Preface

R. Glenn Northcutt Mary Sue Northcutt

Neurobiology Unit, Scripps Institution of Oceanography and Department of Neurosciences, School of Medicine,
University of California, San Diego, La Jolla, Calif., USA

The 15th Annual Karger Workshop at the J.B. Johnston Club had as its theme the development of vertebrate sense organs. When one of us (RGN) initially began planning this Workshop, he had thought to organize it around the evolution and development of sense organs, in the context of five goals of evolutionary developmental biology: (1) to understand the comparative embryology (ontogenetic trajectories) of the character(s) of interest phylogenetically; (2) to understand how the developmental processes underlying these trajectories have been modified; (3) to understand the genetic bases for these trajectories and their modification; (4) to understand what ecological factors have influenced these trajectories and their modification; and (5) to recognize general concepts regarding the development and evolution of a given set of characters.

In considering these goals, it became clear that too little comparative information exists on most sense organs for the evolution of their development to be a major focus of a workshop at present, and the theme was therefore restricted to the development of vertebrate sense organs. Each participant was asked to address four questions regarding a particular sense organ: (1) What is (are) the embryonic origin(s) of the sense organ? (2) What is (are) the tissue(s) inducing the sense organ? (3) What is the ontogenetic trajectory of the morphogenesis and cellular differentiation of the sense organ? and (4) What is the genetic basis of induction, morphogenesis, and cellular differentiation of the sense organ? The participants' answers to these questions ranged widely, due in large part to the differing amounts of information available on the

development of different sense organs. Even though they were not asked to do so, some participants also integrated available comparative information and attempted to address the goals of evolutionary developmental biology.

As the 2003 Special Invited Speaker for the Karger Workshop and Annual Meeting of the J.B. Johnston Club, Thurston Lacalli did an outstanding job of reviewing the development of the nervous system and sense organs in amphioxus and thus placing the origin and development of vertebrate sense organs in their proper evolutionary context. Kathleen Whitlock (olfactory organ), Russell Fernald (eye), Melissa Gibbs (lateral line receptors), and Bernd Fritzsch (inner ear; manuscript co-authored with K. Beisel) all provided richly detailed information on the development of their respective sense organs. Hopefully, readers will find their papers, as well as the contribution on taste buds by one of us (RGN), to be of great help in summarizing our current knowledge about the development of these organs and, in addition, will have their interest piqued to address some of the numerous issues on the development of sense organs that are still unresolved.

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R. Glenn Northcutt
Department of Neurosciences, 0201, University of California, San Diego
9500 Gilman Drive
La Jolla, CA 92093-0201 (USA)
Tel. +1 858 534 5612, Fax +1 858 534 5622, E-Mail rgnorthcutt@ucsd.edu