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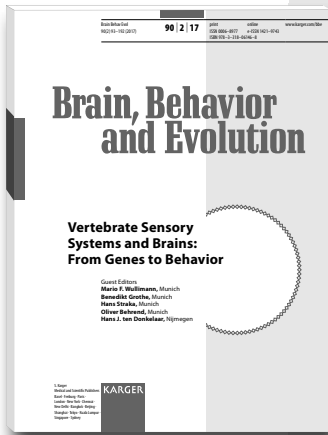
From Fossils to Function: Integrative and Taxonomically Inclusive Approaches to Vertebrate Evolutionary Neuroscience

29th Annual Karger Workshop in
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Guest Editor
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New insights into the variability of neural systems and their functional adaptations

Journal Publication



Vertebrate Sensory Systems and Brains: From Genes to Behavior

Editors

Mario F. Wullimann, Benedikt Grothe, Hans Straka, Oliver Behrend, Hans J. ten Donkelaar

Vertebrate Sensory Systems and Brains: From Genes to Behavior

Selective Papers of the 8th European Conference on Comparative Neurobiology, Munich, April 2016
Editors: Wullimann, M.F.; Grothe, B.; Straka, H.; Behrend, O. (Munich); ten Donkelaar, H.J. (Nijmegen)
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This publication highlights new insights into the evolution of neural systems in vertebrates. The elaboration of links among all levels of vertebrate neural phenomena is the continuing focus of the eighth triannual European conference of comparative neurobiologists (ECCN8), to which this volume is devoted. Topics range from principles of brain morphology and comparative molecular neuroembryology or neuroanatomy over the evolution of hair cell sensory systems, including hearing and lateral line system, to cognitive processes in the teleost fish telencephalon. A comparative approach involves looking at and interpreting facts coming from various developing and adult species in a phylogenetic perspective. The specific value of such a viewpoint is not only to communicate scientific detail but also to open any researcher's mind to the real variability of neural systems and their functional adaptations beyond their own special field. Therefore, this volume is addressed to brain researchers from all disciplines of neuroscience.

Contents

Preface

- Vertebrate Sensory Systems and Brains: From Genes to Behavior: **Wullimann, M.F.; Grothe, B.; Straka, H., Behrend, O.; ten Donkelaar, H.J.**

Original Papers

- Sensing External and Self-Motion with Hair Cells: A Comparison of the Lateral Line and Vestibular Systems from a Developmental and Evolutionary Perspective: **Chagnaud, B.P.; Engelmann, J.; Fritsch, B.; Glover, J.C.; Straka, H.**
- Principles of Current Vertebrate Neuromorphology: **Nieuwenhuys, R.**
- Evolution of Sound Source Localization Circuits in the Nonmammalian Vertebrate Brainstem: **Walton, P.L.; Christensen-Dalsgaard, J.; Carr, C.E.**
- Dynamics of Goldfish Subregional Hippocampal Pallium Activity throughout Spatial Memory Formation: **Ocaña, F.M.; Uceda, S.; Arias, J.L.; Salas, C.; Rodríguez, F.**
- Comments on the Updated Tetrapartite Pallium Model in the Mouse and Chick, Featuring a Homologous Claustro-Insular Complex: **Puelles, L.**

Highlights and Perspectives on Evolutionary Neuroscience

- Names Matter: Commentary on Luis Puelles' Article: **Wullimann, M.F.**

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Journal Information

Aims and Scope

Brain, Behavior and Evolution is a journal with a loyal following, high standards, and a unique profile as the main outlet for the continuing scientific discourse on nervous system evolution. The journal publishes comparative neurobiological studies that focus on nervous system structure, function, or development in vertebrates as well as invertebrates. Approaches range from the molecular over the anatomical and physiological to the behavioral. Despite this diversity, most papers published in *Brain, Behavior and Evolution* include an evolutionary angle, at least in the discussion, and focus on neural mechanisms or phenomena. Some purely behavioral research may be within the journal's scope, but the suitability of such manuscripts will be assessed on a case-by-case basis. The journal also publishes review articles that provide critical overviews of current topics in evolutionary neurobiology.

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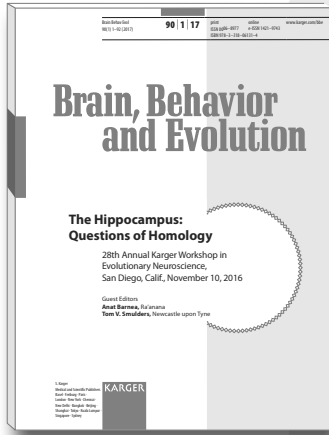
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Contents

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How the hippocampal formation has evolved in vertebrate lineages



The Hippocampus: Questions of Homology

28th Annual Karger Workshop in Evolutionary Neuroscience, San Diego, Calif., November 10, 2016

Editors
Anat Barnea
Tom V. Smulders

The Hippocampus: Questions of Homology

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The mammalian hippocampus is a conserved region and probably one of the best-studied brain areas. However, the homologous regions in other vertebrates differ in the anatomical organization, but are still able to perform similar functions. In this special topic issue, international experts in evolutionary neuroscience discuss the homology of the hippocampus among fishes, amphibians, reptiles, birds, and mammals. The articles cover the history of hippocampal research, developmental patterns of gene expression in mammals, birds and reptiles, and the internal connectivity in adult birds and mammals. Furthermore it explores the role of the hippocampus in spatial navigation and memory, as well as its role in social cognition and in regulating the stress response. In addition to evolutionary neuroscientists, this publication is of special interest to all those studying the mammalian hippocampus, as it puts their structure of interest in a wider evolutionary context. It will also be relevant to behavioral ecologists and other behavioral biologists interested in navigation and memory across a range of species.

Contents

Preface

- The Hippocampus: Questions of Homology: **Barnea, A.; Smulders, T.V.**

Original Papers

- Of Horse-Caterpillars and Homologies: Evolution of the Hippocampus and Its Name: **Butler, A.B.**
- Comparative Contemplations on the Hippocampus: **Witter, M.P.; Kleven, H.; Kobro Flatmoen, A.**
- Contribution of Genoarchitecture to Understanding Hippocampal Evolution and Development: **Medina, L.; Abellán, A.; Desfilis, E.**
- On the Value of Reptilian Brains to Map the Evolution of the Hippocampal Formation: **Reiter, S.; Liaw, H.-P.; Yamawaki, T.M.; Naumann, R.K.; Laurent, G.**
- Reflections on the Structural-Functional Evolution of the Hippocampus: What Is the Big Deal about a Dentate Gyrus?: **Bingman, V.P.; Muzio, R.N.**
- Functional Connectivity Pattern of the Internal Hippocampal Network in Awake Pigeons: A Resting-State fMRI Study: **Behroozi, M.; Ströckens, F.; Stacho, M.; Güntürkün, O.**
- Are There Place Cells in the Avian Hippocampus?: **Sherry, D.F.; Grella, S.L.; Guigueno, M.F.; White, D.J.; Marrone, D.F.**
- The Avian Hippocampal Formation and the Stress Response: **Smulders, T.V.**

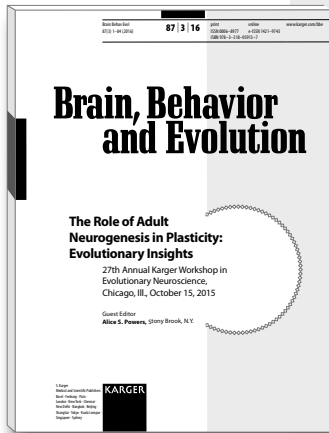
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The Role of Adult Neurogenesis in Plasticity: Evolutionary Insights

Editor
Alice S. Power

The Role of Adult Neurogenesis in Plasticity: Evolutionary Insights

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The effect of adult neurogenesis on plasticity has attracted significant interest in recent years. It has been found in most species that have been studied, including invertebrates, fish, amphibians, reptiles, birds, and mammals. Although a great deal is understood about its role in the brains of mice and rats, much less is known about other species. Given the widespread presence of adult neurogenesis, it is reasonable to assume that it has had a functional role, or multiple functional roles, in the course of brain evolution. The contributors to this publication are researchers who investigate the relationship between adult neurogenesis and environmental and hormonal effects in a wide range of species from crustacea to mammals. Emphasis is on such factors as stress coping, environmental complexity, learning, including song learning, and social interaction.

Contents

Preface

- Adult Neurogenesis: Lessons from Crayfish and the Elephant in the Room: **Beltz, B.S.; Brenneis G.; Benton, J.L.**
- Fish Neurogenesis in Context: Assessing Environmental Influences on Brain Plasticity with-in a Highly Labile Physiology and Morphology: **Dunlap, K.D.**
- On the Role of Neurogenesis and Neural Plasticity in the Evolution of Animal Personalities and Stress Coping Styles: **Overli, Ø.; Sørensen, C.**
- Plasticity and Adult Neurogenesis in Amphibians and Reptiles: More Questions than Answers: **Powers, A.S.**
- Factors that Modulate Neurogenesis: A Top-Down Approach: **LaDage, L.D.**
- Adult Neurogenesis in the Songbird: Region-Specific Contributions of New Neurons to Behavioral Plasticity and Stability: **Pytte, C.L.**
- Adult Neurogenesis in Mammals: Variations and Confusions: **Lipp, H.-P.; Bonfanti, L.**

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29th Annual Karger Workshop in Evolutionary Neuroscience,
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In this special issue of Brain, Behavior and Evolution following the 29th annual Karger Workshop in Evolutionary Neuroscience, international experts provide an extensive overview of the practices, pitfalls, and future aims of paleoneurology within the broader context of evolutionary neuroscience.

Articles cover studies that exemplify the application of digital technology in obtaining virtual endocasts, as well as introductions to statistical and neuroimaging techniques that offer practical solutions for reducing the limitations on endocast studies. Generally, the evaluation of existing standard methods and approaches in paleoneurology has been a major focus of the discussions which form the basis for this special issue.

The discussions and talks of the workshop resulted in a wide-angle view of current standards and future directions of paleoneurological studies and will hopefully foster new collaborative efforts among neuroscientists, paleoneurologists, and phylogenetic comparative methods workers. Such efforts may result in unlocking the full potential of endocast studies and offering a more comprehensive understanding of the evolution of the vertebrate brain.