

# **The Visual System Of Fish**

National Institutes of Health (U.S.).

Division of Research Grants

#### The Visual System Of Fish:

The Visual System of Fish Ron Douglas, Mustafa Djamgoz, 2012-12-06 A question often asked of those of us who work in the seemingly esoteric field of fish vision is why To some of us the answer seems obvious how many other visual scientists get to dive in a tropical lagoon in the name of science and then are able to eat their subjects for dinner However there are better or at least scientifically more acceptable reasons for working on the visual system of fish First in terms of numbers fish are by far the most important of all vertebrate classes probably accounting for over half c 22 000 species of all recognized vertebrate species Nelson 1984 Furthermore many of these are of commercial importance Secondly if one of the research aims is to understand the human visual system animals such as fish can tell us a great deal since in many ways their visual systems and specifically their eyes are similar to our own This is fortunate since there are several techniques such as intracellular retinal recording which are vital to our understanding of the visual process that cannot be performed routinely on primates The cold blooded fish on the other hand is an ideal subject for such studies and much of what we know about for example the fundamentals of information processing in the retina is based on work carried out on fish e g Svaetichin 1953

The Visual System of Fish ,1990-05-17 The Visual System of Fish Ron H. Douglas, Mustafa B. A. Djamgoz,1990

**The Visual System in Vertebrates** F. Crescitelli, 2013-12-11 The vertebrate eye has been and continues to be an object of interest and of inquiry for biologists physicists chemists psychologists and others Quite apart from its important role in the development of ophthalmology and related medical disciplines the vertebrate eye is an exemplar of the ingenuity of living systems in adapting to the diverse and changing environments in which vertebrates have evolved The wonder is not so much that the visual system like other body systems has been able to adapt in this way but rather that these adaptations have taken such a variety of forms In a previous volume in this series VII I Eakin expressed admiration for the diversity of invertebrate photoreceptors A comparable situation exists for the vertebrate eye as a whole and one object of this volume is to present to the reader the nature of this diversity One result of this diversification of ocular structures and properties is that the experimental biologist has available a number of systems for study that are unique or especially favorable for the investigation of particular questions in visual science or neurobiology This volume includes some examples of progress made by the use of such specially selected vertebrate systems It is our hope that this comparative approach will continue to reveal new and useful preparations for the examination of important questions <u>Development of the Visual System</u> Retina Research Foundation (U.S.). Symposium, 1991 Development of the Visual System presents a selection of current studies that clearly illustrate principles of visual system development. These range from retinal development in fish and frogs to the effects of abnormal visual experience on the primary visual cortex of the cat The book is unique in addressing four specific and fundamental aspects of development cell lineage and cell fate specificity and targeting of axons specification of visual cortex and correlates of the critical period Encompassing technical advances in cellular and molecular biology and in video

imaging and microscopy contributions in each of these areas provide new information at the cellular and molecular levels to complement the now classic descriptions of visual development previously available at the level of neural systems ContributorsKaren L Allendoerfer David M Altshuler Antonella Antonini Seymour Benzer Edward M Callaway Constance L Cepko Hollis T Cline Max S Cynader N W Daw Scott E Fraser K Fox Eckhard Friauf Anirvan Ghosh R W Guillery William A Harris Christine E Holt Lawrence C Katz Susan McConnell Pamela A Raymond Thomas A Reh Carla J Shatz Michael P Stryker Claudia A 0 Stuermer Mriganka Sur David L Turner T N Wiesel **Development of the Visual System S.P.** Bhat,2004-01-01 All the tissues of the eye including the lens the cornea the ciliary body the neuroretina and the retinal pigment epithelium must work in harmony for the realization of clear vision The phenotypic emergence of each of these tissues requires intercellular communication which is achieved through direct physical contact as well as through diffusion and reception of the molecular beacons This volume provides an overview of the molecular and cellular biology of eye development and encompasses themes like early gene expression in the surface ectoderm and the optic cup retinal neurogenesis signaling molecules and axonal guidance It presents new findings on the influence of the lens on the development of the visual system and how gene expression in the optic cup controls differentiation of the lens fiber cell while established ideas about the morphogenesis of the ciliary body are challenged A valuable source of information for developmental biologists and neurobiologists as well as ophthalmologists interested in understanding the relationship between temporally and spatially regulated gene activity and function and cellular interactions in early development and neuronal functions Research Awards Index ,1989 Biomedical Index to PHS-supported Research ,1990

What can simple brains teach us about how vision works Davide Zoccolan, David D. Cox, Andrea Benucci, R. Clay Reid, 2015-11-18 Vision is the process of extracting behaviorally relevant information from patterns of light that fall on retina as the eyes sample the outside world Traditionally nonhuman primates macaque monkeys in particular have been viewed by many as the animal model of choice for investigating the neuronal substrates of visual processing not only because their visual systems closely mirror our own but also because it is often assumed that simpler brains lack advanced visual processing machinery However this narrow view of visual neuroscience ignores the fact that vision is widely distributed throughout the animal kingdom enabling a wide repertoire of complex behaviors in species from insects to birds fish and mammals Recent years have seen a resurgence of interest in alternative animal models for vision research especially rodents This resurgence is partly due to the availability of increasingly powerful experimental approaches e g optogenetics and two photon imaging that are challenging to apply to their full potential in primates Meanwhile even more phylogenetically distant species such as birds fish and insects have long been workhorse animal models for gaining insight into the core computations underlying visual processing In many cases these animal models are valuable precisely because their visual systems are simpler than the primate visual system Simpler systems are often easier to understand and studying a diversity of neuronal

systems that achieve similar functions can focus attention on those computational principles that are universal and essential This Research Topic provides a survey of the state of the art in the use of animal models of visual functions that are alternative to macagues It includes original research methods articles reviews and opinions that exploit a variety of animal models including rodents birds fishes and insects as well as small New World monkey the marmoset to investigate visual function The experimental approaches covered by these studies range from psychophysics and electrophysiology to histology and genetics testifying to the richness and depth of visual neuroscience in non macague species **Research Grants Index** National Institutes of Health (U.S.). Division of Research Grants, 1973 The Amphibian Visual System Katherine V. The visual system of fishes .1979\* Fite, 1976 The Amphibian Visual System **The Visual System** Alan Fein, Joseph S. Levine, Edward Ford MacNichol, 1985 *Introduction to a Biological Systems Science* Edward H. Bloch, United States. National Aeronautics and Space Administration, 1971 The Central Nervous System and Fish Behavior David Ingle,1968 Enth Papers presented at a meeting in April 1967 at the University of Chicago Brain, Behavior and Evolution **Journal of Comparative Physiology** ,2006 Sensory Biology of Jawed Fishes B G Kapoor, T.J. .1995 Hara, 2001-01-03 The book reviews recent advances in tropical plant breeding Each of the twenty four chapters describes a specific crop which has been written by scientists working in the field of plant breeding and genetic improvement of that particular species The book will be a useful reference work for professional plant breeders as well as researchers teachers Netherlands Journal of Zoology ,1992 Archivio di oceanografia e and students interested in this topic limnologia, 2001

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