

Russell Dawson Fernald

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EDUCATION:

1959-1963 Swarthmore College (B.S. in Electrical Engineering, 6/63)
1963-1968 University of Pennsylvania (Ph.D. in Biophysics, 6/68)

APPOINTMENTS:

1968-1971 Post-doctoral associate, Max-Planck-Institut für Psychiatrie, Munich,
(Dr. O. Creutzfeldt)
1971-1973 Institute Scientist, Max-Planck-Institute for Behavioral Physiology,
(with Professor Konrad Z. Lorenz), Seewiesen, Germany
1973-1976 Staff Scientist, Max-Planck-Institute for Behavioral Physiology,
Seewiesen, Germany
1976-1990 Assistant (1976), Associate (1980), and Full Professor (1986),
Department of Biology, University of Oregon, Eugene, OR
1990-2004 Professor of Psychology and Human Biology, Stanford University,
Stanford CA
2004-present Professor of Biology and Human Biology, Stanford University, Stanford
CA

HONORS AND AWARDS:

1963-64 Ford Foundation Pre-doctoral Fellowship.
1964-68 NIH Pre-doctoral Fellowship.
1969-71 Max Planck Institut Post-doctoral Fellowship.
1978-83 NIH Research Career Development Award.
1985-86 NIH Fogarty Senior International Fellowship, (Medical Research
Council, London).
1994- Benjamin Scott Crocker Professor of Human Biology, Stanford
University.
1999-2006 Javits Neuroscience Investigator Award, National Institute of
Neurological Disorders and Stroke.
2003 Fellow-American Association for Advancement of Science
2004 Rank Prize in Vision/Opto-electronics, 2004
2003-2013 Mimi and Peter Haas Fellow in Undergraduate Education
2009 Futterman Memorial Lecture, University of Washington
2011 Forbes Lectures, Marine Biological Laboratory, Woods Hole
2011 Elected, American Academy of Arts and Sciences
2013 Marsden Lecture, McGill University, Montreal
2013 Matarazzo Lecture, Oregon Health Sciences Institute, Portland, OR

OTHER PROFESSIONAL EXPERIENCE:

1978-80 Director, PHS Systems and Integrative Biology Training Grant
1980-00 Editorial Board, *Neurobiology & Behavior Monographs*, Pitman
1984 Visiting Professor, Department of Anatomy, University of Colorado
Medical School, Denver, CO, 1984.
1984 NICHD, Panel Member
1985-87 NIGMS, Training grants, Panel Chairman and Site Visitor.
1955-94 Editor, *Neuroethology Newsletter*
1986-90 Director, Institute of Neuroscience, University of Oregon, Eugene, OR
1986-90 National Research Council, Panel member
1987-88 Hilgard Visiting Professor, Stanford University, Stanford CA.
1987-88 Visiting Professor, Neuroscience Program, University of California at
San Francisco.
1988-92 NIH, Study Section Member, Visual Sciences A-2
1987-90 Instructor, Neural Systems and Behavior Course, Marine Biological
Laboratory, Woods Hole, MA.
1987-94 Neuroethology Society, Council Member
1988-92 Society for Neuroscience, Chapters Committee: Member, Chairman,
1990-92
1990-92 Association for Research in Ophthalmology and Vision, Committee on
Animal Research: Member, 1989-92; Chairman, 1990-92;
1991-00 Executive Editor, *Experimental Eye Research*
1996-03 Director, Human Biology Program, Stanford University.
1997-01 Executive Committee, Society for Behavioral Neuroscience
1998-07 Editorial Board, *Brain Behavior and Evolution*
2000- Editorial Advisory Board, *Journal of Comparative Physiology*
2002-07 Advisory Board, Center Behavioral Neuroscience, Emory University
2006-10 Editorial Board, *Endocrinology*, 2006-
2006 Editorial Advisory Board, *Zoological Science*
2008- Advisory Board, Canadian Institute for Advanced Research
2011- Advisory Board, Max Planck Institute for Brain Research, Frankfurt
2012- Reviewing editor, e-Life

STANFORD UNIVERSITY TEACHING AWARDS

1996-99 Bing Prize for Excellence & Innovation in Undergraduate Teaching
1998 Cox Medal for Excellence in Fostering Undergraduate Research
2000 Dinkelspiel Prize for Outstanding Contributions to Undergraduate
Education
2000 Outstanding Advisor, Human Biology Program
2003-13 Bass University Fellow in Undergraduate Education

RECENT INVITED PRESENTATIONS

2014-2015

- Presidential Symposium, Animal Behavior Society, Princeton University (8/13/14)
- Bielefeld Interdisciplinary Symposium: New perspectives in Behavioural Development (9/28/14)

- Keynote speaker: Life in the Aggregate: Mechanisms of Social Dynamics, Janelia Farms, HHMI (10/12/14)
- Neural circuits controlling sexual behavior, Janelia Farms, HHMI (11/12/14)

2013-2014

- Frontiers in Biomedical Sciences, Colorado State University (9/26/13)
- Matarazzo Lecture, Oregon Health University, Portland (10/29/2013)
- Scripps Institute, San Diego (11/5/13)
- Khodadadad Symposium on Aggression, Harvard University (12/17/13)
- Robert Wood Johnson Foundation, UCSF, (4/3/14)
- Cognition: 79th Cold Spring Harbor Symposium on Quantitative Biology (5/28/14-6/2/14)

2012-2013

- Stanford Institute for Translational Neuroscience (10/22/12)
- Symposium on Sex Differences (6/3/13)
- Marsden Lecture, Mc Gill University (3/21/13)
- Bohemian Grove Lecture (7/18/13)

2011-2012

- Department of Biology, New York University (10/17/11)
- Department of Neurobiology, Columbia University Medical School (10/19/11)
- Keynote Speaker, University of Massachusetts, Amherst 10/23/11;
- Arthur Sackler Colloquium, "Towards a new biology of social adversity," National Academy of Sciences;
- University of Illinois, 2/7/12;
- University of North Carolina, 2/9/12;
- E.A. Arbus Memorial Lecture, University of Arizona, Tucson, AZ 4/13/12
- Neuroscience Program, University of Pennsylvania, 3/27/12;
- Broad Institute, MIT/Harvard, 5/24/12;

2010-2011

- Speaker, Genes, Cognition, and Social Behavior: Next Steps for Foundations and Researchers, NSF Workshop (6/28/10)
- Speaker, Neuroscience Seminar, UCSF, (10/10/2010)
- Speaker, Evolution of Cognition Conference, U. Michigan, (10/29/2010)
- Speaker, Neurobiology of Aggression and the Social Brain, Ellison Foundation, Half-Moon Bay, CA (11/1,2)
- Frontiers in Neuroscience, Emory University, Atlanta GA (2/4/11)
- Carnegie Institute for Embryology, Baltimore, MD (2/7/2011)
- Genetics of Behavior, Center for Integrative Genomics, Lausanne, Switzerland (6/20/11-6/21/11)
- Forbes Lectures, Wood Hole Marine Biology Laboratory (7/15-16/11)

2009-2010

- Janelia Farm, Invited speaker (10/12/09)
- Keynote speaker, Zebrafish conference, San Diego (3/3/10);
- Gordon Research Conference: Genes and Behavior, Ventura CA (3/14-18/10);
- Zoology Department, San Francisco State, (4/8/10);
- UCLA, Neuroscience seminar (4/26/10);
- Symposium speaker, Keystone Symposium on Epigenetics, (4/26-30/10, Singapore);
- Cichlid genetics presentation, Broad Institute, Boston, (5/10/10);
- International Fish Behavior Meeting, (Barcelona 7/9/10- Declined);

2008-2009

- Biology of Cognition, Cell Conference, Chantilly, France (10/18/08);
- Darwin Symposium, Stanford University [in Itunes] (11/17/08);
- UCSF Ophthalmology Grand Rounds (1/8/09);
- Georgia State University Neuroscience seminar (1/13/09);
- MIT Darwin Centennial speaker (1/22/09);
- Neuroscience colloquium speaker University of Washington (2/23/09);
- UCSF Robert Wood Johnson Program (2/26/09);
- Environmental Brain and Behavior Program, Vancouver, CN (3/1/09);
- Max Planck Symposium, Berlin “Evolutionary Biology” (3/9/09);
- Harvard University Medical School Invited by graduate students (5/21/09);
- Futterman Memorial Lecture, University of Washington (5/28/09)
- CNP Social Modulation meeting, Lisbon, Portugal (6/5/09- Declined)

2007-2008

- Keynote speaker for the Harvard Department of Neurobiology Retreat, 9/28-9/07;
- Symposium speaker: “Advances in Neurobiology” presented at the annual meeting of the Society for Integrative and Comparative Biology, January 2–6, 2008, at San Antonio, Texas.
- Johns Hopkins University, Baltimore (2/7/08);
- Featured speaker: Gordon Conference on Genes and Behavior, Barga, Italy 2/23-27/08
- Speaker, Broad Institute, Cambridge Mass (3/10/08);
- Neuroscience colloquium speaker Harvard College (3/12/08);

I was invited to speak at the following events, which I declined:

- Forbes Lecture, Woods Hole, 7/2007
- Neurosensory ecology, *J. Exp Biology*, Tuscany, 9/12/07;
- Evolution of Brain, Behaviour and Intelligence, Wellcome Trust & Science Magazine September 12-14, 2007 Cambridge, England;
- Keynote speaker for Symposium of 20 years of Discovery, Oregon Primate Center, 9/15/07;
- Keynote speaker at the Argentine Society for Neuroscience Nov 11-13, 2007;
- NSF conference on Biology and Politics, March 6-8, 2008

2006-2007

- NIH workshop on: "The use of model organisms to study the genetic underpinnings of social behaviors" (Bethesda, 1/4-1/6/07);
- Neuroscience colloquium speaker University of California, Davis (2/10/07);
- Emory University, Center for Behavioral Neuroscience (5/18/07);
- Keynote speaker at the University of Texas (Austin) Neuroscience Retreat (3/3/07);
- Plenary speaker, Endocrinology Meeting, (Toronto, 6/4/07);

2005-2006

- Neuroscience Seminar, Princeton University (12/15/05)
- Neuroscience Seminar, University of Pennsylvania (11/10/05)
- Neuroscience Seminar, UC Davis (1/22/06)
- Neuroscience Seminar, UC Berkeley (12/15/05)
- Symposium speaker: Visual Function: Insights from the revolution in biology, Tel Aviv, Israel (6/15-17/05)

2004-2005

- Lang Lecture at Woods Hole, Marine Biological Station (8/7/04)
- Invited symposium speaker: Society for Behavioral Neuroscience (7/24-29/04)
- Invited speaker Stazione Zoologica Anton Dohrn, Naples, Italy (2/24-27/05)

2003-2004

- Invited symposium speaker, Society for Neuroscience on the Evolution of Eyes (11/6-11/11/03)
- Invited speaker: "The Biology of Cichlid Fishes: Toward a Cichlid Genome Consortium," (1/31-2/4/04)
- Invited speaker, Gordon Research Conference on Genes and Behavior (2/10/04)
- Invited speaker: West Coast Nerve Net (6/20/04)

2002-2003

- Invited plenary speaker: Japanese national Neuroscience Meeting (7/5/02)
- Invited plenary speaker: International Society for Neuroendocrinology, (9/1/02)
- Symposium Speaker: Society for Comparative and Integrative Biology, Toronto, CN (1/5/03)
- Invited speaker: Oregon Health Sciences University, Portland, Oregon (5/15/03)
- Invited speaker: Oregon National Primate Research Center (5/16/03)
- Invited speaker: Society for Study of Reproduction, Cincinnati, OH (7/20/03)
- Invited symposium speaker: Neuronal Assemblies and Dynamical System Conference, University of Pennsylvania, PA (8/22-24/03)

Russell D. Fernald - Publications:

- Fernald, R. D. (1967) Techniques de Recherche Sous Marine. *Archeologia*. **17**:34-35.
- Fernald, R. D. (1969) Cat cochlear nucleus neurons: A distributed model and some experimental observations. University Microfilms 69-15,055. 285.
- Bass, G. F. and R. D. Fernald (1971) Underwater archeological explorations in Turkey. In: *National Geographic Society Research Reports*. 15-22.
- Fernald, R. D. and R. Chase (1970) An improved method for plotting retinal landmarks and focusing the eyes. *Vision Research*. **11**:95-96.
- Fernald, R. D. and R. Chase (1971) Simultaneous recordings from multiple single units in cat visual cortex. *Brain Research*. **24**:557.
- Fernald, R. D. (1971) A neuron model with spatially distributed synaptic input. *Biophysical Journal*. **11**:323-340.
- Fernald, R. D. and G. L. Gerstein (1972) Response to cat cochlear nucleus neurons to frequency and amplitude modulated tones. *Brain Research*. **45**:417-435.
- Fernald, R. D. and G. L. Gerstein (1972) A model of cochlear nucleus neurons responding to complex stimuli. In: *Physiology of the Auditory System*. Ed: M. B. Sachs. National Education Consultants. Baltimore. 189-196.
- Fernald, R. D. (1973) A group of Barbets: Quantitative measures. *Zeitschrift für Tierpsychologie*. **33**:341-351.
- Fernald, R. D. and P. Heinecke (1974) A computer compatible multipurpose event recorder. *Behaviour*. **48**:268-275.
- Fernald, R. D. (1975) Fast body turns in a cichlid fish. *Nature*. **258**:228-229.
- Fernald, R. D. and N. R. Hirata (1975) Non-intentional sound production in a cichlid fish (*Haplochromis burtoni*, Gunther). *Experientia*. **31**:299-300.
- Fernald, R. D. (1976) The effect of testosterone on the behavior and coloration of adult male cichlid fish (*Haplochromis burtoni*). *Hormone Research*. **7**:172-178. a
- Fernald, R. D. (1977) Quantitative behavioural observations of *Haplochromis burtoni* under semi-natural conditions. *Animal Behaviour*. **25**:643-653.
- Fernald, R. D. and N. R. Hirata (1977) Field study of *Haplochromis burtoni* : Habitats and co-habitants. *Environmental Biology of Fishes*. **2**:299-308.

- Fernald, R. D. and N. R. Hirata (1977) Field study of *Haplochromis burtoni* : Quantitative behavioral observations. *Animal Behaviour*. **25**:964-975.
- Fernald, R. D. (1978) A comparison of four variations of Mancala found in central Africa. *Anthropos*. **73**:205-214.
- Fernald, R. D. and N. R. Hirata (1979) The ontogeny of social behavior and body coloration in the African cichlid fish, *Haplochromis burtoni*. *Zeitschrift für Tierpsychologie*. **50**:180-187.
- Rechten, C. and R. D. Fernald (1979) A sampled randomization test for examining single cells of behavioural transition matrices. *Behaviour*. **64**:217-227.
- Fernald, R. D. and P. Liebman (1980) Visual receptor pigments in the African cichlid fish, *Haplochromis burtoni*. *Vision Research*. **20**:857-864.
- Fernald, R. D. (1980) Optic nerve distention in a cichlid fish. *Vision Research*. **20**:1015-1019.
- Fernald, R. D. (1980) Response of male cichlid fish, *Haplochromis burtoni*, reared in isolation to models of conspecifics. *Zeitschrift für Tierpsychologie*. **54**:85-93.
- Fernald, R. D. (1981) Chromatic organization of a cichlid fish retina. *Vision Research*. **21**:1749-1753.
- Johns, P. R. and R. D. Fernald (1981) Genesis of rods in teleost fish retina. *Nature*. **293**:141-142.
- Fernald, R. D. (1982) Retinal projections in the African cichlid fish, *Haplochromis burtoni*. *Journal of Comparative Neurology*. **206**:379-389.
- Fraley, N. B. and R. D. Fernald (1982) Social control of developmental rate in the African cichlid fish, *Haplochromis burtoni*. *Zeitschrift für Tierpsychologie*. **60**:66-82.
- Fernald, R. D. (1982) Cone mosaic in a teleost retina: No difference between light and dark adapted states. *Experientia*. **38**:1337-1338.
- Fernald, R. D. and S. Wright (1983) Maintenance of optical quality during crystalline lens growth. *Nature*. **301**:618-620.
- Fernald, R. D. (1983) Neural basis of visual pattern recognition. In: *Advances in Vertebrate Neuroethology*. Eds. Ewert, J. P., R. R. Capranica, and D. J. Ingle. Plenum, New York. 569-580.

- Fernald, R. D. (1984) Vision and behavior in an African cichlid fish. *American Scientist*. **72**(1):58-65.
- Fernald, R. D. (1984) Neuroethology according to Hoyle. *Behavioral and Brain Sciences*. **7**(3):387-388.
- Fernald, R. D. (1985) Growth of the teleost eye: Novel solutions to complex constraints. *Environmental Biology of Fishes*. **13**(2):113-123.
- Fernald, R. D. (1985) Eye movements in the African cichlid fish, *Haplochromis burtoni*. *Journal of Comparative Physiology*. **156**:199-208.
- Fernald, R. D. and S. Wright (1985) Growth of the visual system of the African cichlid fish, *Haplochromis burtoni* : Optics. *Vision Research*. **25**(2):155-161.
- Fernald, R. D. and S. Wright (1985) Growth of the visual system of the African cichlid fish, *Haplochromis burtoni* : Accommodation. *Vision Research*. **25**(2):163-170.
- Presson, J., R. D. Fernald and M. Max (1985) Organization of retinal projections to the diencephalon and pretectum in the cichlid fish, *Haplochromis burtoni*. *Journal of Comparative Neurology*. **235**:360-374.
- Fernald, R. D. and L. Shelton (1985) The organization of the diencephalon and pretectum in the cichlid fish, *Haplochromis burtoni*. *Journal of Comparative Neurology*. **238**:202-217.
- Allen, E. A. and R. D. Fernald (1985) Spectral sensitivity of the African cichlid fish, *Haplochromis burtoni*. *Journal of Comparative Physiology*. **157**:247-253.
- Presson, J. and R. D. Fernald (1986) Development of the optic tract in the cichlid fish, *Haplochromis burtoni*. *Developmental Brain Research*. **26**:174-186.
- Muske, L. and R. D. Fernald (1987) Control of a teleost social signal: Neural basis for differential expression of a color pattern. *Journal of Comparative Physiology*. **160**:89-97.
- Muske, L. and R. D. Fernald (1987) Control of a teleost social signal: Anatomical and physiological specializations of chromatophores. *Journal of Comparative Physiology*. **160**:99-107.
- Fernald, R. D., R. McDonald, and J. Korenbrot (1987) Light-dark cycle of opsin mRNA production in toads and fish. *Investigative Ophthalmology and Visual Science Suppl.* **28**(3):184.
- Fernald, R.D. (1987) More than meets the eye. *Behavioral and Brain Sciences*. **10**(3):378-9.

- Fernald, R. D. (1988) Aquatic adaptations in fish eyes. In: *Sensory Biology of Aquatic Animals*. Eds: Atema, J., R. R. Fay, A. N. Popper and W. N. Tavolga. Springer-Verlag, New York. 435-466.
- Fernald, R. D. (1989) Retinal Rod Neurogenesis. In: *Development of the Vertebrate Retina*. Eds: Finlay, B. L. and D. R. Sengelaub. Plenum, New York. 31-42.
- Fernald, R. D. (1989) Fish Vision. In: *Development of the Vertebrate Retina*. Eds: B. L. Finlay and D.R. Sengelaub. Plenum, New York. 247-266.
- Korenbrot, J. I. and Fernald, R.D. (1989) Circadian rhythm and light regulate opsin mRNA in rod photoreceptors. *Nature*. **337**:454-457.
- Fernald, R. D. (1989) Seeing Through a Growing Eye. In: *Perspectives in Neural Systems and Behavior*. Eds: T. J. Carew and D. B. Kelley. Liss, New York. 151-174.
- Fernald, R. D. (1990) The Optical System of Fishes. In: *The Visual System of Fish*. Eds: R. H. Douglas and M. B. Djamgoz. Croon Helm Ltd. 45-62.
- Fernald, R. D. (1990) *Haplochromis burtoni* : A case study. In: *The Visual System of Fish* Eds: R. H. Douglas and M. B. Djamgoz. Croon Helm Ltd. 443-464.
- Evans, B. I. and R. D. Fernald (1990) Metamorphosis and fish vision. *Journal of Neurobiology*. **21**(7):1037-1052.
- Davis, M. R. and R. D. Fernald (1990) Social control of neuronal soma size. *Journal of Neurobiology*. **21**(8):1180-1188.
- Mack, A. and R. D. Fernald (1991) Thin slices of teleost retina continue to grow in culture. *Journal of Neuroscience Methods*. **36**:195-202.
- Fernald, R. D. (1991) Teleost vision: Seeing while growing. *Journal of Experimental Zoology*. **5**:167-180.
- Fernald, R. D. (1991) Principles of Sensory Regeneration. In: *Regeneration of Vertebrate Sensory Receptor Cells*. Eds: Bock, G.R., J. Marsh, and J. Whelan. Ciba Foundation Symposia. 160. Wiley. 318-329.
- Bond, C. T., R. D. Fernald, R. C. Francis, and J. P. Adelman (1991) Cloning and characterization of cDNA encoding teleost preproGnRH. In: *Serono Symposia, GnRH, Modes of Action and Analogs*. Scottsdale, Arizona.
- Bond, C. T., R. C. Francis, R. D. Fernald, and J. P. Adelman (1991) Characterization of complementary DNA encoding the precursor for gonadotropin-releasing hormone

- and its associated peptide from a teleost fish. *Journal of Molecular Endocrinology*. **5**(7):931-937.
- Mack, A. and R. D. Fernald (1992) Control of vertebrate retinal cell production. *Experimental Neurology*. **115**:65-68.
- Land, M. F. and R. D. Fernald (1992) The evolution of eyes. *Annual Review of Neuroscience*. **15**:1-29.
- Francis, R. C., B. Jacobson, J. C. Wingfield, and R. D. Fernald (1992) Castration lowers aggression but not social dominance in male *Haplochromis burtoni*. *Ethology*. **90**:247-255.
- Hagedorn, M. and R. D. Fernald (1992) Retinal growth and cell addition during embryogenesis in the teleost, *Haplochromis burtoni*. *Journal of Comparative Neurology*. **321**:193-208.
- Francis, R. C., B. Jacobson, J. C. Wingfield, and R. D. Fernald (1992) Hypertrophy of gonadotropin releasing hormone-containing neurons after castration in male *Haplochromis burtoni*. *Journal of Neurobiology*. **23**:1084-1093.
- White, S. A. and R. D. Fernald (1993) Gonadotropin-releasing hormone-containing neurons change size with reproductive state in female *Haplochromis burtoni*. *Journal of Neuroscience*. **13**:434-441.
- Fernald, R. D. (1993) Vision. pp.161-189 In: *The Physiology of Fishes*. Ed. D. H. Evans. CRC Press, Boca Raton.
- Evans, B. I. and R. D. Fernald (1993) Retinal transformation at metamorphosis in the winter flounder (*Pseudopleuronectes americanus*). *Visual Neuroscience*. **10**:1055-1064.
- Evans, B. I., F. I. Harosi, and R. D. Fernald (1993) Photoreceptor spectral absorbance in larval and adult winter flounder (*Pseudopleuronectes americanus*). *Visual Neuroscience*. **10**:1065-1071.
- Francis, R. C., K. Soma, and R. D. Fernald (1993) Social regulation of the brain-pituitary-gonadal axis. *Proceedings of the National Academy of Science*. **90**:7794-7798.
- Mack, A. and R. D. Fernald (1993) Regulation of cell division and rod differentiation in the teleost retina. *Developmental Brain Research*. **76**:183-187.
- Francis, R.D., H. Lee, and R. D. Fernald (1994) Ontogeny of GnRH containing cells in the brain of a teleost fish. *Developmental Brain Research*. **78**:151-160.

- White, S.A., C. T. Bond, R. C. Francis, T. L. Kasten, R. D. Fernald, and J. P. Adelman (1994) A second gene for GnRH: cDNA and pattern of expression. *Proceedings of the National Academy of Sciences*. **91**:1423-1427.
- Kröger, R. H. H. and R. D. Fernald (1994) Regulation of eye growth in the African cichlid fish, *Haplochromis burtoni*. *Vision Research*. **34**:1807-1814.
- Kröger, R. H. H., M. C. W. Campbell, R. Munger and R. D. Fernald (1994) Refractive index distribution and spherical aberration in the crystalline lens of the African cichlid fish, *Haplochromis burtoni*. *Vision Research*. **34**:1815-1822.
- Fernald, R. D. (1994) Social and Environmental Influences on the Brain: Males and females are different. In: *Flexibility and Constraint in Behavioral Systems*. Eds: R.J. Greenspan and C.P. Kyriacou. Dahlem Conference. Wiley, New York. 99-107.
- Mack, A. F., S. L. Balt and R. D. Fernald (1995) Localization and expression of insulin-like growth factor in the teleost retina. *Visual Neuroscience*. **12**:457-461.
- Chiu, J. F., A. F. Mack. and R. D. Fernald (1995) Daily rhythm of cell proliferation in the teleost retina. *Brain Research*. **673**:119-125.
- Fernald, R. D. (1995) Social Control of Cell Size: Males and females are different. In: *Gene Expression in the Central Nervous System, Progress in Brain Research*. Eds: A.C.H. Yu, L.F. Eng, K.J. McMahan, H.Schulman, E.M. Shooter and A. Stadlin **105**:171-177.
- Powell, J.F.F, W. H. Fischer, M. Park, A. G. Craig, J. E. Rivier, S. A. White, R. C. Francis, R. D. Fernald, P. Licht, C. Warby, and N. M. Sherwood. (1995) Primary structure of solitary form of gonadotropin-releasing hormone (GnRH) in cichlid pituitary; three forms of GnRH in brain of cichlid and pumpkinseed fish. *Regulatory Peptides*. **57(1)**:43-53.
- Mack, A.F. and R. D. Fernald (1995) New rods move before differentiating in adult teleost retina. *Developmental Biology*, **170**:136-141.
- White, S.A., T.L. Kasten, C.T. Bond, J.P. Adelman, and R.D. Fernald (1995) Three gonadotropin-releasing hormone genes in one organism suggest novel roles for an ancient peptide. *Proceedings of the National Academy of Sciences*. **92**:8363-8367.
- Bushnik, T.L. and R. D. Fernald (1995) The population of GnRH-containing neurons which show socially mediated size changes project to the pituitary in the teleost, *Haplochromis burtoni*. *Brain, Behavior and Evolution*, **46**:371-377.

- Colbert, S, A.F. Mack, and R. D. Fernald (1995) A novel, rapid flat-mounting technique for visualizing antibody labeling in the retina. *Journal of Neuroscience Methods*, **62**:179-183.
- Fernald, R.D. (1996) Recognition of visual signals: Eyes specialize. In: *Neuroethological Studies of Cognitive and Perceptual Processes*, Eds. C.F. Moss and S.J. Shettleworth, Westview Press, Boulder, pp. 229-249.
- Kwan, J. W., M. J. Lee, A. F. Mack, J. F. Chiu, and R. D. Fernald (1996) Nonuniform distribution of cell proliferation in the adult teleost retina. *Brain Research*, **712**:40-44.
- Soma, K.K, R. C. Francis, J. C. Wingfield and R. D. Fernald (1996) Androgen regulation of hypothalamic neurons containing gonadotropin-releasing hormone in a cichlid fish: Integration with social cues. *Hormones and Behavior*, **30**(3):216-226.
- Kasten, T.L., S.A. White, T.T. Norton, C.T. Bond, J.P. Adelman, and R.D. Fernald (1996) Characterization of two new preproGnRH mRNAs in the tree shrew: First direct evidence for mesencephalic GnRH gene expression in a placental mammal. *General and Comparative Endocrinology*, **104**(1):7-19.
- Winberg, S., Y. Winberg, and R.D. Fernald (1997) Effect of social rank on brain monoaminergic activity in a cichlid fish. *Brain, Behavior and Evolution*, **49**(4):230-236
- Hoke, K.L. and R.D. Fernald (1997) Rod photoreceptor neurogenesis. *Progress in Retinal and Eye Research*, **16**:31-49.
- White, S. A. and R. D. Fernald (1997) Changing through doing: Behavioral influences on the brain. *Progress in Hormone Research*, **52**:455-474.
- Mack, A. F., and R. D. Fernald (1997) Cell Movement and Cell Cycle Dynamics in the Adult Teleost Retina. *J. Comp. Neurol.* **338**:435-443.
- Fox, H.E., S. A. White, M.H.F. Kao, and R.D. Fernald (1997) Stress and dominance in a social fish. *Journal of Neuroscience*, **17**:6463-6469.
- Fernald, R.D. (1997) The Evolution of Eyes. *Brain, Behavior and Evolution* **50**:253-259.
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