CURRICULUM VITAE

RALPH J. GREENSPAN

Education:	B.A., Biology	1974	Brandeis University
	Ph.D., Biology	1979	Brandeis University
	Postdoctoral training	1979-1982	University of California, San Francisco

ACADEMIC AND RESEARCH APPOINTMENTS

Associate Director, Kavli Institute for Brain and Mind, San Diego, CA, 2004 – present.
Dorothy and Lewis B. Cullman Fellow in Experimental Neurobiology, The Neurosciences Institute, San Diego, 2002 - 2010.
Senior Fellow in Experimental Neurobiology, The Neurosciences Institute, San Diego, 1997 - 2002.
Professor of Biology and Neural Science, and Head of the W.M. Keck Laboratory of Molecular Neurobiology, New York University, 1992 - 1997.
Associate Member, Department of Neurosciences, Roche Institute of Molecular Biology, 1987 - 1992
Assistant Professor of Biology, Princeton University, 1982 -1987.
Post-doctoral Fellow, Division of Neurobiology, UC San Francisco,1979-1982

Secondary appointments:
Adjunct Professor of Systems Neuroscience, College of Life Sciences, National Tsing Hua University, Hsinchu, Taiwan, 2011 – present.
Associate Investigator, Centro Interdiscilpinario de Neurociencia de Valparaíso, Facultad de Ciencias, Universidad de Valparaíso, Valparaíso, Chile, 2011 – present.
International Faculty, CAS-MPG Partner Institute for Computational Biology, Shanghai, China, 2007 – present.
Adjunct Professor of Neurobiology, Scripps Research Institute, La Jolla, CA, 1998 - present.
Advisory Committee for Distance Learning in Science, The New School, 1993 - 1997.
Instructor, The New School for Social Research, New York, NY, 1992 - 1997.
Adjunct Associate Professor, Dept. of Microbiology and Molecular Genetics, University of Medicine and Dentistry of New Jersey at Newark, 1990 - 1992.
Adjunct Professor of Biological Sciences, Columbia University, 1988 - 1992.
Organizer and instructor, Course on Neurobiology of Drosophila, Cold Spring Harbor Laboratory, 1984-1985.

HONORS AND AWARDS

Gavin Borden Lecture, Cold Spring Harbor Laboratory, 2009.
M.R. Bauer Distinguished Lecturer, Brandeis University, 2008.
Marian E. Koshland Memorial Lecture, UC Berkeley, 2006.
Carl Gustaf Bernhard Lecture, Royal Swedish Academy of Sciences, Stockholm, 2002.
International Human Frontier Science Program, P.I., 1994 - 1997.
Klingenstein Fellowships in Neuroscience, 1985-1987 and 1994 - 1996.
Alfred P. Sloan Research Fellow, 1982-1986
Searle Scholar, 1982-1985
McKnight Scholar in Neuroscience, 1982-1985
Fellow of the Helen Hay Whitney Foundation, 1979-1982

PROFESSIONAL ACTIVITIES

Associate Editor, *Current Biology*, 2004 - present.
Faculty of 1000, Behavioural Neuroscience Section, Neuroscience Faculty, 2002 - 2009.
Advisory Panel, *Nature Reviews Genetics*, 2002 - 2009.
Advisory Panel, The Biopsychology of Violent and Conciliatory Leadership, 2000 - 2001.
Associate Editor, *Journal of Neurogenetics*, 1988 - 2008.
Reviewer, Alzheimer's Association, 1999 – 2003.
Reviewer, The Susan G. Komen Breast Cancer Foundation, 1997 – 2004.
Chair, Session on Behavior, Cold Spring Harbor Meeting on "Neurobiology of Drosophila," 1997.
Organizer, international symposium on "Memory and Brain," NYU, 1995.
Organizer, Dahlem Workshop on "Flexibility and Constraint in Behavioral Systems," Berlin, 1993.
Organizer, international symposium on "Development of Function in the Nervous System," NYU, 1993.
Organizer, Cold Spring Harbor meeting on Molecular Neurobiology of Drosophila, 1991.
Organizer, 3rd Meeting in Neural Development, Columbia University, 1991.
Consultant, Hereditary Disease Foundation, Santa Monica, CA, 1986-1987.
Founding Instructor, Cold Spring Harbor Neurobiology of Drosophila summer course, 1984 – 1985.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Genetics Society of America
International Society for Neuroethology
Society for Integrative and Comparative Biology
Society for Neuroscience

RESEARCH INTERESTS

Current

Regulation and evolution of gene and neural networks for behavior and cognition in *Drosophila* and other invertebrates.

Past

Genetic studies of learning and memory in Drosophila.
Genetics of early neural development in Drosophila and the mouse.
Molecular genetics of glutamic acid decarboxylase in the mouse.
Genetics and cell biology of neurite outgrowth in the mouse.
Genetic manipulation of neurotransmitter function in Drosophila.

PATENTS

U. S. Patent (# 6551575), April 23, 2003: Methods for identifying compounds for motion sickness, vertigo and other disorders related to balance and the perception of gravity.

U. S. Patent (# 6730287 B1), May 4, 2004: Methods for identifying compounds that modulate vigilance states.

PUBLICATIONS

Refereed journals --

Kent, C., Daskulchuk, T., Cook, L., Sokolowski, M.B., and Greenspan, R.J. (2009) The *foraging* gene in *D. melanogaster* mediates metabolic as well as behavioral plasticity. PLoS Genetics **5:** e10010609.

Bohland JW, Wu C, Barbas H, Bokil H, Bota M, Breiter HC, Cline HT, Doyle JC, Freed PJ, Greenspan RJ, Haber SN, Hawrylycz M, Herrera DG, Hilgetag CC, Huang ZJ, Jones A, Jones EG, Karten HJ, Kleinfeld D, Kötter R, Lester HA, Lin JM, Mensh BD, Mikula S, Panksepp J, Price JL, Safdieh J, Saper CB, Schiff ND, Schmahmann JD, Stillman BW, Svoboda K, Swanson LW, Toga AW, Van Essen DC, Watson JD, Mitra PP. (2009) A proposal for a coordinated effort for the determination of brainwide neuroanatomical connectivity in model organisms at a mesoscopic scale. PLoS Comput Biol. 5: e1000334.

Andretic, R., Kim, Y.-C., Jones, F.S., Han, K.A. and Greenspan, R.J. (2008) *Drosophila* D1 dopamine receptor mediates caffeine-induced arousal. Proc. Natl. Acad. Sc. USA **105:** 20392-20397.

Weber, K.E., Greenspan, R.J., Chicoine, D.R., Fiorentino, K, Thomas, M.H. and Knight, T.L. (2007) Microarray analysis of replicate populations of *Drosophila melanogaster* selected against a wing shape correlation. Genetics **178:** 1093-1108.

Foltenyi, K., Greenspan, R.J., and Newport, J.W. (2007) Activation of Egf-r and ERK by Rhomboid signaling regulates the consolidation and maintenance of sleep in *Drosophila.* Nature Neuroscience **10:** 1160 – 1167.

Dierick, H.A. and Greenspan, R.J. (2007) Serotonin and neuropeptide F have opposite modulatory effects on fly aggression. Nature Genetics **39**: 678-682.

Dierick, H.A. and Greenspan, R.J. (2006) Molecular analysis of flies selected for aggressive behavior. Nature Genetics **38:** 1023-1031.

Andretic, R., van Swinderen, B. and Greenspan, R.J. (2005) Dopaminergic modulation of arousal in *Drosophila*. Current Biology **15:** 1165-1175.

van Swinderen, B. and Greenspan, R.J. (2005) Flexibility in a gene network affecting a simple behavior in *Drosophila melanogaster*. Genetics **169**: 2151-2163.

Broughton, S.J., Kitamoto, T. and Greenspan, R.J. (2004) Excitatory and inhibitory switches for courtship in the brain of *Drosophila melanogaster*. Current Biology **14:** 538-547.

van Swinderen, B., Nitz, D.A. and Greenspan, R.J. (2004) Uncoupling of brain activity from movement defines arousal states in *Drosophila*. Current Biology **14:** 81-87.

Broughton, S.J., Tully, T. and Greenspan, R.J. (2003) Deficits of CAM-Kinase Transgenic *Drosophila melanogaster* in a New Excitatory Courtship Conditioning Assay. J. Neurogenet. **17:** 91-102.

van Swinderen, B. and Greenspan, R.J. (2003) Salience Modulates 20-30 Hz Brain Activity in *Drosophila*. Nature Neuroscience **6:** 579-586.

Nitz, D.A., van Swinderen, B., Tononi, G. and Greenspan, R.J. (2002) Electrophysiological correlates of rest and activity in *Drosophila melanogaster*. Current Biology **12:** 1934-1940.

Toma, D.P., White, K.P., Hirsch, J. and Greenspan, R.J. (2002) Identification of genes involved in *Drosophila melanogaster* geotaxis, a complex behavioral trait. Nature Genetics **31:** 349-353.

Shaw, P.J., Tononi, Greenspan, R.J. and Robinson, D.F. (2002) Stress response genes protect against the lethal effects of sleep deprivation in *Drosophila melanogaster*. Nature 417: 287-291.

Shaw, P.J., Cirelli, C., Greenspan, R.J. and Tononi, G. (2000) Correlates of sleep and waking in *Drosophila melanogaster*. Science **287:** 1834-1837.

Orgad, S., Rosenfeld, G., Greenspan, R.J. and Segal D. (2000) *courtless,* the *Drosophila* UBC7 homolog, is involved in male courtship behavior and spermatogenesis. Genetics **155:**1267-1280.

Ferveur, J.-F. and Greenspan, R.J. (1998) Courtship behavior of brain mosaics in *Drosophila*. J. Neurogenetics **12:** 205-226.

Osborne, K.A., Robichon, A., Burgess, E., Butland, S., Shaw, R.A., Coulthard, A., Pererira, Greenspan, R.J. and Sokolowski, M.B. (1997) Natural behavior polymorphism due to a cGMP-dependent protein kinase of *Drosophila*. Science **277:** 834-836.

Ferveur, J.-F., Savarit, F., O'Kane, C.J., Sureau, G., Greenspan, R.J. and Jallon, J.-M. (1997) Genetic feminization of pheromones and its behavioral consequences in *Drosophila* males. Science **276:** 1555-1558.

Kane, N.S., Robichon, A., Dickinson, J.A. and Greenspan, R.J. (1997) Learning without performance in PKC-deficient *Drosophila*. Neuron **18**: 307-314.

Broughton, S.J., Kane, N.S., Yoder, M., Greenspan, R.J. and Robichon, A. (1996) A synaptogenesis dependent transport of CaM kinase II along processes evokes an inhibition of arborization and outgrowth in *D. melanogaster* cultured neurons. J. Cellular Biochem **62:** 484-494.

Broughton, S.J., Kane, N.S., Arthur, B., Yoder, M., Greenspan, R.J. and Robichon, A. (1996) Endogenously inhibited protein kinase C in transgenic *Drosophila* embyronic neuroblasts regulates the outgrowth of type I and II processes of cultured mature neurons. J. Cellular Biochem **60**: 584-600.

Szabo, G., Katarova, Z., Kortvely, E., Greenspan, R.J. and Urban, Z. (1996) Structure and the promoter region of the mouse gene encoding the 67-kD form of glutamic acid decarboxylase. DNA Cell Biol 15: 1081-1091.

Ferveur, J.-F., Störtkuhl, K., Stocker, R.F. and Greenspan, R.J. (1995) Genetic feminization of brain structures and changed sexual orientation in male *Drosophila melanogaster*. Science **267:** 902-905.

Wang, J., Renger, J., Griffith, L.C., Greenspan, R.J. and Wu, C.-F. (1994) Concomitant alterations of physiological and developmental plasticity in CaM kinase-inhibited synapses in *Drosophila*. Neuron **13:** 1373-1384.

Griffith, L.C., Wang, J., Renger, J., Wu, C.-F. and Greenspan, R.J. (1994) Calcium/calmodulin-dependent protein kinase II and potassium channel subunit eag similarly affect plasticity in *Drosophila* . Proc. Natl. Acad. Sci. USA **91**: 10044-10048.

Szabo, G., Katarova, Z. and Greenspan, R.J. (1994) Distinct protein forms are produced from alternatively spliced bicistronic GAD mRNAs during development. Mol. Cell Biol. **14:** 7535-7545.

Griffith, L.C. and Greenspan, R.J. (1993) Diversity of calcium/calmodulin-dependent protein kinase II isoforms in *Drosophila melanogaster* is due to alternate splicing of the same transcript. J. Neurochem. **61**: 1534-1537.

Griffith, L.C., Verselis, L., Aitkin, K.M., Kyriacou, C.P., Danho, W. and Greenspan, R.J. (1993) Inhibition of calcium/calmodulin-dependent protein kinase in *Drosophila* disrupts behavioral plasticity. Neuron **10:** 501-509.

Franco del Amo, F., Smith, D.E., Swiatek, P.J., Gendron-Maguire, M., Greenspan, R.J., McMahon, A.P. and Gridley, T. (1992) Expression pattern of *Motch*, a mouse homolog of *Drosophila Notch*, suggests an important role in early postimplantation mouse development. Development **115**: 737-745.

Hoppe, P.E. and Greenspan, R.J. (1990) The *Notch* locus of *Drosophila* is required in epidermal cells for epidermal development. Development **109**: 875-885.

Brilliant, M., Szabo,G., Katarova,Z., Kozak,C.A., Glazer T.M., Greenspan, R.J. and Houseman, D.E. (1990). Sequences homologous to glutamic acid decarboxylase (GAD) cDNA are present on two different mouse chromosones . Genomics **6**: 115-122.

Katarova, Z., Szabo, G., Mugnaini, E. and Greenspan, R.J. (1990) Molecular identification of the 62kd form of glutamic acid decarboxylase from the mouse. Eur. J. Neurosci. **2**: 190-202.

Greenspan, R.J. and O'Brien, M.C. (1989). Genetic evidence for the role of *Thy-1* in neurite outgrowth in the mouse. J. Neurogenetics **5** :25-36.

Berger, J., Micanovic, R., Greenspan, R., and Udenfriend, S. (1989) Conversion of placental alkaline phosphatase from a phosphatidylinositol-glycan-anchored protein to an integral transmembrane protein. Proc. Natl. Acad. Sci. **86**:1457-1460.

Greenspan, R.J. and O'Brien, M.C. (1986). Genetic analysis of mutations at the fused locus in the mouse. Proc. Natl. Acad. Sci. USA **83**: 4413-4417.

Hoppe, P. and Greenspan, R.J. (1986). Local function of the Notch gene for embryonic ectodermal pathway choice in Drosophila. Cell **46:** 773-783.

Matthew, W.D., Greenspan, R.J. Lander, A.D. and Reichardt, L.F. (1985). Immunopurification and characterization of a neuronal heparan sulfate proteoglycan. J. Neurosci. **7:** 1842-1850.

Greenspan, R.J. (1980) Mutations of choline acetyltransferase and associated neural defects in *Drosophila melanogaster*. J. Comp. Physiol. **137**: 83-92.

Greenspan, R.J., Finn, J.A. and Hall, J.C. (1980) Acetylcholinesterase mutants in Drosophila and their effects on the structure and function of the central nervous system. J. Comp. Neurol. **189**: 741-774.

Invited reviews and book chapters --

Greenspan, R.J. (2009) Selection, gene interaction, and flexible gene networks. *Cold Spring Harbor Symp. Quant. Biol*. **74:** 131-138.

Greenspan, R.J. (2009) Seymour Benzer – 1921-2007. Biographical Memoir, Nat. Acad. Sci.: Washington, DC. http://www.nasonline.org/site/PageServer?pagename=MEMOIRS_B .

Greenspan, R.J. and Kreitman, M. (2008) The evolution of fruit-fly biology. The Lancet. Dec., 2008: 529-533.

Greenspan, R.J. (2008) The origins of behavioral genetics. Current Biology **18**: R192-R198.

Greenspan, R.J. (2008) Seymour Benzer (1921-2007). Current Biology **18:** R106-R110.

Foltenyi, K., Andretic, R., Newport, J.W., and Greenspan, R.J. (2007) Neurohormonal and neuromodulatory control of sleep in *Drosophila*. *Cold Spring Harbor Symp. Quant. Biol*. **72:** 565-571.

Greenspan, R.J. (2007) Universality and brain mechanisms. In: *Invertebrate Neurobiology*. G. North and R.J. Greenspan, eds. Cold Spring Harbor Laboratory Press: Cold Spring Harbor, NY, pp. 647-649.

Kendler, K.S. and Greenspan, R.J. (2006) The nature of genetic influences on behavior: Lessons from "simpler" organisms. Am. J. Psychiatry **163:** 1683-1694.

Greenspan, R.J. (2005) No critter left behind: An invertebrate renaissance. Curr. Biol. **15:** R671-R672.

Greenspan, R.J. and van Swinderen, B. (2004) Cognitive consonance: Complex brain functions in the fruit fly and its relatives. Trends in Neurosciences **27**: 707-711.

Greenspan, R.J. and Baars, B. J. (2004) Consciousness eclipsed: Jacques Loeb, Ivan P. Pavlov, and the triumph of reductionistic biology after 1900. Consciousness and Cognition **14:** 220-231.

Greenspan, R.J. and Dierick, H.A. (2004) "Am not I a fly like thee?" From genes in fruit flies to behavior in humans. Human Molecular Genetics **13:** R267-R273.

Greenspan, R.J. (2004) Genetics of behavior. *Storia della scienza, vol. IX*, S. Petruccioli (ed.), Instituto della Enciclopedia Italiana, pp. 515-527.

Greenspan, R.J. (2004a) E pluribus unum, ex uno plura: Quantitative- and single-gene perspectives on the study of behavior. Annual Review of Neuroscience **27:** 79-105.

Greenspan, R.J. (2004b) The varieties of selectional experience in behavioral genetics. J. Neurogenetics **17:** 241-270.

Greenspan, R.J. (2004) Systems neurobiology without backbones. Curr. Biol. **14:** R177-R179.

Greenspan, R.J. (2003) Darwinian uncertainty. KronoScope **3:** 217-225.

Greenspan, R.J. (2003) RNA and memory: from feeding to localization. Current Biology **13**: R126-R127.

Greenspan, R.J. (2003) The 2003 Genetics Society of America Medal: Jeffrey C. Hall. Genetics **164:** 1246-1247.

Greenspan, R.J. (2002) Lost horizon. Project Syndicate <http://www.project-syndicate.org>.

Greenspan, R.J. (2002) The genetic temptation. Project Syndicate <http://www.project-syndicate.org>.

Greenspan, R.J. (2001) Genes and behavior: Animal models. In: *International Encyclopedia of Social and Behavioral Sciences*. N.J. Smelser and P.B. Baltes, eds. Pergamon Press: Amsterdam, New York, Oxford, **9:** 6073-6084.

Greenspan, R.J. (2001) Biology, history and individuality. Nimrod International Literary Journal **45**(1): 141-151.

Greenspan, R.J. (2001) The genetics of behavior. *Frontiers of Life.* Vol. I. D. Baltimore, R. Dulbecco, F. Jacob & R. Levi-Montalcini, eds. Academic Press: San Diego, London, pp 595-618.

Greenspan, R.J. (2001) The flexible genome. Nature Reviews Genetics **2:** 383-387.

Greenspan, R.J., Tononi, G., Cirelli, C. and Shaw, P.J. (2001) Sleep and the fruit fly. Trends Neurosci. **24:** 142-145.

Greenspan, R.J. and Ferveur, J.-F. (2000) Courtship in *Drosophila*. Ann. Rev. Genet. **34:** 205-232.

Greenspan, R.J. (1998) Genetics of behavior. *Enciclopedia Italiana, vol. I: Frontiere Della Vita, Seizione III, Parte Seconda.* Fondata da Giovanni Treccani, pp. 573-593.

Greenspan, R.J. (1997) A kinder, gentler genetic analysis of behavior: Dissection gives way to modulation. Curr. Opinion in Neurobiol. **7**: 805-811.

Greenspan, R.J. (1995) Flies, genes, learning and memory. Neuron **15:** 747-750.

Greenspan, R.J. (1995) Understanding the genetic construction of behavior. Scientific American **272** (4): 72-78.

Greenspan, R.J. and Tully, T. (1994) How do genes set up behavior? In: *Flexibility and Constraint in Behavioral Systems.* R.J. Greenspan and C.P. Kyriacou, eds., Dahlem Konferenzen Publications: Berlin, pp. 65-80.

Greenspan, R.J. (1992) Initial determination of the neurectoderm in *Drosophila*. In: *Determinants of Neuronal Identity.* Shankland, M. and Macagno, E., eds., Academic Press: New York, pp. 155-188.

Greenspan, R.J. (1992) The induction, detection and isolation of mutations. In: *Techniques for the Genetic Analysis of Brain and Behavior: Focus on the Mouse*. D. Goldowitz, D. Wahlsten and R.E.Wimer, eds., Elsevier Science Publishers: Amsterdam, pp. 93-110.

Greenspan, R.J. (1990) The emergence of neurogenetics. Sem. Neurosci. **2**: 145-157.

Greenspan, R.J. (1990) The *Notch* gene, adhesion and developmental fate in the *Drosophila* embryo. The New Biologist **2**: 595-600.

Greenspan, R.J. (1988). Genes as "bits" in nervous system development. In: *Advances in Cognitive Science*. (Kochen, M. & Hastings, H., eds). Westview Press, Boulder, CO. pp. 114-127.

Reichardt, L.F., W.D. Matthew, A.D. Lander, K. Tomaselli, R. Greenspan and K. Greif (1984). Applications of monoclonal antibodies to studies on neurite growth and synapse information. In: *Neuriommunology*, (P. Behan & F. Spreafico, eds.) Raven Press: NY, pp. 99-112.

Quinn, W.G. and Greenspan, R.J. (1984). Learning and courtship in Drosophila: Two stories with mutants. Annual Review of Neuroscience **7**: 67-93.

Hall, J.C., Tompkins, L., Kyriacou, C.P., Siegel, R.W., von Schilcher, F. and Greenspan, R.J. (1980) Higher behavior in Drosophila analyzed with mutants that disrupt the development and function of the central nervous system. In: *Neurobiology and Development of Drosophila* , eds. O. Siddiqi, P. Babu, L.M. Hall and J.C. Hall, Plenum Press: New York, pp. 425-456.

Hall, J.C., Greenspan, R.J. and Kankel, D.R. (1979) Neural defects induced by genetic manipulation of acetylcholine metabolism in Drosophila. Soc. Neurosci. Symp. **4**:1-41.

Hall, J.C. and Greenspan, R.J. (1979) Genetic analysis of Drosophila neurobiology. Annual Review of Genetics **13**: 127-195.

Books and Textbooks --

Flint, J., Greenspan, R.J., and Kendler, K.S. (2010) *How Genes Influence Behavior*. Oxford U. Press: London & New York.

North, G. and Greenspan, R.J.. eds. (2007) *Invertebrate Neurobiology*. Cold Spring Harbor Laboratory Press: Cold Spring Harbor, NY.

Greenspan, R.J. (2007) *An Introduction to Nervous Systems.* Cold Spring Harbor Laboratory Press: Cold Spring Harbor, NY.

Greenspan, R.J. (2004) *Fly Pushing: The Theory and Practice of Drosophila Genetics.* 2nd edition. Cold Spring Harbor Laboratory Press: Cold Spring Harbor, NY.

Greenspan, R.J. (1997) *Fly Pushing: The Theory and Practice of Drosophila Genetics*. Cold Spring Harbor Laboratory Press: Cold Spring Harbor, NY.

Greenspan, R.J. (1995) Genes and behavior. In: *Essentials of Neuroscience and Behavior*, E.R. Kandel, J.H. Schwartz and T.M. Jessell; Appleton & Lange: Norwalk, CT, chap. 30, pp. 555-578.

Greenspan, R.J. and Kyriacou, C.P., eds. (1994) *Flexibility and Constraint in Behavioral Systems*. John C. Wiley: New York.

Hall, J.C., Greenspan, R.J. and Harris, W.A. (1982). *Genetic Neurobiology*. M.I.T. Press: Cambridge, Mass.