

## Biosketch

**Name:** Martin Charles RAFF

**Address:** MRC Laboratory for Molecular Cell Biology and  
Biology Department  
University College London  
London WC1E 6BT

**Born:** 15 January 1938

**Nationality:** Canadian/British citizen

**Marital status:** Married, 3 children

### **Education & Experience:**

1955–59 B.Sc., Magna Cum Laude, McGill University

1959–63 M.D.C.M., McGill University

1963–65 Intern and Assistant Resident in Medicine, Royal Victoria Hospital, Montreal

1965–68 Resident in Neurology, Massachusetts General Hospital;  
Research Fellow in Neurology and Neuropathology,  
Harvard Medical School

1968–71 Postdoctoral Fellow at the National Institute for Medical Research, Mill  
Hill, London (Mentor: N.A. Mitchison)

1971–02 Co-director, Medical Research Council Developmental Neurobiology  
Programme, Biology Department,  
University College London

1979–02 Professor of Biology, Biology Department, University College London  
(Personal Chair, funded as part of Medical Research Council  
Developmental Neurobiology Programme Grant)

1992- Scientist, MRC Laboratory for Molecular Cell Biology, University College  
London

2002- Emeritus Professor, Biology Department and MRC Laboratory for  
Molecular Cell Biology, University College London

**Honours:** Alpha Omega Alpha Honor Medical Society, 1961–  
Fellow of the Royal College of Physicians and Surgeons of Canada  
(Neurology), 1968–  
Fellow of the Royal Society, 1985–  
Academia Europaea, 1988–  
Feldberg Prize, 1989

Honorary Member of American Neurological Society, 1989–  
 President, British Society of Cell Biology, 1991–1995  
 Chairman, UK Life Sciences Committee, 1997–2001  
 British Academy of Medical Sciences, 1998–  
 Foreign Honorary Member of the American Academy of Arts and Sciences,  
 1999–  
 Dunham Lectures, Harvard University, 2001  
 United Kingdom-Canada Rutherford Lectures, 2002  
 Hamdan Prize for Apoptosis in Disease and Health, 2002  
 Foreign Associate of National Academy of Sciences of the USA, 2003–  
 Kuffler Lectures, UCSD, 2004  
 Honorary Degree, McGill University, 2005  
 The Biochemical Society Award, 2006  
 Honorary Degree, Vrije Universiteit Brussel, 2007

***National and International Committees:***

***Present:*** Lasker Prize Jury, 1996–

***Past:*** Association of Medical Charities (UK)  
 Medical Research Council Neurosciences Board  
 EMBO Fellowship Committee  
 EMBO Council  
 Review Committee for Human Frontier Science (Brain Functions)  
 Medical Research Council Strategy and Development Group  
 Nuffield Council on Bioethics

***Scientific Advisory Boards:***

***Present:***

Friedrich Miescher Institute (chairman), Basle  
 Skirball Institute (chairman), NYU  
 Wellcome trust Neuroscience and mental Health Strategy Committee  
 (chairman)  
 Board of Directors, Company of Biologists, UK  
 Ellison Medical Foundation, New York  
 Gulbenkian Institute of Science, Lisbon  
 Medical Research Council Clinical Sciences Centre, London  
 Alberta Heritage Foundation for Medical Research  
 Myelin Repair Foundation, California  
 Rita Levi-Montalcini European Brain Research Institute, Rome  
 Simons Foundation Autism Research Initiative, New York  
 Glaucoma Foundation Catalyst For Cure, San Francisco  
 Salpêtrière Neurosciences Research Centre  
 Champalimaud Foundation, Lisbon  
 Autism Speaks, New York

***Past:***

Centre d'Immunologie, Marseilles

Center for Developmental Neurobiology, King's College London  
 Institute of Molecular Pathology, Vienna (chairman)  
 Idun Pharmaceuticals, San Diego  
 Max-Planck Institute for Psychiatry, Martinsreid  
 Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto  
 San Raffaele Institute, Milan  
 Randall Institute, King's College London  
 ZMBH, Heidelberg  
 Xenova Research Ltd., Cambridge, UK  
 Curis, Inc., Cambridge, MA  
 Topotarget A/S, Abingdon  
 Walter and Eliza Hall Institute of Medical Research, Melbourne  
 Wellcome Trust Centre for Human Genetics, Oxford

***Editorial Boards:***

***Present:*** Cell Cycle  
 Cell Research  
 Cell Structure and Function  
 Current Opinion in Cell Biology  
 Current Opinion in Neurobiology  
 Journal of Biology  
 Multiple Sclerosis  
 Neurobiology of Disease

***Past:*** Cell  
 Cell Death and Differentiation  
 Current Biology  
 Development  
 EMBO Journal  
 EMBO Reports  
 European Journal of Immunology  
 European Journal of Neuroscience  
 Glia  
 Journal of Cell Biology  
 Journal of Membrane Biology  
 Journal of Neurocytology  
 Journal of Neuroscience  
 Journal of Neuroimmunology  
 Journal of Neuroendocrinology  
 Journal of Neuroscience Research  
 Associate Editor, Molecular Biology of the Cell  
 Molecular and Cellular Neuroscience  
 Neuron  
 Quarterly Journal of Experimental Physiology  
 Scandinavian Journal of Immunology  
 Science  
 Trends in Neuroscience

### SELECTED PUBLICATIONS

1. Raff, M.C. (1969) Theta isoantigen as a marker of thymus-derived lymphocytes in mice. *Nature* 224:378–379.
2. Raff, M.C., Sternberg, M., and Taylor, R.B. (1970) Immunoglobulin determinants on the surface of mouse lymphoid cells. *Nature* 225:553–554.
3. Raff, M.C. (1970) Two distinct populations of peripheral lymphocytes in mice distinguishable by immunofluorescence. *Immunology* 19:637–650.
4. Raff, M.C. (1970) Role of thymus-derived lymphocytes in the secondary humoral immune response in mice. *Nature* 226:1257–1258.
5. Taylor, R.B., Duffus, W.P.H., Raff, M.C., and de Petris, S. (1971) Redistribution and pinocytosis of lymphocyte surface immunoglobulin molecules induced by anti-immunoglobulin antibody. *Nature New Biol.* 233:225–229.
6. de Petris, S., and Raff, M.C. (1972) Distribution of immunoglobulin on the surface of mouse lymphoid cells as determined by immunoferritin electron microscopy. Antibody-induced temperature-dependent redistribution and its implications for membrane structure. *Eur. J. Immunol.* 2:523–535.
7. Owen, J.J.T., Cooper, M.D., and Raff, M.C. (1974) In vitro generation of B lymphocytes in mouse foetal liver: a mammalian 'bursa equivalent'. *Nature* 249:361–363.
8. Raff, M.C., Owen, J.J.T., Cooper, M.D., Lawton, A.R., Megson, M., and Gathings, W.E. (1975) Differences in susceptibility of mature and immature mouse B lymphocytes to anti-immunoglobulin-induced immunoglobulin suppression in vitro: possible implications for B-cell tolerance to self. *J. Exp. Med.* 142:1052–1064.
9. Raff, M.C., Megson, M., Owen, J.J.T., and Cooper, M.D. (1976) Early production of intracellular IgM by B-lymphocyte precursors in mouse. *Nature* 259:224–226.
10. Brockes, J.P., Fields, K.L., and Raff, M.C. (1977) A surface antigenic marker for rat Schwann cells. *Nature* 266:364–366.
11. Raff, M.C., Mirsky, R., Fields, K.L., Lisak, R.P., Dorfman, S.H., Silberberg, D.H., Gregson, N.A., Liebowitz, S., and Kennedy, M.C. (1978) Galactocerebroside is a specific cell-surface antigenic marker for oligodendrocytes in culture. *Nature* 274:813–816.
12. Raff, M.C., Abney, E., Brockes, J.P., and Hornby-Smith, A. (1978) Schwann cell growth factors. *Cell* 15:813–822.
13. Lawson, D., Fewtrell, C., and Raff, M.C. (1978) Localized mast cell degranulation induced by concanavalin A-sepharose beads: implications for the Ca<sup>2+</sup> hypothesis of stimulus-secretion coupling. *J. Cell Biol.* 79:394–400.
14. Raff, M.C., Fields, K.L., Hakomori, S., Mirsky, R., Pruss, R.M., and Winter, J. (1979) Cell-type-specific markers for distinguishing and studying neurons and the major classes of glial cells in culture. *Brain Res.* 174:283–308.

15. Mirsky, R., Winter, J., Abney, E.R., Pruss, R.M., Gavrilovic, J., and Raff, M.C. (1980) Myelin-specific proteins and glycolipids in rat Schwann cells and oligodendrocytes in culture. *J. Cell Biol.* 84:483–494.
16. Raff, M.C., Miller, R.H., and Noble, M. (1983) A glial progenitor cell that develops in vitro into an astrocyte or an oligodendrocyte depending on culture medium. *Nature* 303:390–396.
17. Raff, M.C., Abney, E.R., and Miller, R.H. (1984) Two glial cell lineages diverge prenatally in rat optic nerve. *Dev. Biol.* 106:53–60.
18. Raff, M.C. (1984) Citation classic: commentary on "*Immunology* 19:637–650, 1970". *Current Contents Life Sciences* 27:21.
19. Temple, S., and Raff, M.C. (1985) Differentiation of a bipotential glial progenitor cell in single cell microculture. *Nature* 313:223–225.
20. Raff, M.C., Abney, E.R., and Fok-Seang, J. (1985) Reconstitution of a developmental clock in vitro: a critical role for astrocytes in the timing of oligodendrocyte differentiation. *Cell* 42:61–69.
21. Temple, S., and Raff, M.C. (1986) Clonal analysis of oligodendrocyte development in culture: evidence for a developmental clock that counts cell divisions. *Cell* 44:773–779.
23. French-Constant, C., and Raff, M.C. (1986) Proliferating bipotential glial progenitor cells in adult rat optic nerve. *Nature* 319:499–502.
24. Janzer, R.C., and Raff, M.C. (1987) Astrocytes induce blood-brain barrier properties in endothelial cells. *Nature* 325:253–257.
25. Raff, M.C., Lillien, L.E., Richardson, W.D., Burne, J.F., and Noble, M.D. (1988) Platelet-derived growth factor from astrocytes drives the clock that times oligodendrocyte development in culture. *Nature* 333:562–565.
26. Watanabe, T., and Raff, M.C. (1990) Rod photoreceptor development in vitro: intrinsic properties of proliferating neuroepithelial cells change as development proceeds in the rat retina. *Neuron* 2:461–467.
27. Raff, M.C. (1992) Social controls on cell survival and cell death. *Nature* 356:397–400.
28. Barres, B.A., Hart, I.K., Coles, H.S.R., Burne, J.F., Voyvodic, J.T., Richardson, W.D., and Raff, M.C. (1992) Cell death and control of cell survival in the oligodendrocyte cell lineage. *Cell* 70:31–46.
29. Barres, B.A., and Raff, M.C. (1993) Proliferation of oligodendrocyte precursor cells depends on electrical activity in axons. *Nature* 361:258–260.
30. Barres, B.A., Jacobson, M.D., Schmid, R., Sendtner, M., and Raff, M.C. (1993) Does oligodendrocyte survival depend on axons? *Curr. Biol.* 3:489–497.

32. Barres, B.A., Lazar, M.A., and Raff, M.C. (1994) A novel role for thyroid hormone, glucocorticoids and retinoic acid in timing oligodendrocyte development. *Development* 120:1097–1108.
33. Jacobson, M., Burne, J., and Raff, M. (1994) Programmed cell death and Bcl-2 protection in the absence of a nucleus. *EMBO J.* 13:1899–1910.
34. Jacobson, M.D., and Raff, M.C. (1995) Programmed cell death and Bcl-2 protection in very low oxygen. *Nature* 374:814–816.
35. Burne, J.F., Staple, J.K., and Raff, M.C. (1996) Glial cells are increased proportionally in transgenic optic nerves with increased numbers of axons. *J. Neurosci.* 16:2064–2073.
36. Weil, M., Jacobson, M.D., Coles, H.S.R., Davies, T.J., Gardner, R.L., Raff, K.D., and Raff, M.C. (1996) Constitutive expression of the machinery for programmed cell death. *J. Cell Biol.* 133:1053–1059.
37. Durand, B., Gao, F., and Raff, M. (1997) Accumulation of the cyclin-dependent kinase inhibitor p27/kip1 and the timing of oligodendrocyte differentiation. *EMBO J.* 16: 306-317.38.  
Gao, F., Durand, B. and Raff, M. (1997) Oligodendrocyte precursor cells count time but not cell divisions before differentiation. *Curr. Biol.* 7:152-155.
38. Burne, J.F. and Raff, M.C. (1997) Retinal ganglion cell axons drive the proliferation of astrocytes in the developing rodent optic nerve. *Neuron* 18: 223-231.
39. Gao, F-B. and Raff, M.C. (1997) Cell size control and a cell-intrinsic maturation program in proliferating oligodendrocyte precursor cells. *J. Cell Biol.* 138: 1367-1377.
40. Ishizaki, Y. Jacobson, M. and Raff, M.C. (1998) A role for caspases in lens fiber differentiation. *J. Cell Biol.* 140: 153-158.
41. Durand, B., Fero, M.L., Roberts, J.M., and Raff, M. C. (1998) p27 Kip1 alters the response of cells to mitogen and is part of a cell-intrinsic timer that arrests cell division and initiates differentiation. *Curr. Biol.* 8: 431-440.
42. Wallace, V.A. and Raff, M.C. (1999) A role for Sonic hedgehog in axon-to-astrocyte signalling in the rodent optic nerve. *Development*, 126:2901-2909.
43. Conlon, I.J., Dunn, G.A., Mudge, A.W., and Raff, M.C. (2001) Extracellular control of cell size. *Nature Cell Biol.* 3: 918–21.
44. Cayouette, M., and M. Raff. (2003) The orientation of cell division influences cell-fate choice in the developing mammalian retina. *Development* 130: 2329–2339.
45. Conlon I., and Raff, M. (2003) Differences in the way a mammalian cell and yeast cells coordinate cell growth and cell-cycle progression. *J. Biol.* 2: 7.1–7.9.
46. Cayouette, M. Barres, B.A., and Raff, M. (2003) Importance of intrinsic mechanisms in cell-fate choice in the rat retina. *Neuron* 40: 897-904.

47. Kondo, T. and Raff, M. (2004) Chromatin remodelling and histone modification in the conversion of oligodendrocyte precursors to neural stem cells. *Genes Dev.* 18: 2963-2972.

### **BOOKS**

Greaves, M.F., Owen, J.J.T., and Raff, M.C. (1973) T and B Lymphocytes: Origins, Properties and Roles in Immune Responses. Excerpta Medica, Amsterdam.

Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. (2008) Molecular Biology of the Cell, 5th Ed. Garland Press, New York.

Alberts, B., Bray, D., Hopkins, K., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. (2003) Essential Cell Biology, 2<sup>nd</sup> Ed. Garland Press, New York.

Hall, M.N., Raff, M.C., and Thomas, G. (eds.) (2004) Cell Growth: Control of Cell Size. Cold Spring Harbor Laboratory Press.