Brian K. Hall

Brian Hall is the son of Doris Garrad and Harry Hall, and was born in Port Kembla, NSW Australia, on 28 October 1941. He attended the University of New England in Armidale NSW, graduating in 1963 with a BSc in zoology, in 1965 with a BSc (Honors) in zoology, and in 1968 with a PhD in zoology. His PhD thesis, undertaken under the supervision of Patrick D. F. Murray, FAA (Fellow of the Australian Academy) was on the differentiation of bone and secondary cartilage in chicken embryos. Hall's laboratory research focuses on developmental biology and evolutionary developmental biology (evo-devo), especially of the vertebrate neural crest and skeletal tissues that arise from neural crest cells.

His historical interests are in the emergence of evolutionary embryology in the 1860s and its transformation into evo-devo from the 1970s on. Publications include studies on Francis (Frank) Balfour, John Gulick, Anton Dohrn, Conrad Waddington, The Cambridge Morphology Laboratory, the Naples Marine Station, germ layer theory, body plans, the neural crest and neural crest cells. He has also published on William Caldwell and John Budgett, two individuals who sought signs of evolution in embryos of the species thought to be missing links between animal groups. Hall's understanding of the intellectual roots of his discipline deepens his perspective on current theoretical issues and colors much of his writing.

Evolutionary developmental biology is the study of how developmental and evolutionary processes interplay, and his early works on the role of mechanical factors in the formation of secondary cartilage in chick embryos are now landmark studies that established Hall as an important figure in both developmental and skeletal biology. Brian Hall and his students pioneered an epigenetic view of bone differentiation and of vertebrate development in general, and highlighted the importance of epigenetic tissue interactions in vertebrate evolution. With a paper titled "Evolutionary consequences of skeletal differentiation" published in the American Zoologist in 1975, Hall began applying his interest in epigenetic mechanisms in development to understanding the complex interplay of evolutionary and developmental mechanisms, and thus began the process of building a bridge between evolutionary and developmental biology from the developmental biology side. Charles Darwin argued that developmental biology would provide some of the most important evidence for evolution. Evolutionary developmental biology has not only proven this thesis, but is also showing how knowledge of developmental mechanisms informs our understanding of evolutionary processes and vice versa.

Through a combination of empirical studies and theoretical works, the process of building the synthesis between developmental and evolutionary biology has been the major theme in Brian Hall's work and that of his students for the past two decades. A comparative approach using lamprey, fish, avian, reptilian, amphibian and mammalian embryos has focused on the neural crest cell origin of much of the craniofacial skeleton and on the basis for the signaling systems that initiate skeletal differentiation and morphogenesis. This work culminated in the writing of the textbook titled Evolutionary Developmental Biology, which for most workers defines the field. First published in 1992, it was expanded and revised in 1998 and appeared in Japanese translation in 2001. This work defines a field, which, in turn, has revitalized the study of evolution. Further books and monographs deal with the neural crest, skeletal development and evolution, and evolution: The Neural Crest in Development and Evolution, 1999; The Neural Crest and Neural Crest Cells in Vertebrate Development and Evolution, 2009; Developmental and Cellular Skeletal Biology, 1978; Bones and Cartilage: Developmental and Evolutionary Skeletal Biology, 2005; and Strickberger's Evolution (with Benedikt Hallgrímsson), 4th edition, 2008, and Chinese edition, 2009; and Evolution: Principles and Processes, in press.

Hall is also a dedicated teacher and mentor of honors and graduate students and postdoctoral fellow, his career having been spent in the Biology Department at Dalhousie University in Halifax Nova Scotia Canada, where he progressed from assistant professor (1968) to full professor (1975–2007), Chair of the department 1978–1985), Izaak Walton Killam Research Professor (1990–1995), Faculty of Science Killam Professor of Biology (1996–2001), George S. Campbell Professor of Biology (2001–2007), University Research Professor (2002–2007) and University Research Professor Emeritus (2007–). In 2008 he was appointed Visiting Distinguished professor at Arizona State University in Tempe, Arizona. Honors, awards and fellowships include the first DSc in Biological Sciences The University of New England, Armidale, NSW, Australia (1978), election as a Fellow of the Royal Society of Canada (FRSC) (1985), the Fry Medal from the Canadian Society of Zoologists (1994), the International Craniofacial Biology Distinguished Scientist Award (1996), the Alexander Kowalevsky Medal and honorary membership in the Saint-Petersburg Society of Naturalists (2001), election as a Foreign Honorary Member of the American Academy of Arts & Sciences (2002), an NSERC Award of Excellence in Research (2002), Canada Council for the Arts Killam Research Fellowship (2003–2005, honorary membership of The Golden Key International Honor Society (2003), and the $100,000 Killam Prize from the Canada Council for the Arts (2005). The “Hall Award” was established by the Canadian Society of Zoologists in 2006 for the best student platform paper presented in the Comparative Morphology and Development Division at the Society annual meeting.