

Biographical Sketch – Brian Marples, Ph.D.

Academic Appointments:

2001-current **Associate Professor**, Radiation Biology Group,
Wayne State University and Karmanos Cancer Institute, US.

Other Appointments:

2003-current **Faculty Member**, Developmental Therapeutics program,
Karmanos Cancer Institute.

2003-current **Faculty Member**, Molecular Biology and Human Genetics program,
Karmanos Cancer Institute

Role in Graduate Program:

Committee:

Course Instructor: lecturer on RAD7060, RT4150, instructor on CB7070 and Ad hoc

Faculty Advisor:

2003-current Sarah Kreuger B.Sc., doctoral student Wayne State University

2003-current Alaina Powell B.Sc., doctoral student Wayne State University

Graduates Supervised:

2002-2003 Olga Greco Ph.D.

2003-current Susan Wykes, Ph.D.

Students Supervising:

2003-current Sarah Kreuger B.Sc., doctoral student Wayne State University

2003-current Alaina Powell B.Sc., doctoral student Wayne State University

Education:

1986 **Bachelors of Science**, Biological Sciences (Honours) Upper (2.1),
Biochemistry and Cell Biology, Manchester University, UK.

1987 **Master of Science**, Radiation Biology/Physics,
St Bartholomew's Medical College & University College London,
University of London, UK.

1991 **Doctor of Philosophy**, Radiation Biology,
University College London and Gray Laboratory, University of London, UK.
PhD: The effects of low doses of ionising radiation on the viability of mammalian cells.

Post Graduate Training:

1991-1994 **Post Doctoral Fellow**, Department of Medical Biophysics,
British Columbia Cancer Research Centre, Vancouver, Canada.

1994-1996 **Post Doctoral Scientist**, Department of Experimental Radiation Oncology, Paterson
Institute for Cancer Research, Manchester, UK.

Continuing education:

1996-1998 **Scientist Grade I**, self-funded *Friends of Rosie Children's Cancer Research Fund*,
Paterson Institute for Cancer Research, Manchester, UK.

1998-1999 **Scientist**, Department of Experimental Oncology,
Gray Laboratory Cancer Research Trust, Northwood, Middlesex, UK.

2000-2001 **Senior Scientist**, Team Leader, Department of Experimental Oncology,
Gray Cancer Institute, Northwood, Middlesex, UK.

Certification:

Clinical Responsibilities:

Research Interests:

Experimental radiation biology, primarily using *in vitro* models to measure cell killing and radiation-mediated cell-cycle perturbations after low dose exposures. The thrust of my research work is clinically applicable molecular radiation biology.

Inter and Extra-mural Support:

Teaching: (past 3 years)

Date	Course	Title	Credits	Hours
2002-5	RT4150	Radiobiology of Radiation Oncology		6
2004-5	RAD7060	Applied Radiobiology in Radiological Science		6
2003-5	Residents	Radiation Oncology/Radiobiology		12
2004-5	CB7070	Cancer Biology (Faculty contributor)		25
Laboratory supervision of biology, physics and biophysics graduate students				

Clinical Teaching:

Research: Summary

At the cellular level, using DNA repair assays such as pulse-field gel electrophoresis, 'comets', ' γ H2AX foci' to measure the induction and repair of DNA strand breaks for the development of clinical predictive assays, with molecular approaches using siRNA, plasmids and modified viruses to modulate radiosensitivity or exploit hypoxia as a tumour targeting strategy. The common theme connecting these various projects is the application of molecular radiation biology to develop experimental strategies that can be translated to the clinical environment. Understanding how cells respond to damage produced by radiation doses that are used in routine radiotherapy practice, rather than artificially large experimental doses, is essential for the future improvement and application of radiotherapy, either by changing fractionation schedules, varying dose rates or via the use of IMRT, or alternately in combination with natural pharmaceuticals or chemotherapeutic agents.

Areas of Research

1. Regulation of the G2 cell-cycle checkpoints in response to low-dose ionizing radiation
2. Apoptosis as a mode of cell death after low-dose radiation exposures
3. Investigations of natural pharmaceuticals as radioprotectors
4. The role of repair proteins in low-dose cell survival
In collaboration with Dr. Anthony Chalmers (University of Sussex) and Dr. Spencer Collis (Clare Hall, South Mimms)
5. Genetic and molecular manipulation of radiation sensitivity
6. Improving outcome from low-dose rate radiation exposures
In collaboration with Professor Michael Joiner, Wayne State University
7. The Prevalence of Hypoxic Markers in Prostate tumours
In collaboration with Professor George Wilson, Wayne State University

Selected Publications (From 60 peer-reviewed; 2002 onwards)

42. O. Greco, B. Marples, G. U. Dachs, K. J. Williams, A. V. Patterson and S. D. Scott, Novel chimeric gene promoters responsive to hypoxia and ionizing radiation. *Gene Ther* 9, 1403-1411 (2002).
43. O. Greco, S. D. Scott, B. Marples and G. U. Dachs, Cancer gene therapy: 'delivery, delivery, delivery'. *Front Biosci* 7, 1516-1524 (2002).
44. B. Marples, N. E. Cann, C. R. Mitchell, P. J. Johnston and M. C. Joiner, Evidence for the involvement of DNA-dependent protein kinase in the phenomena of low dose hyper-radiosensitivity and increased radioresistance. *Int J Radiat Biol* 78, 1139-1147 (2002).
45. B. Marples, O. Greco, M. C. Joiner and S. D. Scott, Molecular approaches to chemo-radiotherapy. *Eur J Cancer* 38, 231-239 (2002).
46. D. Schaeue, B. Marples and K. R. Trott, The effects of low-dose X-irradiation on the oxidative burst in stimulated macrophages. *Int J Radiat Biol* 78, 567-576 (2002).
47. S. D. Scott, M. C. Joiner and B. Marples, Optimizing radiation-responsive gene promoters for radiogenetic cancer therapy. *Gene Ther* 9, 1396-1402 (2002).

48. S. C. Short, M. Woodcock, B. Marples and M. C. Joiner, Effects of cell cycle phase on low-dose hyper-radiosensitivity. *Int J Radiat Biol* 79, 99-105 (2003).
49. B. Marples, B. G. Wouters and M. C. Joiner, An association between the radiation-induced arrest of G2 phase cells and low-dose hyper-radiosensitivity: A plausible underlying mechanism? *Radiat Res* 160, 38-45 (2003).
50. O. Greco, B. Marples, M.C. Joiner, M.C. & S.D. Scott, Gene therapy vectors activated by hypoxia and ionising radiation. *Proc Am Assoc Cancer Res*, 44, 1263 (2003).
51. B. Marples, O. Greco, M. C. Joiner and S. D. Scott, Radiogenetic therapy: strategies to overcome tumor resistance. *Curr Pharm Des* 9, 2105-2112 (2003).
52. O. Greco, B. Marples, M. C. Joiner and S. D. Scott, How to overcome (and exploit) tumor hypoxia for targeted gene therapy. *J Cell Physiol* 197, 312-325 (2003).
53. O. Greco, B. Marples, G. U. Dachs, K. J. Williams, A. V. Patterson, S. D. Scott and J. T. Hsieh, Novel chimeric gene promoters responsive to hypoxia and ionizing radiation. *Urol Oncol* 21, 314 (2003).
54. Chalmers, A., P. Johnston, M. Woodcock, M. C. Joiner, B. Marples, (2004). PARP-1, PARP-2, and the cellular response to low doses of ionizing radiation. *Int J Radiat Oncol Biol Phys* 58, 410-419 (2004).
55. Marples, B. G. Wouters, A. Chalmers, S. Collis and M. C. Joiner. Low-Dose Hyper-radiosensitivity: A Consequence of Ineffective Cell Cycle Arrest of Radiation-Damaged G(2)-Phase Cells. *Radiat Res* 161, 247-55 (2004).
56. S. D. Scott, and B. Marples, Radiation-activated antitumor vectors. *Methods Mol Med*, 90, 389-402, (2004).
57. B. Marples, Is low-dose hyper-radiosensitivity a measure of G2-phase cell radiosensitivity? *Cancer Metastasis Rev* 23, 197-207 (2004).
58. J. D. Tucker, B. Marples, M. J. Ramsey and L. H. Lutze-Mann, Persistence of chromosome aberrations in mice acutely exposed to 56Fe+26 ions. *Radiat Res* 161, 648-655 (2004).
59. G. G. Hillman, Y. Wang, O. Kucuk, M. Che, D. R. Doerge, M. Yudelev, M. C. Joiner, B. Marples, J. D. Forman and F. H. Sarkar, Genistein potentiates inhibition of tumor growth by radiation in a prostate cancer orthotopic model. *Mol Cancer Ther* 3, 1271-1279 (2004).
60. O. Greco, T. M. Powell B., B. Marples, M. C. Joiner and S. D. Scott. Gene therapy vectors containing CArG elements from the Egr1 gene are activated by neutron irradiation, cisplatin and doxorubicin. *Cancer Gene Ther. OnLine* Apr 8 (2005).