofauna from Botswana. Texas Academy of Science conference 2008.
50. Scanferla A, **Bhullar B-AS**. 2008. Postnatal developmental aspects in a Cretaceous snake, *Dinilysia patagonica*. *Proceedings of the Third Latin-American Congress of Vertebrate Paleontology*.
51. **Bhullar B-AS**. 2007. Developmental and evolutionary insights from the anatomy of *Anolis carolinensis* and other Squamata: membranes and muscles, tracing the neural crest, and the presence of the "rectus lateralis" in Iguania. Presented at the Eighth Meeting of the International Congress of Vertebrate Morphology, Paris, France. *Journal of Morphology* 268: 1049.
52. **Bhullar B-AS**. 2007. The enigmatic fossils *Exostinus* and *Restes*: resolving the stem and the crown of *Xenosaurus*, the knob-scaled lizards. *Journal of Vertebrate Paleontology* 27: 48A.
53. Kennedy AM, **Bhullar B-AS**. 2007. Preliminary analysis of the fossil herpetofauna from the Koanaka Hills site, Ngamiland, Northwestern Botswana. *Journal of Vertebrate Paleontology* 27: 98A-99A.
54. Kennedy AM, **Bhullar B-AS**. 2007. Preliminary analysis of the fossil herpetofauna from the Koanaka Hills. Texas Biological Anthropologist Consortium conference 2007.
55. **Bhullar B-AS**. 2006. Postnatal ontogenetic changes in the cranium of *Varanus exanthematicus* with comparisons to other varanoids and applications to the fossil record. *Journal of Vertebrate Paleontology* 26: 42A.



56. **Bhullar B-AS**. 2003. “Demands of operating in complex three-dimensional environments: A suggestion for comparative field studies of primates and cetaceans with focus on echolocation, other vocalizations, and social behavior.” New England Biological Anthropology Symposium 2003.

#### **Awards, selected**

- NSF CAREER award 2021 (see Funding)
- World Economic Forum Young Scientist since 2013 (Annual Meeting of the New Champions).
- American Association of Anatomists Morphological Sciences Young Investigator Award, 2018.
- Society for Developmental Biology Imaging Award for nonmodel vertebrates 2019: first *and* second place for images of alligator embryo and chicken embryo.
- Nikon Small World Image Competition 2019 for image of gecko embryo.
- NSF Vizzies People’s Choice Award 2018 for image of gecko embryo; covered extensively by press.
- FASEB BioArt Competition 2017 winner for image of alligator embryo taken by postdocs João Botelho and Macarena Faunes and graduate student Daniel Smith. Featured in several outlets including National Geographic and The Scientist.
- Finalist, Beckman Young Investigator Award Program.
- Harvard University Derek Bok Award for Excellence in Graduate Student Teaching of Undergraduates. First student in the biological sciences to receive the award, one of five across the university; \$1,000 cash prize. Spring 2010.
- Harvard University Certificate of Distinction in Teaching for Vertebrate Evolution and Development. Fall 2011.
- Harvard University Certificate of Distinction in Teaching for Evolutionary Human Anatomy and Physiology. Fall 2009.
- James Mills Peirce Fellowship, Harvard University Graduate School of Arts and Sciences, Fall 2008 – Spring 2011. Merit fellowship awarded to top Ph.D. applicants providing total of \$18,000 of support above departmental stipend and other fellowships.
- National Science Foundation Graduate Research Fellowship; awarded 2005, tenure begun Fall 2007 to end Spring 2010.
- Donald D. Harrington Fellowship, University of Texas at Austin; full tuition and three years of funding with \$34,000 stipend + \$2,000 research allowance, beginning Fall 2005.
- Bruton Continuing Fellowship (supplementary to partial Harrington Fellowship and NSF Graduate Research Fellowship), The University of Texas at Austin. Fall 2007.
- NSERC Canada Graduate Scholarship; 2005 (declined in order to accept NSF, Harrington).
- Phi Beta Kappa membership awarded Spring 2005.
- National Merit Scholarship
- Rensselaer Award in Math and Science (accompanying \$15,000/year scholarship offer to Rensselaer Polytechnic Institute, New York declined)
- National Council of Teachers of English Achievement Award in Writing

#### **Awards to lab members, selected (external)**

- Daniel Smith-Paredes, Ph.D. student: Humboldt Fellowship for postdoctoral work in Germany.

- Laurel Yohe (postdoctoral researcher): Linnean Society of London Award, Systematics Association Systematics Research Fund, National Center for Brain Mapping Deep Learning Fellowship, Marine Biological Laboratory imaging computation workshop award, Marine Biological Laboratory Embryology course award.
- Michael Hanson (Ph.D. student): American Ornithologists' Union Award.
- Matteo Fabbri (Ph.D. student): Jackson School of Geosciences Student Award, Paleontological Society research award, Explorers Club award, Theodore Roosevelt grant from American Museum of Natural History, Sigma Xi research award, Jurassic Foundation research award.

#### **Funding: Larger Grants**

- NSF CAREER 2046868 (2021-2026): CAREER: Investigating the deep origin and evolution of the bird beak by synthesizing the fossil record and comparative embryology of archosaurian reptiles. \$856,022.
- NSF RAPID 2032073 (2020): Collaborative Research: Bat goblet cells as immuno-hotspots for infection of coronavirus. \$119,444 + REPS supplement of \$51,498.
- NSF IOS 1701769, "Digitization TCN: Collaborative Research: oVert: Open Exploration of Vertebrate Diversity in 3D." Co-PI with Gregory Watkins-Colwell. \$74,526.
- Two Yale Endowed Postdoctoral Fellowships for postdoctoral fellows; \$56,000 each.
- NSF DDIG, "Dissertation Research: Origin of the modern avian locomotor system across a neglected evolutionary interval: insight from new methods and new fossils" 7/01/2015. PI with student co-PI Daniel Field. \$21,203
- NSF DDIG, "Dissertation Research: The Deep Evolution and Development of the Archosaurian Head and the Origin of the Face of Birds" (DEB 1110564); dissertation research in the lab of Professor Arkhat Abzhanov. \$13,311.

#### **Funding: Smaller Grants**

- American Ornithologists' Union Research Award: \$1,542. Spring 2011.
- American Museum of Natural History Frank M. Chapman Memorial Fund Grant: \$1,392. Spring 2011.
- Harvard Museum of Comparative Zoology Ernst Mayr Travel Grant in Animal Systematics: \$1,395 for travel to South Africa. Spring 2011.
- Best student poster award, Paleontological Society of Southern Africa meeting, Summer 2010.
- Promotion to full membership in Sigma Xi granted May 2009.
- Texas Biological Anthropology Consortium student presentation award for Kennedy and Bhullar (2008) listed above.
- American Museum of Natural History Theodore Roosevelt Memorial Grant; \$2,300 for CT scanning and travel. Spring 2007.
- Society of Systematic Biologists Award for Graduate Student Research; \$1,400 for CT scanning and travel. Spring 2007.
- Analytical fees, Jackson School of Geosciences at The University of Texas at Austin; \$740 for CT scanning. Spring 2007.
- American Society of Ichthyologists and Herpetologists Gage Fund Grant Award; \$500 for CT scanning and travel. Spring 2007.

- Off-campus research support, Jackson School of Geosciences at The University of Texas at Austin; \$365 for trip to University of Florida to examine exceptionally preserved Paleocene lizard fossils. Spring 2007.
- Analytical fees, Jackson School of Geosciences at The University of Texas at Austin; \$1,000 for CT scanning of specimens. Summer 2006.
- Sigma Xi Grant-in-Aid of Research; \$500 for CT scanning of specimens. Spring 2006.

#### **Selected Funding Awarded to Students/Postdocs for Research in Bhullar Lab**

- NSF Postdoctoral Research Fellowship in Biology for Savannah Olroyd (2021, deferred until 2022). \$138,000.
- NSF Postdoctoral Research Fellowship in Biology for Christopher Griffin (2020). \$138,000.
- NSF Earth Sciences Postdoctoral Fellowship for Zachary Morris (2020). \$174,000.
- NSF Postdoctoral Fellowship in the Biological Sciences for Laurel Yohe (2018). \$138,000.
- Visiting student fellowship, Chinese Academy of Sciences, for Chun-Chi Liao (2020). \$20,000.
- Human Frontier Science Program postdoctoral fellowship awarded to João Botelho, starting summer 2016. \$170,000.
- Yale Institute for Biospheric Studies Gaylord Donnelley Postdoctoral Environmental Fellowship for developmental biologist João Botelho. \$131,000 plus \$4,000 contingency (declined for Human Frontier Science grant).
- NSF Postdoctoral Fellowship in the Biological Sciences for Adam Pritchard. \$134,000.

#### **Reviewer for**

- *Acta Palaeontologia Polonica*
- *Bulletin of the American Museum of Natural History*
- *Bulletin of the Peabody Museum of Natural History*
- *Current Biology*
- *Evolution*
- *Genome Biology and Evolution*
- *Herpetologica*
- *Journal of Anatomy*
- *Journal of Herpetology*
- *Journal of Systematic Palaeontology*
- *Nature*
- *Nature Communications*
- *Nature Ecology and Evolution*
- *Nature Scientific Reports*
- *Paleobiology*
- *PeerJ*
- *Proceedings of the National Academy of Sciences, USA*
- *Proceedings of the Royal Society B: Biological Sciences*
- *Royal Society Open Science*
- *Science*
- *Science Advances*
- *Zoology*

#### **Teaching Experience**

- Spring 2020-present: G&G 270, Lecture/lab “Herpetology”
- Fall 2017: Seminar “Vertebrate musculoskeletal anatomy.”
- Spring 2017-present: G&G 126L Lab “Laboratory for History of Life” (co-director)
- Fall 2016: Seminar “Tutorial in Paleobiology: Embryological method and theory”
- Spring 2016-present: G&G 125, Lecture “The History of Life.” (co-director)
- Spring 2016: Guest lecturer, “Comparative developmental anatomy.”
- Spring 2016: Seminar “Tutorial in Paleobiology.”
- Fall 2015: Seminar “Reconstructing the deep-time history of primate behavior and ecology.”
- Spring 2014 and Spring 2015: Guest lecturer, “The History of Life.”
- Fall 2011: Developed and taught intensive laboratory for Harvard College Organismic and Evolutionary Biology (OEB) 150, Vertebrate Evolution and Development (new course). Received Certificate of Distinction in Teaching.
- Spring 2010: Periodically assisted in teaching lab for OEB 167, Herpetology.
- Spring, multiple years: Assisted in preparing lectures and gave short guest lecture for OEB 190, Ornithology.
- Fall 2009: Teaching fellow for Harvard College Life Sciences (LS) 2: Human Evolutionary Anatomy and Physiology. Ran lab section, including anatomy lectures, dissection, and physiological experiments. Received Certificate of Distinction in teaching and Derek Bok Award for Excellence in Graduate Student Teaching of Undergraduates.
- Fall 2007: Helped organize lecture and lab for The University of Texas at Austin Geology (GEO) 391: Morphology and Systematics of Squamate Reptiles.

#### **Postdoctoral Researchers Supervised (with placements)**

- Savannah Olroyd, starting spring 2022.
- Christopher Griffin, 2020-present.
- Zachary Morris, 2020-present.
- Laurel Yohe, 2018-2021. Currently Assistant Professor at University of North Carolina Charlotte and new joint genomics institute (dual appointment).
- Shiro Egawa, 2018-2019. Currently research scientist at RIKEN Institute for Developmental Biology.
- Daniel J. Field, 2016. Currently Lecturer (Assistant Professor equivalent) in Zoology at Cambridge University.
- João Botelho, 2016-2019. Currently Assistant Professor of Biology at Catholic University of Chile.
- Macarena Faunes Carvallo, 2016-2019. Currently researcher at Catholic University of Chile.
- Adam C. Pritchard, 2015-2017. Currently Assistant Curator of Paleontology at Virginia Museum of Natural History.

#### **Ph.D. Students Supervised (primary or co-advisor, with placements)**

- Alexander Ruebenstahl (Ph.D.), 2019-present.
- Caleb Gordon (Ph.D.), 2018-present
- Kelsey Jenkins (Ph.D.), 2018-present.
- Daniel Smith (Ph.D.), 2016-2021. Offered Humboldt Research Fellowship for postdoctoral work at the University of Berlin.
- Michael Hanson (Ph.D.), 2014-present.
- Juri Miyamae (Ph.D.), 2015-present. Co-advised with Günter Wagner.

- Matteo Fabbri (Ph.D.), 2015-2021. Accepted postdoctoral research position at Field Museum of Natural History, Chicago.

#### **Visiting Ph.D. Students Supervised (primary advisor during visit)**

- Chun-Chi Liao (visiting Ph.D. from IVPP), 2019-2020.
- Feng Li (visiting Ph.D. from IVPP), 2017.
- Christopher Griffin (visiting Ph.D. from Virginia Tech), 2017-2018.

#### **Ph.D. Students Supervised (committee member)**

- Elly Goetz (Ph.D., with Pincelli Hull), 2021-present.
- Henry Camarillo (Ph.D., with Martha M. Muñoz), 2021-present.
- Roxanne Armfield (Ph.D., with Jacques A. Gauthier), 2019-present.
- Dalton Meyer (Ph.D., with Jacques A. Gauthier), 2018-present.
- Armita Manafzadeh (Ph.D., Brown), 2017-present.
- Christopher Griffin (Ph.D., Virginia Tech), 2017-2020.
- Daniel J. Field (Ph.D., with Jacques A. Gauthier), 2013-2017.
- Holger Petermann (Ph.D., with Jacques A. Gauthier), 2015-2019.
- Elizabeth Clark (Ph.D., with Derek J. Briggs), 2015-2019.

#### **Undergraduate Students Supervised**

- Miranda Margulis-Ohnuma, 2020-present.
- Selena Martinez, 2019-present.
- Chase Doran Brownstein, 2018-present.
- Alice Tirard, 2019-2021.
- Ludivine Brunissen (undergraduate), 2017-2019.
- Katharine Walls (undergraduate), 2017-2019.
- Anisa Iqbal (undergraduate), 2016-2019.
- Arianna Lord (undergraduate), 2016-2020.
- Maya Juman (undergraduate), 2016-2019.
- Sita Sunil (undergraduate), 2016-2018.
- Adrien Gau (undergraduate), 2014-2018.
- Avinash Subramanian (undergraduate summer intern), 2017.
- Jeffrey Spear (undergraduate summer intern), 2016.
- Volkan Ozen (undergraduate summer intern), 2016.
- Olivier Cloutier (undergraduate summer intern), 2016.
- Savannah Blake (undergraduate summer intern), 2015.
- Jane Lockery (research intern), 2017-present.

#### **High School Students Supervised**

- Amber Polk, 2017-2018.
- Indira Khera, 2017-2018.
- Others, shorter term, through university and museum programs.

#### **Invited Talks**

1. **Bhullar B-AS.** 2021. Invited presentation for vertebrate paleontology students, Virginia Tech.
2. **Bhullar B-AS.** 2020. Invited symposium presentation for Society of Integrative and Comparative Biology.
3. **Bhullar B-AS.** 2019. Invited talk for American Microscopical Society.
4. **Bhullar B-AS.** 2019. Invited presentation for American Association of Anatomists.
5. **Bhullar B-AS.** 2019. Invited talk for North American Paleontological Conference
6. **Bhullar B-AS.** 2019. Invited symposium presentation for International Congress of Vertebrate Morphology.
7. **Bhullar B-AS.** 2019. Invited talk American Society of Ichthyologists and Herpetologists meeting.
8. **Bhullar B-AS.** 2019. Invited talk for Connecticut Bird Club.
9. **Bhullar B-AS.** 2018. Keynote for Palaeontological Association meeting, Bristol, UK. “The embryonic genesis of the dinosaur body.”
10. **Bhullar B-AS.** 2018. Invited talk for award recipients at American Association of Anatomists annual meeting.
11. **Bhullar B-AS.** 2018. Invited talk at International Dinosaur Symposium, Hong Kong.
12. **Bhullar B-AS.** 2017. Keynote speech for European Association of Vertebrate Palaeontologists annual meeting.
13. **Bhullar B-AS.** 2017. Stony Brook University seminar.
14. **Bhullar B-AS.** April 2017. American Museum of Natural History seminar series.
15. **Bhullar B-AS.** 2017. Yale Ecology & Evolutionary Biology seminar series.
16. **Bhullar B-AS.** 2017. Marsh Fellows talk series.
17. **Bhullar B-AS.** 2017. Saybrook College Fellows talk.
18. **Bhullar B-AS.** 2016. Forging the great vertebrate radiations: Development, anatomy, and function of the avian head over 150 million years. University of Connecticut EEB symposium talk.
19. **Bhullar B-AS.** 2016. The vertebrate neck is old and some of it is made of head. SVP 2016 Symposium: “Paleo Evo-Devo: the New Science of the Very Old.”
20. **Bhullar B-AS.** 2016. Bird jaws and the origin of Aves. SICB 2016 Symposium: “A bigger picture: organismal function at the nexus of development, ecology, and evolution.”
21. **Bhullar B-AS.** 2015. Forging the great vertebrate radiations: Development, anatomy, and function of the avian head over 150 million years. Yale Institute of Biospheric Studies Friday Noon Seminar Series.
22. **Bhullar B-AS.** 2015. The evolutionary and developmental underpinnings of divergence in head form and function between crocodiles and birds. University of Chicago Evolutionary Morphology seminar series.
23. **Bhullar B-AS.** 2015. The origin and developmental underpinnings of craniofacial divergence between crocodiles and birds, the two great archosaurian lineages..SICB 2015 Integrative Biology of the Crocodylia symposium.
24. Orsbon C and **Bhullar B-AS.** 2015. Potential and challenges of iodine and phosphomolybdic acid in staining cartilage and muscle. The University of Texas at Austin & The High-Resolution X-Ray CT Facility; The Austin Working Group -- Advancing Contrast-Enhanced CT Imaging in the Biological Sciences.
25. **Bhullar B-AS.** 2014. Integrated evolution and development of the avian brain and skull. NESCENT Catalysis Meeting: The Avian Brain, May 2014.
26. **Bhullar B-AS.** 2014. The ascendance of birds and the trappings of a kingly crown. Royal Tyrrell Museum Speaker Series, Drumheller, Alberta. March 2014.
27. **Bhullar B-AS.** 2014. Of dragons and Darwin: teaching evolution with dinosaurs and deep time. Harvard Museum of Natural History teacher training program. April 2014.
28. **Bhullar B-AS.** 2013. Departmental seminar series, Harvard University.

29. **Bhullar B-AS.** 2012. Stories and the tree of life: Teaching evolution from a deep-time perspective. Harvard Museum of Natural History teacher training program. February 2012.
30. **Bhullar B-AS.** 2011. The deep evolution and development of the bird face. Departmental seminar, Department of Biological Sciences, Sam Houston State University. February 2011.
31. **Bhullar B-AS.** 2010. New discoveries from removing rock and dissecting fossils digitally with CT scanning technology. 20-minute talk as invited junior paleontology representative at Rank Prize Funds Symposium on High-Resolution X-Ray Imaging at the Wordsworth Hotel, Grasmere, UK, October 2010.
32. **Bhullar B-AS.** 2007. The relationships and deep history of the dragon-form lizards: a story, told by comparative anatomy, across six continents and two hundred million years. Amarillo symposium for Donald D. Harrington Student and Faculty Fellows, 11 April 2007, Amarillo, Texas. Attended by President William Powers, Jr. and other officials of The University of Texas at Austin.

### **Other Presentations**

1. **Bhullar B-AS.** 2010. "The deep history of the archosaurian face." Interdepartmental Evolution and Development Group meeting, Harvard University, November 2010.
2. **Bhullar B-AS.** 2009. "The archosaur face and prospects for craniofacial evo/devo on *Alligator mississippiensis*." Interdepartmental Evolution and Development Group meeting, Harvard University, July 2009.
3. **Bhullar B-AS.** 2008. "Homology: Plurality or unity?" Led two-hour discussion on homology for seminar group organized by Professor Karel Liem.
4. **Bhullar B-AS.** 2008. "The anatomy and phylogeny of Xenosauridae, the knob-scaled lizards." Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin Technical Sessions presentation, 5 April 2008.

### **Field Experience**

- Hamilton, KS, 2022 (planned). Quarrying of Pennsylvanian small vertebrate sites. Leader.
- Dinosaur National Monument, Utah, 2011-present. Quarrying of Late Jurassic microvertebrate sites. Leader.
- Fruita, Colorado, 2011-present. Quarrying of Late Jurassic microvertebrate sites. Co-Leader with Gabe Bever.
- Driefontein, Free State, South Africa, 2010-present. Paleontological prospecting and excavation at Early Triassic terrestrial microvertebrate site and surrounding area. Co-leader with Patrick J. Lewis.
- New Mexico, Arizona, California, Oregon, Nevada, 13 May 2007 – 18 June 2007. Collection of specimens for osteological studies of phylogeny and intraspecies variation in North American Squamata and Amphibia. Over 330 specimens collected. With Christopher J. Bell and Krister Smith.
- Escalante National Monument, Utah, 12 May 2004 – 29 May 2004. Paleontological prospecting and excavation in Chinle Formation Triassic sediments in Circle Cliffs and Fry Canyon areas. With Yale Peabody Expedition 2004.
- Kansas and Missouri, Fall 1999 – Summer 2001. Biodiversity data collection on reptiles, amphibians, and fishes, water quality testing independently and in conjunction with the Kansas Herpetological Society. With Eric Kessler, Faculty of Science, Blue Valley North High School, Overland Park, Kansas.

### **University Service**

- Spring 2021 to present: Department of Earth & Planetary Sciences IDEA (Inclusion, Diversity, Equity, Anti-racism/discrimination) committee member.
- Chair of Faculty Advisory Committee for Yale microCT scanner. Active participant in every aspect of logistics around scanner as a Yale-wide facility.
- Academic year 2016-2017: Chair, Curriculum Subcommittee of Yale Committee on Teaching in the 21<sup>st</sup> Century. Wrote and delivered extensive report.
- Academic year 2016-2017: Member, Yale College Dean Search Advisory Committee.
- Academic year 2016-2017: Member, Arts Subcommittee of Yale Committee on Teaching in the 21<sup>st</sup> Century.
- Academic year 2016-present: Chair, Yale Peabody Museum Student Programs Steering Group.
- Gave several lab tours to potential donors, including well-known musician Residente.
- Academic year 2019-present: Assisting in envisioning new purpose for former Yale Geology Library space.
- Academic year 2017-present: Member, Yale Peabody Museum Fossil Hall Exhibits Committee
- Academic year 2017-2018: Member, Saybrook College Dean Search Committee.
- Academic year 2017-present: Member of or heavily involved in Yale Geology & Geophysics Undergraduate Curriculum Committee.
- Summer 2021: Yale NSF CAREER Award panel.
- Summer 2016: Panelist for Yale Junior Faculty Academy.
- January 2016-present: General Yale College faculty advisor.
- August 2016-present: Saybrook College Freshman Advisor.
- August 2016-present: Saybrook College Resident Fellow.
- February 2016: Yale College Engineering and Science (YES) recruitment event presenter.
- February 2016: Yale Peabody Museum Science Café presenter (“The dragon inside the dove: resurrecting the dinosaur within a bird and other works of genetic time travel”)
- Panel co-convener and member, “Grand challenges in cultural heritage data and information,” 2016 United Nations Global Colloquium of University Presidents.

### **Professional Service**

- Hosted Professor Takanobu Tsuihiji of the University of Tokyo during a research leave.
- Convened International Congress of Vertebrate Morphology symposium on brain and skull evolution and development.
- Wrote several (successful) letters of support for faculty and staff promotions and awards at Johns Hopkins University, the University of Kansas, Hong Kong University, and others.
- Evaluated applications and wrote letters of support for CONICET Argentina, Hong Kong Academy of Sciences, and others.
- Hosted several visiting students from universities across the world, including Virginia Tech in the U.S. and the University of Beijing / Institute of Vertebrate Paleontology and Paleoanthropology in China.
- Reviewed articles for numerous journals including:
  - *Acta Palaeontologia Polonica*
  - *Bulletin of the American Museum of Natural History*
  - *Bulletin of the Peabody Museum of Natural History*
  - *Current Biology*
  - *Evolution*
  - *Genome Biology and Evolution*



- *Herpetologica*
- *Journal of Anatomy*
- *Journal of Herpetology*
- *Journal of Systematic Palaeontology*
- *Nature*
- *Nature Communications*
- *Nature Ecology and Evolution*
- *Nature Scientific Reports*
- *Paleobiology*
- *PeerJ*
- *Proceedings of the National Academy of Sciences, USA*
- *Proceedings of the Royal Society B: Biological Sciences*
- *Royal Society Open Science*
- *Science Advances*
- *Zoology*
- Continued to mentor former lab members who now have faculty and curator positions

### **Public Service**

- Major advisor on upcoming Netflix Life on Our Planet documentary series.
- Lab is featured in large segment of October 2020 50-page cover article in *National Geographic Magazine*. Article is about the past, present, and future of research in paleontology. Bhullar Lab represents “future.” Appeared in several sponsored online events related to the article.
- Extensive appearances as one of major personalities in 2019 PBS documentary *When Whales Walked*, aired internationally on many channels.
- Filmed 2020 episode of CuriosityStream (major digital documentary company) on Bhullar lab and research.
- Contacted and quoted extensively in print and audio by press as expert for articles on recent scientific research and current events.
- Provided imagery and information for major exhibit, opening 2020, at Bruce Museum, CT.
- 2015-present: Various public outreach events and lectures as curator of vertebrate paleontology and vertebrate zoology, Yale Peabody Museum of Natural History. Generally at least 3 per year.
- July 2013: Lecture and tour on paleontology for Harvard Museum of Natural History Ancient Life Program.
- February 2013: Lecture to middle and high school teachers as part of Harvard Museum of Natural History adult and teacher education program on mammal origins and evolution.
- August 2012: Lecture and tour on paleontology for Harvard Museum of Natural History Ancient Life Program.
- March 2012-2014: Ran "meet a paleontologist" tables at annual Harvard Museum of Natural History Earth Rocks program.
- February 2012: Lecture to middle and high school teachers on teaching evolution from a paleontological/deep time perspective.
- August 2011: Lecture and tour on paleontology for Harvard Museum of Natural History Ancient Life Program.
- March 2011: Recorded segments in New York City about teaching philosophy and strategy to be incorporated into Epigeum E-Learning Course "University and College Teaching" based out of Imperial College, London.

- January 2011: Co-led Harvard-wide panel on teaching excellence for Harvard University Derek Bok Center for Teaching and Learning.
- October 2010: Led tours of MCZ Vertebrate Paleontology collection for undergraduate research organization.
- September 2009: Platform session moderator for Society of Vertebrate Paleontology 69<sup>th</sup> Annual Meeting.
- Fall 2005: Presented snake anatomy and phylogeny to the public using skeletal material and illustrations as part of University of Texas “Hot Science, Cool Talks” public outreach lecture “The Striking Behavior of Rattlesnakes” by Dr. Travis LaDuc.

### **Press Coverage (selected)**

- Major advisor on upcoming Life on Our Planet documentary series.
- Lab is featured in 50-page cover article in October 2020 *National Geographic Magazine*. Article is about the past, present, and future of research in paleontology. Bhullar Lab represents “future.”
- Extensive appearances as one of major personalities in 2019 PBS documentary *When Whales Walked*, aired internationally on many channels.
- Filmed 2020 episode of CuriosityStream (major digital documentary company) on Bhullar lab and research.
- Award-winning images from lab featured in pages of several major international science magazines and websites.
- For Field et al. (2018) on the skull of *Ichthyornis*: numerous print articles, NPR interview, etc. One of the highest Altmetric scores for any paper in 2018: 1673; 99<sup>th</sup> percentile of all papers and 98<sup>th</sup> percentile of all papers from *Nature* of the same age.
- For Bhullar et al. (2015) in *Evolution* and ongoing work on bird beak development: Two articles including an editorial in *The New York Times*, numerous other print and online articles including *Nature* and *Science* news, live and recorded interviews by many news sources including NPR and NPR’s Science Friday.
- For ongoing molecular developmental research on the origins of the bird skull: NPR, *New Scientist*, *The Telegraph*, *Escapist Magazine*, Gawker.com, *Irish Times*, *The Daily Mail*, *Science News Daily*, *Nature*, *Swerve*. Work featured in several popular books and textbooks.
- For Bhullar et al. (2012) in *Nature* on bird skull evolution: *The New York Times*, *The LA Times*, *Nature* Podcast (recorded interview), CBC Canada (recorded interview), *Scientific American*, *Science News*, *American Scientist*, *New Scientist*, *Discovery News*, *Science et Vie* (France), various international newspapers, *The Harvard Gazette*, Smithsonian blog, American Museum of Natural History blog, Why Evolution is True blog, numerous other blogs and online news sources.
- For Longrich et al. (2012) in *Nature* on snake origins: BBC World News, *Scientific American* blog, *The Hindu*, *New Haven Register*, *Yale Alumni Magazine*, *Daily Mail UK*, numerous other blogs and online news sources.

### **Professional Affiliations**

- World Economic Forum; member since 2013
- Sigma Xi; member since 2006
- Phi Beta Kappa Honor Society; member since 2005
- Society of Vertebrate Paleontology
- International Society of Vertebrate Morphology