Curriculum vitae

James Dickson Murray FRS, FRSE
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Centre for Mathematical Biology
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Department of Applied Mathematics
University of Washington
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Home address: 119 Parkside Drive, Princeton, NJ 08540 U.S.A.

Date and place of birth: 2nd January 1931, Moffat, Scotland

Nationality: UK & US dual citizenship (Married to Sheila T. Murray U.S. citizen (now dual UK and US citizen), 2 children, 3 grandchildren all dual citizens UK & US

Degrees:

B.Sc.	1st class Honours in Mathematics 1953 with equivalent of an ordinary B.Sc. in Natural Philosophy 1952	University of St. Andrews
Ph.D.	Applied Mathematics 1956 (first awarded)	University of St. Andrews
M.A.	1961	University of Oxford
D.Sc.	Mathematics 1968	University of Oxford

Honorary Degrees:

D.Sc.	*Honoris causa* 1994	University of St. Andrews
D.Sc.	*Honoris causa* 1999	University of Strathclyde
Dott.Mat.	*Laurea Honoris causa* 2004	University of Milan
Dr. Math.	*Honoris causa* 2006	University of Waterloo
LLD	*Honoris causa* 2011	University of Dundee

Fellowship elections, honours, prizes, plenary lectures (selection) etc.:

Distinguished Visiting Fellow, St. Catherine's College, University of Oxford, 1967
Guggenheim Fellow (elected 1967) in Paris, 1968
FRSE Fellow of the Royal Society of Edinburgh, 1979
Ida Beam Visiting Professor, University of Iowa, 1979
Winegard Visiting Professor, University of Guelph, 1980
Stanislaw Marcin Ulam Visiting Scholar (the 1st), University of California, Los Alamos National Laboratory, 1985
Ulam Lecture 1985
FRS Fellow of the Royal Society, 1985
Plenary Lecture, 27th British Theoretical Mechanics Colloquium, Leeds 1985
Plenary Lecture, IMA Conference on *The Mathematical Theory of the Dynamics of Biological Systems*, Oxford 1986
FSB/F.Inst.Biol. 1988 (Institute of Biology renamed Society of Biology 2009)
CBiol Chartered Biologist, 1988
London Mathematical Society's Naylor Prize in Applied Mathematics, 1988-90
London Mathematical Society's Naylor Lecture, 1989

Landsdowne Lectures, University of Victoria, BC, 1990
Ostrom Lectures, Washington State University, 1990
President (the 1st), European Society for Mathematical and Theoretical Biology, 1991-4
Plenary lecture, ICIAM (International Congress of Industrial & Applied Mathematics) Washington, DC, 1991
Opening plenary lecture, 1st European Conference on the *Applications of Mathematics to Medicine & Biology*, Grenoble 1991
Distinguished Lecturer Series (Mathematics), University of New Mexico, Albuquerque1992
Distinguished Lecturer Series (Mathematics), Emory University 1992
Invited guest lecture, Annual Scientific Meeting of Assoc. of Surgeons of Great Britain & Ireland 1992
Pinkham Lecturer, Swedish Hospital, Seattle, 1992, 1998
Japan Society for the Promotion of Science Fellow, Japan, October 1992
Plenary Lecture: *Annual Meeting of the Japanese Association of Mathematical Biology*, Kyoto 1992
University of Angers, Public lecture (in French) 1993
Distinguished Lecture Series: *Epidemiological models for animal diseases*, University of Washington 1993
Plenary lecture, 2nd Conference of the European Society for Mathematical and Theoretical Biology on the *Applications of Mathematics in Medicine and Biology*, Lyon 1993
Distinguished Lecture Series, Arizona State University 1994
Plenary lecture, University of California Annual Conference on *Nonlinear Phenomena*
University of California, Davis 1994
University of Oxford (St. Catherine's College) Tayler Lecture, 1994
University of St. Andrews Curle Lecture, 1994
La Chaire Européenne, University of Paris (IX-Dauphine), May 1994, 1995, 1996
Invited lecture, Amer. **Assoc. for Advancement of Science**, Atlanta, February 1995
Plenary lecture, 4th Pacific Northwest Workshop in *Mathematical Biology*, University of British Columbia, Vancouver 1995
Plenary lecture, Institut National de la Santé et de la Recherche Medicalé (INSERM) workshop on *Modèlees nonlinéaires: Fractals et Chaos en Biologie*, Versailles 1995
University of Minnesota, Distinguished Lecture Series on "*Aesthetic Considerations in Science and Engineering*", 1995
Williams College. Class of '62 lecture, 1995
Concluding Plenary Lecture, 3rd Conference of the European Society for Mathematical and Theoretical biology on the *Applications of Mathematics in Medicine & Biology*, Heidelberg, 1996.
Annual Faculty (Lecture) Award (biennial), University of Washington, 1997-8
Distinguished Lecture Series, Cornell University *Evolution and Developmental Biology* 1999
Membre de l'Insitut de France (Foreign member Académie des sciences) 2000
Honorary Fellow, Corpus Christi College, University of Oxford 2001
Lectio doctoralis, University of Milan 2004
Akiro Okubo Prize 2005
Akira Okubo Prize lecture, Dresden 2005
University of Washington donor endowed chair in perpetuity: James D. Murray Chair of Applied Mathematics in Neuropathology 2006
Honorary Member, Edinburgh Mathematical Society 2008 (Celebrating its 125th Anniversary: only 25 have been elected Honorary Members since the Society's foundation in 1883)
Maxwell Colloquium to honour Professor James D. Murray FRS 2008
FIMA Fellow of the Institute of Mathematics and its Applications (IMA) UK 2008
Royal Society Bakerian Medal and Prize Lecture (Physical Sciences premier prize lecture) 2009
Institute of Mathematics and its Applications (IMA) 2009 Gold Medal
Institute of Mathematics and its Applications (IMA) Summer Lecture 2009
Rees Distinguished Lectures, University of Delaware 2009
Sears Public Lecture, Woods Hole Oceanographic Institute 2010
Boeing Distinguished Lecture, University of Washington 2011
European Academy of Sciences Leonardo da Vinci Medal (Academy's premier medal) 2011
Leonardo da Vinci prize lecture, Milano 2011
William Benter Prize in Applied Mathematic 2012
William Benter Prize Lecture 2012
Plenary lecture, Turing Centenary Conference, Princeton University 2012
Microsoft Research Lecture, Cambridge Turing Centenary Conference, Cambridge University

Current positions:

1992- Professor of Mathematical Biology (Emeritus), University of Oxford
2000- Professor of Applied Mathematics (Emeritus), University of Washington
2010- Senior Scholar, Applied and Computational Mathematics, Princeton University
Visiting Professor, Ecology and Evolutionary Biology, Princeton University

Appointments:

1955-56 Lecturer in Applied Mathematics, **King's College, Durham University**
1956-59 Post-doc 1956-57, Gordon MacKay Lecturer and Research Fellow in Applied Mathematics, 1957-9; Tutor (Leverett House) in Applied Mathematics, **Harvard University**
1959-61 Lecturer in Applied Mathematics, **University College London**
1961-63 Fellow in Mathematics, Hertford College; Lecturer (1962-3), **University of Oxford**
1963-64 Research Associate in Engineering and Applied Physics, **Harvard University**
1964-67 Professor of Engineering Mechanics, 1965-67 (Assoc. Professor 1964-5) **University of Michigan**
1967-70 Professor of Mathematics, **New York University**

University of Oxford:

1969-85 Fellow, Corpus Christi College, University of Oxford
1985-86 Senior Research Fellow, Corpus Christi College, University of Oxford
1986-92 Professorial Fellow, Corpus Christi College, University of Oxford
1992-2001 Emeritus Fellow, Corpus Christi College, University of Oxford
2001- Honorary Fellow, Corpus Christi College, University of Oxford
1972-86 Reader in Mathematics, University of Oxford
1983-92 Director, Centre for Mathematical Biology, University of Oxford
1986-92 Professor of Mathematical Biology, University of Oxford
1992- Emeritus Professor of Mathematical Biology, University of Oxford

University of Washington:

1987-94 Robert F. Philip Professor, University of Washington
1987-2000 Professor of Applied Mathematics, Adjunct Professor of Zoology, University of Washington
1997-2000 Boeing Professor, University of Washington
2000- Emeritus Professor of Applied Mathematics, University of Washington

Student medals and awards: University of St. Andrews:

Various medals, prizes and scholarships in mathematics 1949-52; Smeaton Scholar 1950, Medals in Mathematics, Natural Philosophy 1951, 1952; Carstairs Medalist in Mathematics 1953; Miller Prizeman 1953 (top science graduate for the year); Carnegie Scholar 1953-55, Sir James Caird Travelling Scholar 1956.

Visiting positions 1975-1996:

Visiting Research Professor, National Tsing Hua University, Taiwan, January - June 1975.
Visiting Research Professor, University of Florence, April 1976.
Visiting Professor of Applied Mathematics, M.I.T., September - January 1979.
Ida Beam Visiting Professor, University of Iowa, 1979.
Visiting Professor of Mathematics, University of Utah, Salt Lake City, January - June 1979.
Visiting Associate in Applied Mathematics, Caltech, July 1979.
Guest Lecturer, University of British Columbia, Vancouver, August 1979.
Guest Professor of Applied Mathematics, University of Heidelberg, July - August 1980.
Winegard Visiting Professor, University of Guelph, 1980.
NATO Heineman Stiftung Award, 1982.
Visiting Professor of Applied Mathematics, Caltech, January - April 1983.
Distinguished Visiting Professor, Scott Hawkins Lecturer, Southern Methodist University, Dallas ,September - December 1984.
Stanislaw Marcin Ulam Visiting Scholar (1st), University of California, Los Alamos National Laboratory, January - April, June - September 1985.

Visiting Professor of Mathematics, University of Utah, Salt Lake City, April - June 1985.
Fellow, The Neurosciences Institute, Rockefeller University, New York, August and September 1985.
Visiting Professor, Institut de Biologie Théorique, Université d'Angers, 1993.
Visiting Professor (La Chaire Européenne), University of Paris (IX-Dauphine), May: 1994, 1995, 1996.

International Media (small selection):

Television programmes:

1. Public Broadcasting (USA) Series: Patterns of Nature 1998 WQED Pittsburgh *Life By The Numbers: Math Like You've Never Seen It Before.*(approximately 20 minute section on my work)
2. Téléfiction Inc. NTSC Montréal, Quebec (TV) c1999 *C'est mathématique* (primarily about my work on animal coat patterns)
3. EBS (Educational Broadcast System) Korean Public Television: 3 hour series on the biological work of Alan M. Turing and James D. Murray 2010

Live lecture (London) http://royalsociety.org/Prize-lectures-events/# Royal Society Prize (public) lectures which can be seen on the web by clicking on the Bakerian Prize Lecture: **Mathematics in the real world: From brain tumours to saving marriages** Professor James Murray FRS Bakerian Prize Lecture 26 March 2009, 66 minutes

Selection from approximately 100 media interviews: the following are only on modelling marital interaction & divorce
AUSTRALIA:
The Australian (also on World News Network) 26 March 2009
"Professor James Murray has formula to predict divorce"
The Sydney Morning Herald March 27, 2009 "Love by numbers"
http://www.news.com.au/breaking-news/professor-has-formula-to-predict-divorce/story-e6frfku0-1225697163518
ENGLAND:
Live interview (London) BBC Today
26 March 2009 (#0844) (03.16 minutes)
http://news.bbc.co.uk/today/hi/today/newsid_7964000/7964950.stm
The Telegraph 26 March 2009 "The formula that tells whether you will get divorced"
Daily Mail 26 March 2009 "The test that can tell you if your marriage will survive"
Telegraph.co.uk 26 March 2009 "Will true love last? Mathematical model may provide may provide the answer"
http://www.telegraph.co.uk/news/newstopics/howaboutthat/5050284/Will-true-love-last-Mathematical-model-may-provide-the-answer.html
Telegraph London 27 March 2009 "Love by numbers: maths professor's formula for romantic success"
http://www.smh.com.au/articles/2009/03/27/1237657116307.html
Good Housekeeping June 2009
Reuters UK 16 February 2004 "Equation Predicts Marriage Success or Failure"
New Scientist 13 Feb. 2004
FRANCE:
Libération 2 June 2009 "Le divorce, c'est mathématique
Psycologies Magazine 2009 "L'Équation du marriage"
ITALY:
Libero 16 June 2009 "La matematica dell'amore: elaborato in Gran Bretagna l'algoritmo del divorzio"
http://arte-cultura-recensioni.noiblogger.com/la-matematica-dellamore-elaborato-in-gran-bretagna-lalgoritmo-del-divorzio/
martedì 16 giugno 2009 alle 06:15 Pubblicato da arte-cultura-recensioni
HONG KONG :
29 May 2012: Ta Kung Pao, Economic Times, Sky Post, Wen Wai Po

Invitations accepted (selection) for guest/plenary lectures 2000-

University of Washington [Physics]; University of California at Irvine [Mathematics] 2000, 2006; University of British Columbia [Mathematics] 2000; Plenary lecture, Trends in Nonlinear Analysis TINA 2000, University of Heidelberg; University of Strathclyde [Mathematics] 2004

University of Paris (Cergy-Pontoise) [Mathematics]; Jacques Monod Institute (Univ. of Paris) Conference on Biological Complexity; Plenary lecture, 21st Anniversary Conference of the French Society for Theoretical Biology, Paris; École Normale Superieure (Paris) [Mathematics]; Plenary lecture, Mathematical Modelling in Biology and Medicine, University of Paris (University of Evry d'Essone); University of Oxford [Centre for Mathematical Biology]; Santa Fe Institute (Modeling and Simulating Complexity in Biology); University of Michigan [Mathematics] Distinguished Lecture Series in Theoretical Biology, University of California, Irvine, Distinguished Lecturer 2004; École Haute Études de Sciences Sociales (EHESS, Paris) 2003; University of Washington (Applied Mathematics); University of California (Santa Barabara) 2003 ; Invited talk American Assoc. Advancement of Science 2004, École Normale Superieure (Lyons) 2004, University of Grenoble (Medical School), University of Milan [Magister lecture] 2004, University of Minnesota (Public lecture), University of Dresden (Akira Okubo Prize Lecture) 2005, University of Massachusetts (Mathematics) 2005, University of Connecticut (Biology) 2006, University of Toronto (Fields Institute) 2006, New Jersey Institute of Technology 2008, University of Edinburgh 2008, Rees Distinguished Lectures, University of Delaware 2009; Columbia University 2010; New York University 2010; Woods Hole Oceanographic Institute, Massachusetts 2010; Royal Society of Edinburgh (Dumfries & Galloway, Scotland public lecture) 2011; Opening plenary lecture 11th European Conference on Artificial Life, Paris 2011; SUNY Albany NY; Boeing Lecture, University of Washington 2011 ; Plenary lecture, NAUM, Mexico City 2012 ; Plenary lecture, Turing Centenary Conference, Cambridge University 2012; Plenary lecture, Turing Centenary Conference, Princeton University 2012, Plenary Lecture: Turing Centenary Conference (CIE 2012: How the World Computes), Cambridge University 2012

Patent application (USA): Method and System for Characterizing Brain Tumors

Filed February 19, 2010 Appl. No. 12/709.367

Current primary research interests:

Brain tumours (glioblastomas): growth, control, imaging enhancement, efficacy of treatment scenarios for individual patients; determining when brain tumours start;
Prostate cancer detection, treatment and testing anomalies;
Temperature dependent sex determination in crocodilia and its effect on survival with temperature changes due to global warning;
Marital interaction, divorce prediction and a new scientific marital therapy;
Benefits of cannibalism

PUBLICATIONS

Books:

Asymptotic Analysis. Clarendon Press, Oxford, 1974 (140 pages).

Asymptotic Analysis (Applied Mathematical Sciences, Vol.**48**). Springer-Verlag, New York, 1984 (165 pages). (2nd edition of 1974 volume with further material) 2nd printing 1996.

Nonlinear Differential Equation Models in Biology. Clarendon Press, Oxford, 1977 (370 pages). Russian translation, M.I.R., Moscow, 1983.

Theories of Biological Pattern Formation (editors S. Brenner, J.D. Murray and L. Wolpert). Proceedings of the Royal Society meeting of that name at the Royal Society, London, 1981.

Modelling of Patterns in Space and Time (editors W. Jäger and J.D. Murray). Proceedings of a workshop of that name in Heidelberg, 1983. Springer-Verlag, Heidelberg, 1984 (405 pages).

Mathematical Biology. Springer-Verlag, Heidelberg, 1989 (767 pages) (2nd printing 1990, 3rd printing 1993); Mathematics Book Club (U.S.A.) adoption, 1991.

Experimental and Theoretical Advances in Biological Pattern Formation (editors, H.G. Othmer, P.K. Maini and J.D. Murray). NATO ASI Series A: Life Sciences, vol. **259**. Plenum Press, New York, 1993 (388 pages). [Proceedings of a NATO Advanced Research Workshop of that name in Oxford, 1992.]

Modèles non linéares: fractals et chaos en biologie (*Nonlinear models: fractals and chaos in biology*) (editors: N.P. Chau and J.D. Murray) INSERM Atelier 73, 12-14 juin 1995 Le Vesinet, France (Printed lecture notes INSERM workshop)

The Mathematics of Marriage: Dynamic Nonlinear Models(J. M. Gottman, J.D. Murray, Catherine C. Swanson, Rebecca Tyson, Kristin R. Swanson). MIT Press, Cambridge, MA, 2002.

Mathematical Biology. 3rd edition in 2 volumes: Mathematical Biology: I. An Introduction (551 pages) 2002 (2nd printing 2004); Mathematical Biology: II. Spatial Models and Biomedical Applications (811 pages) 2003 (2nd printing 2004, 3rd printing 2008). Polish translation Vol. I 2006, Russian translation Vol. I 2010, Vol. II 2011.

Edited special issues of journals:

Sydney Goldstein Memorial Volume J. Fluid Mech. **44**: Part 2, 1970 (editors L. Howarth and J.D. Murray).

Principles of Pattern Formation and Morphogenesis in Biological Systems. (editors T. Sekimura, J.D. Murray) *Forma* **8**: No. 2, 157-296, 1993. [Proceedings of Workshop of that name in Chubu University 1992 and 1993.]

Research Papers:

(Papers 21, 27, 29, 31, 34-36, 39-235 are on problems in the biomedical sciences)

1. Two dimensional flow with constant shear past cylinders with various cross sections (A.R. Mitchell and J.D. Murray). *Z. Angew. Math. Phys*. 6: 223-235, 1955.

2. Flow with variable shear past circular cylinders (J.D. Murray and A.R. Mitchell). *Quart. J. Mech. Appl. Math*. 10: 13-23, 1957.

3. Two-dimensional compressible shear flow in a channel (J.D. Murray). *Quart. Appl. Math*. 15: 231-236, 1957.

4. Non-uniform shear flow past cylinders (J.D. Murray). *Quart. J. Mech. Appl. Math.* 10: 406-424, 1957.

5. On the mathematics of exchange processes in fixed columns. III. The solution for general entry conditions, and a method of obtaining asymptotic expressions (S. Goldstein and J.D. Murray). *Proc. Roy. Soc. (Lond.)* A 252: 334-347, 1959.

6. On the mathematics of exchange processes in fixed columns. IV. Limiting values, and correction terms, for the kinetic-theory solution with general entry conditions (S. Goldstein and J.D. Murray). *Proc. Roy. Soc. (Lond.)* A 252: 348-359, 1959.

7. On the mathematics of exchange processes in fixed columns. V. The equilibrium-theory and perturbation solutions, and their connection with kinetic-theory solutions, for general entry conditions (S. Goldstein and J.D. Murray). *Proc. Roy. Soc. (Lond.)* A 252: 360-375, 1959.

8. The flow of a conducting fluid past a magnetized cylinder (J.D. Murray and L. Chi). *Mathematika* 7: 64-77, 1960.

9. On the flow of a conducting fluid past a magnetized sphere (G.S.S. Ludford and J.D. Murray). *J. Fluid Mech*. 7: 516-528, 1960.

10. Further results on the flow of a conducting fluid past a magnetized sphere (G.S.S. Ludford and J.D. Murray). *Proc. VIth Conference on Fluid Mech*. (Austin, Texas, 1959): pp. 457-465.

11. The boundary layer on a flat plate in a stream with uniform shear (J.D. Murray). *J. Fluid Mech.* 11: 309-316, 1961.

12. Electromagnetic generation of vorticity in the uniform efflux of a conducting fluid from the surface of a magnetized sphere (J.D. Murray). *Appl. Sci. Res.* B 9: 65-76, 1961.

13. Strong cylindrical shock waves in magnetogasdynamics (J.D. Murray). *Mathematika* 8: 99-120, 1961.

14. Note on the propagation of disturbances in a liquid containing gas bubbles (J.D. Murray). *Appl. Sci. Res.* A 13: 281-290, 1965.

15. Incompressible viscous flow past a semi-infinite flat plate (J.D. Murray). *J. Fluid Mech*. 21: 337-344 (plus tables of fundamental functions), 1965.

16. On the mathematics of fluidization. I. Fundamental equations and wave propagation (J.D. Murray). *J. Fluid Mech.* 21: 465-493, 1965.

17. Viscous damping of gravity waves over a permeable bed (J.D. Murray). *J. Geophys. Res.* 70: 2325-2331, 1965.

18. On the mathematics of fluidization. II. Steady motion of fully developed bubbles (J.D. Murray). *J. Fluid Mech.* 22: 57-80, 1965.

19. Incompressible slip flow past a semi-infinite flat plate (J.D. Murray). *J. Fluid Mech.* 22: 463-469, 1965.

20. Mathematical aspects of bubble motion in fluidized beds (J.D. Murray). (Invited survey lecture at the American Inst. Chem. Engs. *Symposium on Fluidized Particles*, Houston, Texas, 1965). *Chem. Eng. Prog. Symposium Ser*. 62: 71-82, 1966.

21. A theoretical study of the effect of impulse on the human torso (Y.K. Liu and J.D. Murray). *Amer. Soc. Mech. Eng. Symposium on Biomechanics* (New York, 1966): pp. 167-186.

22. Some basic aspects of one-dimensional incompressible particle-fluid two-phase flows (J.D. Murray). (Symp. on *Fluid Dynamics of Heterogeneous Multi-phase Continuous Media*, Oct. 1966, Naples.) *Astronautica Acta.* 13: 417-430, 1967.

23. On the viscosity of a fluidized system (J.D. Murray). *Acta Rheolgica* 6: 27-30, 1967.

24. A simple method for determining asymptotic forms of Navier-Stokes solutions for a class of large Reynolds number flows (J.D. Murray). *J. Maths. and Physics* 46: 1-20, 1967.

25. Initial motion of a bubble in a fluidized bed. I. Theory (J.D. Murray). *J. Fluid Mech*. 28: 417-428, 1967.

26. On the effect of drainage on free surface oscillations (J.D. Murray). *Appl. Sci. Res.* 19: 234-249, 1968.

27. A simple method for obtaining approximate solutions for a class of diffusion-kinetic enzyme problems. I. General class and illustrative examples (J.D. Murray). *Mathematical Biosci.* 2: 379-411, 1968. **doi:10.1016/0025-5564(68)90025-4**

28. Singular perturbations of a class of nonlinear hyperbolic and parabolic equations (J.D. Murray). *J. Maths. and Physics* 47: 111-133, 1968.

29. A simple method for obtaining approximate solutions for a class of diffusion-kinetics enzyme problems. II. Further examples and nonsymmetric problems (J.D. Murray). *Mathematical Biosci.* 3: 115-133, 1968.

30. Fluidization on the Moon? (J.D. Murray, E.A. Spiegel, and J. Theys). *Comm. Astrophysics and Space Physics* 1: 165-171, 1969.

31. An asymptotic solution of a class of nonlinear wave equations: a model for the human torso under impulsive stress (J.D. Murray and A.B. Tayler). *SIAM J. Appl. Maths.* 18: 792-809, 1970.

32. Perturbation effects on the decay of discontinuous solutions of nonlinear first order wave equations (J.D. Murray). *SIAM J. Appl. Maths*. 19: 273-298, 1970. (Invited Guest Speaker at the annual SIAM meeting, Washington 1969).

33. On the Gunn effect and other physical examples of perturbed conservation equations (J.D. Murray). *J. Fluid Mech.* 44: 315-346, 1970. (Sydney Goldstein Memorial Volume).

34. On the molecular mechanism of facilitated oxygen diffusion by haemoglobin and myoglobin (J.D. Murray). *Proc. Roy. Soc. (Lond)* B 178: 95-110, 1971. (Read at the Royal Society 13th May, 1971). **doi:10.1098/rspb.1971.0054** (pdf)

35. Facilitated diffusion: the case of carbon monoxide (J.D. Murray and J. Wyman). *J. Biol. Chem*. 246: 5903-5906, 1971.

36. Facilitated diffusion: the problem of boundary conditions (P.J. Mitchell and J.D. Murray). *Biophysik* 9: 177-190, 1973.
http://www.jbc.org/content/246/19/5903.abstract?ijkey=e9be07ffeb534849cd9ba2853cad7851e282b2af&keytype2=tf_ipsecsha (pdf)

37. Approximate methods in mathematics (J.D. Murray). *Mathematical Spectrum* 6: 19-24, 1973.

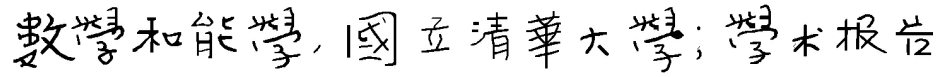
38. On Burgers' model equations for turbulence (J.D. Murray). *J. Fluid Mech*., 59: 263-279, 1973.

39. On the role of myoglobin in muscle respiration (J.D. Murray). *J. Theor. Biol*. 47: 115-126, 1974. **(doi:10.1016/0022-5193(74)90102-7) CrossRefMedlineWeb of Science**

40. On a model for the temporal oscillations in the Belousov-Zhabotinskii reaction (J.D. Murray). *J. Chem. Phys*. 61: 3610-3613, 1974.

41. The existence of oscillatory solutions in the Field-Noyes model for the Belousov-Zhabotinskii reaction (S.P. Hastings and J.D. Murray). *SIAM J. Appl. Maths*. 28: 678-688, 1975.

42. Non-existence of wave solutions for the class of reaction diffusion equations given by the Volterra interacting-population equations with diffusion (J.D. Murray). *J. Theor. Biol.* 52: 459-469, 1975.

43.


(J.D. Murray) **4**: 49-59, 1975. [Mathematics and Ecology, National Tsing Hua University, Taiwan, Insitute of Appl. Maths. article]

44. On travelling wave solutions in a model for the Belousov-Zhabotinskii reaction (J.D. Murray). *J. Theor. Biol*. 56: 329-353, 1976.

45. On the functional role of myoglobin in skeletal muscle (J.D. Murray). (Invited Guest Lecturer) *First European Colloquium on Myoglobin*, Brussels, May 1976. In: *Myoglobin* (eds. A.G. Schneck and V. Vandecasserie) (Éditions de l'Université de Bruxelles, 1977): pp. 179-201.

46. Spatial structures in predator-prey communities—a nonlinear time delay diffusional model (J.D. Murray). *Math. Biosci.* 30: 73-85, 1976.

弱肉強食的社會之空間性結構：
一個非線性延期擴散的數學模式 by 麥萊雅各 (J. D. Murray)
[1975: National Tsing Hua University, Institute of Appl. Maths. report]

47. Effect of the rate of oxygen consumption on muscle respiration (B.A. Taylor and J.D. Murray). *J. Math. Biol.* 4: 1-20, 1977.

48. Oscillatory phenomena in biological systems (A. Boiteux, B. Hess, Th. Plesser, and J.D. Murray). *FEBS Letters* 75: 1-4, 1977.

49. The effect of carbon monoxide on haem-facilitated oxygen diffusion (N.F. Britton and J.D. Murray). *Biophys. Chem.* 7: 159-167, 1977.

50. Biological and chemical oscillatory phenomena and their mathematical models (J.D. Murray). *Bull. Inst. Math. Applic.* 14: 162-169, 1978.

51. On a diffusive prey-predator model which exhibits patchiness (M. Mimura and J.D. Murray). J. Theor. Biol. 75: 249-262, 1978.

52. Spatial structures in a model substrate-inhibition reaction diffusion system (M. Mimura and J.D. Murray). *Z. für Naturforsch* 33c: 580-586, 1978.

53. Propagation d'onde dans un système à enzyme immobilisée (J.P. Kernevez, J.D. Murray, G. Joly, M-C. Duban, and D. Thomas). *Compte Rendus Acad. Sci. Paris A* 287: 961-964, 1978.

54. Threshold, wave and cell-cell avalanche behaviour in a class of substrate inhibition oscillators (N.F. Britton and J.D. Murray). *J. Theor. Biol.* 77: 317-332, 1979.

55. Finite amplitude travelling solitary waves in a model for the Belousov-Zhabotinskii reaction mechanism (D.A. Larson and J.D. Murray). *National Academy of Sciences (India) P.L. Bhatnagar Commemorative Volume*: pp. 24-42, 1979.

56. A pattern formation mechanism and its application to mammalian coat markings (J.D. Murray). 'Vito Volterra' Symposium on Mathematical Models in Biology, Academia dei Lincei, Rome, Dec. 1979. In: *Lect. Notes in Biomathematics* (Springer Verlag, Heidelberg) 39: 360-399, 1980.

57. Spiral wave solutions of practical reaction-diffusion systems (M.R. Duffy, N.F. Britton, and J.D. Murray). *SIAM J. Appl. Math.* 39: 8-13, 1980.

58. Threshold analysis of a drug use epidemic model (F. Hoppensteadt and J.D. Murray). *Math. Biosci.* 53: 79-87, 1981.

59. A pre-pattern formation mechanism for animal coat markings (J.D. Murray). *J. Theor. Biol.* 88: 161-199, 1981.
(doi:10.1016/0022-5193(81)90334-9) **CrossRefWeb of Science**

60. A generalized diffusion model for growth and dispersal in a population (D.S. Cohen and J.D. Murray). *J. Math. Biol.* 12: 237-249, 1981.

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186. On a model mechanism for the spatial patterning of teeth primordia in the alligator (P.M. Kulesa, G.C. Cruywagen, S.R. Lubkin, P.K. Maini, J. Sneyd, M.W.J. Ferguson, and J.D. Murray). *J. Theor. Biol.* . 180: 287-296, 1996.

187. Modelling the spatial patterning of teeth primordia in the alligator (P.M. Kulesa, G.C. Cruywagen, S.R. Lubkin, M.W.J. Ferguson, and J.D. Murray). *Acta Biotheoretica* 44: 153-164, 1996.

188. A mathematical model of glioma growth: the effect of extent of surgical resection (D. E. Woodward, J. Cook, P. Tracqui, G.C. Cruywagen, J.D. Murray, E.C. Alvord). *Cell Prolif.* 29: 269-288, 1996. **(doi:10.1111/j.1365-2184.1996.tb01580.x)** **MedlineWeb of Science**

189. Compact set valued flows: Applications in biological modelling (J. Demongeot, P.M. Kulesa, and J.D. Murray). *Acta Biotheoretica* 44: 349-358, 1996.

190. Competition in spatially heterogeneous environment: modelling the risk of spread of a genetically engineered population (G.C. Cruywagen, P. Kareiva, M.A. Lewis and J.D. Murray). *Theor. Popul. Biol.* 49: 1-38, 1996.

191. Effect of seasonal host reproduction on host-macroparasite dynamics (K.A.J. White, B.T. Grenfell, R.J. Hendry, O. Lejeune, and J.D. Murray). *Math. Biosci.* 137 (12): 79-99, 1996.

192. On a dynamic reaction-diffusion mechanism: the spatial patterning of teeth primordia in the alligator (J.D. Murray and P.M. Kulesa). *J. Chem. Soc., Faraday Trans.* 92: 2927-2932, 1996.

193. A mechanical model for the formation of vascular networks *in vitro* (D. Manoussaki, S.R. Lubkin, R.B. Vernon, and J.D. Murray). *Acta Biotheoretica* 44: 271-282, 1996.

194. The interaction of growth rates and diffusion coefficients in a three-dimensional mathematical model of gliomas (P.K. Burgess, P.M. Kulesa, J.D. Murray and E.C. Alvord). *J. Neuropath. & Exp. Neurology* 56: 704-713, 1997**.** **CrossRefMedline**
http://pt.wkhealth.com/pt/re/lwwgateway/landingpage.htm;jsessionid=PgpG8J3nGdM1SV5LJRp4zVstYBnRr2LFYCYQlqQjD802g96LGk54!1393764361!181195629!8091!-1?sid=WKPTLP:landingpage&an=00005072-199756060-00008

195. Analysis of a model for wolf territories (M.A. Lewis, K.A.J. White, and J.D. Murray). *J. Math. Biol.*. 35: 749-774, 1997.

196. What should be the focus of emotion regulation in children? A nonlinear dynamic mathematical model of children's peer interaction in groups. (J.M. Gottman, M.J. Guralnick, B. Wilson, C.C. Swanson, K.R. Swanson, J.D. Murray) . *Development & Psychopathology* 9(2): 421-52, 1997.

197. Biological pattern formation on two-dimensional spatial domains: a nonlinear bifurcation analysis (G.C. Cruywagen, P.K. Maini, and J.D. Murray). *SIAM J. Appl. Math*. 57: 1485-1509, 1997.

198. Compact set valued flows II. Application in biological modeling (J. Demongeot, P.Kulesa and J.D. Murray. *Comptes Rendus Acad. Sci. Paris* (Life Sciences) 324: 107-115, 1997.

199. Spatial pattern formation in biology: I. Dermal wound healing II. Bacterial patterns (J.D. Murray, J. Cook, S.R. Lubkin, R. Tyson). *J. Franklin Institute* [Special Issue on Biomathematics] 335B: 303-332, 1998.

200. A mechanical theory of *in vitro* vascular network formation (J.D. Murray, D. Manoussaki, S.R. Lubkin, R. Vernon). In: *Vascular Morphogenesis: In Vivo, In Vitro and In Mente* (eds. C.D. Little, V. Mironov, E.H. Sage), pp.173-188, Birkhaüser, Boston 1998.

201. Pattern formation in Lepidopteran wings (T. Sekimura, P.K. Maini, J.B. Nardi, M. Zhu, J.D. Murray). *Comments on Theor. Biol*. 5:69-87, 1998.

202. A minimal mechanism for bacterial patterns (R. Tyson, S. R. Lubkin, J. D. Murray). *Proc. Roy. Soc. Lond.* B266:299-304, 1998.

203. On wolf territoriality and deer survival (M.A. Lewis, K.A.J. White, and J.D. Murray). In: *Modeling Spatiotemporal Dynamics in Ecology* (eds. J. Bascompte, R.V. Sole) pp.105-126, Springer-Verlag, New York 1998.

204. The mathematics of marital conflict: dynamic mathematical nonlinear modeling of newlywed marital interaction (J.M. Gottman, C.C. Swanson,, J.D. Murray). *J. Family Psychol*. 13: 1-17, 1999. **(doi:10.1037/0893-3200.13.1.3) CrossRefWeb of Science**
http://psycnet.apa.org/?&fa=main.doiLanding&doi=10.1037/0893-3200.13.1.3

205 Model and analysis of chemotactic bacterial patterns in liquid medium (R. Tyson, S. R. Lubkin, J. D. Murray*). J. Math. Biol.* 38:359-375, 1999.

206. Theoretical analysis of conjugate localization in two-step cancer chemotherapy (T.L. Jackson, S.R. Lubkin, J.D. Murray). *J.Math. Biol*. 39:353-376, 1999.

207. On the mechanochemical theory of biological pattern formation with applications to wound healing and angiogenesis (J.D. Murray, Kristin R. Swanson). In: *On Growth and Form: Spatio-temporal Patterning in Biology* (eds. M. Chaplain, J. McLachlan, G.D. Singh), pp. 251-285, Wiley: London 1999.

208. Pattern formation of scale cells in Lepidoptera by differential origin-dependent cell adhesion (T. Sekimura, M. Zhu, J. Cook, P.K. Maini, J.D. Murray). *Bull. Math. Biol.* 61: 807-827, 1999.

209.Mathematical and experimental analysis of localization of anti-tumor anti-body-enzyme conjugates (T.L. Jackson, S.R. Lubkin, S.R. Siemens, N.O. Kerr, P.D. Senter, J.D. Murray). *Br. J. of Cancer* 80:1747-1753, 1999.

210. Pattern formation in integrative biology – a marriage of theory and experiment (J.D. Murray). *Comptes Rendus Acad. Sci. Paris* (Life Sciences) 323:5-14, 2000. (Introductory article in Special Issue on *Hypothèses et Modelisation*).

211. Development and validation of a mathematical model to describe anti-cancer prodrug activation by antibody enzyme conjugates (T.L. Jackson, P.D. Senter, J.D. Murray). *J. Theor. Medic*. 2:93-111, 2000.

212. Delay model for the dynamics of HIV infection (P. Nelson, A.S. Perelson, J.D. Murray*) Math. Biosci.* 163:201-215, 2000.

213. An envelope method for analysing sequential pattern formation (G.C. Cruywagen, P.K. Maini, J.D. Murray). *SIAM J. Appl. Math.* 61:213-231, 2000.

214. Biological pattern formation– a marriage of theory and experiment (J.D. Murray). In: *Mathematical Models for Biological Pattern Formation* (eds: P.K. Maini, H.G. Othmer) pp.1-10, Springer-Verlag, New York 2000.

215. Theoretical and mathematical modeling of marriage (K.D. Ryan, J.M. Gottman, J.D. Murray, S. Carrière, C. Swanson). In: *Emotion, Development, and Self-Organisation. Dynamic Systems Approach to Emotional Development*. (eds. M.C. Lewis, I. Granic) pp.349-372, Cambridge University Press, Cambridge 2000.

216. A quantitative model for differential motility of gliomas in grey and white matter (K.R. Swanson, E.C. Alvord, J.D. Murray). *Cell Proliferation* 33:317-329, 2000.
2002-(doi:10.1046/j.1365-2184.2000.00177.x) CrossRefMedlineWeb of Science

217. A simple method of parameter space determination for diffusion-driven instability with three species (Hong Qian and J.D. Murray). *Appl. Math. Letters*, 14:405-411, 2001

218. A quantitative model for the dynamics of serum prostate specific antigen as a marker for cancerous growth: an explanation of a medical anomaly. (Kristin R. Swanson, (J. D. Murray , D. Lin, L. True, K. Buhler, R. Vassella). *Amer. J. Pathol.*, 158(6):2195-2199, 2001 (**Invited editorial**).
(doi:10.1016/S0002-9440(10)64691-3) CrossRefMedlineWeb of Science

219. Virtual brain tumors (gliomas) enhance the reality of medical imaging and highlight inadequacies of current therapy (K.R. Swanson, E.C. Alvord, J.D. Murray). *British J. Cancer*, 86:14-18, 2002. [**Abstracted and featured in the Year Book of the Institute of Oncology 2003**, Elsevier Science]
(doi:10.1038/sj.bjc.6600021) CrossRefMedlineWeb of Science (pdf)

220. Transient dynamics and pattern formation: reactivity is necessary for Turing instabilities (M.G. Neubert, H. Caswell and J.D.Murray). *Math. Biosci.*, 175:1-11, 2002

221. Pattern formation, biological (J.D. Murray). In: *The Handbook of Brain Theory and Neural Networks* (ed. M.A. Arbib) pp. 851-859, MIT Press, Cambridge, 2002.

222. Quantifying efficacy of chemotherapy of brain tumors (gliomas) with homogeneous and heterogeneous drug delivery therapy (K.R. Swanson, E.C. Alvord, J.D. Murray) *Acta Biotheoretica*, 50(4): 223-237, 2002.
(doi:10.1023/A:1022644031905) CrossRefMedlineWeb of Science

223. On the mechanochemical theory of biological pattern formation with application to vasculogenesis (J.D. Murray). *Comptes Rendus Acad. Sci. Paris* (*Biologies*) 326: 239-252, 2003.

224. On the use of quantitative modeling to help understand PSA dynamics and other medical problems (K. R. Swanson, L. D. True, J. D. Murray). *Amer. J. Clin. Pathol.*, 119(1):14-7, 2003

225. Virtual resection of gliomas: effect of extent of resection on recurrence (K.R. Swanson, E.C. Alvord, J.D. Murray). *Mathematical and Computer Modelling*, 37(11):1177-1190, 2003. [Special Issue: "*Modeling and Simulation of Tumor Development, Treatment, and Control*"]

226. Morphogenesis and Pattern Formation in Biological Systems. Experiments and Models (Eds. T. Sekimura, S. Noji, N. Ueno, P.K. Maini) Springer, New York Proceedings of the Meeting in Chubu, Japan 2002. Foreword (J.D. Murray). V-IX, 2003.

227. Virtual and real brain tumors: using mathematical modeling to quantify glioma growth and invasion (K.R. Swanson, C. Bridge, J.D. Murray, E.C. Alvord), *Journal of the Neurological Sciences*, 216(1):1-10, 2003.

228. How to Improve the Diagnosis of Gliomas (E.C. Alvord Jr., K. R. Swanson, J. D. Murray). *J. Neuropathology and Experimental Neurology* 2(5): 129 2003 [Abstract of talk: American Association of Neuropathologists (Orlando), June 2003]

229. Dynamics of a model for brain tumors reveals a small window for therapeutic intervention (K.R. Swanson, E. C. Alvord, J. D. Murray). *Discrete and Continuous Dynamical Systems* (Ser. B) 4(1):289-295, 2004.

230. Le role des mathématiques dans les sciences biologiques et médicales (P. Auger, J. Demongeot, J. Murray, M. Thelier), In *Les mathématiques dans le monde scientifique contemporain*.Anim. Jean-Christoph Yoccoz. Rapport sur la science et la technologie (Academie des Sciences, Paris) 20:103-162, 2005.

231. On the Growth of Brain Tumours: enhancing imaging techniques, highlighting limitations of current imaging, quantifying therapy efficacy and estimating patient life expectancy (James D. Murray). In: *Advances in Artificial Life, ECAL 2011*: *Proceedings of the Eleventh European Conference on the Synthesis and Simulation of Living Systems* (Eds. Tom Lenaerts, Mario Giacobini, Hugues Bersini, Paul Bourgigne, Marca Dorigo, René Doursat), MIT Press pp. 23-26, 2011. (MIT Press online open-access proceedings volume: http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=12760 2011.

232. Vignettes from the field of mathematical biology - the application of mathematics to biology and medicine (J.D. Murray). *Phil. Trans. Roy. Soc. Interface Focus* 2012. doi: 10.1098/rsfs.2011.0102 http://rsfs.royalsocietypublishing.org/cgi/reprint/rsfs.2011.0102?ijkey=7kVEpPkrEmznYow&keytype=ref Journal issue: http://royalsocietypublishing.org/search?fulltext=vignettes&submit=yes&journalcode=roybiogmem%7Croyobits%7Croybiolett%7Croyinterface%7Croyfocus%7Croynotesrec%7Croyopenbio%7Croyprs%7Croyprsa%7Croyprsb%7Croypt%7Croypta%7Croyptb&x=0&y=0 (pdf)

233. Glioblastoma brain tumours: estimating the time from brain tumour initiation and resolution of a patient survival anomaly after similar treatment protocols, (J. D. Murray) *J. Biol. Dyn.*, DOI: 10.1080/17513758.2012.678392 2012. http://dx.doi.org/10.1080/17513758.2012.678392

234. After Turing – the birth and growth of interdisciplinary mathematics and biology (J. D. Murray). In: *The Selected Works of A.M. Turing: His work and impact.* (Eds. S. B, Cooper,A. Dawar, B. Löwe) (Springer-Verlag) pp. 518-528, 2012.

235. Why Are There No 3-Headed Monsters? Mathematical Modeling in Biology. (J.D. Murray) *Notices of the Amer. Math. Soc.*. June/July, 785-795, 2012. http://dx.doi.org/10.1090/noti865 http://www.ams.org/notices/201206/rtx120600785p.pdf

Completed paper for submission:

Nonlinear differential equation models of marital interaction (K.R. Swanson, J.M. Gottman, K.-K. Tung, J.D. Murray, C. Swanson)

Published abstracts (small selection associated with brain tumours, prostate cancer and marital interaction):

K. R. Swanson, E. C. Alvord, J. D. Murray: Mathematical Modeling of the Growth and Control of Gliomas. Gordon Conference on Theoretical Biology and Biomathematics, June 1998

K. R. Swanson, E. C. Alvord, J. D. Murray: Modeling the Growth and Diffusion of Gliomas on Anatomically Accurate Domains. Year in Mathematical Biology Pattern Formation Workshops, Institute for Mathematics and It's Application. (Minneapolis), October 1998

K.R. Swanson, E. C. Alvord, J. D. Murray: Predicting In Vitro Behavior of Brain Tumor Growth and Invasion. Theory and Mathematics in Biology and Medicine (Amsterdam), June 1999.

K. R. Swanson, J. Gottman, J. D. Murray. The Mathematics of Marriage: Using Modeling to Determine Marital Stability. Annual Meeting of the Society for Industrial and Applied Mathematics (Puerto Rico), July 2000

K.R. Swanson, E. C. Alvord, J. D. Murray: A Three-Dimensional Quantitative Model for Brain Tumor (Glioma) Growth and Invasion. Annual Meeting of the Society for Industrial and Applied Mathematics (Puerto Rico), July 2000

K. R. Swanson, L. True, J. D. Murray: A Quantitative Model for Prostate Specific Antigen (PSA) as a Marker of Tumor Growth. Annual Meeting of the Society for and Applied Mathematics (Puerto Rico), July 2000

K. R. Swanson, L. D. True, J. D. Murray, D. Lin, R. Vessella: The Dynamics of Prostate Specific Antigen (PSA) as a Marker of Cancerous Growth. Annual Meeting of the Society for Mathematical Biology (Hilo, Hawaii), July 2001

K. R. Swanson, J. D. Murray, E. C. Alvord: Combining Radiological Observations with a Three-Dimensional Model to Predict Behavior of Brain Tumors in Real Patients. SIAM Life Sciences and Imaging Sciences Conference (Boston), March 2002

E.C. Alvord Jr., K. R. Swanson, J. D. Murray: How to Improve the Diagnosis of Gliomas. American Association of Neuropathologists (Orlando), June 2003. J. Neuropathology and Experimental Neurology 62(5): 129 2003

Substantial Book Reviews:

Scale effects in animal locomotion. (ed. T.J. Pedley). Academic Press: London 1977. *Biometrics* 1978.

The Geometry of Biological Time. A.T. Winfree, Springer-Verlag: Heidelberg. 1980. *Nature* **292**: 660, 1981.

Selection of Technical Reports/unpublished manuscripts:

On the mathematics of fluidisation (J.D. Murray). National Science Foundation: GP2226, 1963.

On equations of motion for a particle-fluid two-phase flow (J.D. Murray). I. U.S. National Center for Air Pollution Control: AP00455, 1966.

On the forces on small particles in a viscous fluid (J.D. Murray and J.R. Ockendon). U.S. National Center for Air Pollution Control: AP00671, 1967.

On equations of motion for a particle-fluid two-phase flow (J.D. Murray). II. Energy Equations. U.S. National Center for Air Pollution Control: AP00671, 1968.

Generalized Exchange Equations of Elliptic Type: Singular Perturbation Solutions. I. Without Shocks.. (J.D. Murray and P.J. Mitchell), 1974.

Generalized Exchange Equations of Elliptic Type: Singular Perturbation Solutions. II. With Shocks. (J.D. Murray and P.J. Mitchell), 1974.

On models of oscillation in the glycolytic pathway (J.D. Murray and R. Gibbs), 1976.

Biological oscillations: spatial structure and nonlinear wave propagation in reaction systems (J.D. Murray). Quaderni dell'Instituto di Matematica Applicata, Universita degli Studi di Firenze, 1976.

Pattern generation in developmental biology (J.D. Murray). Science and Engineering Research Council (U.K.) *Annual Report*, pp. 82-84, 1987.

The transfer of marital conflict to the developing infant: Examining dynamics within the Father—Mother—Baby triad (A.F. Shapiro, J. Gottman, S.R. Lubkin, C. Swanson, P. Burgess, and J.D. Murray) 2000

Modelling and control of bovine tuberculosis infection in badgers and cattle. II. Control strategies (D.E. Bentil, J.D. Murray). 1995

On the generation of dermatoglyphic patterns in primates: mathematical models and *in vitro* experiments (D.E. Bentil and J.D. Murray). 1996

Analysis of chemotactic *Salmonmella Typhimurium* patterns in semi-solid medium experiments (R. Tyson, S. R. Lubkin, J. D. Murray) 1996

Simple cellular forces form vascular networks *in vitro* (D. Manoussaki, S.R. Lubkin, R.B. Vernon, J.D. Murray) 1997

Model and analysis of chemotactic *Salmonella Typhimurium* patterns in semi-solid medium experiments (R. Tyson, S. R. Lubkin, J. D. Murray) 1997

Mechanics of *in vitro* vascular network formation: Consequences of cell proliferation and extra-cellular matrix generation. (Trachette L Jackson, James D. Murray, Patrick W. Nelson) 2000

The Evolution of Modeling Invasive Brain Tumors. (E.C. Alvord Jr., H.L.P. Harpold, J.D. Murray, K. R. Swanson) 2006

Graduate students (35) (all, except 2, worked in biomedical problems)**:**

	Thesis
Ph.D. (University of Michigan)	
Terry Tranen (1967)	A viscous problem in fluid mechanics
D.Phil. (University of Oxford)	
Terry P. Paton (1974)	A theoretical study of Gunn effect instabilities
Peter J. Mitchell (1974)	Generalized exchange equations of elliptic type: singular perturbation solutions
Richard Gibbs (1976)	On models of oscillation in the glycolytic pathway.
Nicholas F. Britton (1978)	The analysis and application of some nonlinear reaction-diffusion models.
Jacqueline E.R. Cohen (1980)	Travelling waves in reaction-convection-diffusion models
Martin R. Duffy (1981)	Waves and spatial structure in practical reaction diffusion models.
Philip A. Arcuri (1984)	Reaction diffusion mechanisms for biological pattern formation.
Dean I. Baldwin (1984)	Pattern formation in reacting and diffusing systems (with applications to morphogenesis).
Philip K. Maini (1985)	On mechanochemical models for morphogenetic pattern.
David C. Lane (1985)	A mathematical investigation of a mechanochemical model for the cytoskeleton.
Stephen Wilmott (1988)	Age dependent host-parasite population models.
Mary R. Myerscough (1989)	A chemotactic model for biological pattern formation.
David M. Crawford (1990)	Mathematical analysis of models for generating spatial patterns.
Louisa J. Shaw (1990)	Tissue interaction models for waves and spatial patterning in epithelial sheets.
Daniel E. Bentil (1991)	Aspects of dynamic pattern generation in embryology and epidemiology.
Mark A. Lewis (1991)	Modelling sol-gel pattern formation.
Michael J. Jenkins (1991)	Spatial pattern formation through self-organisation in reaction diffusion systems.
Jonathan A. Sherratt (1991)	Mathematical models of wound healing.
Gwen C. Littlewort (1991)	Neural network simulation and analysis.

Meghan A. Burke (1992)	Suicide substrates: An analysis of the enzyme reaction and reaction-diffusion equations
Gerhard C. Cruywagen (1992)	Dermal-epithelial interaction models for complex patterns.

M.Sc. (University of Oxford)

Niel A. Edwards (1981)	On discrete population models.
Ann Wilson (1981)	Spatial effects in a model for the budworm-balsam fir ecosystem.
Michael Dumbrell (1982)	The influence of spatial dispersal on discrete population models.

Ph.D. (University of Washington):

Mei Zhu (1994)	Mechanisms for biological pattern formation—nonlinear effects.
Jane White (1995)	Territoriality and survival in wolf-deer interactions.
Julian Cook (1995)	Mathematical models for dermal wound healing: wound contraction and scar formation.
Paul Kulesa (1995)	A model mechanism for the initiation and spatial patterning Of teeth primordia in the alligator
Daphne Manoussaki (1996)	Modeling formation of vascular networks *in vitro*
Rebecca Tyson (1996)	Pattern formation in *E. coli* and *S. typhimurium*—mathematical and numerical investigation of a biological phenomenon
Trachette Jackson (1998)	Methods of drug control delivery.
Patrick Nelson (1998)	Mathematical models of the immune system.
Kristin Swanson (1999)	Mathematical modeling of the growth and control of tumors

M.Sc. (University of Washington)

Anja Karin Sturm (1998)	On mechanisms that synchronize neuronal activity

Post-doctorals (20) – known current positions in brackets:

University of Michigan

John Ockendon 1967 (FRS, Professor of Mathematics, University of Oxford)

University of Oxford

Mayayasu Mimura 1977 (Professor of Mathematics, University of Tokyo)
Dale Larson 1978
Francisco Lara Ochoa 1982 (Professor, Instituto de Quimica, Universidad Nacional Autónoma de México, Circuito Exterior, Ciudad Universitaria)
Anders Kallèn, Sweden 1984
Christoph Berding Germany 1985
Philip K. Maini 1986 (Foreign Member, Mexican Academy of Sciences, Professor of Mathematical Biology, Director, Centre for Mathematical Biology, University of Oxford)
V.S. Manoranjan 1986 (Professor of Mathematics, State University of Washington, Pulman)
Robert Tranquillo 1987 (Distinguished McKnight Professor, University of Minnesota)
Lloyd Goldwasser 1987 (California Institute for Biodiversity)
Peter Grindrod 1988 (CBE, Professor of Mathematics, Reading University)
Somdatta Sinha 1988 (Professor of Mathematics, University of Hyderabad)
James Sneyd 1989 (FRNZ, Professor of Applied Mathematics, University of Auckland)
Scott Camazine 1989 (Emergency Physician, Altoona Hospital, Pennsylvania)

University of Washington

Daniel Bentil 1991 (Professor of Mathematics, University of Vermont)
Mark Lewis 1992 (Senior Canada Research Professor in Mathematical Biology, University of Alberta)
Wendy Seward 1991
Philippe Tracqui 1992 (University of Grenoble, Director of Research C.N.R.S., Group DynaCell, Faculté de Médecine)
Diane Woodward 1994
Sharon Lubkin 1994 (Professor of Mathematics, North Carolina State University, Chapel Hill)

Major Research Grants (selection):
England

Awarded major grants 1983-86, 1986-89, 1988-93 from the Science and Engineering Research Council for research and a **Centre for Mathematical Biology** in the Mathematical Institute, Oxford.
The Centre regularly hosted from **15-25 senior visitors a year**—mathematicians and biomedical scientists—who came for at least a month. The aim of the Centre was to promote interdisciplinary mathematics/biomedical sciences research and provide a focus for the establishment of mathematical biology in Britain.) There are now numerous such centres in UK universities.
U.S.A.
National Science Foundation Grants (Division of Mathematical Sciences) 1989-1990; 1990-1993; 2 for 1992-5; 1995-8; Environmental Protection Agency Grant (investigator) 1992-4; NIH grant (investigator) 1992-7. 1997-2002.

Professional activities (selection) since 1976:

Conferences organised (selection):

EMBO (European Molecular Biology Organisation) meeting on *Oscillatory Phenomena in Biological Systems*, Germany, October 1976, (with Professor Benno Hess).

Royal Society two day meeting on *Theories of Biological Pattern Formation*, London, March 1981 (with Professors Sidney Brenner FRS and Lewis Wolpert FRS).

Models in Developmental Biology: interdisciplinary meeting, Oxford, June 1982.

Modelling of Patterns in Space and Time: interdisciplinary meeting, Heidelberg, August 1983, (with Professor W. Jäger).

Mathematical Problems in Biology: interdisciplinary meeting, Oxford, June 1984.

Physiology and Developmental Biology session at the Institute for Maths. and its Applications (IMA) conference on *The Mathematical Theory of the Dynamics of Biological Systems,* Oxford, July 1984.

Tissue Interaction in Large Scale Patterning, Neurosciences Institute, Rockefeller University, New York, August 1985 (with G.F. Oster).

Neural Mechanisms for Pattern Generation, Neurosciences Institute, Rockefeller University, New York, August 1985.

Physiology and Developmental Biology session at the IMA conference on *The Mathematical Theory of the Dynamics of Biological Systems*, Oxford, July 1986.

The Mathematical Theory of the Dynamics of Biological Systems, Oxford, July 1986 (organising committee).

The Mathematical Theory of the Dynamics of Biological Systems, Oxford, July 1989 (organising committee).

International Congress of Mathematicians, Kyoto 1990 (Sub-Committee, Applications Section 17).

British Applied Mathematics Colloquium, Oxford, April 1991 (organising committee).

1st European Conference on Mathematics Applied to Medicine and Biology, Grenoble, January 1991 (organising committee).

IMA conference on *The Mathematical Theory of the Dynamics of Biological Systems*, Oxford, July 1992 (organising committee; chairman of developmental biology mini-symposium).

NATO meeting on *Biological Pattern Formation*; Oxford, August 1992 (with P.K. Maini & H. G. Othmer).

European Science Foundation (ESF) and Wellcome Trust Workshop in Mathematical Biology: *Non-linear pattern formation modelling in medicine and biology*; Abbaye de Fontevraud, Maine et Loire, April/May 1993 (with G. Chauvet).

2nd European Conference on Mathematics Applied to Medicine and Biology, Lyon, December 1993 (organizing committee).

European Science Foundation (ESF) (Network: *Complex Systems in Biology*) meeting: *Morphogenesis* (with W. Jäger, P.K. Maini, A. Stevens), Heidelberg, June 1994.

Institut National de la Santé et de la Recherche Médicale (INSERM) workshop: *Modèles nonlinéaires: Fractals et Chaos en Biologie* (with N.P. Chau), Paris, June 1995.

2nd European Conference on Artificial Life (ECAL) (organising committee), Granada, Spain, June 1995.

3rd European Conference on Mathematics Applied to Medicine and Biology, Heidelberg, October 1996 (organising committee and chair of a session).

Inst. Maths. & its Applications, University of Minnesota, *Year in Mathematics in Biology*. (Organising Committee for a series of meetings, 1998-99)

Inst. Maths. & its Applications, University of Minnesota, *Year in Mathematics in Biology*: Workshop on: Pattern formation and morphogenesis: The basic process. September 1998 (with H.G. Othmer and P.K. Maini)

Inst. Maths. & its Applications, University of Minnesota, *Year in Mathematics in Biology*: Workshop on: Pattern formation and morphogenesis: Model systems. September 1998 (with H.G. Othmer, P.K. Maini, and L.A. Segel)

Society for Mathematical Biology and European Society for Mathematical and Theoretical Biology meeting *On Growth and From: Spatio-temporal Patterning in Biology* University of Dundee September, 1998 (Scientific Advisory Committee)

Centre de Physique des Houches (France): Dynamique et Morphogenèse des Structures Arborescentes de la Cellule aux Réseaux Fluviaux (Scientific Committee), October 1999.

Acquisition conduite par le Modèle (Model Driven Acquisition), (Scientific Committee) Grenoble November 2000.

2001- Member of scientific committees of numerous international conferences and workshops, (e.g. 2008 Workshop on Archeology-Mathematics, Chile).

Editorial boards etc.:

S.I.A.M. J. Applied Math. 1975-83
J. Theoretical Biol. 1978-2000
J. Mathematical Biol. 1979-96
J. Maths. Applied in Medicine and Biol. 1983-96
Lecture Notes in Biomathematics (Springer-Verlag) 1984-95 (Series terminated at Volume 100)
Biomathematics (Book) Series (Springer-Verlag) 1984-
Acta Biotheoretica 1986-98
Bull. Mathematical Biol. 1987-
IMPACT of Computing in Science and Engineering 1989-93
Applied Mathematics Letters 1989-96
J. Nonlinear Science 1990-96
Interdisciplinary Applied Mathematics (Book) Series (Springer-Verlag) 1990-
Bifurcation and Chaos 1994-96
Journal of Theoretical Medicine 1997-2007
Consulting Editor: Computational and Mathematical Methods in Medicine 2007-
Board of Directors, Society for Mathematical Biology (elected office for a three year period) 1986-89
Mathematics Committee, Science and Engineering Research Council (UK) 1985-88

SIAM Committee on Mathematics in the Life Sciences 1989-92
Wellcome Trust Committee on Studentships and Fellowships in Mathematical Biology 1991-96
European Science Foundation (ESF) Network Committee on *Complex Systems in Biology* 1991-94
Honorary Member of Centre for Non-linear Systems in Biology, University of Dundee 1992-
Scientific Council, Institute of Mathematical Sciences, Ghana 1996-

Invitations accepted (selection) for guest/plenary lectures at conferences and universities (outside of England until 1989) 1975 -1999:

[Until 1988, when I spent a year in the U.S.A., about 15-20 research seminars, not listed below, were given each year at universities in Britain]

1975

Japan Academy of Science—Royal Society Exchange: Tokyo University [Physics]; Hokkaido University [Engineering College; Department of Surgery, Medical School]; Kyoto University [Maths.; Chemical Engineering; Biophysics]; Indian Institute of Science, Bangalore [Aeronautics; Research Institute for Theoretical Studies]; Indian Institute of Technology, Madras [Appl. Maths.]; Indian Institute of Technology, Delhi [Appl. Maths.; Chem. Eng.]; Tam Chang University, Taipei; Academia Sinica, Taipei; Marmara Institute, Istanbul [Maths.]

1976

University of Florence [Appl. Maths.]; Snamprojeti Laboratory, Rome; University of Tübingen [BioMaths.]; *1st European Conference on Myoglobin,* Brussels; Max Planck Institut, Dortmund [Biology].

1978

Princeton University [Maths.]; Harvard University [Appl. Maths.]; MIT [Appl. Maths.]; Courant Institute, New York University [Maths.]; University of Michigan, Ann Arbor [Engineering College—Interdept. colloquium]; Dalhousie University [Maths.; Biophysics]; Rensselaer Polytechnic Institute [Maths.]; Rutgers University [Maths.]; International Institute Physics and Chemistry conference on *The Relevance of Models in Pattern Formation and Morphogenesis*, Brussels [Chairman, Theoretical Section].

1979

Caltech [Appl. Maths.]; University of Chicago [Maths.]; University of British Columbia, Vancouver [Maths.; Ecology]; University of Arizona, Tucson [Maths.]; Claremont Colleges [Maths.]; University of Colorado, Boulder [Maths.]; University of Illinois, Chicago [Maths.]; University of Iowa, Iowa City [Maths.; Bioengineering; Medicine and Biophysics; Public lecture]; Northwestern University [Appl. Maths.]; University of Utah, Salt Lake City [Maths.]; American Association of Mathematics Teachers Meeting, Idaho [general lecture]; Symposium on *Physicochemical Origins of Biological Structure,* Imperial College London [Chemistry].

1980

Utrecht [Maths.]; Amsterdam [Maths.]; Heidelberg [Appl. Maths.; Medicine]; Guelph [Maths.; Public lecture]; Tübingen [Theor. Chemistry]; Leiden University, Institute for Theor. Biology and Mathematics Symposium on *Biological Pattern Formation in Reaction Diffusion Mechanisms*; Gordon Conference on *Theoretical Biology and Biomathematics*, New Hampshire.

1981

Dahlem workshop on *Evolution and Development*, Berlin; Institute de la Vie meeting on *The Physical Theory of Biology*, Versailles.

1982

Stuttgart [Theor. Physics]; Tübingen [Biomaths.]; Heidelberg [Appl. Maths.]; Compiegne [Appl. Maths.]

1983

Berkeley [Mechanical Engineering; Zoology]; UCLA [Maths.; Geophysics and Earth Sciences; Evolution Group]; Stanford University [Maths.]; Caltech [Appl. Maths.]; Brown University [Appl. Maths.; Biology]; University of Utah, Salt Lake City [Maths.]; Claremont Colleges [Maths.]; University of California, Irvine [Biology]; Northwestern University [Appl. Maths.]; University of North Carolina, Chapel Hill [Zoology]; Duke University [Biology]; University of Pennsylvania [Chemical Engineering]; University of Iowa, Iowa City [Interdepartmental—Engineering, Maths., and Biology]; British Assoc. for the Advancement of Science; International Conference on *Modeling of Patterns in Space and Time*, Heidelberg.

1984

Gordon Conference (US National Science Foundation) on *Theoretical Biology*, New Hampshire; Special Lecture, University of Bristol; *European Congress of Developmental Biology*, Southampton; Conference on

Ordinary and Partial Differential Equations, Dundee; University of Texas, Arlington [Maths.]; Scott Hawkins Lecture, Southern Methodist University.

1985

Los Alamos National Laboratory [Theor. Div. Colloquium]; Caltech [Appl. Maths.]; Conference on *Generation of Pattern and Form*, San Francisco; *British Theoretical Mechanics Colloquium* (Plenary lecture) Leeds; University of California, Davis [Appl. Maths.]; University of Washington, Seattle [Zoology and Appl. Maths. Colloquium]; University of Utah, Salt Lake City [Maths.]; University of Colorado [Chemistry]; Exxon Research, New Jersey; Cornell University [Ecology and Systematics Colloquium]; Edinburgh Mathematical Society.

1986

Western Symposium on Nonlinear Systems, Bristol; London Mathematical Society meeting on *Mathematical Biology*; Plenary Lecture, IMA Conference on *The Mathematical Theory of the Dynamics of Biological Systems*, Oxford; British Assoc. for the Advancement of Science, Bristol; British Society for Developmental Biology meeting on *Physical Correlates of Morphogenetic Phenomena*, Brighton; Special Research Series, [Zoology], Oxford.

1987

Society for Experimental Biology meeting on *Cell-Matrix and Cell-Cell Interactions,* Manchester; Royal Society of Edinburgh; *British Mathematical Colloquium*, St. Andrews; UCLA [Biomaths.; Maths.]; UC Davis [Maths.]; University of Washington [Zoology; Appl. Maths.]

1988

IXth Congress, International Association of Mathematical Physicists, Swansea; UBC, Vancouver [Maths.]; Caltech [Appl. Maths.]

1989

Cornell [Biophysics Series]; University of Minnesota [Engineering Sciences]; University of Victoria [Maths.]; University of Virginia (Blacksburg) [Zoology; Maths.]; Institute Maths. and its Applications (IMA)/Society for Math. Biol. meeting on *Classics in Theoretical Biology*, Oxford, July; Institute Maths. and its Applications (IMA) *Workshop in Mathematical Biology*, Oxford, July; London Mathematical Society's Naylor Lecture for 1988-90.

1990

University of Victoria, Landsdowne Lectures [Maths.; Public lecture]; State University of Washington, Pullman, Ostrom Lectures [Maths.; Public lecture]; Institute of Mathematics, University of Minnesota; Oberwolfach Institute of Mathematics meeting on *Mathematical Models in Biology*; 6th International NEI Symposium on *Development, Transplantation and Plasticity of the Nervous System*, Manchester.

1991

Opening plenary lecture, 1st European Conference on the Applications of Mathematics to Medicine & Biology, Grenoble; Distinguished Lecturer Series, University of New Mexico, Albuquerque [Maths.]; Center for Nonlinear Studies, Los Alamos National Laboratory; Distinguished Lecturer Series, Emory University [Maths.]; Invited lecture, Annual Scientific Meeting of Assoc. Surgeons of Great Britain & Ireland; University of Montana [Distinguished lecture series, Chemistry; Mathematics]; University of Bordeaux [Chemistry]; University of Angers [Theoretical Biology]; University of Paris [Maths.]; Gordon Conference on *Oscillations and Dynamic Instabilities in Chemical Systems*; Invited lecture, ICIAM (International Congress of Industrial & Applied Mathematics) Washington D.C. 1991.

1992

Claremont Colleges [Maths.; 1992 Special Spring Lectures]; UCLA Medical School [Biomaths.]; University of Washington [Psychology: Special Lecture Series]; University of Sheffield [Maths.]; University of Leeds [Maths.]; University of Strathclyde [Maths. and Statistics]; University of St. Andrews [Mathematical Sciences]; University of Exeter [Maths.; General lecture]; University of Oxford [Maths.]; University of Kyoto [Plenary Lecture: *Annual Meeting of the Japanese Association of Mathematical Biology*; Research Institute for Mathematical Sciences: *International Conference on Nonlinear Phenomena, Interfacial Dynamics and Patterns*]; Chubu University [Engineering].

1993

University of Paris [École Normale Supérieure]; University of Paris (Paris 7) [Biomaths.]; Workshop in Mathematical Biology: *Non-linear pattern formation modelling in medicine and biology*; Abbaye de Fontevraud, France; University of Angers [Public lecture (in French)]; Distinguished Lecture Series: *Epidemiological models for animal diseases*, University of Washington; (Introductory) Plenary lecture, 2nd

Conference of the European Society for Mathematical and Theoretical Biology on the *Applications of Mathematics in Medicine and Biology*, Lyon.

1994

University of Washington [Biological Structure, Health Sciences]; Arizona State University [Distinguished Lecture Series]; Plenary lecture, University of California Annual Conference on Nonlinear Phenomena, University of California, Davis; University of Paris (École Normale Supérieure); University of St. Andrews, Curle Lecture; University of Oxford (St. Catherine's College), Tayler Lecture; Invited lecture *4th Annual European Tissue Repair Society Meeting*, Oxford

1995

University of Washington [Neurosurgery, Health Sciences]; Plenary lecture, Mathematics Day 1995; Invited lecture, Amer. Assoc. for Advancement of Science, Atlanta (February); University of Victoria [Biology]; University of Western Washington [Mathematics]; Invited Plenary lecture, 4th Pacific Northwest Workshop in *Mathematical Biology*, University of British Columbia, Vancouver; University of Paris (École Normale Supérieure); Plenary lecture, Institut National de la Santé et de la Recherche Medicalé (INSERM) workshop on *Modèlees nonlinéaires: Fractals et Chaos en Biologie*, Versailles; University of Minnesota (Chemical Engineering) Distinguished Lecture Series on "Aesthetic Considerations in Science and Engineering"; McGill University [Physiology]; University of Vermont [Mathematics]; Williams College (Class of '62 lecture).

1996

University of Nice [Institut Non-Linéaire]; Stanford University [Applied Mechanics]; University of Utah [Mathematics]; Concluding plenary lecture, 3rd Conference of the European Society for Mathematical and Theoretical Biology on the *Applications of Mathematics in Medicine and Biology*, Heidelberg; University of Paris-Dauphine (Mathematics); University of Paris, Insitut Poincaré [Mathematics]

1997

University of Lausanne (Troisième Cycle de la Physique 1996-7—series of lectures on mathematical biology); ETH Zürich [Mathematics].

1998

University of Washington Annual Faculty Lecture 1997-8; University of Washington [Fisheries}

1999

Oxford University [Mathematics]; Universities of: Bath [Mathematics]; Heriot-Watt University [Mathematics]; Strathclyde University [Mathematics]; University of Nottingham [Mathematical Sciences]; Cornell University [Evolution and Developmental Biology: Distinguished Lecture Series]; Courant Institute, New York University [Mathematics]