

BIOGRAPHICAL SKETCH

NAME Paul A. Bottomley, Ph.D.	POSITION TITLE Russell H. Morgan Professor of Radiology		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD
Monash University, Victoria, Australia	BSc(Hons)	1975	Physics
Nottingham University, England	PhD	1978	Physics, NMR imaging

A. Positions and Honors

Dec 1971-Feb 1972	Information Scientist, Commonwealth Bureau of Meteorology, Melbourne, Australia
1974	Physics Laboratory Demonstrator, Department of Physics, Monash University, Victoria, Australia
1975	Demonstrator, Department of Applied Physics, Caulfield Institute of Technology, Victoria, Australia; 4. Physics Lecturer, Swinburne College of Technology, Victoria, Australia
Aug 1975-1978	University of Nottingham Demonstrator in Physics, Department of Physics, UK.
Oct 1978	Research Associate, Departments of Physiological Chemistry, and Radiology (1979), The Johns Hopkins University, Baltimore, MD, USA.
Aug 1980-May 1994	Physicist, GE Corporate Research and Development, Schenectady, NY, USA.
Sept 1992-June 1993	Coolidge Fellowship: MRC Magnetic Resonance Unit, John Radcliffe Hospital and Department of Biochemistry, Oxford University, Oxford, UK.
July 1991-1994	Visiting Associate Professor of Medicine, Johns Hopkins University, Baltimore MD.
May 1994	Russell H Morgan Professor, Department of Radiology, Johns Hopkins University. Joint appointments: Professor of Medicine, Biomedical Engineering, and Electrical Engineering.
Jan 1997	Director, Division of MR Research, Department of Radiology, Johns Hopkins University.
Sept 1998	Member, Board of Directors, Surgi-Vision Inc, a start-up company for internal MRI coils.

Honors and Awards:

Gold Medal of the Society for Magnetic Resonance in Medicine (1989)
 GE Coolidge Fellow and Medal, (1990)
 GE gold (1989), silver (1985) and bronze (1982) patent medallions
 Editors recognition awards from Radiology (1986, 1988, 1989, 1990)
 GE Dushman Award (1983)
 Associate Editor, Magn Reson Med (1983-) and Radiology (1991-5)
 Editorial Boards of Magn Reson Imag (1982-), Rev Sci Instrum (1986-1988), Advanced Medicine (Japan: 1995-); MAGMA (2003-2006)
 Elected Trustee, Soc Magn Reson Med (1986-1989), Magn Reson Imag (1982-1986)
 Fellow, Soc Magn Reson (1989)
 Commonwealth University Scholarship (1972-1974)
 Inventor with 30 US Patents

NIH grant reviewer '79, '85,'86,'90,'97, '01, '02,'03

B. Selected peer-reviewed publications (in chronological order). Excluding publications submitted or in preparation (from a total of 126 papers)

Hinshaw WS, Bottomley PA, Holland GN. Radiographic thin-section image of the human wrist by nuclear magnetic resonance. *Nature* 1977; 270: 722-723.

Bottomley PA, Andrew ER. RF magnetic field penetration, phase-shift and power dissipation in biological tissue: Implications for NMR imaging. *Phys Med Biol* 1978; 23: 630-643.

Nunnally RL, Bottomley PA. Assessment of pharmacological treatment of myocardial infarction by phosphorus-31 NMR with surface coils. *Science* 1981; 211:177-180.

Bottomley PA, Hart HR, Edelstein, et al. NMR imaging/spectroscopy system to study both anatomy and metabolism. *The Lancet* 1983; ii, 273-274.

Bottomley PA, Hart HR, Edelstein WA, et al. Anatomy and metabolism of the normal human brain studied by magnetic resonance at 1.5 Tesla. *Radiol* 1984; 150, 441-446.

Bottomley PA, TH Foster, WM Leue. Chemical imaging of the brain by NMR. *Lancet* 1984; i: 1120.

Bottomley PA, Foster TH, Darrow RD. Depth resolved surface coil spectroscopy (DRESS) for in vivo ¹H, ³¹P, and ¹³C NMR. *J.Magn. Reson.* 59, 338-342 (1984).

Bottomley PA, Foster TH, Argersinger RE, Pfeifer LM. A review of normal tissue hydrogen NMR relaxation times and relaxation mechanisms: dependence on tissue type, NMR frequency, temperature, species, excision, and age. *Med Phys* 1984; 11: 425-448.

Bottomley PA Non-invasive study of high-energy phosphate metabolism in the human heart by depth resolved ³¹P NMR spectroscopy. *Science*, 229, 769-772 (1985).

Bottomley PA, Edelstein WA, Foster TH, Adams WA. In vivo solvent suppressed localized hydrogen nuclear magnetic resonance spectroscopy: a window to metabolism? *Proc Natl Acad Sci USA* 1985; 82:2148-52

Bottomley PA, Hardy CJ, Argersinger RE, Allen-Moore G. A review of ¹H NMR relaxation in pathology: are T1 and T2 diagnostic? *Med Phys* 1987; 14: 1-37.

Bottomley PA, Edelstein WA, Hart HR, et al. High-field nuclear magnetic resonance imaging/spectroscopy system. US Patent 4,689,563 (Aug 25, 1987).

Bottomley PA. Spatial localization in NMR spectroscopy in vivo. *Annal NY Acad Sci* 1987; 508: 333-348.

Bottomley PA. State of the art. Human in vivo NMR spectroscopy in diagnostic medicine: clinical tool or research probe? *Radiology* 1989; 170: 1-15.

Bottomley PA, Hardy CJ, Roemer, PB. Phosphate metabolite imaging and concentration measurements in human heart by nuclear magnetic resonance. *Magn Res Med* 1990; 14: 425-434.

Weiss R, Bottomley P, Hardy C, Gerstenblith G. Regional myocardial metabolism of high-energy phosphates during isometric exercise in patients with coronary artery disease. *N Engl J Med* 1990; 323:1593-1600.

Bottomley PA, Weiss RG, Hardy CJ, Baumgartner WA. Myocardial high-energy phosphate metabolism and allograft rejection in patients with heart transplants. *Radiol* 1991; 181: 67-75.

Hardy CJ, Weiss RG, Bottomley PA, Gerstenblith G. Altered myocardial high-energy phosphate metabolites in patients with dilated cardiomyopathy. *Am Heart J* 1991; 122: 795-801.

Bottomley PA, Ouwerkerk R. Fast sensitive T1 measurement in vivo with low angle adiabatic pulses: the dual-angle method. *J Magn Reson Ser B* 1994; 104:159-167.

Bottomley P. NMR spectroscopy of the human heart: the status and the challenges. *Radiol* 1994;191:593-612.

Bottomley PA, Ouwerkerk R. Optimum flip-angles for...uncertain T1 values. *Mag Res Med* 1994;32:137-41.

Dumoulin CL, Bottomley PA, Souza SP (1994). Magnetic resonance active invasive devices for the generation of selective MR angiograms. RD 21,822. US patent 5,447,156 (Sept 5, 1995).

Bottomley PA, Atalar E, Weiss RG. Human cardiac high-energy phosphate metabolite concentrations by 1D-resolved NMR spectroscopy. *Magn Reson Med* 35; 664-670 (1996)

Bottomley PA. Absolute metabolite concentrations from poorly spatially-resolved MR response signals. US patent 5,500,592 (June 4, 1996).

Atalar E, Bottomley PA, Ocali O, Correia LCL, Kelemen MD, Lima JAC, Zerhouni EA. High resolution intravascular MRI and MRS using a catheter receiver coil. *Magn Reson Med* 1996; 36: 596-605.

Atalar E, Bottomley PA, Zerhouni E. Method of internal magnetic resonance imaging and spectroscopic analysis and associated apparatus DM-9911. US patent 5,699,801 (Dec 23, 1997).

Bottomley PA, Lugo Olivieri, CH, Giaquinto R. What is the optimum phased-array coil design for cardiac and torso magnetic resonance? *Magn Reson Med* 1997; 37: 591-599.

Bottomley PA, Lee YH, Weiss RG. Total creatine in muscle: imaging and quantification with proton MR spectroscopy. *Radiology* 1997; 204: 403-410.

Conway MA, Bottomley PA, Ouwerkerk R, Radda GK, Rajagopalan B. Mitral Regurgitation: Impaired Systolic Function, Eccentric Hypertrophy, and Increased Severity Are Linked to Lower Phosphocreatine/ATP Ratios in Humans. *Circulation* 1998; 97: 1716-1723.

Bottomley PA, Weiss RG. Noninvasive magnetic resonance detection of creatine depletion in non-viable infarcted myocardium. *The Lancet* 1998; 351: 714-718.

Lee RF, Giaquinto R, Constantinides, Souza S, Weiss RG, Bottomley PA. A broadband phased-array system for direct phosphorus and sodium metabolic MRI on a clinical scanner. *Magn Reson Med* 2000; 43:269-277.

Constantinides C, Weiss RG, Lee R, Bolar D, Bottomley PA. Restoration of low resolution metabolic images with a priori anatomic information: ^{23}Na MRI in myocardial infarction. *Mag Reson Imag* 2000; 18: 461-71.

Constantinides C, Gillen JS, Boada FE, Pomper MG, Bottomley, PA. Sodium MRI and quantification in human skeletal muscle: potential applications in exercise and disease. *Radiology* 2000; 216: 559-568.

Lee RF, Westgate CR, Weiss RG, Bottomley PA. An analytical SMASH procedure (ASP) for sensitivity-encoded MRI. *Magn Reson Med* 2000; 43: 716-725.

Bottomley P. Method and apparatus for determining or imaging longitudinal spin lattice relaxation time or producing images which substantially reflect longitudinal spin lattice time contrast. US Patent 6,064,203; 2000.

Ouwerkerk R, Bottomley PA. On neglecting chemical exchange effects when correcting in vivo ^{31}P MRS for partial saturation. *J Magn Reson* 2001; 148: 425-435.

Bottomley PA, Weiss RG. Noninvasive localized magnetic resonance quantification of creatine kinase metabolites in normal and infarcted canine myocardium. *Radiology* 2001; 219: 411-418.

Lee RF, Westgate CR, Weiss RG, Newman D, Bottomley PA. The planar strip array (PSA) for parallel spatial encoded MRI. *Magn Reson Med* 2001; 45: 673-683.

Beache GM, Herzka DA, Boxerman JL, Post WS, Gupta SN, Faranesh AZ, Solaiyappan M, Bottomley PA, Weiss JL, Shapiro EP, Hill MN. Attenuated myocardial vasodilator response in patients with hypertensive hypertrophy revealed by oxygenation-dependent magnetic resonance imaging. *Circulation* 2001;104:1214-7.

Bottomley PA, Ouwerkerk R, Lee RF, Weiss RG. Four angle saturation transfer (FAST) method for measuring creatine kinase reaction rates in vivo. *Magn Reson Med* 2002; 47: 850-863.

Ouwerkerk R, Bleich KB, Gillen JS, Pomper MG, Bottomley PA. Tissue Sodium Concentration In Human Brain Tumors as Measured with ^{23}Na MR Imaging. *Radiology* 2003; 227:529-537.