

ACADEMIC CURRICULUM VITAE

1. PERSONAL DETAILS:

Name: Mark Andrew Joseph Chaplain

Department: Department of Mathematics, University of Dundee

Present Position: Professor of Mathematical Biology, 1st October 2000 -

Fellow of The Royal Society of Edinburgh (elected March 2003)

Home Address: 30 Buddon Drive, Monifieth DD5 4TH.

Date of Birth: 1st May 1964, **Age:** $N = 20XY - 1964$.

Nationality: Scottish. **Marital Status:** Married, three children.

2. HIGHER EDUCATION: 1982-1986, BSc (Honours) 1st Class, Applied Mathematics,
University of Dundee

1987-1990, PhD Applied Mathematics,
University of Dundee

3. PREVIOUS POSTS: Lecturer, Grade A September 1990 - April 1995
Lecturer, Grade B April 1995 - September 1996
School of Mathematical Sciences, University of Bath
Senior Lecturer, 1st September 1996 - 30th September 1998
Reader, 1st October 1998 - 30th September 2000
Department of Mathematics, University of Dundee

4. UNIVERSITY TEACHING DUTIES:

Undergraduate

EG21004 Mechanics, 2nd year, 40 hours (until 10/11)

MA22003 Statistics, 2nd Year, 30 hours (until 10/11)

Postgraduate

MA52001 Mathematical Oncology, 33 hours

MA52002 - Mathematical Ecology And Epidemiology (10/11)

From 1st September 2007 - 31st August 2009, no teaching duties due to award of Leverhulme Personal Research Fellowship

5. RESEARCH PROGRAMME:

Research Interests, Future Plans

My Ph.D. Thesis involved studying and modelling the growth and development of solid tumours. This work involved using a wide variety of techniques to attempt to capture the many aspects of this phenomenon. These techniques included moving boundary methods, non-linear elasticity theory and differential geometry. During the course of my research, I liaised with the Department of Pathology at Ninewells Hospital, Dundee to see first hand, actual specimens of various tumours and cancers. I also had the opportunity to model certain aspects of the morphological changes exhibited by the marine alga *Acetabularia mediterranea*. This stimulated my interest in the much wider field of developmental biology.

My current research interests include continuing to develop mathematical models for all aspects of tumour growth: the early growth of a tumour and the immune response; avascular growth; tumour-induced angiogenesis; capillary network formation; blood and drug flow through networks; chemotherapy and radiotherapy treatment modelling; cell cycle modelling; tumour invasion and metastasis; general cell invasion/migration models; chemotaxis problems; nematode movement in soil; plant cell wall morphogenesis; host-parasitoid systems; numerical analysis of systems of hyperbolic/parabolic equations. The main modelling techniques involved are the use and analysis of nonlinear partial and ordinary differential equations. I currently have several collaborative projects with experimental colleagues and this forms the core of my research activity (Prof. C. Weijer, Dept. of Anatomy and Physiology; Prof. S. and Dr. A. Schor, Dept. of Oral Pathology; Prof. R. Steele, Prof. A. Thompson and Dr. L. Newman, Dept. of Surgical Oncology; Dr. S. Hubbard, Dept. of Biological Sciences; Prof. P. Crocker, Dept. of Biochemistry).

Having established the SIMBIOS Centre (joint with Abertay University) and the Dundee University Centre for Theoretical Biology, my long term aim is to continue to work with colleagues in other departments (medical and life sciences) on interesting biological and medical problems using mathematical modelling. Much of my current work is focussed on what may be described as a Systems Biology approach to modelling cancer growth through the development of quantitative and predictive mathematical models.

GRANTS AWARDED

SHEFC RDG:

1) Awarded a SHEFC Research Development Grant (RDG) to the value of £950,000 to set up the SIMBIOS Centre (Scottish Informatics, Mathematics and Biology Centre) (joint with Abertay University). June 1999.

EU Human Potential Programme Framework V (FP5):

Marie Curie Research Training Network:

1) Awarded an EU Grant of 180,000 EURO as part of an overall Research Training Network (RTN) Grant of 1,450,000 EURO "Using Mathematical Modelling and Computer Simulation to Improve Cancer Therapy", HPRN-CT-2000-00105. To fund a 3 year post-doctoral research assistant position, commencing October 2000. The RTN consisted of 8 partner institutions in 7 different EC countries.

EU Human Potential Programme Framework VI (FP6):

Marie Curie Research Training Network:

2) Awarded an EU Grant of 236,000 EURO as part of an overall Research Training Network (RTN) Grant of 2,900,000 EURO "Modelling, Mathematical Methods and Computer Simulation of Tumour Growth and Therapy", MRTN-CT-2004-503661. To fund an 18 month post-doctoral research assistant position, and a PhD studentship, commencing October 2004. The RTN consists of 11 partner institutions in 9 different EC countries.

RESEARCH FELLOWSHIPS

Leverhulme Trust:

1) Awarded a Leverhulme Personal Research Fellowship £22,620. September 2007 - August 2009.

European Research Council:

1) Awarded a European Research Council Advanced Investigator Grant (ERC AdG) of 1,680,975 EURO “From Mutations to Metastases: Multiscale Mathematical Modelling of Cancer Growth and Spread”, (227619 - M5CGS). To fund 3 post-doctoral research assistants, 3 PhD students and one teaching replacement over a 5 year period. September 2009 - September 2014.

Post-doctoral:

1) Awarded an EPSRC Grant to the value of £90,153 (GR/J39267 “The Mathematical Modelling of Avascular and Vascular Tumour Growth”) to employ a Postdoctoral Research Assistant (RA1A) for three years beginning October 1993. This position was initially taken up by Dr. Byrne, H.M., Oxford University. Dr. Byrne took up a permanent position in the Dept. of Applied Maths, UMIST, 1st January 1996. The remaining 10 months of the grant was taken up by Dr. A. Anderson, University of Dundee, beginning 1st March 1996. Grant was awarded an α 4 rating for scientific merit (very significant contribution to the field) with **excellent** for use of resources.

2) EPSRC RA1A grant (GR/K70397 “Probabilistic Modelling & Analysis: Reaction-diffusion Systems in Biology and Physics”, principal investigator Prof. D. Williams, Bath; co-investigator Prof. A. Truman, Swansea) for 36 months, October 1995, £99,339. Grant was awarded an α 5 rating for scientific merit (highly significant contribution to the field) with **excellent** for use of resources.

3) EPSRC RA1A grant (GR/K92641 “Biological Networks: Form, Function and Heterogeneity”) for 24 months, April 1997, £85,935. Grant was awarded an α 3 rating for scientific merit (significant contribution to the field) with **excellent** for use of resources.

4) BBSRC RA1A/RA1B grant (94/E07916 “A combined mathematical and experimental study of the consequences of heterogeneity in soil structure and moisture for microbial dynamics”, with I. Young, J. Crawford, SCRI) for 36 months, January 1998, £197, 552. Grant was **graded B** “*Work that has met the majority of its agreed or related key objectives and added significantly to knowledge in the field*”.

5) BBSRC/EPSRC Mathematical Biology Initiative RA1A/Technician grant (94/MMI09008 “The mathematical modelling, simulation and prediction of matrix modulation of angiogenesis”, with Prof. S.L. Schor, Dr. A.M. Schor) for 36 months, October 1997, £223, 876. Grant was **graded A** “*Very high class work that has met all or almost all of the agreed or related key objectives and produced results of considerable scientific importance in a cost effective way.*”

6) EU funded PDRA, Dr. Jose Valenciano, through MCRTN “Using Mathematical Modelling and Computer Simulation to Improve Cancer Therapy”, HPRN-CT-2000-00105. October 2000, 36 months.

7) Wellcome Trust Postdoctoral Research Training Fellowship in Mathematical Biology (“Empirical approaches to verifying novel individual-based mathematical models of the spatio-temporal dynamics of parasite-host-pathogen associations: Sex, flies and videotape”), November 2001, with Mr. Peter Schofield and Dr. S. Hubbard, for 36 months, **£189, 727**.

8) Co-investigator on EPSRC fast-track grant (GR/R74789/01 “The mathematical modelling of dynamic capillary growth and vascular perfusion of chemotherapy treatments”) along with Principal investigator Dr. S. McDougall, Heriot-Watt University (Dr. A. Anderson and Prof. J. Sherratt co-investigators).

9) Wellcome Trust Postdoctoral Research Training Fellowship in Mathematical Biology (“Mathematical modelling of neuronal differentiation dynamics during development”), November 2002, with Dr. Ruth Diez del Corral and Dr. K. Storey. 36 months, **£178,840**

10) BBSRC RA1A grant (94/E18787) “An individual-based mathematical model of chick embryo gastrulation: Developing a virtual embryo computational tool” (co-applicants Prof. C. Weijer, Dr. B. Vasiev), December 2002, 36 months, **£134,940**

11) EU funded PDRA, Dr. Olivier Lejeune, through MCRTN “Modelling, Mathematical Methods and Computer Simulation of Tumour Growth and Therapy”, MRTN-CT-2004-503661. October 2004, 18 months.

12) EPSRC RA1A grant (EP/D043859/1) “The modelling and analysis of the pharmacodynamics of anti-cancer drugs” (co-applicant; PI, Dr. F. Davidson), October 2006, 36 Months, **£152,908**

13) CRUK RA1A grant (C22147/A7037) “Mathematical modelling of radiotherapy strategies for early breast cancer”, May 2006, 8 months **£20,000**

14) MRC Discipline Hopping Award “Mathematical modelling of the p53 signalling pathway” (co-applicant; PI Dr. Sonia Lain), December 2007, 12 months **£83,028**

15) BBSRC RA1A grant (BB/F002254/1) “Guidance cues and pattern formation in the developing retinal vacuature: a combined experimental and theoretical modelling approach, July 2008, 18 months **£182,505**

RESEARCH NETWORKS:

1) EPSRC Research Network (GR/S43467/01) “Mathematics Biomedical Network (MBN)”, January 2004, 36 months. Research Network award **£61,246**. Co-applicant with N. Hill (Glasgow), J. Sherratt (Heriot-Watt). PI Prof. S. McKee (Strathclyde). Rated tending to internationally excellent.

VISITING FELLOWSHIPS:

1) EPSRC Visiting Fellowship (GR/M29849 “Mathematical Modelling of the Spatio-temporal Dynamics of Tumour-Immune System Interactions”) for 6 months, March 1999, £6500, for the visit of Dr. V. A. Kuznetsov. Grant was awarded an $\alpha 3$ rating for scientific merit (significant contribution to the field) with **good** for management and use of resources.

2) EPSRC Visiting Fellowship (GR/M81878 “Mathematical Modelling of Morphogenesis: Application of Mechanical and Chemical Theories”) for 3 months, June 1999, £4840, for the visit of Professor T. Sekimura (joint with Professor Maini, P.K., University of Oxford). Grant was awarded an $\alpha 3$ rating for scientific merit (significant contribution to the field) with **good** for management and use of resources.

CONFERENCES:

1) EPSRC Award (GR/S42965/01 “International Meeting on Mathematical Biology”). £4336 to fund Mathematical Biology Conference, 6-9 August 2003, University of Dundee.

2) £5000 from Scottish Enterprise to support the International Conference on Mathematical Biology, Annual Meeting of the SMB, 6-9 August 2003, University of Dundee.

3) £21,000 from ICMS to support a workshop on cancer invasion, March 25-30, 2007, West Park Centre,

University of Dundee

4) 125,000 EURO from EU FP6 Marie Curie Conferences and Training Courses Programme (MSCF-CT-2006-045961), to fund a Summer School and Workshop, 15-28 August 2010, "The Mathematical Modelling of Cancer Growth and Treatment", West Park Centre, Dundee.

PhD:

1) Miss Michelle Humphreys (1st class Hons, Exeter) was awarded an EPSRC Award and started a PhD under my supervision September/October 1993. c.£30,000. Completed September 1996. Degree awarded July 1997.

2) Miss Emma Stott (1st class Hons, Oxford) was awarded an EPSRC award and started a PhD under joint supervision with Dr. N. F. Britton, October 1995 - September 1996. c.£30,000. Degree awarded May 1999.

3) Mr. Gordon Henderson, jointly supervised by myself, Professors I. Young, J. Crawford of Abertay University. Funding from SCRI. October 1996 - October 1999. c.£30,000. Completed April 2000. Degree awarded May 2000.

4) EPSRC Mathematics Earmarked Studentship "Mathematical modelling of cell movement in multicell development". Joint supervision with Prof. C. Weijer, Anatomy and Physiology. 3 Year award. Mr. A. Pitcairn commenced September 1998. c.£30,000. Completed February 2003. Degree awarded July 2003.

5) BBSRC Committee Studentship "The spatio-temporal dynamics of horizontal and vertical transmission of the intracellular parasite *Wolbachia* in insect populations". Joint supervision with Dr. S. Hubbard, Biological Sciences. 3 Year Award. Mr. P. Schofield commenced January 1999. c.£30,000. Degree awarded July 2002.

6) "Mathematical modelling of the Urokinase Plasminogen Activator System and its Role in Tumour Invasion". Self-funded by Mr. G. Lolas, commenced October 1999. c.£10,000. Completed May 2003.

7) Co-supervision of Angélique Stephanou under the European "co-tutelle" framework with France. October 1999 - October 2001; funded by "Région Rhône-Alpes"; Co-supervisor, Dr. P. Tracqui, University of Joseph Fourier, Grenoble. "The spatio-temporal dynamics of cell membrane deformations and cell migration". c.£10,000. Completed November 2001. Degree awarded February 2002, "*très honorable avec félicitations*".

8) "Mathematical modelling of the spatio-temporal response of cytotoxic T-lymphocytes to a solid tumour" Self-funded by Mr. A. Matzavinos, commenced October 2001. c.£10,000. Completed June 2004. Degree awarded June 2005.

9) "Modelling and analysis of stage-structured population dynamics". Mr. Rui Xu funded under University of Dundee Postgraduate Research Award (Butchart Bursary Award); commenced March 2002. c.£21,000. Completed January 2005. Degree awarded June 2005.

10) BBSRC Committee Studentship "Mathematical modelling of wound healing". Joint supervision with Prof. S. Schor. 3 Year award, Mr. James Arnold commenced 1 January 2003. c.£40,000. Corrections required. Student did not complete due to personal medical problems.

11) NERC 4 year award, MRes + Phd "Stochastic models of host-parasitoid-parasite dynamics". Joint supervision with Dr. S. Hubbard, Dr. A. Anderson. Mr. I. Pearce commenced October 2002. c.£62,000.

Completed December 2006. Degree awarded June 2007.

12) University of Dundee Nicholl-Lindsay Scholarship, 3 year PhD award. Joint supervision with Dr. A. Anderson, Dr. G. Rowe. PhD student Mr. Heiko Enderling commenced May 2003. **£29,760**. Completed September 2006. Degree awarded June 2007.

13) EPSRC CASE Studentship, 3 year PhD award, with Cyclacel. PhD student Miss Kirsty Gordon commenced October 2003. **£40,000**. Completed December 2006. Degree awarded June 2007.

14) BBSRC Studentship, 3 year PhD award, joint supervision with Dr. S. Hubbard. Miss K. Preedy commenced January 2004. **£40,000**. Completed February 2007. Degree awarded June 2007.

15) EU funded PhD Studentship via MCRTN “Modelling, Mathematical Methods and Computer Simulation of Tumour Growth and Therapy”, MRTN-CT-2004-503661. Mr. Ignacio Ramis Conde commenced October 2004. Completed November 2007. Degree awarded June 2008.

16) EPSRC CASE Studentship, 3 year PhD award, with CXR Biosciences. October 2006. Miss Lydia Marthews commenced September 2006. c.**£50,000**. Completed December 2010. Degree awarded June 2011.

17) 3 year PhD student Sahar Al-Dakheel (self-funding) commenced January 2007. c.**£39,000**

18) EPSRC CASE Studentship, 3.5 year PhD award, with SCRI, October 2007. Dr. Andrew Burgess commenced September 2007. c.**£62,000**

19) Northern Research Partnership (NRP) funded Studentship, 3 year PhD award, joint supervision with Professor Celso Grebogi (Aberdeen). October 2007. Miss Vivi Andasari commenced November 2007. Completed June 2011. Degree awarded November 2011. **£30,000**

20) Mr. Mohannad Al-Tameemi, commenced January 2008 (self-funding). c.**£40,000** Completed December 2011. Degree awarded June 2012.

21) EPSRC CASE Studentship, 3.5 year PhD award, with SCRI, October 2008. Miss Ananthi Anandanadesan commenced March 2009 **£65,000**

22) ERC AdG funded PhD Studentship, 3.5 year award. Ms. Daniela Schlueter commenced September 2009.

23) ERC AdG funded PhD Studentship, 3.5 year award. Mr. Marc Sturrock commenced September 2009.

24) ERC AdG funded PhD Studentship, 3.5 year award. Mr. Niall Deakin commenced September 2009.

25) Cancer Bequest PhD Studentship, 3.5 year PhD award, October 2009. Mr. John Kelly commenced September 2010 **£50,000**

26) EPSRC DTA PhD Studentship, joint with JHI, 3.5 year award. Ms. Rebecca Cornwell commenced May 2011 c.**£60,000**

27) Division/EPM funded PhD studentship, 3.5 year award. Ms. Lu Peng commenced September 2011. c.**£60,000**

MISCELLANEOUS GRANTS:

- 1) Royal Society Travel Grant £375, July 1991.
- 2) Royal Society Travel Grant £220, September 1992.
- 3) Wellcome Trust £2000, to run Mathematical Biology minisymposium at the 2nd BAMC, Strathclyde University, April 1993.
- 4) Royal Society Travel Grant £360, December 1993.
- 5) Société Française de Biologie Théorique FF 1000, June 1994.
- 6) £1000 from LMS: “Order and Disorder in Tissue Growth” with Maini, P.K. (Oxford), J.A. Sherratt (Warwick).
- 7) £1000 from ICRF for ICMS Workshop “Chemotherapy Modelling”
- 8) £1000 from LMS fSU scheme for the visit of Dr. V. Kuznetsov, Moscow.
- 9) Royal Society Travel Grant £375, May 1995.
- 10) £1500 from Academic Planning Committee, University of Bath, for Centre of Mathematical Biology International Conference, July 1995.
- 11) £2000 from The Wellcome Trust for Centre of Mathematical Biology International Conference, University of Bath, April 1996.
- 12) £1700 from Hewlett-Packard Laboratories, Bristol, for Centre of Mathematical Biology International Conference, with Dr. N. R. Franks, School of Biology, University of Bath, April 1996.
- 13) £1000 from LMS: “Order and Disorder in Tissue Growth II ” with Maini, P.K. (Oxford), J.A. Sherratt (Warwick), June 1996.
- 14) £3000 from EPSRC with J.A. Sherratt (Warwick) to run 3 day meeting on “Mathematical Modelling of Tumour Invasion and Metastasis”, September 1996.
- 15) Royal Society Travel Grant £770, January 1997.
- 16) £1000 from LMS: “Order and Disorder in Tissue Growth III ” with Maini, P.K. (Oxford), J.A. Sherratt (Warwick), H. Byrne (UMIST) June 1997.
- 17) £2000 from SmithKline Beecham Bioinformatics to support D’Arcy Thompson Meeting, March 1998.
- 18) £473.50 from Edinburgh Mathematical Society to support D’Arcy Thompson Meeting, June 1998.
- 19) £2500 from the London Mathematical Society to support D’Arcy Thompson Meeting, June 1998.
- 20) £1000 from the London Mathematical Society to support the visit of Dr. A. Polezhaev to the D’Arcy Thompson Meeting, June 1998, under the fSU scheme.
- 21) £2000 from the Wellcome Trust to support D’Arcy Thompson Meeting, June 1998.

- 22) £995 from the London Mathematical Society to support the visit of Dr. A. Polezhaev, January 2000.
- 23) Royal Society Travel Grant £610, July 2000.
- 24) Royal Society Ex-Agreement Visit from Former Soviet Union £6215, November 2001, for 6 month visit of Dr. A. Samoletov.
- 25) Royal Society Travel Grant £995, July 2002.

6. ADMINISTRATIVE AND COMMUNITY CONTRIBUTIONS:

- 1) Departmental seminar organiser, October 1997 - September 2005
- 2) Department of Mathematics representative of Curriculum Planning Review Group, 1997-1998
- 3) External examiner, 1 October 1997 - 30 September 2000 in the Faculty of Science and Engineering, University of Edinburgh for 1st and 2nd Year Engineering Mathematics Service Courses.
- 4) External examiner, June 2006 - June 2009, Department of Mathematics, University of Glasgow, Honours Applied Mathematics Courses.
- 5) External examiner, October 2007 - , Department of Mathematics, University of Nottingham, MSc Mathematical Medicine
- 6) External examiner, June 2009 - June 2013, Department of Mathematics, University of Liverpool, Honours Applied Mathematics Courses.

7. PROFESSIONAL STATUS:

Seminar Presentations:

November 1988, Department of Mathematics, Dundee University.
 February 1990, Department of Mathematics, Dundee University.
 January 1991, School of Mathematics, Bath University.
 July 1991, New Jersey Institute of Technology, New Jersey, U.S.A.
 November 1991, Oxford University.
 January 1992, University of Nottingham.
 February 1992, Heriot-Watt University.
 February 1992, Dundee University.
 September 1992, University of British Columbia, Vancouver, Canada.
 September 1992, University of Washington, Seattle, Washington, U.S.A.
 January 1993, Heriot-Watt University.
 March 1993, Leeds University.
 June 1993, Institute of Life Sciences, Bath University.
 September 1993, School of Postgraduate Medicine, Bath University.
 November 1993, Surrey University.
 November 1993, Bristol University.
 May 1994, Hewlett-Packard Laboratories, Bristol.
 September 1994, UCL Medical School, London.
 December 1994, Centre for Mathematical Biology, Bath University

March 1995, Oxford University.
March 1995, Keele University.
April 1995, Royal United Hospital, Bath.
September 1995, University of Sydney,
September 1995, University of Queensland,
September 1995, Queensland University of Technology,
October 1995, University of Bath,
November 1995, Southampton University,
November 1995, Sheffield University,
December 1995, Strathclyde University,
February 1996, Dundee University,
November 1996, Dundee University,
January 1997, University College London,
February 1997, Edinburgh University,
March 1997, Bristol University,
March 1997, St. Andrews University,
April 1997, Royal Marsden Hospital, London,
November 1997, Western General Hospital, Edinburgh,
December 1997, Warwick University,
December 1997, UMIST,
May 1998, Liverpool University
May, 1998, Abertay University
May 1998, Glasgow University
December 1998, Halle University, Germany
March 1999, UCL
June 1999, Aberdeen University
December 1999, Royal College of Physicians, Edinburgh
June 2000, Ross Priory, STAMS Seminar Day, Strathclyde University
November 2000, Glasgow Caledonian University
February 2001, Leeds University
March 2001, Imperial College London
March 2001, Stirling University
May 2001, University of Utah, Salt Lake City, USA
November 2001, Isaac Newton Institute, Cambridge
December 2001, Edinburgh Mathematical Society, Heriot-Watt University
February 2002, University of Dundee, Public Evening Lecture
April 2002, Glasgow University
May 2002, Oxford University
May 2003, King's College, London
February 2004, University of Warsaw
May 2004, University of Nottingham
October 2004, University of Ulster
November 2004, University of Warwick
December 2004, University of Warsaw
June 2005, University of Warsaw
September 2005, University of Edinburgh
February 2006, University of Brunel
February 2006, University of Belfast
April 2006, University of Heidelberg
March 2007, Maxwell Symposium on Computational Mathematics, ICMS
December 2007, University of Warsaw
October 2008, University of Warsaw

January 2009, University of Warwick
March 2009, University of Lyon
January 2010, University of Edinburgh
January 2010, University of Nottingham
October 2011, University of Bath, Landscape Seminar
November 2011, Université Pierre et Marie Curie, Paris
November 2011, Université Claude Bernard Lyon 1, Lyon

Conference Presentations:

April 1989, 31st BTMC, Exeter University.
July 1989, IMA Conference on Theoretical and Mathematical Biology, Oxford University.
April 1990, 32nd BTMC, St. Andrews University.
July 1990, Differential Equations Conference, Dundee University.
April 1991, BAMC, Oxford University.
July 1991, ICIAM '91, Washington D.C., U.S.A.
March/April 1992, 34th BTMC, Keele University.
July 1992, 6th IMA Conference on Mathematics and Biology, Oxford University, **plenary speaker**.
August 1992, NATO Advanced Research Workshop on Biological Pattern Formation, Merton College, Oxford University, **plenary speaker**.
April 1993, BAMC, Strathclyde University.
April/May 1993, Mathematical Biology: nonlinear pattern formation modelling in medicine and biology, Research Workshop, Abbaye de Fontevraud, France, **plenary speaker**
December 1993, 2nd European Conference Mathematics Applied in Medicine and Biology, Lyon, France.
April 1994, BAMC Sheffield University.
June 1994, Société Française de Biologie Théorique, St. Flour, France, **plenary speaker**. *Talk presented in French.*
June 1994, ESF Workshop, Biological Pattern Formation, Heidelberg, Germany, **plenary speaker**
December 1994, ICMS Workshop-Conference “Biomechanics”, Edinburgh, **plenary speaker**
January 1995, ICMS Workshop-Conference “Wound Healing”, Edinburgh
February 1995, ICMS Workshop-Conference “Tumour Growth and Development”, **plenary speaker** Edinburgh
April 1995, ICMS Workshop-Conference “Chemotherapy Modelling”, Edinburgh
June 1995, Conference “Biomechanics in Medicine and Biology”, IIMAS, Mexico City, Mexico **plenary speaker**
July 1995, ICIAM '95, Hamburg, Germany, **invited speaker** in the *Mathematics in Physiology* minisymposium
November 1995, ICMS Workshop-Conference “Cell Kinetics”, **plenary speaker** Edinburgh
September 1996, workshop “Mathematical Modelling of Cancer Invasion and Metastasis”, Warwick University, **plenary speaker**
October 1996, 3rd European Conference on Mathematics Applied to Biology and Medicine, Heidelberg, Germany, **plenary speaker** (350 conference participants)
April 1997, BAMC Edinburgh University
May 1997, International Conference on Mathematical Models in Medical and Health Sciences, Vanderbilt University, Nashville, USA, **invited speaker** in *Tumor Models* minisymposium
June 1997, St. Flour Summer School on Theoretical and Population Biology, **plenary speaker**
July 1997, British Oncological Association, Association of Cancer Physicians and Royal College of Radiologists Joint Meeting, St. Andrews, **invited speaker** in *Chaos Theory and Oncology* symposium
October 1997, Dundee University Cancer Forum, “Breast Cancer”, **plenary speaker**
January 1998, British/Irish Annual SIAM Meeting, UMIST, **plenary speaker**
March 1998, British Oncological Association Biennial Presidential Symposium, Royal Society of Medicine,

plenary speaker

March 1998, Theoretical Biology Spring School, St. Flour, France, **plenary speaker**
April 1998, International Meeting on Mathematical Biology, University of Bath, **plenary speaker**
September 1998, 5th Franz Volhard Symposium, Gross-Dolln (by Berlin), Germany, **plenary speaker**
December 1998, Guest lecturer at Halle University
February 1999, RiP Workshop, Oberwolfach, Germany,
March 1999, **plenary speaker**, Cells to Continua Meeting, ICMS, Edinburgh
April 1999, BAMC, University of Bath
June 1999, TMBM, ESMTB Meeting, Amsterdam
July 1999, ICIAM, Edinburgh, Tumour growth minisymposium
November 1999, **invited speaker** BBSRC/EPSRC Workshop in Theoretical Biology, Bournemouth
January 2000, **plenary speaker** Theoretical Medicine Meeting, Nottingham University
June 2000, **plenary speaker** IMA Meeting, Mathematics in Medicine and Healthcare, Glasgow Caledonian University
June 2000, **plenary speaker** SFB-Workshop, Numerical Simulations of Polymer and Cell Dynamics, Bad Honnef (Bonn), Germany
August 2000, SMB Conference on Mathematics in Biology, University of Utah, USA
August 2000, **invited speaker**, International Conference on Interfaces, Pulses and Waves in Nonlinear Dissipative Systems, Kyoto, Japan
September 2000, **plenary speaker** European Society of Mathematical and Theoretical Biology Summer School, Martina-Franca, Italy
February 2001, **Plenary Guest Speaker** Cancer Research Campaign, 2001 National Cancer Symposium, Manchester; 500 participants.
June 2001, **plenary speaker** European Society of Mathematical and Theoretical Biology Summer School, Sigüenza, Spain
June 2001, **plenary speaker**, Brain Tumour Modelling Meeting, ICMS, Edinburgh
September 2001, **plenary speaker**, Cancer modelling workshop, Propriano, Corsica
August 2002, **Invited speaker**, International Conference on Mathematical Biology, Guilin, China
September 2002, **Plenary speaker**, LMS Meeting: Numerical Methods and Stochastic Simulation Applied to Life Sciences, University of Edinburgh
September 2002, **Plenary speaker**, International Conference on Morphogenesis and Pattern Formation in Biological Systems, Chubu University, Nagoya, Japan
October 2003, **Invited Speaker**, Differential Equations in Biology and Medicine Conference, Institute of Mathematics, Polish Academy of Sciences, Mathematical Research and Conference Centre, Bedlewo, Poland
November 2003, **Invited Speaker**, Mathematical Models of Cell Proliferation and Cancer Chemotherapy Workshop, Mathematical Biosciences Institute, Ohio State University, USA
July/August 2004, Annual Meeting of the Society of Mathematical Biology, University of Michigan, USA
November 2004, **Invited Plenary Speaker**, Current Research in Mathematical Biology, Royal Society of Edinburgh and Royal Swedish Academy of Sciences Joint Conference, Kelvin Gallery, University of Glasgow
June 2005, **Invited Speaker**, Mathematical Models in Medicine and Biology Conference, Bedlewo, Poland
July 2005, ECMTB2005, Dresden Germany
September 2005, **Invited Speaker**, Modelling Tumour Growth Workshop, Puerto de la Cruz, Tenerife, Spain
January 2006, **Invited Speaker**, Mathematical Biology Workshop, National Center for Theoretical Sciences, National Tsing Hua University, Hsinchu, Taiwan
May 2006, **Invited Speaker**, Mathematical Biology Workshop, Oberwolfach, Germany
May 2006, **Plenary Speaker**, Cancer Modelling Workshop, Karolinska Institute, Stockholm, Sweden
June 2006, **Invited Speaker**, ICMS Workshop, Asymptotic Analysis, ICMS Edinburgh
2-9 September 2006, **Invited Speaker** From a Microscopic to a Macroscopic Description of Complex Systems, Workshop, Bedlewo, Poland
February 2007, **Invited Speaker**, PIMS 10th Anniversary, University of Alberta, Canada
June 2007, **Invited speaker**, Angionet 3, University of Ulster, Coleraine

July/August 2007, contributed talk, Annual Meeting of the Society of Mathematical Biology, San Jose, USA
 July/August 2007, invited minisymposium talk, Annual Meeting of the Society of Mathematical Biology, San Jose, USA
 September 2007, Plenary Speaker, Workshop on Mathematical Modelling and Analysis of Biological Pattern Formations, Nagoya University, Nagoya, Japan
 November 2007, invited speaker, Conference Differential Equations and Mathematical Biology, Mathematical Biosciences Institute, Ohio State University, USA
 January 2008, invited speaker, Pattern Formation Workshop, RICAM, Linz, Austria
 February 2008, invited speaker, Cancer Modelling Workshop, UCI, Irvine, USA
 May 2008, invited speaker, CancerSim2008, Euroconference on modelling and simulation of cancer growth and therapy, Torino, Italy
 October 2008, invited speaker, 1st Transatlantic Workshop on Modelling Cancer Growth, Brussels, Belgium
 October 2008, invited speaker, Centenary Symposium on Mathematical and Statistical Modelling in Medicine and Health Sciences, Queen's University of Belfast, N. Ireland
 June 2009, Plenary Speaker, SMB-CSMB International Conference, Hangzhou, China
 July 2009, SMB Annual Meeting, Vancouver, Canada
 September 2009, invited speaker, Dynamics in Systems Biology Conference, University of Aberdeen
 October 2009, invited speaker, Mathematical Modelling of Cellular Biosystems II Workshop, Warsaw, Poland
 October 2009, invited speaker, Workshop on Advanced Mathematical Sciences, New Development of Iatromathematics, "Mathematical modeling of cancer growth and treatment", Meiji University, Tokyo, Japan
 March 2010, invited speaker, Dundee Cancer Centre Forum, "Imaging Technology and Cancer", West Park Centre, Dundee
 June 2010, **invited minisymposium speaker**, Physiology 2010 Conference, Manchester
 July 2010, **Plenary Speaker**, ECMI 2010, The 16th European Conference on Mathematics for Industry, July 26-30, 2010, Wuppertal, Germany
 December 2010, invited speaker, MathCell2010 Workshop, CIMAB, Inter-university Centre for Mathematics Applied to Biology, Medicine and Environmental Sciences, 14-15 December, 2010, Rome, Italy
 April 2011, **Plenary Speaker**, BAMC University of Birmingham
 June 2011, **Plenary Speaker**, The 3rd CREST-SBM International Conference "Mathematical Methods in Cancer Cell Biology", June 8-9, 2011, Hiroshima, Japan
 July 2011, **Invited minisymposium speaker**, Thematic Minisymposium *Cancer Modelling*, ICIAM 2011, July 18 -22, Vancouver, Canada
 September 2011, **Plenary Speaker**, Workshop "The role of multiscale structure in biological systems", 27-29 September, ICM, University of Warsaw, Warsaw, Poland

Organisation of Conferences, Minisymposia, Workshops, Meetings:

January 25th 1993, co-organiser (with B.D.Sleeman) of one day meeting on "The mathematical modelling of solid tumour growth", International Centre for Mathematical Sciences, Heriot-Watt University.

April 5th-8th 1993, co-organiser (with Maini, P.K.) of Mathematical Biology Minisymposium, BAMC Strathclyde University. Received a grant of £2000 from the Wellcome Trust. This was used to fund the expenses of the invited speakers and to subsidise travel for young graduate students of mathematical biology from all over the country.

Co-organiser along with Professor Sleeman, B.D. (University of Leeds) of **year long** ICMS (International Centre for Mathematical Sciences) programme " Mathematics in Medicine". The programme was held in Edinburgh and ran between October 1994 - November 1995 and focussed on three main areas - mathematics applied to physiology, mathematical models for tumour growth and cell cycle kinetics and chemotherapy and image analysis. A total of 8 workshop-conferences took place - Modelling the Heart, the Lung and

Cardiovascular System, Biomechanics, Wound Healing, Tumour Growth and Development, Chemotherapy, Image Analysis, Cell Kinetics. As scientific director for 7 of the 8 workshop-conferences I was heavily involved in the planning at all stages including advertising the programme for each workshop, inviting the plenary speakers, drawing up a timetable for each workshop-conference.

Organiser of 1-day meeting “Mathematical Modelling of Solid Tumour Growth”, 6th October 1994, University of Bath.

Co-organiser of ICMS lecture, Edinburgh Science Festival talk by Professor R. M. Anderson, 6th April 1995.

Co-organiser of LMS/RSE Spitalfields Day, “Mathematics in Medicine” 10th June 1995.

Co-organiser of “International Workshop on Spatial Heterogeneity and Temporal Complexity in Biological Systems”, University of Bath, 1-4 April 1996. Attended by over 100 participants.

Co-organiser (with J.A. Sherratt) of workshop “Mathematical Modelling of Cancer Invasion and Metastasis”, Warwick University, September 1996.

Organiser of “On Growth and Form: Spatio-temporal pattern formation in biology”, celebrating the life and works of D’Arcy Thompson on the 50th Anniversary of his death. September 20-24, 1998. Over 100 participants.

Organiser, first Scottish Theoretical Biology Forum Meeting, University of Dundee, 13th May 1999

Organiser of two minisymposia on “Mathematical modelling of tumour growth, angiogenesis and invasion I, II”, 8th July, ICIAM99, Edinburgh. Special report of the minisymposia appeared in the October issue of *SIAM News*.

Organiser of minisymposium on tumour growth, annual meeting of the Society of Mathematical Biology (SMB), August 2000, University of Utah, Salt Lake City, Utah, USA

Organiser of International Conference on Mathematical Biology, Annual Meeting of The Society for Mathematical Biology, 6-9 August 2003. First time the annual meeting of the SMB has been held independently outside North America. 225 participants.

Organiser of workshop for Sleeman, B.D.’s 65th Birthday, University of Dundee, October 10-12, 2004 (40 participants)

Organiser of minisymposium on cell migration, ECMTB2005, Dresden, Germany, July 2005

Organiser of workshop on cancer modelling, University of Dundee, June 5-9, 2006 (35 participants)

Organiser of ICMS workshop on cancer invasion, University of Dundee, March 25-30, 2007 (50 participants)

Organiser of Marie Curie RTN Summer School on Modelling Cancer Treatment and Therapy, University of

Dundee, August 24-28, 2007 (40 participants)

Organiser of ECMTB08, the 7th Triennial Conference of the European Society for Mathematical and Theoretical Biology (ESMTB), University of Edinburgh, June 29 - July 4, 2008 (540 participants)

Organiser of minisymposium “Multiscale modelling of cancer growth and treatment”, ECMTB08, Edinburgh, June 29 - July 4, 2008

Co-organiser (with Dr. M. Owen, Nottingham) of “Angionet 2009” meeting, Westpark Centre, Dundee, April 20-22, 2009

Track Chair, Track E - From Molecules to Living Systems, ECCS09 European Conference on Complex Systems, University of Warwick, 21-25 September 2009

Organiser of Marie Curie Conferences and Training Courses Programme (MSCF-CT-2006-045961) Summer School and Workshop, 15-28 August 2010, “The Mathematical Modelling of Cancer Growth and Treatment”, West Park Centre, Dundee (80 participants)

Organiser of **Thematic Minisymposium** *Mathematics of Cancer*, ICIAM 2011, July 18 -22, Vancouver, Canada

External Professional Activities:

Scientific Director, SIMBIOS Centre, 1999 - 2001

Scientific Director, Centre for Theoretical Biology, University of Dundee

IMA Forum on Mathematics in Medicine and Biology

Committee Member 12th January 1993- 2000

Secretary 13th May 1996 - 2000

EPSRC Peer Review College for Mathematics

Member 1 January 1995 - 31 December 1996

Member 1 January 1997 - 31 December 1999

Member 1 January 2000 - 31 December 2002

Member 1 January 2003 - 31 December 2005

Member 1 April 2010 -

Mathematical Biosciences Institute

Member of the Scientific Advisory Committee, October 2008 - 2012

Grant Committee:

Member of the BBSRC/EPSRC Mathematical Modelling Simulation and Prediction of Biological Systems Initiative Committee, May 1997

Member of EPSRC Mathematics Responsive Mode Panel Meeting, June 2001

Chair of EPSRC Mathematics Responsive Mode Panel Meeting, October 2001

Member of MRC Grant Panel for Discipline Hopping Awards, January 2004, January 2005, January 2006, February 2007, February 2008, February 2009, March 2010

External Review Panel:

Member of External Review Panel for the Department of Computer Science and Mathematics, University of Stirling, November 2001.

ESMTB:

Member of the Board of the European Society for Mathematical and Theoretical Biology, September 1997 - September 2002

Secretary and Treasurer of the ESMTB Board, January 1998 - September 2002

SMB:

Elected to the Board of the Society of Mathematical Biology, July 1998 - July 2002

President-elect, Society for Mathematical Biology, July 2004 - July 2005

President of the Society for Mathematical Biology, July 2005 - July 2007

past-President, Society for Mathematical Biology, July 2007 - July 2008

EMS:

Member of the EMS (Edinburgh Mathematical Society) Policy Action Group, October 2009 - October 2012

Vice-President EMS, October 2010 - October 2011

President EMS, October 2011 - October 2013

EEC Piano 4 Joint Research Project:

“Population (Cellular) Dynamics Towards Modelling the Competition Between the Immune System and the Host Environment”

Research Group Member October 1994 - 1996

North British Differential Equations Seminars:

NBDES representative for the University of Dundee, October 1996 - 2007

NBDES Secretary and Meetings Organiser, January 1998 - January 2002

Society Memberships:

Member of London Mathematical Society

Member of Edinburgh Mathematical Society

Member of Society for Mathematical Biology

Member of European Society for Mathematical and Theoretical Biology

Journal Editorial Boards:

Editorial adviser to *LMS Journal of Computation and Mathematics*, 1995 - 2006

Editorial adviser to *Journal of Theoretical Medicine*, 1997 -

Editorial adviser to *Discrete Dynamical Systems, Series B*

Editorial adviser to *IMA Journal: Mathematics in Medicine and Biology*, 2003 -

Member of Editorial Board of *Journal of Theoretical Biology*, 2005 -

Member of Editorial Board of *Bulletin of Mathematical Biology*, 2006 -

Member of Editorial Board of *Proceedings of the Royal Society of Edinburgh, Section A: Mathematics*, 2006 -

Guest Editor for a special edition of the journal *Mathematical Methods and Models in Applied Sciences* devoted to the mathematical modelling of cancer growth. Special edition published in July 1999.

Guest Editor for a special edition of the *Journal of Mathematical Biology* devoted to the mathematical modelling of cancer growth. Special edition published in 2009.

Birkhaeuser Series: Mathematics and Biosciences in Interaction:

Member of Editorial Board, 1996 -

World Scientific Series: Advances in Mathematics for Applied Sciences:

Member of Editorial Board

Undergraduate Textbook Editorial Boards:

Editorial adviser to SUMS - Springer Undergraduate Mathematics Series.

Scientific Organizing Committees:

Member of the Scientific Committee for the conference "Mathematical Models in Medical and Health Sciences", Vanderbilt University, 28 - 31 May 1997.

Member of the Scientific Committee for the Fifth International Conference on Mathematical Population Dynamics, Zakopane, Poland, 20 - 24 June, 1998

Member of the Scientific Committee for Annual Meeting of Society of Mathematical Biology, SMB 2000, University of Utah, Salt Lake City, USA

Member of the Scientific Committee for Annual Meeting of Society of Mathematical Biology, SMB 2001, Hawai'i, USA

Member of the Scientific Organizing Committee for International Conference on Morphogenesis and Pattern Formation in Biological Systems, Chubu University, Nagoya, Japan, 24-27 September 2002

Member of the Scientific Organizing Committee ECMTB2005, Dresden, July 2005

Member of the Scientific Organizing Committee SMB2007, San Jose, July/August 2007

Member of the Scientific Organizing Committee ECMTB2011, Krakow, June 2011

Invited Research Visits:

Visit to University of Washington, Seattle, U.S.A., September/October 1992 to collaborate with Professor

J.D. Murray, F.R.S.

Visit to Queensland University of Technology, Brisbane, to collaborate with Professor Sean McElwain, 8 weeks during August/September 1995.

Visit to University of Utah, to collaborate with Professors Jim Keener and Mark Lewis, May 2001.

Invited Undergraduate Course Lecturer:

Invited external lecturer to AIMS (African Institute for Mathematical Sciences), Muizenberg, Cape Town, South Africa, March 2009.

Royal Institution Mathematics Masterclass

Given four masterclasses to a group of 100 school children, January 1992, March 1993, March 1994, January 1995.

Refereeing:

I referee papers for the Journal of Theoretical Biology, Proceedings of The Royal Society, Series B, IMA Journal of Mathematics Applied in Medicine and Biology, Journal of Cancer Research, Acta Mathematica Applicanda, Mathematical Biosciences, Philosophical Transactions of the Royal Society: Biological Sciences, Wound Repair and Regeneration, Bulletin of Mathematical Biology, SIAM Journal on Applied Mathematics, IMA Journal of Applied Mathematics, British Journal of Cancer

Referee for EPSRC Earmarked awards in Mathematical Biology.

Referee for The Wellcome Trust Mathematical Biology Grant applications.

Scholarship - Awards/Prizes/Medals:

Undergraduate Awards

- i) Recipient of Blythe-Martin Bursary of £750 p.a. throughout 4 years as undergraduate.
- ii) 6 class medals in years I and II for Mathematics and Physics.
- iii) NCR prizes in years I-IV.
- iv) Awarded a Carnegie Research Scholarship during year III.
- v) Fidler and Steggall prize for distinction in mathematics in year III.
- vi) British Association 1939 Prize for best graduating student in the Science Faculty year IV.

Research Awards:

- i) Recipient of the John Willis Young Academic Award 1995, University of Bath, for outstanding contribution to research and commitment to students.
- ii) Recipient of a **London Mathematical Society Whitehead Prize**, for research work on the mathematical modelling of cancer growth, July 2000.

- iii) Elected Fellow of the Royal Society of Edinburgh, March 2003
- iv) Elected Fellow of the Institute of Mathematics and Its Applications, April 2003
- v) Recipient of a Royal Society of Edinburgh Annual Inspiration Award, September 2006
- vi) Recipient of a Leverhulme Personal Research Fellowship, April 2007

Teaching Award

shortlisted (1 of final 12) for the 1994 Mary Tasker Award for best lecturer throughout whole university (Bath).

MSc Thesis Supervision

supervised 5 MSc students at the University of Bath (1990-1994) for summer project and dissertation:

- “Mathematical Models for Normal and Neoplastic Tissue Growth”, I.D. Jones, 1991
- “Mathematical Models for Epidermal Wound Healing”, D.P. Williams, 1992
- “Mathematical Models for Tumour-related Angiogenesis”, A. White, 1993; awarded with distinction.
- “Mathematical Models of Avascular and Vascular Tumour Growth”, R. Phillipson, 1993
- “Dispersal, Aggregation and Segregation Phenomena in Ecological Problems” C. Gasson, 1994

University of Dundee:

- “Finite difference methods for coupled nonlinear hyperbolic and parabolic partial differential equations in one and two dimensions”, A. Gerisch, University of Dundee, 1997, co-supervision with Dr. D. Griffiths; awarded with distinction.
- “Spatio-temporal pattern formation and reaction diffusion equations”, G. Lolas, 1999; awarded with distinction.

External PhD Thesis Examining:

- Dr. M.E. Burke, June 1992, D. Phil., Oxford University.
- Dr. S.D.W. Frost, December 1995, D. Phil., Oxford University.
- Dr. L. Olsen, July 1996, D. Phil., Oxford University.
- Dr. J. P. Ward, May 1997, PhD, Nottingham University
- Dr. A. Petrovski, March 1999, PhD, Robert Gordon University
- Dr. A. Chavez-Ross, June 1999, PhD, University College London
- Dr. D. Schley, December 1999, PhD, University of Surrey
- Dr. B. Marchant, March 2000, D. Phil., Oxford University
- Dr. M. Holmes, April 2000, PhD, University of Leeds
- Dr. S. Webb, December 2000, PhD, Heriot-Watt University
- Dr. F. Mustapha, January 2001, PhD, Strathclyde University
- Dr. S. McDermott, January 2002, PhD, Glasgow Caledonian University
- Dr. E. Norris, June 2002, PhD, Nottingham University

Dr. C. Carillo, December 2002, PhD, Bath University
Dr. I. Wallis, December 2002, PhD, Leeds University
Dr. D. Mallet, January 2004, PhD, Queensland University of Technology
Dr. D. Bennett, February 2005, PhD, University of Surrey
Dr. B. Ribba, September 2006, PhD, University of Lyon
Dr. A. Qian Yao Cai, June 2007, PhD, University of Melbourne
Dr. A. Forlan, March 2008, PhD, UCL
Dr. E. Boston, December 2008, PhD, University of Birmingham
Dr. P. Murray, January 2009, D. Phil., Oxford University
Dr. J. Stamper, February 2009, PhD, Nottingham University
Dr. R. Shipley, April 2009, D. Phil., Oxford University
Dr. J. Osborne, September 2009, D. Phil., Oxford University
Dr. J. Thackham, October 2009, PhD, Queensland University of Technology
Dr. A. Krinner, March 2010, PhD, University of Leipzig
Dr. M. Gupta, December 2010, PhD, University of Strathclyde
Dr. P. Kurbatova, November 2011, PhD, Université Claude Bernard Lyon 1, Lyon
Dr. J. Maclaurin, December 2011, D.Phil., Oxford University
Dr. S-J. Dunn, April 2012, D.Phil., Oxford University

Habilitation Examining:

External examiner and Jury Member for the Habilitation of Dr. Marcello Delitala, University of Toulouse, France, October 2008.

VISITORS (to University of Bath)

- 1) Dr. S. Gourley (University of Surrey), July 1994
- 2) Dr. V. A. Kuznetsov (Moscow), June 1995
- 3) Dr. D. L. Evans (Cardiff), June 1995
- 4) Dr. S. Gourley (Surrey), July 1995
- 5) Prof. J. Glazier (Notre Dame), October 1995
- 6) Dr. I. Hopkinson (UCW, Cardiff), December 1995

VISITORS (to University of Dundee)

- 1) Dr. H. Byrne (UMIST), January 1997
- 2) Dr. Pettet, G. (QUT), July 1997
- 3) Dr. H. Byrne (UMIST), July 1997
- 4) Dr. S. Gourley (Surrey), August 1997
- 5) Dr. C. Garcia-Reimbert (UNAM, Mexico), August 1997
- 6) Dr. A. Vargas (UNAM, Mexico), August 1997
- 7) Dr. P. Maini (Oxford), September 1997
- 8) Dr. S. Gourley (Surrey), January 1998
- 9) Dr. A. Polezhaev, (Lebedev Inst., Moscow), September 1998
- 10) Dr. Pettet, G. (QUT), August/September 1999
- 11) Professor T. Sekimura (Chubu, Japan), August 1999
- 12) Professor V. Kuznetsov (NIH, USA), September 1999
- 13) Dr. A. Polezhaev, (Lebedev Inst., Moscow), January 2000
- 14) Dr. S. Gourley, (University of Surrey), February 2000

- 15) Dr. A. Deutsch, (MPI-KPS, Dresden), March 2001
- 16) Dr. A. Polezhaev, (Lebedev Inst., Moscow), October 2001
- 17) Dr. A. Samoletov, (NASU, Donetsk), January - July 2002
- 18) Professor V. Kuznetsov (NIH, USA), August 2003
- 19) Dr. L. Preziosi (Politecnico, Turin), August 2003
- 20) Dr. A. Samoletov, (NASU, Donetsk), August 2003
- 21) Dr. A. Samoletov, (NASU, Donetsk), April 2004
- 22) Dr. G. Petter (QUT), August 2005
- 23) Professor M. Lachowicz (Warsaw), December 2005
- 24) Professor J. Lowengrub (UC Irvine), March 2006
- 25) Dr. A. Gerisch, (Halle-Leipzig), April 2006
- 26) Prof. A. Samoletov, (NASU, Donetsk), May/June, 2006
- 27) Dr. A. Gerisch, (Halle-Leipzig), April-October 2007

8. SCIENTIFIC PUBLICATIONS:

EDITED BOOKS:

- 1) *On Growth and Form: Spatio-temporal Pattern Formation in Biology*, pp 1-439, eds. Chaplain, M.A.J., G.D. Singh, J. McLachlan, 1999, Wiley: Chichester.
- 2) *Polymer and Cell Dynamics: Multiscale Modelling and Numerical Simulations*, eds. W. Alt, Chaplain, M.A.J., M. Griebel, J. Lenz, 2003, Birkhauser Verlag, Basel.
- 3) *Single-cell-based Models in Biology and Medicine*, eds. A. Anderson, Chaplain, M.A.J., K. Rejniak, 2007, Birkhauser Verlag, Basel.
- 4) *Selected Topics in Cancer Modelling: Genes, Evolution, Immune Competition and Therapy*, eds. N. Bellomo, Chaplain, M.A.J., E. de Angelis, 2008, Birkhauser Verlag, Boston.

SPECIAL JOURNAL EDITIONS:

- 1) Guest Editor of special edition of the journal *M³AS Mathematical Models & Methods in Applied Sciences*, on Mathematical Models for the Growth, Development and Treatment of Tumours. (1999) **9**, 491-626.
- 2) Guest Editor of special edition of the *Journal of Theoretical Medicine* on Mathematical Modelling and Simulation of Aspects of Cancer Growth, (2002) **4**, 1-93.
- 3) Guest Editor of special edition of the *Journal of Mathematical Biology* on Computational Oncology, (2009) **48**, 481-844

CONTRIBUTED CHAPTERS IN BOOKS:

- 1) "From mutation to metastasis: The mathematical modelling of the stages of tumour development", chapter 5, pp187-236, in *A Survey of Models for Tumor-Immune System Dynamics*, eds. J.A. Adam, N. Bellomo, 1996, Birkhauser: Boston.
- 2) "Mathematical modeling of tumor-induced angiogenesis", chapter 3.4, pp205-240, in *Vascular Morphogenesis: In Vivo, In Vitro, In Mente*, eds. C. Little, E.H. Sage, V. Mironov, Birkhauser: Boston 1998

- 3) “Modelling the Growth and Form of Capillary Networks”, chapter 13, pp225-250, in *On Growth and Form: Spatio-temporal Pattern Formation in Biology*, eds. Chaplain, M.A.J., G.D. Singh, J. McLachlan, Wiley: Chichester 1999
- 4) “Mathematical models in cancer research”, Chapter 60, pp937-951, in *The Cancer Handbook*, ed. M.R. Alison, Nature Publishing Group, 2002.
- 5) “Mathematical modelling of solid tumour growth: Applications of pre-pattern formation”, Chapter 24, pp283-293, in *Morphogenesis and Pattern Formation in Biological Systems*, eds. T. Sekimura, S. Noji, N. Ueno and Maini, P.K., Springer: Tokyo, 2003
- 6) “Mathematical modelling of tissue invasion”, Chapter 10, pp269-297, in *Cancer Modelling and Simulation*, ed. L. Preziosi, Chapman Hall/CRC, 2003
- 7) “Mathematical modelling of tumour-induced angiogenesis: Network growth and structure”, Chapter 3, pp51-75, in *Angiogenesis in Brain Tumours*, eds. Kirsch, M. and Black, P. McL., Kluwer Academic, Boston, 2004
- 8) “D’Arcy Thompson: nature and design through growth and form”, Chapter 5, pp85-93, in *Nature and Design*, eds. M.W. Collins, M.A. Atherton and J.A. Bryant, WIT Press, Southampton, Boston, 2005
- 9) “Mathematical modelling of spatio-temporal phenomena in tumour immunology”, *Lect. Notes Math.* **1872**, 131-183 (2006)
- 10) “Mathematical models of cancer growth and development”, Chapter 68, pp936-953, in *The Cancer Handbook*, 2nd Edition, ed. M.R. Alison, John Wiley and Sons, 2007.
- 11) “Multiscale problems in the life sciences: From microscopic to macroscopic”, *Lect. Notes Math.* **1940**, 147-200 (2008)
- 12) “Multiscale Mathematical Modeling of Vascular Tumor Growth: An Exercise in Transatlantic Cooperation”, Chapter 13, in *Multiscale Cancer Modeling*, eds. T. Deisboeck and G. Stamatakos, CRC Press, Chapman & Hall/CRC Mathematical & Computational Biology (2010)
- 13) “A Hybrid Discrete-Continuum Model of Tumor-Induced Angiogenesis”, Chapter 5, pp105 - 134, in *Modeling Tumor Vasculature: Molecular, Cellular and Tissue Level Aspects and Implications*, ed. T.L. Jackson, Springer: New York
- 14) “Blood Flow and Tumour-Induced Angiogenesis: Dynamically Adapting Vascular Networks”, Chapter 8, pp167 - 212, in *Modeling Tumor Vasculature: Molecular, Cellular and Tissue Level Aspects and Implications*, ed. T.L. Jackson, Springer: New York

BOOK REVIEWS:

- 1) “Case studies in mathematical modelling: ecology, physiology and cell biology” eds. H. Othmer, F. Adler, M. Lewis, J. Dallon, Prentice Hall: New Jersey, 1997. *Bull. Math. Biol.* **59**, 1193-1995.

REFEREED JOURNAL PUBLICATIONS:

- 1) Chaplain, M.A.J. and Sleeman, B.D. (1990) "An application of membrane theory to the tip morphogenesis in *Acetabularia*" *J. theor. Biol.* **146**, 177-200. **Front cover of issue of journal.**
- 2) Chaplain, M.A.J. and Sleeman, B.D. (1990) "A mathematical model for the production and secretion of tumour angiogenesis factor in tumours", *IMA J. Math. Appl. Med. Biol.* **7**, 93-108.
- 3) Chaplain, M.A.J. and Stuart, A.M. (1991) "A mathematical model for the diffusion of tumour angiogenesis factor into the surrounding host tissue" *IMA J. Math. Appl. Med. Biol.* **8**, 191-220.
- 4) Chaplain, M.A.J. and Sleeman, B.D. (1992) "A mathematical model for the growth and classification of a solid tumour: a new approach via nonlinear elasticity theory using strain-energy functions", *Math. Biosci.* **111**, 169-217.
- 5) Chaplain, M.A.J. and Sleeman, B.D. (1993) "Modelling the growth of solid tumours and incorporating a method for their classification using nonlinear elasticity theory", *J. Math. Biol.* **31**, 431-479.
- 6) Chaplain, M.A.J. and Britton, N.F. (1993) "A qualitative analysis of some models of tissue growth", *Math. Biosci.* **113**, 77-89.
- 7) Chaplain, M.A.J. (1993) "The development of a spatial pattern in a model for cancer growth", in *Experimental and Theoretical Advances in Biological Pattern Formation* pp 45-60 (Othmer, H.G., Maini, P.K. & Murray, J.D.), Plenum Press.
- 8) Chaplain, M.A.J. and Britton, N.F. (1993) "On the concentration profile of a growth inhibitory factor in multicell spheroids", *Math. Biosci.*, **115**, 233-245.
- 9) Chaplain, M.A.J. (1993) "The strain energy function of an ideal plant cell wall ", *J. theor. Biol.*, **163**, 77-97.
- 10) Chaplain, M.A.J. and Stuart, A.M. (1993) "A model mechanism for the chemotactic response of endothelial cells to tumour angiogenesis factor", *IMA J. Math. Appl. Med. Biol.*, **10**, 149-168.
- 11) Hofer, T., Maini, P.K., Sherratt, J.A., Chaplain, M.A.J., Chauvet, P., Metevier, D., Montes, P.C., Murray, J.D. (1994) "A resolution of the chemotactic wave paradox" *Appl. Math. Lett.*, **7**, 1-5.
- 12) Chaplain, M.A.J., D.L. Benson, Maini, P.K. (1994) "Nonlinear diffusion of a growth inhibitory factor in multicell spheroids", *Math. Biosci.*, **121**, 1-13.
- 13) Chaplain, M.A.J. (1995) "Reaction-diffusion pre-patterning and its potential role in tumour invasion" *J. Bio. Systems* **3**, 929-936.
- 14) Hofer, T., Maini, P.K., Sherratt, J.A., Chaplain, M.A.J., Murray, J.D. (1995) "Resolving the chemotactic wave paradox: A mathematical model for chemotaxis of dictyostelium amoebae" *J. Bio. Systems* **3** 967-973.
- 15) Britton, N.F., Skevington, S.M. & Chaplain, M.A.J. (1995) "Mathematical Modelling of Acute Pain" *J. Bio. Systems* **3**, 1119-1124.
- 16) Chaplain, M.A.J., Byrne, H.M. (1995) "Mathematical models for tumour angiogenesis: numerical simulations and nonlinear wave solutions" *Bull. Math. Biol.* **57**, 461-486.

- 17) Byrne, H.M., Chaplain, M.A.J. (1995) "Explicit solutions of a simplified model of capillary sprout growth during tumour angiogenesis" *Appl. Math. Letters* **8**, 71-76.
- 18) Byrne, H.M., Chaplain, M.A.J. (1995) "Growth of non-necrotic tumours in the presence and absence of inhibitors" *Math. Biosci.* **130**, 151-181.
- 19) Chaplain, M.A.J. (1995) "The mathematical modelling of tumour angiogenesis and invasion" *Acta Biotheor.* **43**, 387-402.
- 20) Chaplain, M.A.J., Giles, S.M., Sleeman, B.D., Jarvis, R.J. (1995) "A mathematical analysis of a model for tumour angiogenesis" *J. Math. Biol.* **33**, 744-770.
- 21) Chaplain, M.A.J. (1996) "Avascular growth, angiogenesis and vascular growth in solid tumours: The mathematical modelling of the stages of tumour development" *Math. Comp. Modell.* **23 (6)** 47-87.
- 22) Chaplain, M.A.J. & Orme, M.E. (1996) "Travelling Waves Arising in Mathematical Models of Tumour Angiogenesis and Tumour Invasion" *FORMA* **10**, 147-170.
- 23) Chaplain, M.A.J. & Byrne, H.M. (1996) "The mathematical modelling of wound healing and tumour growth: Two sides of the same coin" *WOUNDS* **8**, 42-48.
- 24) Orme, M.E. & Chaplain, M.A.J. (1996) "A Mathematical Model of Vascular Tumour Growth and Invasion" *Math. Comp. Modelling* **23 (10)** 43-60.
- 25) Orme, M.E. & Chaplain, M.A.J. (1996) "A mathematical model of the first steps of tumour-related angiogenesis: capillary sprout formation and secondary branching" *IMA J. Math. Appl. Med. Biol.* **13**, 73-98.
- 26) Britton, N.F., Chaplain, M.A.J. & Skevington, S.M. (1996) "The role of N-methyl-D-aspartate (NMDA) receptors in wind-up - a mathematical model" *IMA J. Math. Appl. Med. Biol.* **13**, 193-205.
- 27) Byrne, H.M. & Chaplain, M.A.J. (1996) "Growth of Necrotic Tumours in the Presence and Absence of Inhibitors" *Math. Biosci.* **135**, 187-216.
- 28) Gourley, S.A., Britton, N.F., Chaplain, M.A.J. & Byrne, H.M. (1996) "Mechanisms for stabilisation and destabilisation of systems of reaction-diffusion equations" *J. Math. Biol.* **34**, 857-877.
- 29) Pettet, G., Chaplain, M.A.J., McElwain, D.L.S., Byrne, H.M. (1996) "On the role of angiogenesis in wound healing" *Proc. Roy. Soc. Lond. B* **263**, 1487-1493.
- 30) Chaplain, M.A.J. (1996) "The mathematical modelling of angiogenesis and vascular tumour growth" *ZAMM* **76 (S4)**, 24-27.
- 31) Byrne, H.M., Chaplain, M.A.J. (1996) "On the role of cell-cell adhesion in models for solid tumour growth" *Math. Comp. Modelling* **24**, 1-17.
- 32) Byrne, H.M. & Chaplain, M.A.J. (1996) "On the importance of constitutive equations in mechanochemical models of pattern formation" *Appl. Math. Letters* **9** 85-90.
- 33) Orme, M.E., Chaplain, M.A.J. (1997) "Two-dimensional models of tumour angiogenesis and anti-angiogenesis strategies" *IMA J. Math. Appl. Med. Biol.* **14**, 189-205.

- 34) Chaplain, M.A.J., Anderson, A.R.A. (1997) "The mathematical modelling, simulation and prediction of tumour-induced angiogenesis" *Invas. Metast.* **16**, 222-234.
- 35) Byrne, H.M., Chaplain, M.A.J. (1997) "Free boundary value problems associated with the growth and development of multicellular spheroids" *Euro. Jnl. of Applied Mathematics* **8**, 639-658.
- 36) Anderson, A.R.A., Chaplain, M.A.J. (1998) "A mathematical model for capillary network formation in the absence of endothelial cell proliferation" *Appl. Math. Letters* **11**, 109-114.
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