

BIOGRAPHICAL SKETCH

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NAME Mason, Ralph P.		POSITION TITLE Professor	
eRA COMMONS USER NAME RPMASON			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Churchill College, Cambridge, UK	B.A. (Honors)	1983	Natural Sciences Chemistry
Churchill College, Cambridge, UK	Ph.D.	1986	In Vivo NMR
UT Southwestern Medical Center, Dallas, TX	Post-doc	1989	MRS/MRI

A. Personal Statement

Dr. Mason is Director of the Cancer Imaging Program (CIP) at UT Southwestern with over 25 years experience in cancer imaging, therapy, and tumor pathophysiology. He is Professor of Radiology and member of the NCI designated Simmons Cancer Center. Dr. Mason's primary research interest is prognostic radiology- developing and implementing methods for predicting optimal cancer therapy and assessing early response to treatment. The CIP was supported by an NCI U24 small animal imaging research program (SAIRP) grant and continues as a core of the Cancer Center Support Grant (P30). Dr. Mason oversees a team of experts who can advise on diverse imaging techniques and modalities including optical, ultrasound, MRI, and radionuclides. In collaboration with the Advanced Imaging Research Center we have state of the art instrumentation. Through the SAIRP, Dr. Mason has had many opportunities to develop research collaborations, notably where we have the imaging expertise and resources and other investigators have biological questions. Dr. Mason successfully led applications for SIG S10 grants to purchase an IVIS Spectrum and Vevo770, which now provide critical infrastructure for the Imaging Resource.

B. Positions and Honors

1989-1990 Faculty Research Instructor, Radiology, UT Southwestern Medical Center
1990-1997 Assistant Professor, Radiology, UT Southwestern Medical Center
1997-2002 Associate Professor, Radiology, UT Southwestern Medical Center
1997-Present Member Joint BME Program, UT Southwestern Medical Center and UT Arlington
2002-Present Professor, Radiology, UT Southwestern Medical Center
2003-Present Member Molecular Biophysics Graduate Program, UT Southwestern Medical Center
2003-Present Member Simmons Cancer Center, UT Southwestern Medical Center
2009-Present Member Cancer Biology Graduate Program, UT Southwestern Medical Center
2012-Present Section Chief Pre-clinical Imaging, Department of Radiology
2014-Present Chair-Elect of MR Cancer Study Group of ISMRM

Reviewer - Permanent member RTB 2010-14

Ad hoc Funding Agencies: DOD Prostate and Breast Cancer Initiatives; NIH (P01, T32, Microscopic Imaging; SBIR, ICMIC); Mary Kay Ash Charitable Foundation; Cancer Res UK, Dutch Cancer Soc; Diabetes UK; Cancerinnovation of European Research Council; MRC UK; Wellcome Foundation.

Professional Society Memberships American Association for Cancer Research; International Society of Magnetic Resonance in Medicine, Royal Society of Chemistry, FRSC, CSci, CChem

C. Selected Peer-reviewed Publications (selected from >125)

Most relevant to the current application

1. **Mason RP**, Zhao D, Liu L, Trawick ML and Pinney KG, A Perspective on Vascular Disrupting Agents that Interact with Tubulin: Preclinical Tumor Imaging and Biological Assessment, *Integr. Biol.*, 3, 375-387,

(2011) DOI: 10.1039/C0IB00135J. PMID:PMC3071431

2. Alhasan MK, Liu L, Lewis MA, Magnusson J and **Mason RP**, Comparison of Optical and Power Doppler Ultrasound Imaging for Non-Invasive Evaluation of Arsenic Trioxide as a Vascular Disrupting Agent in Tumors, *PLoS ONE* 7(9): e46106 (2012) doi:10.1371/journal.pone.0046106 PMID:PMC3460997
3. Jiang L, Weatherall PT, McColl RW, Tripathy D, **Mason RP**, Blood Oxygenation Level Dependent (BOLD) Contrast Magnetic Resonance Imaging (MRI) for Prediction of Breast Cancer Chemotherapy Response: a Pilot Study, *J. Magn. Reson. Imaging (JMRI)*, 37:1083–1092 (2013), DOI: 10.1002/jmri.23891. PMID: 23124705
4. Hallac RR, Zhou H, Pidikiti R, Song K, Stojadinovic S, Zhao D, Solberg T, Peschke P and **Mason RP**, Correlations of noninvasive BOLD and TOLD MRI with pO₂ and relevance to tumor radiation response, *Magn. Reson. Med.*, 71:561–569 (2014) DOI 10.1002/mrm.24846. PMID: PMC3883977
5. Swiercz R, Chiguru S, Tahmasbi A, Ramezani SM, Hao G, Challa DK, Lewis MA, Kulkarni PV, Sun X, Ober RJ, **Mason RP** and Ward ES, Use of Fc-engineered antibodies as clearing agents to increase contrast during PET, *J. Nucl. Med.* 55 (7) 1204 - 1207 2014 (10.2967/jnumed.113.136481). PMID: 24868106

Additional recent publications of importance to the field (in chronological order)

6. Lewis MA, Kodibagkar VD, Öz OK and **Mason RP**, On the potential for molecular imaging with Cerenkov luminescence, *Optics Letters*, 35 (23), 3889-3891 (2010) PMID:PMC3023798
7. Zhao D, Chang CH, Kim JG, Liu H, **Mason RP**, *In vivo* near-infrared spectroscopy and MRI monitoring of tumor response to Combretastatin A4 phosphate correlated with therapeutic outcome, *Int. J. Radiat. Oncol. Biol. Phys.*, 80 (2), 574-581 (2011) PMID:PMC3090506
8. Liu L, Beck H, Wang X, Hsieh HP, **Mason RP** and Liu X, Tubulin-Destabilizing Agent BPR0L075 Induces Vascular-Disruption in Human Breast Cancer Mammary Fat Pad Xenografts, *PLoS One* 7, 8 e43314 (2012) doi:10.1371/journal.pone.0043314 PMID: PMC3427339
9. Yu JX, Hallac RR, Chiguru S and **Mason RP**, New Frontiers and Developing Applications in ¹⁹F NMR, *Prog. NMR Spectrosc.*, 70 25–49 (2013) <http://dx.doi.org/10.1016/j.pnmrs.2012.10.001>. PMID: PMC3613763
10. Lewis MA, Richer E, Slavine NV, V. D. Kodibagkar, T. C. Soesbe, P. P. Antich and **R. P. Mason** “A Multi-Camera System for Bioluminescence Tomography in Preclinical Oncology Research”, *Diagnostics*, 3, 325-343; 2013, doi:10.3390/doi:10.3390/diagnostics3030325.
11. Hadimani MB, MacDonough MT, Ghatak A, Strecker TE, Lopez R, Sriram M, Nguyen BL, Kessler RJ, Shirali AR, Liu L, Garner CM, Pettit G, Hamel RE, Chaplin DJ, **Mason RP**, Trawick ML, Pinney KG, Synthesis of a 2-Aryl-3-Aroyl-Indole Salt (OXI8007) Resembling Combretastatin A-4 with Application as a Vascular Disrupting Agent, *J. Nat. Prod.*, 76(9):1668-78, (2013). PMID: PMC3985392
12. Gulaka PK, Rojas-Quijano F., Kovacs Z, **Mason RP**, Sherry AD and Kodibagkar VD, GdDO3NI, a nitroimidazole-based T₁ MR contrast agent for imaging tumor hypoxia *in vivo*, *J. Bio. Inorg. Chem.*: 1–10 (2013) DOI 10.1007/s00775-013-1058-5. PMID: PMC4043141
13. Zhang Z, Hallac RR, Peschke P, **Mason RP**, A Noninvasive Tumor Oxygenation Imaging Strategy using Magnetic Resonance Imaging of Endogenous Blood and Tissue Water, *Magn. Reson. Med.*, 71, (2), 561–569, February (2014). PMID: PMC3718873
14. Zhou H, Stafford JH, Hallac R, Zhang L, Huang G, **Mason RP**, Gao J, Thorpe P and Zhao D, Phosphatidylserine-Targeted Molecular Imaging of Tumor Vasculature by Magnetic Resonance Imaging, *J. Biomed. Nanotechnol.*, 10 (5):846-855; 10.1166/jbn.2014.1851 May (2014). PMID: 24734537
15. Xie Z, Zhang Y, Liu L, Weng H, **Mason RP**, Tang L, Nguyen KT, Hsieh JT, Yang J, Development of Intrinsically Photoluminescent and Photostable Polylactones, *Adv. Mater.* 2014 (online ahead of publication) DOI: 10.1002/adma.201306070. PMID: PMC4107036

D. Research Support

Ongoing Research Support

RP140285 Mason (PI) 12/01/14–11/30/17
CPRIT - IIRA

Noninvasive Identification of Prostate Tumor Hypoxia as a Prognostic Biomarker of Radiation Response
The goals of this study are to validate MOXI (MR Oximetry) as a measure of prostate tumor oxygenation and hypoxia and to use MOXI to identify tumors as hypoxic or oxygenated and demonstrate differential radiation doses required for tumor control.

Role: Principal Investigator

RP 140399 Pinney (PI) 12/01/14–11/30/17

CPRIT – IIRA subcontract with Baylor University

Targeting Hypoxia in Breast Cancer with Highly Potent Small-Molecule Anticancer Prodrugs

The goals of this study are to confirm, map, and quantitate hypoxic regions of tumors in animal models for breast cancer to identify tumor types exhibiting well defined levels of hypoxia and *in vivo* evaluation of the two most promising BAPCs (determined at Baylor) for efficacy in reducing breast cancer tumor burden in two animal models.

Role: Principal Investigator of subcontract

RP120670-P3 Mason (PI) 09/01/12-08/31/17

CPRIT

P3: Effects of Hypoxia (Main PI Timmerman)

The goal of this study is to evaluate tumor oxygenation in pre-clinical models and translate measurements to human lung cancer patients. Assess the ability to determine hypoxia, modulate hypoxia, and enhance radiation response.

Role: Principal Investigator

RP110441-C1-02 Mason (PI) 07/01/11-06/30/16

CPRIT

C1: In Vivo Imaging Core (Main PI Ward)

The goal of this study is to engineer enhanced antibodies for improved targeting of tumor associated phosphatidylserine- the core is responsible for pharmacokinetics and imaging.

Role: Principal Investigator

P30 CA142543-03 Willson (PI) 08/01/10-07/31/15

NIH/NCI

Cancer Center Support Grant

The goal of this study is to Provide Infrastructure support

Role: Small Animal Imaging Resource director

1 R01 CA140674-02 Pinney (Mason UTSW PI) 06/01/10-03/31/15

NIH/NCI – subcontract w/ Baylor University

Discovery and Development of Improved Chemotherapeutic Agents with Enhanced Selectivity for the Tumor Microenvironment

The goal of this study is Evaluation of novel vasculature disrupting agents.

Role: Principal Investigator of Subcontract

5 R01 CA139043-03 Mason (PI) 01/01/10-12/31/14

NIH/NCI

Hypoxia and Radiotherapy: Evaluation and Mitigation in Tumors

The goal of this study is to develop a prognostic test to reveal tumor hypoxia

Role: Principal Investigator

Recently Completed Research

5 U24 CA126608-05 – SAIRP NIH/National Cancer Institute UT Southwestern Small Animal Imaging Resource The goal of this study is Oversight of multi-modality imaging resource Role: Principal Investigator	Mason (PI)	04/18/07-03/31/13
R21 EB009795-01 NIH/NIBIB- subcontract w/UT Arlington Enabling Aliphatic Biodegradable Photoluminescent Polymeric Biomaterials The goal of this study is to develop in vivo applications of novel polymeric materials. Role: Principal Investigator of subcontract	Yang (Mason UTSW PI)	08/01/09-07/31/12
PC074348 US Department of Defense Stereotactic Body Radiation Therapy for Underserved Populations of Men with Low- and Intermediate-Risk Prostate Cancer The goal of this study is to assess predictive factors influencing radiotherapy of human prostate tumors Role: Co-Investigator	Timmerman (PI)	05/01/08-04/30/11
PC081501 US Department of Defense Targeting Phosphatidylserine to Improve Hormone Therapy of Prostate Cancer Major Goal: To develop a new drug (1N11) that will improve the effectiveness of traditional hormone therapy for prostate cancer that has metastasized to the lymph nodes and lungs of mice bearing implanted and spontaneous prostate tumors Role: Co-Investigator	Thorpe (PI)	04/01/09-03/31/11
1R21 CA132096-01A1 NIH, NCI ¹ H MRI Based Nanosensors for Imaging Tumor Oxygenation Major Goal: Develop HMDSO based nanoemulsions as proton MRI pO ₂ reporter nanoprobe and to use them to explore the tumor micro environmental response to combination chemotherapy Role: Co-Investigator	Kodibagkar (PI)	03/01/09-02/28/11
1R21CA120774-01A1 NIH/National Cancer Institute MAGIC – Magnetic Resonance Assessment of Gene Imaging Constructs Major Goal: Design, synthesize, and evaluate novel ¹ H MRI gene reporters Role: Principal Investigator	Mason (PI)	04/01/07-11/30/10
BC051255 - W81XWH-06-1-0475 DOD Breast Cancer Initiative: IDEA Development Award (no cost extension) Breast Tumor Detection and Treatment Using Tarvacin Labeled with Arsenic Radionuclides Role: Principal Investigator	Mason (PI)	04/01/06-06/30/10
1S10RR02564801 ARRA-NIH Small Animal Ultrasound System (VisualSonics Vevo 770) Role: Principle Investigator	Mason (PI)	05/01/09-04/30/10
081-07 The Mary Kay Ash Charitable Foundation Predicting Treatment Response for Cervical Cancer: Non-Invasive Assessment Using BOLD MRI Develop two new MRI methods sensitive to tumor oxygen concentrations Role: Principal Investigator	Mason (PI)	08/01/07-02/28/10