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EDUCATION

Tufts University, B.S. 1959 (Biology); Rutgers University, M.S. 1962; Ph.D. 1964 (Zoology/Physiology); Research Associate/Assistant Professor, 1975-82 (Laboratory for Human Reproduction and Reproductive Biology) Harvard Medical School

HONORS AND FELLOWSHIPS

B.S. magna cum laude (1959)
Phi Beta Kappa (1958)
Fulbright Scholar, University of Sheffield, England (1960-61)
National Science Foundation Pre-doctoral Fellow (1961-63)
Fellow (1982- present), American Association for the Advancement of Science
Boston University Methodist Teacher-Scholar of the Year (1986)
Lifetime Achievement Award, International Symposium on Fish Endocrinology (ISFE) (2012)

PROFESSIONAL SOCIETIES

Phi Beta Kappa
American Association for the Advancement of Science: elected Fellow (1982); Council Delegate, Biological Sciences (l992-1995)
The Endocrine Society
Society for the Study of Reproduction
The Society for Neuroscience

COURSES TAUGHT

Neuroendocrinology (BI554/NE554), upper division undergraduate/graduate); Brain, Hormones and Behavior (BI111, lower division undergraduate/non-science majors)

FULL PAPERS

1. Callard GV, Callard IP and Leathem JH 1965 20α-hydroxy-pregn-4-3-one, an interfering fluorogen in the assay of corticosterone. Proc Soc Exp Biol Med 118:745-747
2. Callard GV and Leathem JH 1965 In vitro synthesis of steroids by experimentally induced cystic ovaries. Proc Soc Exp Biol Med 118:996-999
3. Callard GV and DeMerre LH 1966 Beta-glucuronidase during menstruation. Fertil Steril 17:547-555
4. Callard GV, Litofsky FS and DeMerre LJ 1966 Menstruation in women with normal or artificially controlled cycles Fertil Steril 17:684-688
5. Callard IP, Chan SWC and Callard GV 1973 Hypothalamic-pituitary-adrenal relationships in reptiles. In: Brodish A. and Redgate M (eds) Brain-Pituitary-Adrenal Interrelationships, Karger, Basel, pp. 270-292

6. Callard GV 1973 Hormonal Integration. In: Suthers R and Gallant R (eds.) Biology: a Behavioral View, Wiley, pp. 355-372
7. Callard GV 1975 Control of the interrenal gland of the freshwater turtle Chrysemys picta in vivo and in vitro. Gen Comp Endocrinol 25:323-331
8. Callard GV 1975 Corticotropic effects on isolated interrenal cells of the turtle (Chrysemys picta). Gen Comp Endocrinol 26:301-309
9. Callard GV, Callard IP and Chan SWC 1975 Negative feedback control of the lizard adrenal gland by corticosterone and aldosterone. Gen Comp Endocrinol 25:387-390
10. Callard GV, Chan SWC and Callard IP 1975 The effect of temperature on ACTH-stimulated adrenocorticoid secretion and carbohydrate metabolism in the lizard (Dipsosaurus dorsalis) J Comp Physiol 99:271-277
11. Laub JM, Callard GV and Callard IP 1975 The role of adrenal steroids in the negative feedback control of the amphibian adrenal gland. Gen Comp Endocrinol 25:425-431
12. Callard IP, Callard GV, Lance V and Eccles S 1976 Seasonal changes in testicular structure and function and the effects of gonadotropins in the freshwater turtle (Chrysemys picta).Gen Comp Endocrinol 30:347-356
13. Callard IP, McChesney I, Scanes C and Callard GV 1976 The influence of mammalian and avian gonadotropins on in vitro ovarian steroid synthesis in the turtle (*Chrysemys picta*).Gen Comp. Endocrinol 28:2-9
14. Callard GV and Ryan KJ 1977 Gonadotropin action and androgen synthesis in enzyme dispersed testicular cells of the turtle (*Chrysemys picta*). Gen Comp Endocrinol 31:414-421
15. Callard GV, Petro Z and Ryan KJ 1977 Identification of aromatase in reptilian brain. Endocrinology 100:1214-1218
16. Callard IP, Callard GV, Lance V, Bolaffi JL and Rosset JS 1978 Testicular regulation in non-mammalian vertebrates. Biol Reprod 18:16-43
17. Callard GV, Petro Z and Ryan KJ 1978 Androgen metabolism in the brain and non-neural tissues of the bullfrog, Rana catesbeiana. Gen Comp Endocrinol 34:18-55
18. Callard IP and Callard GV 1978 The reptilian adrenal cortex. In: Chester Jones I and Henderson IW (eds.) General, Clinical and Comparative Endocrinology of the Adrenal Cortex, Vol.2, Academic Press, New York, pp.370-418
19. Callard GV, Petro Z and Ryan KJ 1978 Conversion of androgen to estrogen and other steroids in the vertebrate brain. Amer Zool 18:511-523
20. Callard GV, Petro Z and Ryan KJ 1978 Phylogenetic distribution of aromatase and other androgen converting enzymes in the central nervous system. Endocrinology 103:2283-2290
21. Callard GV, Hoffman RA, Petro Z and Ryan KJ 1979 In vitro aromatization and other androgen transformations in the brain of the hamster (*Mesocricetus auratus*). Biol Reprod 21:33-38
22. Callard IP, Callard GV and Lance V 1979 Lower vertebrate animal models in reproduction research. In: Animal Models for Research on Contraception and Fertility, National Academy of Sciences, New York, pp. 346-359.
23. Callard GV and Petro Z 1979 Estrogen synthesis in dogfish testis. The Bulletin, Mount Desert Island Biological Laboratory 19:38-40
24. Callard GV, Petro Z and Ryan KJ 1980 Aromatization and 5α-reduction in brain and non-neural tissues of a cyclostome (*Petromyzon marinus*). Gen Comp Endocrinol 42:155-159
25. Callard GV, Petro Z and Ryan KJ 1980 Aromatization of androgen to estrogen in cultured turtle brain cells. Brain Res 202:117-130

26. Callard GV, Canick JA and Pudney J 1980 Estrogen synthesis in Leydig cells: structural-functional correlates in *Necturus* testis. Biol Reprod 23:461-479
27. Callard GV 1981 Aromatization is cyclic AMP-dependent in cultured brain cells. Brain Res 204:451-454
28. Callard GV, Petro Z, Ryan KJ and Claiborne JB 1981 Estrogen synthesis in vivo and in vitro in the brain of a marine teleost (*Myoxocephalus*). Gen Comp Endocrinol 43:243-255
29. Callard GV, Petro Z and Ryan KJ 1981 Biochemical evidence for aromatization of androgen to estrogen in the pituitary. Gen Comp Endocrinol 44:359-364
30. Kime KE and Callard GV 1982 Formation of 15α-hydroxylated androgens by the testis and other tissues of the sea lamprey, *Petromyzon marinus*, in vitro. Gen Comp Endocrinol 46:267-270
31. Callard GV, Petro Z and Tyndale-Biscoe CH 1982 Aromatase activity in marsupial brain, ovaries and adrenals. Gen Comp Endocrinol 46:541-546
32. Callard GV 1985 Estrogen synthesis and other androgen converting pathways in vertebrate brain and pituitary: role in hormone action. In: Lofts B and Holmes WN (eds) CurrentTrends in Comparative Endocrinology, Vol 2, Hong Kong Univ.Press, pp. 1179-1184
33. Callard GV, Pudney J and Canick J 1982 Topographic distribution of steroidogenic enzymes in *Squalus* testis: structural and functional correlations. The Bulletin, Mount Desert Island Biological Laboratory 21:27-40.
34. Callard GV 1982 Aromatase in the teleost brain and pituitary: role in hormone action. In: Richter CJJ and Goos HJTH (eds) Physiology of Reproduction in Fish, Pudoc, Wageningen, The Netherlands, pp. 40-44
35. Mak P, Callard IP and Callard GV 1983 Characterization of an estrogen receptor in the testis of the urodele amphibian *Necturus maculosus*. Biol Reprod 28:261-270
36. Pudney J, Canick JA, Mak P and Callard GV 1983 The differentiation of Leydig cells, steroidogenesis and the spermatogenic wave in the testis of *Necturus maculosus*. Gen Comp Endocrinol 50:43-66
37. Callard GV, Kunz T and Petro Z 1983 Identification of androgen metabolic pathways in the brain of little brown bats (*Myotis lucifugus*): sex and seasonal differences. Biol Reprod 28:1115-1119
38. Callard GV, Petro Z and Tashjian, Jr. AH 1983 Identification of aromatase activity in rodent pituitary cell strains. Endocrinology 113:152-158
39. Callard GV, Manz L, Petro Z and Claiborne JB 1983 Brain estrogen biosynthesis and estrogen conjugation systems in the sculpin (*Myoxocephalus*). The Bulletin, Mount Desert Island Biological Laboratory 22:41-43
40. Callard GV, Manz L and Mak P 1983 Identification of an estrogen receptor in the testis of the shark *Squalus acanthias*. The Bulletin, Mount Desert Island Biological Laboratory 22:43-44
41. Pudney JP, Callard GV and Canick J 1983 Morphological identification of steroid producing cells in the testis of *Squalus acanthias*. The Bulletin, Mount Desert Island Biological laboratory 22:14-15.
42. Callard GV 1983 Androgen and estrogen actions in the vertebrate brain. Amer Zool 23: 607-620
43. Callard GV 1984 Aromatization in brain and pituitary: an evolutionary perspective. In: Celotti F, Martini L and Naftolin F (eds), Metabolism of Hormonal Steroids in the Neuroendocrine Structures, Raven Press, New York, pp.79-102
44. Canick JA, Fox CD and Callard GV 1984 Studies on cytochrome P-450 dependent microsomal enzymes of testicular androgen and estrogen biosynthesis in a urodele amphibian, *Necturus*. J Steroid Biochem 21:15-20
45. Callard GV, Pudney JA, Kendall SL and Reinboth R 1984 In vitro conversion of androgen to estrogen in amphioxus gonadal tissue. Gen Comp Endocrinol 56:53-58

46. Pudney J and Callard GV 1984 Organization of the interstitial tissue in the testis of the urodele *Necturus*. J Morph 181:87-95
47. Pudney J and Callard GV 1984 Development of the agranular endoplasmic reticulum in the Sertoli cell of the shark *Squalus acanthias* during spermatogenesis. Anat Rec 209:311- 321
48. Pudney J and Callard GV 1984 Identification of Leydig-like cells in the intersitium of the shark testis (*Squalus acanthias*) Anat Rec 209:321-330
49. Callard GV and Mak P 1985 Exclusive nuclear location of estrogen receptors in *Squalus* testis. Proc Natl Acad Sci USA 82:1336-1340
50. Pudney J, Canick J and Callard GV 1985 The testis and reproduction in male *Necturus* with emphasis on *N. lewisi*(Brimley). In: Braswell A and Ashton R (eds) The Biology of *Necturus*, Brimleyana (North Carolinaa State Natural History Museum) 10:53-74
51. Olivereau M and Callard GV 1985 Distribution of cell types and aromatase activity in the sculpin (*Myoxocephalus*) pituitary. Gen Comp Endocrinol 58:280-290
52. Mak P and Callard GV 1985 Characterization of cytosolic and nuclear estrogen receptors in the hamster brain. J Steroid Biochem 22:355-361
53. Callard GV, Pudney JA, Mak P and Canick J 1985 Stage-dependent changes in steroidogenic enzymes and estrogen receptors during spermatogenesis in the testis of the dogfish *Squalus acanthias*. Endocrinology 117:1328-1335
54. Pudney J, Koob T, and Callard GV 1984 Identification of Sertoli cell remnants in semen of *Squalus acanthias*. The Bulletin, Mount Desert Island Biological Laboratory 24:93
55. Mak P, Koob T, and Callard GV 1984 Evidence that estrogen receptor activation can occur entirely within the nucleus. The Bulletin, Mount Desert Island Biological Laboratory 24:93
56. Pasmanik M and Callard GV 1985 Aromatase and 5α-reductase in the teleost brain, spinal cord and pituitary gland. Gen Comp Endocrinol 60:244-251
57. Pudney J, Canick JA, Clifford NM, Knapp JB and Callard GV1985 Location of enzymes of androgen and estrogen biosynthesis in the testis of the ground squirrel *Citellus lateralis*. Biol Reprod 33:971-980
58. Rosenblum PM, Yamada L, Callard IP and Callard GV 1985 Validation of radioimmunoassay systems for the measurement of 11-keto and 11B-hydroxytestosterone in teleost blood. Comp Biochem Physiol 82B: 659-665
59. Ruh MF, Singh RH, Mak P and Callard GV 1986 Tissue and species specificity of nuclear acceptor sites for the estrogen receptor of *Squalus* testis. Endocrinology 118:811-818
60. Pudney J and Callard GV 1986 Sertoli cell cytoplasts in the semen of the spiny dogfish (*Squalus acanthias*). Tissue and Cell 18:375-382
61. Callard GV, Mak P and Solomon D 1986 Effects of short days on aromatization and accumulation of nuclear estrogen receptors in hamster brain. Biol Reprod 35:282-291
62. Pasmanik M and Callard GV 1986 Characteristics of a testosterone-estradiol binding globulin (TEBG) in goldfish serum. Biol Reprod 35:838-845
63. Callard GV, Olivereau M and Craig J 1986 Identification and intraglandular distribution of aromatase in eel (Anguilla rostrata) pituitary. The Bulletin, Mount Desert Island Biological Laboratory 25:6-7
64. Callard GV 1986 A review of Marshall's Physiology of Reproduction, Lamming GE (ed), Vol 1, Reproductive Cycles inVertebrates, Churchill Livingstone, New York, 1984, in Amer Zool 26:1055-1056
65. Callard IP and Callard GV 1987 Sex steroid receptors and nonreceptor binding proteins. In: Norris DO and Jones RE (eds), Reproductive Endocrinology of Fishes, Amphibians and Reptiles, Chapter 12, Plenum, New York, pp 355-384

66. Callard GV 1987 A review of Principles of Neural Development, Purves D and Lichtmann JW, Sinauer, Sunderland MA, 1985, 433 pp. J Coll Sci Teaching 16:490-491
67. Cleeman L, Dukes I, Morad M, Craig J and Callard GV 1987 Effects of estradiol on membrane properties of cultured goldfish (*Carassius auratus*) neurons. The Bulletin, Mount Desert Island Biological Laboratory 26:33-36
68. Cuevas ME and Callard GV 1987 Characterization and stage-dependent distribution of an estrogen sulfotransferase in the testis of the dogfish *Squalus acanthias*. The Bulletin Mount Desert Island Biological Laboratory 26:40-42
69. Schlinger BA and Callard GV 1987 A comparison of aromatase 5α- and 5ß-reductase in brain and pituitary of male and female quail (*Coturnix c. japonica*). J Exp Zool 242:171-180
70. Schlinger BA, Palter B and Callard GV 1987 A method to quantify aggressiveness in Japanese quail (*Coturnix c. japonica*). Physiol Behav 40:343-348
71. Mak P and Callard GV 1987 A novel steroid binding protein in the testis of the dogfish *Squalus acanthias*. Gen Comp Endocrinol 68:104-112
72. Callard GV and Pasmanik M 1987 The role of estrogen as a parahormone in brain and pituitary. In: (RJ Santen, ed) Aromatase: Future Perspectives. Steroids 50:475-493
73. Kitawaki J, Osawa Y and Callard GV 1987 Aromatase isozyme in goldfish brain and stereochemistry or aromatization. In:(RJ Santen, ed), Aromatase: Future Perspective. Steroids 50:637-638
74. Callard GV 1988 Reproductive Physiology: (B) The Male. In: (Shuttleworth TJ) Physiology of Elasmobranch Fishes, Springer Verlag, New York, pp. 292-317
75. Pasmanik M and Callard GV 1988 Changes in brain aromatase and 5α-reductase activities correlate significantly with seasonal reproductive cycles in goldfish (*Carassius auratus*) Endocrinology 122:1349-1356
76. Pasmanik M, Schlinger BA and Callard GV 1988 In vivo steroid regulation of aromatase and 5α-reductase activities in brain and pituitary of goldfish. Gen Comp Endocrinol 71:175-182
77. Pasmanik M and Callard GV 1988 A high abundance androgen receptor in goldfish brain: characteristics and seasonal changes. Endocrinology 123:1162-1171
78. Callard GV and Dubois W 1988 Methods for isolation and culture of staged spermatogenic lobules and staged Sertoli cells from dogfish testis. The Bulletin, Mount Desert Island Biological Laboratory 27:30-32
79. Callard GV, Specker J, Knapp J, Nishioka R, and Bern H 1988 Aromatase is concentrated in the proximal pars distalis of tilapia pituitary. Gen Comp Endocrinol 71:70-79
80. Callard GV and Mak P 1988 Characteristics and stage-dependent distribution of a novel steroid binding protein *Squalus* testis. Steroids 52:359-360
81. Schlinger BS and Callard GV 1989 Localization of aromatase in synaptosomal and microsomal subfractions of quail (*Coturnix c. japonica*) brain. Neuroendocrinology 49:434-441
82. Schlinger BS and Callard GV 1989 Aromatase activity in quail brain: correlation with aggressiveness. Endocrinology 124:437-443
83. Schlinger BS and Callard GV 1989 Estrogen receptors in quail brain: a functional relationship to aromatase and aggressiveness. Biol Reprod 40:268-275
84. Cuevas ME and Callard GV 1989 In vitro steroid secretion by Sertoli/germ cell units (spermatocysts) derived from dogfish (*Squalus acanthias*) testis. The Bulletin, Mount Desert Island Biological Laboratory 28:30-31
85. DuBois W, Mak P and Callard GV 1989 Sertoli cell functions during spermatogenesis: the shark testis model. Fish Physiol Biochem 7:221-227

86. Singh S and Callard GV 1989 A specific androgen binding protein (ABP) in *Necturus* testis and its zonal distribution J Exp Zool 250:73-81
87. Schlinger BA, Fivizzani AJ and Callard GV 1989 Aromatase, 5α- and 5ß-reductase activities in brain, pituitary and skin of the sex role-reversed Wilson's phalarope. J Endocrinol 122:573-581
88. Callard GV, Mak P, DuBois W and Cuevas M 1989 Regulation of spermatogenesis: the shark testis model. In: Evolutionary and Contemporary Biology of Elasmobranchs (Hamlett W, and Tota B, eds.) J Exp Zool Suppl 2, 23-34
89. Barry T and Callard GV 1990 Identification and stage- related synthesis of 11-deoxycorticosterone (DOC) by the dogfish (*Squalus acanthias*) testis. The Bulletin, Mount Desert Island Biological Laboratory 29:133-134
90. Cuevas ME and Callard GV 1990 A testosterone-binding component having characteristics of an androgen receptor is concentrated in premeiotic stages during spermatogenesis in he dogfish (*Squalus acanthias*). The Bulletin, Mount Desert Island Biological Laboratory 29:133-134
91. Schlinger BA and Callard GV 1990 Aromatization mediates aggressive behavior in quail. Gen Comp Endocrinol 79:39-53
92. Callard GV, Schlinger BA, Pasmanik M and Corina K 1990 Aromatization and estrogen action in brain. In: Epple A, Scanes CG, and Stetson MH (eds), Progress in Comparative Endocrinology, Liss-Wiley, NY. Progr in Clin and Biol Res 342:105-111
93. Schlinger BA and Callard GV 1990 Aggressive behavior in birds: an experimental model for studies of brain-steroid interactions. Comp Biochem Physiol 97A:307-316
94. Callard GV, Schlinger BA, and Pasmanik M 1990 Non-mammalian vertebrate models in studies of brain-steroid interactions. In: Callard IP and Callard GV (eds), Unconventional Vertebrate Models for Endocrine Research, J Exp Zool, Suppl. 4:6-16
95. DuBois W and Callard GV 1990 The shark testis model: stage-dependent functions and the regulation of spermatogenesis. In: Callard IP and Callard GV (eds), Unconventional Vertebrate Models for Endocrine Research, J Exp Zool, Suppl. 4:142-144
96. Callard GV 1991 Spermatogenesis. In: Pang P and Schreibman M (eds), Vertebrate Endocrinology: Fundamentals and Medical Implications, Vol 4, Part A, Academic Press, NY. pp. 304-341
97. Schlinger BA and Callard GV 1991 Brain-steroid interactions and the control of aggressiveness in birds. In: Muller EE and MacLeod RM (eds), Neuroendocrine Perspectives, Vol 9, Springer-Verlag, NY, pp. 1-43
98. Callard GV 1991 Reproduction in male elasmobranchs, In: Kinne RKH, Kinne-Saffran E, and Beyenbach KW (eds), Oogenesis, Spermatogenesis, and Reproduction, Comparative Physiology, Vol 10, Karger, Basel, pp.104-154
99. Soder O, Syed B, Froysa B, Callard GV, Toppari J, Pollanen P, Parvinen M and Ritzen EM 1991 Production and secretion of an interleukin-1-like factor correlates with spermatogonial DNA synthesis in the rat seminiferous tubule. Int J Androl 14: 223-231
100. Redding JM and Callard GV 1991 Regulation of DNA and protein synthesis in the dogfish (*Squalus acanthias*) testis. The Bulletin, Mount Desert Island Biological Laboratory 30: 30-32
101. DuBois W and Callard GV 1991 Culture of intact Sertoli/germ cell units and isolated Sertoli cells from *Squalus* testis (I) Evidence of stage-related functions in vitro. J Exp Zool 258: 359-372
102. Callard GV and Gelinas D 1991 Intracellular and neuroanatomic location of aromatase and androgen receptors in goldfish (*Carassius auratus*) brain: basis for functional interactions. In: Scott AP, Sumpter JP, Kime DE, and Rolfe MS (eds), Reproductive Physiology of Fish, Proc 4th Int Symp on the Reprod Physiol of Fish, Fish Symp 91, Sheffield pp. 218-220.

103. Callard GV l992 The autocrine and paracrine role of steroids during spermatogenesis: Studies in *Squalus acanthias* and *Necturus maculosus*. In: Grier H and Cochran R (eds) Proc of a Symp on the Chordate Testis, J Exp Zool 260(3): 132-l42.
104. Singh S and Callard GV l992 Identification of an androgen receptor in the zonal testis of the salamander *Necturus maculosus*. Gen Comp Endocrinol 86:220-230.
l05. Cuevas ME and Callard GV l992 Androgen and progesterone receptors in shark (*Squalus*) testis: characteristics and stage-related distribution. Endocrinology 130:2173-2l82.
l06. Cuevas ME and Callard GV l992 In vitro steroid secretion by staged spermatocysts (Sertoli/germ cell units) of dogfish (*Squalus acanthias*) testis. Gen Comp Endocrinol 88: l5l-l65.
l07. Piferrer F and Callard GV l992 Paracrine regulation of premeiotic germ cell proliferation in the testis of the spiny dogfish, *Squalus acanthias*. The Bulletin, Mount Desert Island Biological Laboratory 3l:49-50.
l08. Betka M, Haverly JE and Callard GV l992 Stage-dependency of proteins and gelatinolytic proteinase activities during spermatogenesis. The Bulletin, Mount Desert Island Biological Laboratory 3l:47-48.
l09. Cuevas ME, Miller W and Callard GV l992 Sulfoconjugation of steroids and the vascular pathway of communication in dogfish testis. J Exp Zool 264: ll9-l29.
110. Cuevas ME, Collins K and Callard GV l993 Stage-related changes in steroid converting enzymes in *Squalus* testis: synthesis of biologically active metabolites via 3ß-hydroxysteroid dehydrogenase/isomerase (3ßHSD/isomerase) and 5α-reductase. Steroids 58: 87-94.
111. Barry TP, Thomas P, and Callard GV l993 Stage-related production of 2l-hydroxylated progestins by the dogfish (*Squalus acanthias*) testis. J Exp Zool 265: 522-532.
112. Piferrer F, Redding M, Jorgensen J, DuBois W, and Callard GV l993 Stimulatory and inhibitory regulation of DNA synthesis during spermatogenesis: studies in *Squalus acanthias*. Fish Physiol Biochem 11:293-298.
113. Betka M and Callard GV l993 Stage-related and regulated changes in protein synthesis during spermatogenesis in vitro. The Bulletin, Mount Desert Island Biological Laboratory 32:113-114.
114. Callard GV, Drygas M and Gelinas D l993 Molecular and cellular physiology of aromatase in the brain and retina. J Steroid Biochem and Mol Biol 44:541-547.
115. DuBois W and Callard GV l993 Culture of intact Sertoli/germ cell units and isolated Sertoli cells from *Squalus* testis. (II) Stimulatory effects of IGF-I and other factors on DNA synthesis. J Exp Zool 267:233-244.
116. Gelinas D and Callard GV l993 Evidence for aromatase in neurons of the retina, optic tectum and retinotectal pathways in goldfish. J Neuroendocrinology 5:635-64l.
117. Callard GV, Betka M, and Jorgensen J l994 Stage-related functions of Sertoli cells: Lessons from lower vertebrates. In: Bartke A (ed). Function of Somatic Cells in the Testis. Springer Verlag, NY. pp. 27-54
118. Callard GV, Jorgensen JC, and Redding MJ l995. Biochemical analysis of programmed cell death during premeiotic stages of spermatogenesis in vivo and in vitro. Develop Genetics16:140-l47.
119. Krasnow HL, Callard GV 1995. Cloning of a ß-tubulin cDNA from shark (*Squalus acanthias*) testis. l995 The Bulletin, Mount Desert Island Biological Laboratory 34:111.
120. Piferrer FC, Callard GV l995. Inhibition of DNA synthesis during premeiotic stages of spermatogenesis by a factor from testis-associated lymphomyeloid tissue in the dogfish shark (*Squalus acanthias*). Biol Reprod 53:390-398.
121. Callard GV, Kruger A, Betka M. 1995. The goldfish as a model for studying neuroestrogen synthesis, localization and action in the brain and visual system. Env. Hlth. Persp. 103 (Suppl. 7 Estrogens in the

Environment III), 51-57.
122. Piferrer F, Callard GV l995. Inhibitory regulation of spermatogenesis in shark testis. In: (Goetz F and Thomas P, eds.) Proc 5th Int Symp on the Reproductive Physiology of Fish, FishSymp 95, Univ Texas Austin, Marine Sci Inst, Port Aransas TX. pp. 351-353.
123. Callard GV. 1996 Endocrinology of Leydig cells in nonmammalian vertebrates. In: AH Payne, MP Hardy and LD Russell (eds), The Leydig Cell, Cache River Press. Clearwater FL. pp. 307-332.
124. Betka M, Callard GV 1996. Metallothionein induction during spermatogenesis. The Bulletin, Mount Desert Island Biological Laboratory 35: 93.
125. McClusky LM, Betka M, Miller D, and Callard GV 1996. Analysis of the apoptotic form of programmed cell death (PCD) during spermatogenesis in the spiny dogfish (*Squalus acanthias*). The Bulletin, Mount Desert Island Biological Laboratory 35: 96-97.
126. Callard GV, Betka M, and Miller D. l997. Unconventional models for toxicology research. In: Comprehensive Toxicology, Vol.10, Reproductive and Endocrine Toxicology, Section I. Male Reproductive Toxicology, K. Boekelheide, R. Chapin, P. Hoyer, C. Harris (eds), Elsevier, New York, pp. 235-247.
127. Berardini TZ, Drygas-Williams M, Callard GV, Tolan DR. l997. Identification of neuronal isozyme specific residues by comparison of goldfish aldolase C to other aldolases. Biochem Biophys Res Comm 117A, 471-476.
128. Betka M, Callard GV l997. Cadmium accumulation in cardiac and skeletal muscle of *Squalus acanthias*. The Bulletin, Mount Desert Island Biological Laboratory 36:89.
129. McClusky LM, Callard GV l997. In situ end-labeling of fragmented DNA in apoptotic germ cells in the spiny dogfish (*Squalus acanthias*) testis. The Bulletin, Mount Desert Island Biological Laboratory 36:106-107.
130. Gelinas D, Callard GV. l997. Immunolocalization of aromatase-and androgen receptor-positive neurons in the goldfish brain. Gen Comp Endocrinol 106:155-168.
131. Callard GV, Tchoudakova A 1997. Evolutionary and functional significance of two CYPl9 genes differentially expressed in brain and ovary of goldfish. Steroid Biochem Mol Biol 61:387-392.
132. Gelinas D, Pitoc GA, Callard GV l998. Isolation of goldfish brain P450 aromatase cDNA and analysis of expression during the reproductive cycle and after steroid treatment in vivo. Mol Cell Endocrinol 138:81-93.
133. Betka M, Callard GV l998. Negative feedback control of the spermatogenic progression by testicular estrogen synthesis: insights from the shark testis model. In: Neoplastic Transformation of Testicular Germ Cells, Rajpert-DeMeyts E, Grigor KM, and Skakkebaek NE, eds., Acta Physiologica, Microbiologica, Immunologica Scandinavica 106:252-258.
134. Tchoudakova A, Callard GV l998. Identification of multiple CYPl9 genes encoding different cytochrome P450 aromatase isozymes in brain and ovary. Endocrinology 139:2179-2189.
135. Betka M, and Callard GV l998. Cloning of an androgen receptor cDNA from *Squalus acanthias* testis. The Bulletin, Mount Desert Island Biological Laboratory 37:111 (short report).
136. Callard GV, McClusky L, Betka M. 1998 Apoptosis as a normal mechanism of growth control and target of toxicant actions during spermatogenesis: insights using the shark testis model. In: New Developments in Marine Biotechnology, LeGal Y, Halvorson H (eds), Plenum. pp. 125-128.
137. Callard GV, and Callard IP l999. Spermatogenesis in subavian vertebrates. In: Encyclopedia of Reproduction (eds., Knobil E., and Neill, J.), Vol 4, Academic Press, pp. 563-570.
138. Betka M, and Callard GV l999. Stage-dependent accumulation of cadmium and induction of metallothionein-like binding activity in the testis of the dogfish shark *Squalus acanthias*. Biol Reprod

60:147-157.
139. Tchoudakova A, Pathak S, and Callard GV l999. Molecular cloning of an estrogen receptor ß-subtype from the goldfish, *Carassius auratus*. Gen Comp Endocrinol 113:388-400.
140. Kishida M, Tchoudakova A, Miller D, and Callard GV l999. Analysis of the goldfish (*Carassius auratus*) aromatase (P450arom) gene promoter by green fluorescent protein (GFP) expression in living zebrafish (*Danio rerio*) embryos. The Bulletin, Mount Desert Island Biological Laboratory 38: 37-38.
141. Betka M, Welenc A, Franks DG, Hahn ME, Callard GV. 2000. Characterization of two aryl hydrocarbon receptor (AHR) mRNA forms in *Squalus acanthias* and stage-dependent expression during spermatogenesis. The Bulletin, Mount Desert Island Biological Laboratory 39:110-112.
142. Kishida M, Callard GV. 2001. Distinct cytochrome P450 aromatase isoforms in zebrafish (*Danio rerio*) brain and ovary are differentially programmed and estrogen regulated during early development. Endocrinology 142:740-750.
143. Zhao J, Tchoudakova A, Callard G, Chen S (2001). Different catalytic properties and inhibitor responses of the goldfish brain and ovary cytochrome P450 aromatase isozymes. Gen Comp Endocrinol 123:180-91.
144. Kishida M, McLellan M, Miranda JA, Callard GV (2001). Estrogen and xenoestrogens upregulate the brain aromatase isoform (P450aromB) and perturb markers of early development in zebrafish (*Danio rerio*). Comp Physiol Biochem 129/2-3:261-268.
145. Tchoudakova A, Kishida M, Wood E, Callard GV (2001). Promoter characteristics of two *cyp19* genes differentially expressed in the brain and ovary of teleost fish. J Steroid Biochem Mol Biol 78/5:427-439.
146. Callard GV, Tchoudakova A, Kishida M, Wood E (2001). Differential tissue distribution, developmental programming, estrogen regulation and promoter characteristics of *cyp19* genes in in teleost fish. J Steroid Biochem Mol Biol 79:305-314.
147. Wang C, Callard GV (2001). Polymerase chain reaction (PCR)-differential display identifies a subset of stage-dependent and cadmium-regulated genes during spermatogenesis in *Squalus acanthias*. The Bulletin, Mount Desert Island Biological Laboratory 40:54-7.
148. Engel, KB, Callard GV (2005). The testis and spermatogenesis. In: Jamieson B, Hamlett W (eds). Reproductive Biology and Phylogeny of Chondrichthyes: Sharks, Skates and Chimeras. Science Publishers, Inc., Enfield NH, pp. 171-200.
149. Greytak SR, Champlin D, Callard GV (2005). Isolation and characterization of two cytochrome P450 aromatase forms in killifish (*Fundulus heteroclitus*): differential expression in fish from polluted and unpolluted environments. Aquatic Toxicol 71:371-389.
150. McClusky LM (2005). Stage and season effects on cell cycle and apoptotic activities of germ cells and Sertoli cells during spermatogenesis in the spiny dogfish (Squalus acanthias). Reproduction 129(1):89-102.
151. Sawyer SJ, Gerstner KA, Callard GV. (2006). Development of a real time PCR assay for cytochrome P450 aromatase isoforms in zebrafish: tissue distribution, sex differences, developmental programming, and estrogen regulation. Gen Comp Endocrinol 147(2):108-17.
152. McClusky LM (2006). Stage-dependency of apoptosis and the blood-testis barrier in the dogfish shark (Squalus acanthias): cadmium-induced changes as assessed by vital fluorescence techniques. Cell Tissue Res 325(3):541-53.
153. Tarrant AM, Greytak SR, Callard GV, Hahn ME. (2006) Estrogen receptor-related receptors in the killifish *Fundulus heteroclitus*: diversity, expression and estrogen responsiveness. Mol Cell Endocrinol 37:105-120.

154. Engel KB, Callard GV. (2007). Endocrinology of Leydig Cells in Nonmammalian Vertebrates. Chapter 15. In: Payne A, Hardy M (eds)., The Leydig Cell in Health and Disease, Humana Press. pp. 207-224.
155. Greytak SR, Callard GV (2007). Cloning of three estrogen receptors (ER) from killifish (*Fundulus heteroclitus*): Differences in populations from polluted and reference environments. Gen Comp Endocrinol 150:174-188.
156. Burnett KG, Bain LJ, Baldwin WS, Callard GV, Cohen S, Di Giulio RT, Evans DH, Gómez-Chiarri M, Hahn ME, Hoover CA, Karchner SI, Katoh F, MacLatchy DL, Marshall WS, Meyer JN, Nacci DE, Oleksiak MF, Rees BB, Singer TP, Stegeman JJ, Towle DW, Van Veld PA, Vogelbein WK, Whitehead A, Winn RN, Crawford DI. (2007). *Fundulus* as the Premier Teleost Model in Environmental Biology: Opportunities for New Insights Using Genomics. Comp Physiol Biochem, Part D: 257-286.
157. McCurley A, Callard GV (2008). Characterization of housekeeping genes in zebrafish: male-female differences and effects of tissue type, developmental stage and chemical treatment. BMC Molecular Biology 9:102.
158. McCurley A, Callard GV (2010). Time course analysis of gene expression patterns in zebrafish eye during optic nerve regeneration. J Exptl Neurosci 4:17-33.
159. Greytak SR, Tarrant A, Nacci D, Hahn ME, Callard GV (2010). Estrogen responses in killifish (*Fundulus heteroclitus*) from polluted and unpolluted environments are site- and gene-specific. Aquatic Toxicol. 99(2): 291–299.
160. Callard GV, Tarrant A, Novillo A, Yacci P, Ciaccia L, Vajda S, Chuang G-Y, Kozakov D, Greytak SR, Sawyer S, Hoover C, Cotter K. (2011). Evolutionary origins of the estrogen signaling system: insights from amphioxus. J Steroid Biochem Mol Biol 127: 176-188.
161. Callard GV, Greytak SR, Novillo A, Cotter KA, Meyer R (2012). Brain Aromatase in Fishes. In: Balthazart J, Ball G (eds), Ch 2, Brain Aromatase, Estrogens and Behavior, Oxford Univ Press, pp. 2-42.
162. Griffin LB, January K, Ho K, Cotter K, Callard GV. (2013). Morpholino-mediated knockdown of genes encoding estrogen receptor-alpha, -betaA and –betaB in zebrafish (*Danio rerio*) embryos reveals differential regulation of estrogen responsive target genes. Endocrinology 154:4158-4169.
163, Cotter K, Yershov A, Novillo A, Callard GV. (2013). Alternative splicing of the *esr1* gene encoding estrogen receptor alpha in zebrafish (*Danio rerio*): differential tissue expression, developmental programming, and regulation by estrogen and estrogen-like environmental chemicals Gen Comp Endocrinol, 194: 217-229.