

Curriculum Vitae and Research Publications
George Owen Mackie

Early years and training.

1929 Born at Louth, Lincolnshire, England, Oct 20.

1940 Evacuated to Canada. School in Vernon B.C. Repatriated 1944 to school in UK.

1948 Military service, commissioned 2nd Lieut. Royal Artillery. Served in Gibraltar, 54th Anti-Aircraft Regiment, 1949/50.

1950 Oxford University. Elected to Casberd Scholarship, St John's College.

1953 Graduated with Hons B.A. degree.

1954- 57 D.Phil programme at Oxford. Awarded Oxford Naples Scholarship and ranked *proxime accessit* in Christopher Welch Scholarship.

M.A. and D.Phil. awarded in 1957.

1956 Emigrated to Canada. Canadian citizenship 1965.

Marital status

Married with five children

Jobs and research appointments in Canada.

Alberta

1956 Lecturer, University of Alberta, Edmonton

1957 Assistant Professor

1961 Associate Professor

1963-4. N.R.C. Postdoctoral Overseas Fellow, studied at Wood Hole, Mass., USA (Marine Biological Laboratory), St Andrews, Scotland (Gatty Marine Lab) and Villefranche-sur-Mer, France (Station Zoologique, Université de Paris)

1966 Professor

1966 Visiting Research Associate, University of Wisconsin, Madison.

1968 President, Association of the Academic Staff, University of Alberta.

Victoria

1968-1994 Professor, University of Victoria

1971-73 Chairman, Biology Dept.

1974-5 NRC Travel Fellow and NRC/CNRS Scientific Exchange Visitor for sabbatical year. Research at Plymouth, England (Marine Biological Association), Kotor, Montenegro (International Brain Research Institute) and Villefranche-sur-Mer, France (Station Zoologique, Université de Paris).

1977. NRC/CNRS Scientific Exchange Visitor in France (work at Villefranche-sur-Mer)

1978 Visiting Professor, University of California, Los Angeles, California.

1980-88. Editor, Canadian Journal of Zoology

1982 NSERC International Collaborative Research Visitor, Hopkins Marine Station, Stanford University, Pacific Grove California.

1985/6. Exchange visitor under Canada-Switzerland Scientific Exchange Programme (Basel).

1986-88. Killam Research Fellow.

1995 Professor emeritus

Honours

1982. Fellow, Royal Society of Canada

1989. Fry Medalist, Canadian Society of Zoologists

1991. Fellow, Royal Society of London

1999. Honorary Member, Canadian Society of Zoologists

Scientific writings

1. Totton, A.K. and G.O. Mackie. 1956. Dimorphism in the Portuguese Man-of-War. *Nature* 177: 290.

2. Mackie, G.O. 1959. The evolution of the Chondrophora. *Trans. Roy. Soc. Canada. LIII Ser. III. Sect. 5: 7-20.*

3. Mackie, G.O. 1960a. The structure of the nervous system in *Velella*. *Quart. J. Micro. Sci.* 101: 119-131.

4. Mackie, G.O. 1960b. In: Totton, A.K. & G.O. Mackie. *Studies on Physalia physalis (L.) Part II, Behaviour and Histology.* "Discovery" Reports 30: 301-408. Cambridge University Press.

5. Mackie, G.O. 1960c. Echiuroids from the Canary Islands. *Ann. Mag. Nat. Hist. Ser. 13, Vol. iii:* 247-251.
6. Mackie, G.O. 1961. In: "Is there a nervous system in *Hydra*?" (Floor Discussion) pp. 69-72 in the *Biology of Hydra* (ed. Lenhoff and Loomis), Univ. of Miami Press.
7. Mackie, G.O. 1962. Factors affecting the distribution of *Velevella* (Chondrophora). *Internat. Rev. Ges. Hydrobiol.* 47: 26-32.
8. Mackie, G.O. 1962. Pigment effector cells in a cnidarian. *Science* 137 (3531): 689-690.
9. Mackie, G.O. 1963. Siphonophores, bud-colonies and superorganisms. In: *The Lower Metazoa; Comparative Biology and Phylogeny*, (ed. E. Dougherty), Univ. of California Press, pp. 329-337.
10. Mackie, G.O. & D.A. Boag. 1963. Fishing, feeding and digestion in siphonophores. *Publ. Staz. Zool. Napoli* 33: 178-196.
11. Adshead, P.C., G.O. Mackie & P. Paetkau. 1963. On the hydras of Alberta and the Northwest Territories. *Nat. Mus. Can., Bull* 199: 1-13.
12. Mackie, G.O. & G.V. Mackie. 1963. Systematic and biological notes on living hydromedusae from Puget Sound. *Nat. Mus. Can., Bull.* 199: 63-84.
13. Mackie, G.O. 1964. Analysis of locomotion in a siphonophore colony. *Proc. Roy. Soc. B.* 159: 366-391.
14. Mackie, G.O., D.B. Fillion, B. Hammond, & A. Hancock. 1964. Massive accumulations of protein in the nuclei of *Cordylophora*. *Can. J. Zool.* 42: 1011-1016.
15. Mackie, G.O. 1965. Conduction in the nerve-free epithelia of siphonophores. *Amer. Zool.* 5: 439-453.
16. Josephson, R.K. & G.O. Mackie. 1965. Multiple pacemakers and the behaviour of the hydroid *Tubularia*. *J. Exp. Biol.* 43: 292-332.
17. Mackie, G.O. 1966. Growth of the hydroid *Tubularia* in culture. In: "The Cnidaria and their Evolution" (ed. W.J. Rees), Academic Press, New York.
18. Mackie, G.O. 1966. Treatise on the Siphonophora (Book Review), *Science* 152: 944-945.
19. Mackie, G.O., L.M. Passano & M. Pavans de Ceccatty. 1967. Physiologie du comportement de l'Hydroméduse *Sarsia tubulosa* Sars. Les systèmes à conduction aneurale. *Comptes rendus de l'Acad. Sci. Paris* 264: 466-469.

20. Passano, L.M., G.O. Mackie, & M. Pavans de Ceccatty. 1967. Physiologie due comportement du l'Hydroméduse *Sarsia tubulosa* Sars. Les systèmes des activités spontanées. Comptes rendus de l'Acad. Sci. Paris 264: 614-617.
21. Mackie, G.O. & G.V. Mackie. 1967. Mesogloal ultrastructure and reversible opacity in a transparent siphonophore. Vie et Milieu, Sér. A: Biologie marine 28: 47-71.
22. Jha, R.K. & G.O. Mackie. 1967. The recognition, distribution and ultrastructure of Hydrozoan nerve elements. J. Morph. 123: 43-61.
23. Mackie, G.O. & L.M. Passano. 1968. Epithelial conduction in hydromedusae. J. Gen. Physiol. 52: 600-621.
24. Mackie, G.O. 1968. Electrical activity in the hydroid *Cordylophora*. J. Exp. Biol 49: 387-400.
25. Mackie, G.O., A.N. Spencer, & R. Strathmann. 1969. Electrical activity associated with ciliary reversal in an echinoderm larva. Nature 223: 1384-1385.
26. Mackie, G.O. 1970. Neuroid conduction and the evolution of conducting tissues. Quart. Rev. Biol. 45(4): 319-332.
27. Mace, T.F. & G.O. Mackie. 1970. A study of an estuarine lagoon, with particular reference to *Cordylophora lacustris* Allman. Can. J. Zool. 48: 1454-1456.
28. Mackie, G.O. 1971. Neurological complexity in medusae: a report of central nervous organization in *Sarsia*. Actas del 1° Simposio Internacional de Zoofilogenia, Salamanca, pp. 269-280.
29. Galt, C.P. & G.O. Mackie. 1971. Electrical correlates of ciliary reversal in *Oikopleura*. J. Exp. Biol. 55: 205-212.
30. Fields, W.G. & G.O. Mackie. 1971. Evolution of the Chondrophora: Evidence from behavioural studies on *Verella*. J. Fish. Res. Bd. Canada 28: 1595-1602.
31. Mackie, G.O. 1972. The anatomy of the nervous system of *Octopus vulgaris*, by J.Z. Young. Book Review in Science 177: 1183.
32. Mackie, G.O. 1973. Coelenterata. p. 95-97 In: Encyclopedia of Microscopy and Microtechnique (ed. Peter Gray). Van Nostrand Reinhold Co., New York.
33. Mackie, G.O. 1973. Co-ordinated Behaviour in Hydrozoan Colonies. In: Development and Function of Animal Colonies (ed. R.S. Boardman, A.H. Cheetham and W.A. Oliver). Dowden, Hutchinson and Ross, New York.
34. Mackie, G.O. Report on giant nerve fibres in *Nanomia*. 1973. In: Recent Trends in Research in Coelenterate Biology (ed. T. Tokioka). Publ. Seto Mar. Biol. Lab. 20: 745-756.

35. Mackie, G.O. and D.H. Paul. 1973. (abstract) Electrical recordings from tunicate ciliated cells. *Amer. Zool.* 4: 229.
36. Mackie, G.O. 1974. Behaviour of a compound ascidian. *Can. J. Zool.* 52: 23-27.
37. Mackie, G.O. Locomotion, flotation and dispersal. 1974. In: *Coelenterate Biology: Reviews and New Perspectives*. (ed. L. Muscatine and H.M. Lenhoff). Academic Press, New York. p. 313-357.
38. Mackie, G.O., D.H. Paul, C.L. Singla, M.A. Sleight and D.E. Williams. 1974. Branchial innervation and ciliary control in the ascidian *Corella*. *Proc. R. Soc. Lond.* 187: 1-35.
39. Mackie, G.O. and C.L. Singla. 1975. Neurobiology of *Stomatoca*. I. Action systems. *J. Neurobiol.* 6: 339-356.
40. Mackie, G.O. 1975. Neurobiology of *Stomatoca*. II. Pacemakers and conduction pathways. *J. Neurobiol.* 6: 357-378.
41. Bone, Q. and G.O. Mackie. 1975. Skin impulses and locomotion in *Oikopleura* (Tunicata: Larvacea). *Biol. Bull.* 149: 267-286.
42. Mackie, G.O. 1975. (abstract) Spike propagation through coupled gland cells and secretion release. *J. Cell Biol.* 67: 254a.
43. Mackie, G.O., C.L. Singla and C. Thiriot-Quiévreux. 1976. Nervous control of ciliary activity in gastropod larvae. *Biol. Bull.* 151: 182-199.
44. Mackie, G.O. and Q. Bone. 1976. Skin impulses and locomotion in an ascidian tadpole. *J. Mar. Biol. Ass. U.K.* 56: 751-768.
45. Mackie, G.O. 1976. Propagated spikes and secretion in a coelenterate glandular epithelium. *J. Gen. Physiol.* 68: 313-325.
46. Mackie, G.O. (editor) 1976. *Coelenterate Ecology and Behavior*. Plenum Publishing Corp. New York, 725 pp.
47. Mackie, G.O. 1976. The control of fast and slow muscle contractions in the siphonophore stem. In: *Coelenterate Ecology and Behavior* (ed. G.O. Mackie) Plenum Publishing Corp. New York, 647-569.
48. Anderson, P.A.V. and G.O. Mackie. 1977. Electrically coupled, photosensitive neurons controlling swimming in a jellyfish. *Science* 197: 186-188.
49. Mackie, G.O. and Q. Bone. 1977. Locomotion and propagated skin impulses in salps. *Biol. Bull.* 153: 180-197.

50. Bone, Q., P.R. Flood, G.O. Mackie and C.L. Singla. 1977. On the organization of the sarcotubular systems in the caudal muscle cells of larvaceans (Tunicata). *Acta. Zool.* 58: 187-196.
51. Bone, Q., R. Fenaux and G.O. Mackie. 1977. On the external surface in Apendicularia. *Ann. Inst. Océanogr. Paris* 53: 237-244.
52. Bone, Q. and G.O. Mackie. 1977. Ciliary arrest potentials, locomotion and skin impulses in Doliolum (Tunicata: Thaliacea). *Riv. Biol. Norm. Patol.* 3: 181-191.
53. Mackie, G.O. 1978. Coordination in physonectid Siphonophores. *Mar. Behav. Physiol.* 5: 325-346.
54. Mackie, G.O. and Q. Bone. 1978. Luminescence and ciliary control in Pyrosoma. *Proc. Roy. Soc. B.* 202: 483-495.
55. Bassot, J.M., A. Bilbaut, G.O. Mackie, L.M. Passano and M. Pavans de Ceccatty. 1978. Bioluminescence and other responses spread by epithelial conduction in the siphonophore Hippopodius. *Biol. Bull.* 155: 473-479.
56. Anderson, P.A.V., Q. Bone, G.O. Mackie and C.L. Singla. 1979. Epithelial conduction in salps II. The role of nervous and non-nervous conduction system interactions in the control of locomotion. *J. Exp. Biol.* 80: 241-250.
57. Mackie, G.O. 1979. Is there a conduction system in sponges? pp 145-151 in C. Levi and N. Boury-Esnault (eds.) *Biologie des Spongiaires*. CNRS Paris.
58. Mackie, G.O. 1980. Epithelium. pp 177-178. In: *Yearbook of Science and Technology*. McGraw Hill, New York.
59. Donaldson, S., G.O. Mackie and A. Roberts. 1980. Preliminary observations on escape swimming and giant neurons in Aglantha digitale (Hydromedusae: Trachylina). *Can. J. Zool.* 58: 549-552.
60. Hernandez-Nicaise, M.L., G.O. Mackie and R.W. Meech. 1980. Giant smooth muscle cells of Beroe: ultrastructure, innervation and electrical properties. *J. Gen. Physiol.* 75: 79-105.
61. Prosser, C.L. and G.O. Mackie. 1980. Contractions of holothurian muscles. *J. Comp. Physiol.* 136: 103-112.
62. Roberts, A. and G.O. Mackie. 1980. Escape swimming and "giant" neurons in a small jellyfish. *J. Exp. Biol.* 84: 303-318.
63. Mackie, G.O. 1980. Jellyfish neurobiology since Romanes. *Trends in Neuroscience.* 13-16.
64. Mackie, G.O. 1980. Slow swimming and cyclical "fishing" behavior in Aglantha digitale (Hydromedusae: Trachylina). *Can. J. Fish. Aquat. Sci.* 37: 1550-1556.

65. Mackie, G.O., R.J. Larson, K.S. Larson and L.M. Passano. 1981. Swimming and vertical migration of *Aurelia aurita* (L) in a deep tank. *Mar. Behav. Physiol.* 7: 321-329.
66. Lawn, I.D., G.O. Mackie and G.A. Silver. 1981. A conduction system in a sponge. *Science* 211: 1169-1171.
67. Mackie, G.O. 1981. Plugged syncytial interconnections in hexactinellid sponges. *J. Cell Biol.* 91: 103a.
68. Pavans de Ceccatty, M. and Mackie, G.O. 1982. Genèse et interconnexions syncytiales et cellulaires chez une éponge hexactinellide en cours de réaggrégation après dissociation in vitro. *C.R. Acad. Sci. Paris* 294: 939-944.
69. Bone, Q. and Mackie, G.O. 1982. Urochordata. In: *Electrical Conduction and Behaviour in 'Simple' Invertebrates* (ed. G.A.B. Shelton). Clarendon Press, Oxford, pp. 473-536.
70. Mackie, G.O. and Carré, D. 1983. Coordination in a diphyid siphonophore. *Mar. Behav. Physiol.* 9: 139-170.
71. Mackie, G.O. and Mills, C.E. 1983. Use of the PISCES IV submersible for zooplankton studies in coastal waters of British Columbia. *Can. J. Fish. Aquat. Sci.* 40: 763-776.
72. Mackie, G.O. and Singla, C.L. 1983. Studies on hexactinellid sponges I. Histology of *Rhabdocalyptus dawsoni* (Lambe, 1873). *Phil. Trans. Roy. Soc. London.* B301: 365-400.
73. Mackie, G.O., Lawn, I.D. and Pavans de Ceccatty, M. 1983. Studies on hexactinellid sponges II. Excitability, conduction and coordination of responses in *Rhabdocalyptus dawsoni* (Lambe, 1873). *Phil. Trans. Roy. Soc. London.* B301: 401-418.
74. Reiswig, H.M. and Mackie, G.O. 1983. Studies on hexactinellid sponges III. The taxonomic status of Hexactinellida within the Porifera. *Phil. Trans. Roy. Soc. London.* B301: 419-428.
75. Mackie, G.O. and Singla, C.L. 1983. Coordination of compound ascidians by epithelial conduction in the colonial blood vessels. *Biol. Bull.* 165: 209-220.
76. Mackie, G.O. 1984. Fast pathways and escape behavior in Cnidaria. Ch. 2, pp. 15-42 in: R.C. Eaton (ed.) *Neural Basis of Startle Behavior*. Plenum. New York.
77. Mackie, G.O. 1984. Introduction to the Diploblastic Level. Ch. 4, pp. 43-46 in: *Biology of the Integument, Vol. 1: Invertebrates* (eds. J. Bereiter-Hahn, A.G. Matoltsy and K.S. Richards), Springer-Verlag, Heidelberg. Ch. 4: pp 43-46.
78. Mackie, G.O., Anderson, P.A.V. and Singla, C.L. 1984. Apparent absence of gap junctions in two classes of cnidaria. *Biol. Bull.* 167: 120-123.

79. Mackie, G.O. and Stell, W.K. 1984. FMRFamide-like immunoreactivity in the neurons of medusae. *Am. Zool.* 24: 201.
80. Mackie, G.O. 1984. Submersible observations of plankton distribution in Saanich Inlet. p. 81 in Juniper, S.K. and R.O. Brinkhurst (eds.). Proceedings of a multidisciplinary symposium on Saanich Inlet, 2nd February 1983. *Can. Tech. Rep. Hydrogr. Ocean Sci.* 38: 104 pp (abstract).
81. Mackie, G.O. and Meech, R.W. 1985. Separate sodium and calcium spikes in the same axon. *Nature* 313: 791-793.
82. Kerfoot, P.A.H., Mackie, G.O., Meech, R.W., Roberts, A. and Singla, C.L., 1985. Neuromuscular transmission in the jellyfish *Aglantha digitale*. *J. Exp. Biol.* 116: 1-25.
83. Mackie, G.O. 1985. Zoology/Invertebrates In: New Canadian Encyclopedia. New Canadian Encyclopedia Publishing Ltd., Edmonton.
84. Mills, C.E., Mackie, G.O. and Singla, C.L. 1985. Giant nerve axons and escape swimming in *Amphogona apicata* with notes on other hydromedusae. *Can. J. Zool.* 63: 2221-2224.
85. Mackie, G.O. 1985. Midwater plankton of British Columbia studied by submersible PISCES IV. *J. Plankton Res.* 7: 753-777.
86. Mackie, G.O., Singla, C.L. and Stell, W.K. 1985. Distribution of nerve elements showing FMRFamide-like immunoreactivity in hydromedusae. *Acta Zoologica.* 166: 199-210.
87. Mackie, G.O. 1986. "Portuguese man-of-war" (vol. 15, p. 700) and "Sea fan" (vol. 17, p. 261) in: The World Book Encyclopedia, World Books, Inc. Chicago.
88. Mackie, G.O. 1986. From aggregates to integrates: physiological aspects of modularity in colonial animals. *Phil. Trans. Roy. Soc B.* 313: 175-196.
89. Mackie, G.O. 1986. Conduction and contraction in the tunic of a compound ascidian. *Amer. Zool.* 26: 130A.
90. Mackie, G.O. 1986. Donald Murray Ross, 1914-1986 (obituary), *Trans. Roy. Soc. Canada Ser V*, Vol. 1, 340-342.
91. Mackie, G.O. 1987. Nerve nets in G. Adelman (ed.) *Encyclopedia of Neuroscience*. Vol. II: 747-748. Reprinted 1988 in L.N. Irwin (ed.). *Comparative Neuroscience and Neurobiology*. Birkhäuser. Boston. 84-86.
92. Mackie, G.O., Pugh, P.R. and Purcell, J.E. 1987. Siphonophore Biology. *Advances in Marine Biology* 24: 97-262. Figs. 1-49.
93. Mackie, G.O. and Singla, C.L. 1987. Impulse propagation and contraction in the tunic of a compound ascidian. *Biol. Bull.* 173: 188-204.

94. Arkett, S.A., Mackie, G.O. and Meech, R.W. 1987. Hair cell mechanoreception in the jellyfish *Aglantha digitale*. J. Exp. Biol. 173: 188-204.
95. Arkett, S.A., Mackie, G.O. and C.L. Singla. 1987. Neuronal control of ciliary locomotion in a gastropod veliger (*Calliostoma*). Biol. Bull. 173, 513-526.
96. Mackie, G.O., Mills, C.E. and Singla, C.L. 1988. Structure and function of the prehensile tentilla of *Euplokamis dunlapae* (Ctenophora, Cydippida). Zoomorphology 107: 319-337.
97. Mackie, G.O. and Marx, R.M. 1988. Phosphatic spicules in the nematocyst batteries of *Nanomia cara* (Siphonophora: Physonectae). Zoomorphology 108: 85-91.
98. Mackie, G.O., Singla, C.L. and Arkett, S.A. 1988. On the nervous system of *Velella* (Hydrozoa: Chondrophora). J. Morph. 198: 15-23.
99. Mackie, G.O. 1989. Louis Agassiz and the discovery of the coelenterate nervous system. Hist. Philos. Life Sciences 11: 71-81.
100. Arkett, S.A., Mackie, G.O. and Singla, C.L. 1989. Neuronal organization of the ascidian branchial basket revealed by cholinesterase activity. Cell. Tissue. Res. 257: 285-294
101. Mackie, G.O., Nielsen, C. and Singla C. 1989. The tentacle cilia of *Aglantha digitale* (Hydrozoa-Trachylina) and their control. Acta Zoologica 70: 133-141.
102. Meech, R.W., Arkett, S.A., Mackie, G.O. and Maitland, N.J. 1989. Potassium channel family in the jellyfish *Aglantha*. Soc. Neuroscience abstracts, 15(1): 77.
103. Mackie, G.O. and Meech, R.W. (1989). Potassium channel family in axons of the jellyfish *Aglantha digitale*. J. Physiol. 418: 14P.
104. Mackie, G.O. and Paul, D.H. (1990) Nervous Systems in Invertebrates. ed. M.A. Ali (book review). American Scientist 78:56.
105. Mackie, G.O. 1990. Zoology at the University of Victoria. Bull. Can. Soc. Zool. 21 (1), 13-14.
106. Mackie, G.O. 1990. Evolution of cnidarian giant axons. pp 395-407. in P.A.V. Anderson (ed.) Evolution of the First Nervous Systems. Plenum Publishing Corp. New York.
107. Mackie, G.O. The Biology of Nematocysts. eds. D.A. Hessinger and H.M. Lenhoff (book review). American Scientist.
108. Mackie, G.O. 1990. Giant axons and control of jetting in the squid *Loligo* and the jellyfish *Aglantha*. Can. J. Zool. 68: 799-805.
109. Mackie, G.O. 1990 The elementary nervous system revisited. Amer. Zool. 30: 907-920.

110. Mackie, G.O. 1991. A history of the international conferences on coelenterate biology. *Hydrobiologia* 216, IX-X.
111. Mackie, G.O. 1991. Propagation of bioluminescence in *Euphysa japonica* (Hydromedusae: Tubulariidae). *Hydrobiologia* 216, 581-588.
112. Singla, C.L. and Mackie, G.O. 1991. Immunogold labelling of FMRFamide-like neuropeptide in neurons of *Aglantha digitale* (Hydromedusae: Trachylina). *Can. J. Zool.* 69, 800-802
113. Bickell-Page, L.R. and Mackie, G.O. 1991. Tentacle autotomy in the hydromedusa *Aglantha digitale*: an ultrastructural and neurophysiological investigation. *Phil. Trans. Roy. Soc. London. B* 331, 155-170.
114. Gilly, W.F. and Mackie, G.O. 1991. Development of the giant motor axons and neural control of the escape response in squid embryos and hatchlings. *Biol. Bull.* 180, 209-220.
115. Mackie, G.O., Mills, C.E. and Singla, C.L. (1992). Giant axons and escape swimming in *Euplokamis dunlapae* (Ctenophora: Cydippida). *Biol. Bull.* 182: 248-256.
116. Meech, R.W. and Mackie, G.O. (1993). Ionic currents in giant motor axons of *Aglantha digitale*. *J. Neurophysiol* 69(3): 884-93.
117. Meech, R.W. and Mackie G.O.(1993). Potassium channel family in giant motor axons of *Aglantha digitale*. *J. Neurophysiol* 69(3): 894-901.
118. Leys, S.P. and Mackie, G.O. (1994). Cytoplasmic streaming in the hexactinellid sponge *Rhabdocalyptus dawsoni* (Lambe,1873). in *Sponges in Time and Space* (Proceedings of the 4th International Porifera Congress), edited by R.W.M. van Soest, T.M.G. Kempen & J.-C. Braekman, Balkema, Rotterdam.
119. Mackie, G.O. (1995). On the visceral nervous system of *Ciona*. *J. Mar. Biol. Ass. UK* 75, 141-151.
120. Meech, R.W and Mackie, G.O. (1995). Synaptic potentials and threshold currents underlying spike production in motor giant axons of *Aglantha digitale*. *J. Neurophysiol.* 74, 1662-1670.
121. Mackie, G.O. and Meech, R.W. (1995). Central circuitry in *Aglantha* I. The relay system. *J. Exp. Biol.* 198, 2261-2270.
122. Mackie, G.O. and Meech, R.W. (1995). Central circuitry in *Aglantha* II. The ring giant and carrier systems. *J. Exp. Biol.* 198, 2271-2278.

123. Mackie, G.O. (1995). Defensive strategies in planktonic coelenterates. *Mar. Fresh. Beh. Physiol.* 26, 119-129.
124. Mackie, G.O. (1995). Unconventional signalling in tunicates. *Mar. Fresh. Beh. Physiol.* 26, 197-205
125. Cameron, C.B. and Mackie, G.O. (1996). Conduction pathways in the nervous system of *Saccoglossus* sp. (Enteropneusta). *Can. J. Zool.* 74, 15-19.
126. Wyeth, R.C., Leys, S.P and Mackie, G.O. (1996) Use of sandwich cultures for the study of feeding in the hexactinellid sponge *Rhabdocalyptus dawsoni* (Lambe, 1892). *Acta Zoologica* 77, 227-232.
127. Powell, J.F.F., Reska-Skinner, S.M., Om Prakash, M., Fischer, W.H., Park, M., Rivier, J.E., Craig, A.G., Mackie, G.O. and Sherwood, N.M. (1996). Two new forms of gonadotropin-releasing hormones in a protochordate and the evolutionary implications. *Proc. Nat. Acad. Sci. USA* 93, 10461-10464.
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129. Moroz, L.L., Mackie, G.O. and Meech, R.W. (1997). The distribution and action of nitric oxide in the jellyfish *Aglantha digitale* (Hydromedusae: Trachylina). Abstract No 19P, The Physiological Society, 27, 28 May 1997.
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