

References

- Antonov, I., Kandel, E. R. and Hawkins, R. D. (1999). The contribution of facilitation of monosynaptic PSPs to dishabituation and sensitization of the *Aplysia* siphon withdrawal reflex. *J. Neurosci.*, *19*, 10438-50.
- Baines, R. A. and Downer, R. G. (1991). Pharmacological characterization of a 5-hydroxytryptamine-sensitive receptor/adenylate cyclase complex in the mandibular closer muscles of the cricket, *Gryllus domestica*. *Arch. Insect Biochem. Physiol.*, *16*(3), 153-63.
- Barbas, D., DesGroseillers, L., Castellucci, V. F., Carew, T. J. and Marinesco, S. (2003). Multiple serotonergic mechanisms contributing to sensitization in *Aplysia*: evidence of diverse serotonin receptor subtypes. *Learn. Mem.*, *10*, 373-86.
- Barron, A., Schulz, D. and Robinson, G. (2002). Octopamine modulates responsiveness to foraging-related stimuli in honey bees (*Apis mellifera*). *J. Comp. Physiol. A*, *188*(8), 603-10.
- Barzilai, A., Kennedy, T. E., Sweatt, J. D. and Kandel, E. R. (1989). 5-HT modulates protein synthesis and the expression of specific proteins during long-term facilitation in *Aplysia* sensory neurons. *Neuron*, *2*(6), 1577-86.
- Bermudez, I., Beadle, D. J. and Benson, J. A. (1992). Multiple serotonin-activated currents in isolated, neuronal somata from locust thoracic ganglia. *J. Exp. Biol.*, *165*, 43-60.
- Bicker, G. (1999). Biogenic amines in the brain of the honeybee: cellular distribution, development, and behavioral functions. *Microsc. Res. Tech.*, *44*, 166-78.
- Bicker, G. and Menzel, R. (1989). Chemical codes for the control of behaviour in arthropods. *Nature*, *337*(6202), 33-9.
- Bicker, G., Schmachtenberg, O. and De Vente, J. (1996). The nitric oxide/cyclic GMP messenger system in olfactory pathways of the locust brain. *Eur. J.*

- Neurosci.*, 8, 2635-43.
- Bicker, G., Schmachtenberg, O. and De Vente, J. (1997). Geometric considerations of nitric oxide-cyclic GMP signalling in the glomerular neuropil of the locust antennal lobe. *Proc. R. Soc. Lond. B*, 264, 1177-81.
- Bloch, G., Simon, T. and Robinson, G. E. (2000). Brain biogenic amines and reproductive dominance in bumble bees (*Bombus terrestris*). *J. Comp. Physiol. A*, 186(3), 261-8.
- Braun, G. and Bicker, G. (1992). Habituation of an appetitive reflex in the honeybee. *J. Neurophysiol.*, 67(3), 588-98.
- Breer, H. and Shepherd, G. M. (1993). Implications of the NO/cGMP system for olfaction. *Trends Neurosci.*, 16, 5-9.
- Breidbach, O. (1990). Serotonin-immunoreactive brain interneurons persist during metamorphosis of an insect - a developmental study of the brain of *Tenebrio molitor*, L. (Coleoptera). *Cell Tissue Res.*, 259(2), 345-60.
- Broillet, M. C. and Firestein, S. (1996). Direct activation of the olfactory cyclic nucleotide-gated channel through modification of sulfhydryl groups by NO compounds. *Neuron*, 16(2), 377-85.
- Brown, C. S. and Nestler, C. (1985). Comprehensive insect physiology, biochemistry and pharmacology. In G. A. Kerkut and L. I. Gilbert (Eds.), (Vol. 11, p. 436-497). Oxford: Pergamon.
- Brunelli, M., Castellucci, V. and Kandel, E. R. (1976). Synaptic facilitation and behavioral sensitization in *Aplysia*: possible role of serotonin and cyclic AMP. *Science*, 194, 1178-81.
- Bult, R., Schuling, F. H. and Mastebroek, H. A. K. (1991). Circadian inputs influence the performance of a spiking, movement-sensitive neuron in the visual system of the blowfly. *J. Biol. Rhythms*, 6(1), 55-69.
- Casagrand, J. L. and Ritzmann, R. E. (1992). Biogenic amines modulate synaptic transmission between identified giant interneurons and thoracic interneurons in the escape system of the cockroach. *J. Neurobiol.*, 23(6), 644-55.

- Chen, B., Meinertzhagen, I. A. and Shaw, S. R. (1999). Circadian rhythms in light-evoked responses of the fly's compound eye, and the effects of neuromodulators 5-HT and the peptide PDF. *J. Comp. Physiol. A*, 185(5), 393-404.
- Cho, W., Heberlein, U. and Wolf, F. W. (2004). Habituation of an odorant-induced startle response in *Drosophila*. *Genes Brain Behav.*, 3(3), 127-37.
- Claassen, D. E. and Kammer, A. E. (1986). Effects of octopamine, dopamine and serotonin on production of flight motor output by thoracic ganglia of *Manduca sexta*. *J. Neurobiol.*, 17(1), 1-14.
- Collmann, C., Carlsson, M. A., Hansson, B. S. and Nighorn, A. (2004). Odorant-evoked nitric oxide signals in the antennal lobe of *Manduca sexta*. *J. Neurosci.*, 24(27), 6070-7.
- Daly, K. C., Chandra, S., Durtschi, M. L. and Smith, B. H. (2001). The generalization of an olfactory-based conditioned response reveals unique but overlapping odour representations in the moth *Manduca sexta*. *J. Exp. Biol.*, 204(17), 3085-95.
- Daly, K. C., Christensen, T. A., Lei, H., Smith, B. H. and Hildebrand, J. G. (2004). Learning modulates the ensemble representations for odors in primary olfactory networks. *Proc. Natl. Acad. Sci. U S A*, 101(28), 10476-81.
- Daly, K. C. and Figueredo, A. J. (2000). Habituation of sexual response in male *Heliothis* moths. *Physiol. Entomol.*, 25, 180-90.
- De Belle, J. S. and Kanzaki, . (1999). Protocerebral olfactory processing. In B. S. Hansson (Ed.), *Insect olfaction* (p. 125-61). Springer.
- Dringenberg, H. C. (2000). Serotonergic receptor antagonists alter responses to general anesthetics in rats. *Br. J. Anaesth.*, 85(6), 904-6.
- D'yakonova, T. L. (2002). Interaction between serotonin and nitric oxide (NO) in the activation of the serotonergic system in the common snail. *Neurosci. Behav. Physiol.*, 32, 275-82.
- Edwards, L. K. (1993). *Applied analysis of variance in behavioral science* (L. K.

- Edwards, Ed.). New York: M. Dekker.
- Ehrlich, J. S., Boulis, N. M., Karrer, T. and Sahley, C. L. (1992). Differential effects of serotonin depletion on sensitization and dishabituation in the leech, *Hirudo medicinalis*. *J. Neurobiol.*, *23*, 270-9.
- Elphick, M. R., Green, I. C. and O'Sheah, M. (1993). Nitric oxide synthesis and action in an invertebrate brain. *Brain Res.*, *619*, 344-6.
- Erber, J., Kloppenburg, P. and Scheidler, A. (1993). Neuromodulation by serotonin and octopamine in the honeybee: behaviour, neuroanatomy and electrophysiology. *Experientia*, *49*, 1073-83.
- Evans, P. D. (1980). Biogenic amines in the insect nervous system. *Adv. Insect Physiol.*, *15*, 317-473.
- Fan, R. J., Anderson, P. and Hansson, B. (1997). Behavioural analysis of olfactory conditioning in the moth *Spodoptera littoralis* (Boisd.) (Lepidoptera: Noctuidae). *J. Exp. Biol.*, *200*(23), 2969-76.
- Farooqui, T., Robinson, K., Vaessin, H. and Smith, B. H. (2003). Modulation of early olfactory processing by an octopaminergic reinforcement pathway in the honeybee. *J. Neurosci.*, *23*, 5370-80.
- Fiala, A., Müller, U. and Menzel, R. (1999). Reversible downregulation of protein kinase A during olfactory learning using antisense technique impairs long-term memory formation in the honeybee, *Apis mellifera*. *J. Neurosci.*, *19*(22), 10125-34.
- Figueredo, A. J. and Baker, T. C. (1992). Reduction of the response to sex pheromone in the Oriental Fruit Moth (Lepidoptera: Tortricidae) following successive pheromonal exposures. *J. Insect Beh.*, *5*(3), 347-63.
- Fukami, S., Uchida, I., Mashimo, T., Takenoshita, M. and Yoshiya, I. (1998). Gamma subunit dependent modulation by nitric oxide (NO) in recombinant GABAA receptor. *Neuroreport*, *9*(6), 1089-92.
- Garthwaite, J. and Boulton, C. L. (1995). Nitric oxide signalling in the central nervous system. *Ann. Rev. Physiol.*, *57*, 683-706.

- Garthwaite, J., Charles, S. L. and Chess-Williams, R. (1988). Endothelium-derived relaxing factor release on activation of nmda receptors suggests role as intracellular messengers in the brain. *Nature*, *336*, 385-8.
- Gelperin, A. (1994). Nitric oxide mediates network oscillations of olfactory interneurons in a terrestrial mollusc. *Nature*, *369*, 61-3.
- Granger, N. A., Ebersohl, R. and Sparks, T. C. (2000). Pharmacological characterization of dopamine receptors in the corpus allatum of *Manduca sexta* larvae. *Insect Biochem. Mol. Biol.*, *30*, 755-66.
- Granger, N. A., Sturgis, S. L., Ebersohl, R., Geng, C. and Sparks, T. C. (1999). Dopaminergic control of corpora allata activity in the larval tobacco hornworm, *Manduca sexta*. *Arch. Insect Biochem. Physiol.*, *32*, 449-66.
- Groves, P. M. and Thompson, R. F. (1970). Habituation: a dual-process theory. *Psychological Review*, *77*, 419-50.
- Hammer, M. (1993). An identified neuron mediates the unconditioned stimulus in associative olfactory learning in honeybees. *Nature*, *366*, 59-63.
- Hammer, M. and Menzel, R. (1995). Learning and memory in the honeybee. *J. Neurosci.*, *15*(3), 1617-30.
- Hanley, N. R. and Hensler, J. G. (2002). Mechanisms of ligand-induced desensitization of the 5-hydroxytryptamine(2A) receptor. *J. Pharmacol. Exp. Ther.*, *300*(2), 468-77.
- Heinbockel, T., Kloppenburg, P. and Hildebrand, J. G. (1998). Pheromone-evoked potentials and oscillations in the antennal lobes of the sphinx moth *Manduca sexta*. *J. Comp. Physiol. A*, *182*, 703-14.
- Heisenberg, M. (1988). What do the mushroom bodies do for the insect brain? An introduction. *Learn. Memory*, *5*, 1-10.
- Helfrich-Forster, C., Stengl, M. and Homberg, U. (1998). Organization of the circadian system in insects. *Chronobiol. Int.*, *15*(6).
- Hentschel, E. (1981). Investigations on catecholamine integrated influences on reproduction in *Periplaneta americana* l. *Adv. Physiol. Sci.*, *22*, 205-34.

- Herman, J. K., O'Halloran, K. D., Janssen, P. L. and Bisgard, G. E. (2003). Dopaminergic excitation of the goat carotid body is mediated by the serotonin type 3 receptor subtype. *Respir. Physiol. Neurobiol.*, 136(1), 1-12.
- Hildebrand, J. G. (1996). Olfactory control of behavior in moths: central processing of odor information and the functional significance of olfactory glomeruli. *J. Comp. Physiol. A*, 178(1), 5-19. (Review)
- Hildebrandt, H. and Müller, U. (1995). Octopamine mediates rapid stimulation of protein kinase A in the antennal lobe of honeybees. *J. Neurobiol.*, 27(1), 44-50.
- Hill, E. S., Iwano, M., Gatellier, L. and Kanzaki, R. (2002). Morphology and physiology of the serotonin-immunoreactive putative antennal lobe feedback neuron in the male silkworm *Bombyx mori*. *Chem. Senses*, 27(5), 475-83.
- Hill, E. S., Okada, K. and Kanzaki, R. (2003). Visualization of modulatory effects of serotonin in the silkworm antennal lobe. *J. Exp. Biol.*, 206(2), 345-52.
- Homborg, U. and Müller, U. (1999). Neuroactive substances in the antennal lobe. In B. S. Hansson (Ed.), *Insect olfaction* (p. 181-206). Springer.
- Ichikawa, T. (1998). Activity patterns of neurosecretory cells releasing pheromotropin neuropeptides in the moth *Bombyx mori*. *Proc. Natl. Acad. Sci. USA*, 95(7), 4055-60.
- Iwano, M. and Kanzaki, R. (2005). Immunocytochemical identification of neuroactive substances in the antennal lobe of the male silkworm moth *Bombyx mori*. *Zoolog. Sci., In Press*.
- Kamimura, M. and Tatsuki, S. (1994). Effects of photoperiodic changes on calling behavior and pheromone production in the oriental tobacco budworm, *Helicoverpa assulta* (Lepidoptera : Noctuidae). *J. Insect Physiol.*, 40, 731-4.
- Kandel, E. R. (1997). Genes, synapses, and long-term memory. *J. Cell. Physiol.*, 173, 124-5.
- Kandel, E. R., Schwartz, J. H. and Jessell, T. M. (2000). *Principles of neural science* (4th ed.; E. R. Kandel, J. H. Schwartz and T. M. Jessell, Eds.). New

- York : McGraw-Hill, Health Professions Division, c2000.
- Kanzaki, R. (1996). Behavioral and neural basis of instinctive behavior in insects: odor-source searching strategies without memory and learning. *Robotics and Autonomous Syst.*, 18, 33-43.
- Kanzaki, R. (1997). Pheromone processing in the lateral accessory lobes of the moth brain: flipflopping signals related to zigzagging upwind walking. In T. R. Cardé and A. K. Minks (Eds.), *Pheromone research: New direction* (p. 291-303). Chapman and Hall, New York.
- Kanzaki, R., Arbas, E. A. and Hildebrand, J. G. (1991). Physiology and morphology of descending neurons in pheromone-processing olfactory pathways in the male moth *Manduca sexta*. *J. Comp. Physiol. A*, 169, 1-14.
- Kanzaki, R., Ikeda, A. and Shibuya, T. (1994). Morphological and physiological properties of pheromone-triggered flipflopping descending interneurons of the male silkworm moth, *Bombyx mori*. *J. Comp. Physiol. A*, 175, 1-14.
- Kanzaki, R. and Mishima, T. (1996). Pheromone-triggered 'flipflopping' neural signals correlated with activities of neck motor neurons of a male moth, *Bombyx mori*. *Zoolog. Sci.*, 13, 79-87.
- Kanzaki, R. and Shibuya, T. (1983). Olfactory neural pathway and sexual pheromone responses in the deutocerebrum of the male silkworm moth, *Bombyx mori* (Lepidoptera : Bombycidae). *Appl. Ent. Zool.*, 18, 131-33.
- Kanzaki, R. and Shibuya, T. (1992). Long-lasting excitation of protocerebral bilateral neurons in the pheromone-processing pathways of the male moth *Bombyx mori*. *Brain Res.*, 587, 211-5.
- Kanzaki, R., Soo, K., Seki, Y. and Wada, S. (2003). Projections to higher olfactory centers from subdivisions of the antennal lobe macroglomerular complex of the male silkworm. *Chem. Senses*, 28, 113-30.
- Kanzaki, R., Sugi, N. and Shibuya, T. (1992). Self-generated zigzag turning of *Bombyx mori* males during pheromone-mediated upwind walking. *Zoolog. Sci.*, 9, 515-27.

- Karlson, P. and Sekeris, C. E. (1962). *N*-acetyldopamine as sclerotizing agent of the insect cuticle. *Nature*, *195*, 183-4.
- Kent, K. S., Hoskins, S. G. and Hildebrand, J. G. (1987). A novel serotonin-immunoreactive neuron in the antennal lobe of the sphinx moth *Manduca sexta* persists throughout postembryonic life. *J. Neurobiol.*, *18*, 451-65.
- Kiehn, L., Saleuddin, S. and Lange, A. (2001). Dopaminergic neurons in the brain and dopaminergic innervation of the albumen gland in mated and virgin *Helisoma duryi* (Mollusca : Pulmonata). *BMC Physiol.*, *1*, 9.
- Kiss, J. P. (2000). Role of nitric oxide in the regulation of monoaminergic neurotransmission. *Brain Res. Bull.*, *52*, 459-66.
- Kiss, J. P., Zsilla, G. and Vizi, E. S. (2004). Inhibitory effect of nitric oxide on dopamine transporters: interneuronal communication without receptors. *Neurochem. Int.*, *45*, 485-9.
- Kloppenburg, P., Ferns, D. and Mercer, A. R. (1999). Serotonin enhances central olfactory neuron responses to female sex pheromone in the male sphinx moth *Manduca sexta*. *J. Neurosci.*, *19*, 8172-81.
- Kloppenburg, P. and Heinbockel, T. (2000). 5-hydroxytryptamine modulates pheromone-evoked local field potentials in the macroglomerular complex of the sphinx moth *Manduca sexta*. *J. Exp. Biol.*, *203*, 1701-9.
- Kloppenburg, P. and Hildebrand, J. G. (1995). Neuromodulation by 5-hydroxytryptamine in the antennal lobe of the sphinx moth *Manduca sexta*. *J. Exp. Biol.*, *198*, 603-11.
- Kondoh, Y. and Hisada, M. (1986). Regional specialization in synaptic input and output in an identified local nonspiking interneuron of the crayfish revealed by light and electron microscopy. *J. Comp. Neurol.*, *15*, 334-48.
- Kostowski, W., Tarchalska, B. and Wanchowicz, B. (1975). Brain catecholamines, spontaneous bioelectrical activity and aggressive behavior in ants (*Formica rufa*). *Pharmacol. Biochem. Behav.*, *3*, 337-42.
- Kramer, E. (1975). Orientation of the male silkworm to the sex attractant Bom-

- bykol. In D. A. Denton and J. Coghlan (Eds.), *Mechanisms in insect olfaction* (p. 329-35). Academic Press: New York.
- Krasne, F. B. and Teshiba, T. M. (1995). Habituation of an invertebrate escape reflex due to modulation by higher centers rather than local events. *Proc. Natl. Acad. Sci. U S A*, *92*, 3362-6.
- Kuenen, L. P. and Baker, T. C. (1981). Habituation versus sensory adaptation as the cause of reduced attraction following pulsed and constant sex pheromone pre-exposure in *Trichoplusia ni*. *J. Insect Physiol.*, *27*, 721-6.
- Kutsukake, M., Komatsu, A., Yamamoto, D. and Ishiwa-Chigusa, S. (2000). A tyramine receptor gene mutation causes a defective olfactory behavior in *Drosophila melanogaster*. *Gene*, *245*, 31-42.
- Laurent, G. and Naraghi, M. (1994). Odorant-induced oscillations in the mushroom bodies of the locust. *J. Neurosci.*, *14*, 2993-3004.
- Lei, H., Anton, S. and Hansson, B. S. (2001). Olfactory protocerebral pathways processing sex pheromone and plant odor information in the male moth *Agrotis segetum*. *J. Comp. Neurol.*, *432*, 356-70.
- Lingren, P. D., Greene, G. L., Davis, D. R., Baumhover, A. H. and Henneberry, T. J. (1977). Nocturnal behavior of four lepidopteran pests that attack tobacco and other crops. *Ann. Entomol. Soc. Am.*, *70*, 161-7.
- Linn, C. E., Campbell, M. G. and Roelofs, W. L. (1992). Photoperiod cues and the modulatory action of octopamine and 5-hydroxytryptamine on locomotor and pheromone response in male gypsy moth, *Lymantria dispar*. *Arch. Insect Biochem. Physiol.*, *20*, 265-84.
- Linn, C. E., Poole, K. R. and Roelofs, W. L. (1994a). Studies on biogenic amines and metabolites in nervous tissue and hemolymph of male cabbage looper moth - III. Fate of injected octopamine, 5-hydroxytryptamine and dopamine. *Comp. Biochem. Physiol. Vol. C*, *108*, 99-106.
- Linn, C. E., Poole, K. R. and Roelofs, W. L. (1994b). Studies on biogenic amines and metabolites in nervous tissue and hemolymph of male cabbage looper

- moth - I. Quantitation of photoperiod changes. *Comp. Biochem. Physiol.* Vol. C, 108, 73-85.
- Linn, C. E. and Roelofs, W. L. (1986). Modulatory effects of octopamine and serotonin on thresholds for male sensitivity and periodicity of response to sex pheromone in the cabbage looper moth. *Arch. Insect Biochem. Physiol.*, 3, 161-71.
- Liu, W., Yoon, J., Burg, M., Chen, L. and Pak, W. L. (1995). Molecular characterization of two *Drosophila* guanylate cyclases in the nervous system. *J. Biol. Chem.*, 270, 12418-27.
- Lotufo, C. M., Lopes, C., Dubocovich, M. L., Farsky, S. H. and Markus, R. P. (2001). Melatonin and *N*-acetylserotonin inhibit leukocyte rolling and adhesion to rat microcirculation. *Eur. J. Pharmacol.*, 430, 351-7.
- MacLeod, K. and Laurent, G. (1996). Distinct mechanisms for synchronization and temporal patterning of odor-encoding neural assemblies. *Science*, 274, 976-9.
- Malyshev, A., Bravarenko, N. and Balaban, P. (1997). Dependence of synaptic facilitation postsynaptically induced in snail neurones on season and serotonin level. *Neuroreport*, 8(5), 1179-82.
- Marcus, E. A., Nolen, T. G., Rankin, C. H. and Carew, T. J. (1988). Behavioral dissociation of dishabituation, sensitization, and inhibition in *Aplysia*. *Science*, 241, 210-3.
- Matsumoto, T., Nakane, M., Pollock, J. S., Kuk, J. E. and Förstermann, U. (1993). A correlation between soluble brain nitric oxide synthase and NADPH-diaphorase activity is only seen after exposure of the tissue to fixation. *Neurosci. Lett.*, 55, 61-4.
- Menzel, R. (2001). Searching for the memory trace in a mini-brain, the honeybee. *Learn. Mem.*, 8(2), 53-62.
- Menzel, R., Heyne, A., Gerber, C. and Fiala, A. (1999). Pharmacological dissociation between the reinforcing, sensitizing, and response-releasing functions

- of reward in honeybee classical conditioning. *Behav. Neurosci.*, *113*, 744-54.
- Menzel, R. and Müller, U. (1996). Learning and memory in honeybees: from behavior to neural substrates. *Annu. Rev. Neurosci.*, *19*, 379-404.
- Mercer, A. R., Kloppenburg, P. and Hildebrand, J. G. (1996). Serotonin-induced changes in the excitability of cultured antennal-lobe neurons of the sphinx moth *Manduca sexta*. *J. Comp. Physiol. A*, *178*, 21-31.
- Mercer, A. R. and Menzel, R. (1982). The effects of biogenic amines on conditioned and unconditioned responses to olfactory stimuli in the honeybee, *Apis mellifera*. *J. Comp. Physiol. A*, *145*, 363-8.
- Mills, R. R., Lake, J. C. R. and Alworth, W. L. (1967). Biosynthesis of *N*-acetyldopamine by the American cockroach. *J. Insect Physiol.*, *13*, 1539-46.
- Mishima, T. and Kanzaki, R. (1998). Coordination of flipfopping neural signals and head turning during pheromone-mediated walking in a male silkworm moth *Bombyx mori*. *J. Comp. Physiol. A*, *183*(3), 273-82.
- Mishima, T. and Kanzaki, R. (1999). Physiological and morphological characterization of olfactory descending interneurons of the male silkworm moth, *Bombyx mori*. *J. Comp. Physiol. A*, *184*(2), 143-60.
- Müller, U. (1996). Inhibition of nitric oxide synthase impairs a distinct form of long-term memory in the honeybee, *Apis mellifera*. *Neuron*, *16*, 541-9.
- Müller, U. (1997). The nitric oxide system in insects. *Progr. Neurobiol.*, *51*, 363-81.
- Müller, U. (2000). Prolonged activation of cAMP-dependent protein kinase during conditioning induces long-term memory in honeybees. *Neuron*, *27*(1), 159-68.
- Müller, U. and Hildebrandt, H. (2002). Nitric oxide/cGMP-mediated protein kinase A activation in the antennal lobes plays an important role in appetitive reflex habituation in the honeybee. *J. Neurosci.*, *22*, 8739-47.
- Muszynska-Pytel, M. and Cymborowski, B. (1978). The role of serotonin in regulation of the circadian rhythms of locomotor activity in the cricket (*Acheta domesticus* L.) I. circadian variations in serotonin concentration in the brain

- and hemolymph. *Comp. Biochem. Physiol.*, *59*, 13-5.
- Nagao, T. and Tanimura, T. (1988). Distribution of biogenic amines in the cricket central nervous system. *Anal. Biochem.*, *171*(1), 33-40.
- Nagao, T. and Tanimura, T. (1989). Simultaneous determination of biogenic amines, their precursors and metabolites in a single brain of the cricket using high-performance liquid chromatography with amperometric detection. *J. Chromato.*, *496*(1), 39-53.
- Nässel, D. R. (1988). Serotonin and serotonin-immunoreactive neurons in the nervous system of insects. *Prog. Neurobiol.*, *30*, 1-85.
- Nighorn, A., Gibson, N. J., Rivers, D. M., Hildebrand, J. G. and Morton, D. B. (1998). The nitric oxide-cGMP pathway may mediate communication between sensory afferents and projection neurons in the antennal lobe of *Manduca sexta*. *J. Neurosci.*, *18*, 7244-55.
- Obara, Y. (1979). *Bombyx mori* mating dance: an essential in locating the female. *Appl. Entomol. Zool.*, *14*, 130-32.
- Okada, K. and Kanzaki, R. (2001). Localization of odor-induced oscillations in the bumblebee antennal lobe. *Neurosci. Lett.*, *316*(3), 133-6.
- Olberg, R. M. (1983). Pheromone-triggered flip-flopping interneurons in the ventral nerve cord of the silkworm moth, *Bombyx mori*. *J. Comp. Physiol. A*, *152*, 297-307.
- Page, T. L. (1987). Serotonin phase-shifts the circadian rhythm of locomotor activity in the cockroach. *J. Biol. Rhythms*, *2*, 23-34.
- Rehder, V., Bicker, G. and Hammer, M. (1987). Serotonin-immunoreactive neurons in the antennal lobes and suboesophageal ganglion of the honeybee. *Cell Tissue Res.*, *247*, 59-66.
- Rhines, L. D., Sokolove, P. G., Flores, J., Tank, D. W. and Gelperin, A. (1993). Cultured olfactory interneurons from *Limax maximus*: optical and electrophysiological studies of transmitter-evoked responses. *J. Neurophysiol.*, *69*, 1940-7.

- Richter, K., Peschke, E. and Peschke, D. (2000). A neuroendocrine releasing effect of melatonin in the brain of an insect, *periplaneta americana* (l. *J. Pineal Res.*, *28*, 129-35.
- Roeder, T. (1994). Biogenic amines and their receptors in insects. *Comp. Biochem. Physiol. C*, *107*, 1-12.
- Roeder, T. (1999). Octopamine in invertebrates. *Progr. Neurobiol.*, *59*, 533-61.
- Roeder, T. (2004). Tyramine and octopamine: ruling behavior and metabolism. *Ann. Rev. Entomol.*, *Epub ahead of print*.
- Roeder, T., Seifert, M., Kähler, C. and Gewecke, M. (2003). Tyramine and octopamine: antagonistic modulators of behavior and metabolism. *Arch. Insect Biochem. Physiol.*, *54*, 1-13.
- Ruben, P. and Lukowiak, K. (1983). Modulation of the *Aplysia* gill withdrawal reflex by dopamine. *J. Neurobiol.*, *14*(4), 271-84.
- Saifullah, A. S. M. and Tomioka, K. (2003). 5-HT₇-like receptors mediate serotonergic modulation of photo-responsiveness of the medulla bilateral neurons in the cricket, *Gryllus bimaculatus*. *Zoolog. Sci.*, *20*, 303-9.
- Salecker, I. and Distler, P. (1990). Serotonin-immunoreactive neurons in the antennal lobes of the American cockroach *Periplaneta americana* : light- and electron-microscopic observations. *Histochem.*, *94*, 463-73.
- Saraswati, S., Fox, L. E., Soll, D. R. and Wu, C. F. (2004). Tyramine and octopamine have opposite effects on the locomotion of *Drosophila* larvae. *J. Neurobiol.*, *58*, 425-41.
- Sasaki, K. and Nagao, T. (2001). Distribution and levels of dopamine and its metabolites in brains of reproductive workers in honeybees. *J. Insect Physiol.*, *47*, 1205-16.
- Saudou, F., Amlaiky, N., Plassat, J. L., Borrelli, E. and Hen, R. (1990). Cloning and characterization of a *Drosophila* tyramine receptor. *EMBO J.*, *9*, 3611-7.
- Scheiner, R., Pluckhahn, S., Oney, B., Blenau, W. and Erber, J. (2002). Behavioural pharmacology of octopamine, tyramine and dopamine in honey bees.

- Behav. Brain Res.*, 136(2), 545-53.
- Schulz, D. J., Elekonich, M. M. and Robinson, G. E. (2002). Biogenic amines in the antennal lobes and the initiation and maintenance of foraging behavior in honey bees. *J. Neurobiol.*, 54, 406-16.
- Schurmann, F. W. and Klemm, N. (1984). Serotonin-immunoreactive neurons in the brain of the honeybee. *J. Comp. Neurol.*, 225, 570-80.
- Schwaerzel, M., Monastirioti, M., Scholz, H., Friggi-Grelin, F., Birman, S. and Heisenberg, M. (2003). Dopamine and octopamine differentiate between aversive and appetitive olfactory memories in *Drosophila*. *J. Neurosci.*, 23, 10495-502.
- Seki, Y., Aonuma, H. and Kanzaki, R. (2005). Pheromone processing center in the protocerebrum of *Bombyx mori* revealed by NO-induced anti-cGMP immunocytochemistry. *J. Comp. Neurol.*, 481(4), 340-51.
- Sombati, S. and Hoyle, G. (1984). Central nervous sensitization and dishabituation of reflex action in an insect by the neuromodulator octopamine. *J. Neurobiol.*, 15, 455-80.
- Sorensen, P. W. (1996). Biological responsiveness to pheromones provides fundamental and unique insight into olfactory function. *Chem. Senses*, 21(2), 245-56.
- Stefano, G. B., Salzet, B., Rialas, C. M., Pope, M., Kustka, A., Neenan, K. et al. (1997). Morphine- and anandamide-stimulated nitric oxide production inhibits presynaptic dopamine release. *Brain Res.*, 763, 63-8.
- Stevenson, P. A., Hofmann, H. A., Schoch, K. and Schildberger, K. (2000). The fight and flight responses of crickets depleted of biogenic amines. *J. Neurobiol.*, 43, 107-20.
- Stopfer, M. and Carew, T. J. (1996). Heterosynaptic facilitation of tail sensory neuron synaptic transmission during habituation in tail-induced tail and siphon withdrawal reflexes of *Aplysia*. *J. Neurosci.*, 16, 4933-48.
- Sun, X. J., Tolbert, L. P. and Hildebrand, J. G. (1993). Ramification pattern

- and ultrastructural characteristics of the serotonin-immunoreactive neuron in the antennal lobe of the moth *Manduca sexta*: a laser scanning confocal and electron microscopy study. *Neuron*, *338*, 5-16.
- Tanaka, N., Awasaki, T., Shimada, T. and Ito, K. (2004). Integration of chemosensory pathways in the *Drosophila* second-order olfactory centers. *Current Biology*, *14*(6), 449-57.
- Teerapong, P. and Harvey, A. L. (1977). The effect of 5-hydroxytryptamine on the chick biventer cervicis muscle. *Eur. J. Pharmacol.*, *44*, 99-104.
- Teshiba, T., Shamsian, A., Yashar, B., Yeh, S. R., Edwards, D. H. and Krasnel, F. B. (2001). Dual and opposing modulatory effects of serotonin on crayfish lateral giant escape command neurons. *J. Neurosci.*, *21*, 4523-29.
- Thompson, R. F. and Spencer, W. A. (1966). Habituation: a model phenomenon for the study of neuronal substrates of behaviour. *Psychol. Review*, *73*, 16-43.
- Tierney, A. J. (2001). Structure and function of invertebrate 5-HT receptors: a review. *Comp. Biochem. Physiol. A*, *128*, 791-804.
- Tomioka, K. (1999). Light and serotonin phase-shift the circadian clock in the cricket optic lobe in vitro. *J. Comp. Physiol. A*, *185*, 437-44.
- Tomioka, K., Ikeda, M., Nagao, T. and Tamotsu, S. (1993). Involvement of serotonin in the circadian rhythm of an insect visual system. *Naturwissenschaften*, *80*, 137-9.
- Truman, J. W. (1974). Physiology of insect rhythms. IV. Role of the brain in the regulation of the flight rhythm of the giant silkmoths. *J. Comp. Physiol. A*, *95*, 281-96.
- Tully, T. (1996). Discovery of genes involved with learning and memory: an experimental synthesis of hirschian and benzerian perspectives. *Proc. Natl. Acad. Sci. U S A*, *93*(24), 13460-7.
- Ureshi, M., Dainobu, M. and Sakai, M. (2002). Serotonin precursor (5-hydroxytryptophan) has a profound effect on the post-copulatory time-fixed sexually refractory stage in the male cricket, *Gryllus bimaculatus* DeGeer.

- J. Comp. Physiol. A*, 188, 767-79.
- von Nickisch-Rosenegk, E., Krieger, J., Kubick, S., Laage, R., Strobel, J., Strotmann, J. et al. (1996). Cloning of biogenic amine receptors from moths (*Bombyx mori* and *Heliothis virescens*). *Insect Biochem. Mol. Biol.*, 26, 817-27.
- Wellard, J. W. and Morgan, I. G. (2004). Inhibitory modulation of photoreceptor melatonin synthesis via a nitric oxide-mediated mechanism. *Neurochem. Int.*, 45, 1143-53.
- Wright, W. G., Marcus, E. A. and Carew, T. J. (1991). A cellular analysis of inhibition in the siphon withdrawal reflex of *Aplysia*. *J. Neurosci.*, 11, 2498-509.
- Yin, J. C., Del Vecchio, M., Zhou, H. and Tully, T. (1995). CREB as a memory modulator: induced expression of a dCREB2 activator isoform enhances long-term memory in *Drosophila*. *Cell*, 81, 107-15.
- Yin, J. C., Wallach, J. S., Del Vecchio, M., Wilder, E. L., Zhou, H., Quinn, W. G. et al. (1994). Induction of a dominant negative CREB transgene specifically blocks long-term memory in *Drosophila*. *Cell*, 79, 49-58.