***CURRICULUM VITAE ~ PETER ANDREW HARDY, PhD, DABMP, MRSE***

**CONTENT ORGANIZATION**

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Office Address, Email, Telephone, Fax

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Undergraduate, Professional/Graduate/Post-Graduate, Continuing

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Publications, Abstract Presentations, Sponsored Research Projects, Grant & Contract Activities, Non-Sponsored Research Projects, Other Creative Activities

**XV.** **OTHER ACTIVITIES**

**Date Prepared**: December 18, 2019

#### *CURRICULUM VITAE*



Peter Andrew Hardy, PhD, DABMP, MRSE

Associate Professor, non-tenure track, Clinical Title Series

Department of Radiology

Division of Medical Physics

Associate Professor, Clinical Title Series, Joint Appointment

Department of Neuroscience

University of Kentucky College of Medicine

UK HealthCare

Associate Professor, Clinical Title Series, Joint Appointment

**F. Joseph Halcomb III, MD Department of Biomedical Engineering**

University of Kentucky College of Engineering

**I. GENERAL INFORMATION**

**Office Address** 800 Rose Street, HX-311B

 Lexington, Kentucky 40536-0293

**Email** peter.hardy@uky.edu

**Telephone** 859-323-2703

**Fax** 859-257-4457

**Professional Licensure**

 Not Applicable

**Board Certification**

 **The American Board of Medical Physics**

2013 General MRI Science Part 1 Examination

2014 General MRI Science Part 2 Examination

2015 General MRI Science Part 3 Examination

2015- Maintenance of Certification Program

**Research Certification**

**Collaborative Institutional Training Initiative,** **Human Research**

**Curriculum, Group 1 Biomedical Investigators and Key Personnel**

09/2013-09/2017 Initial Completion Certificate, University of Kentucky

**I. GENERAL INFORMATION - *cont***

**Research Certification *- cont***

 **American Association of Laboratory Animal Science (AALAS)**

Training for working with experimental animals:

03/14/2010 Euthanasia of Research Animals: AVMA Guidelines

03/14/2010 Working with the IACUC

03/16/2010 Pain Recognition and Alleviation in Lab Animals

03/16/2010 Aseptic Technique for Rodent Survival Surgery

10/20/2010 Good Laboratory Practice Standards

12/14/2010 OCCHLTH & Safety w/ Primates

12/17/2010 Intro to Nonhuman Primates

12/19/2010 Health Risks and Safety Procedures for Working with Nonhuman Primates

12/19/2010 Continuing Education

02/17/2014 2009 ALAT Nonhuman Primates

02/17/2014 Working with the IACUC

02/17/2014 Continuing Education

07/27/2015 Intro to Rabbits

10/23/2017 Refresher: Working with the IACUC

10/23/2017 Continuing Education

**II. EDUCATION**

**Undergraduate**

**University of Western Ontario**

London, Ontario

09/1975-05/1979 BS, Physics

**Professional/Graduate**

**University of Toronto**

Toronto, Ontario

09/1979-12/1981 MS, Solid State Physics

**Post-Graduate**

**University of Toronto**

Toronto, Ontario

07/1985-06/1991 PhD, Medical Physics

**Continuing**

 Not Applicable

**III. PROFESSIONAL EXPERIENCES**

**University of Toronto**

Department of Physics

Toronto, Ontario

01/1982-05/1982 Research Associate

**Ontario Cancer Institute**

Toronto, Ontario

12/1982-06/1985 Research Associate

**The Cleveland Clinic Foundation**

Division of Radiology

Cleveland, Ohio

02/1991-12/1997 Medical Physicist

**The Cleveland Clinic Foundation**

Department of Biomedical Engineering

Cleveland, Ohio

01/1998-06/1998 Project Scientist

**University of Kentucky College of Engineering**

F. Joseph Halcomb III, MD Department of Biomedical Engineering

Lexington, Kentucky

07/1998-02/2009 Research Scientist

**University of Kentucky Medical Center**

Department of Anatomy & Neurobiology

 Lexington, Kentucky

03/2009-06/2011 Research Scientist

**University of Kentucky Medical Center**

Department of Radiology

Lexington, Kentucky

07/2011- Faculty Medical Physicist, Division of Medical Physics

**IV. ACADEMIC APPOINTMENTS**

**Faculty**

**University of Kentucky College of Engineering**

Lexington, Kentucky

07/1998-02/2009 Assistant Professor of Biomedical Engineering, Research Title Series, non-tenure track, full-time

03/2009-02/2013 Assistant Professor of Biomedical Engineering, Research Title Series, non-tenure track, Joint Appointment

03/2013-07/2017 Assistant Professor of Biomedical Engineering, Clinical Title Series, non-tenure track, Joint Appointment

07/2017- Associate Professor of Biomedical Engineering, Clinical Title Series, non-tenure track, Joint Appointment

**University of Kentucky College of Medicine**

Lexington, Kentucky

07/1998-02/2009;

07/2012-02/2013 Assistant Professor of Anatomy & Neurobiology (n/k/a Neuroscience), Research Title Series, non-tenure track, Joint Appointment

04/2005-06/2012 Assistant Professor of Radiology, Research Title Series, non-tenure track, Joint Appointment

03/2009-06/2012 Assistant Professor of Anatomy & Neurobiology (n/k/a Neuroscience), Research Title Series, non-tenure track, full-time

07/2012-02/2013 Assistant Professor of Radiology, Research Title Series, non-tenure track,

full-time

03/2013-07/2017 Assistant Professor of Radiology, Clinical Title Series, non-tenure track,

full-time

03/2013-07/2017 Assistant Professor of Neuroscience (f/k/a Anatomy & Neurobiology), Clinical Title Series, non-tenure track, Joint Appointment

07/2017- Associate Professor of Radiology, Clinical Title Series, non-tenure track,

full-time

07/2017- Associate Professor of Neuroscience (f/k/a Anatomy & Neurobiology), Clinical Title Series, non-tenure track, Joint Appointment

**IV. ACADEMIC APPOINTMENTS - *cont***

**Visiting Professorships**

**University of Kentucky/University of Louisville/University of Cincinnati Visiting Professor Exchange Program**

**University of Louisville**

Louisville, Kentucky

03/2016 “Teaching Medical Physics to Radiology Residents Using a Hands-on Approach”

**University of Cincinnati**

Cincinnati, Ohio

10/2016 “Improved Teaching of Medical Physics to Residents”

**V. HOSPITAL or CLINICAL APPOINTMENTS**

**University of Kentucky Medical Center**

Department of Radiology

Lexington, Kentucky

07/2011-06/2013 Faculty Medical Physicist, Division of Medical Physics (60% effort)

07/2013-06/2014 Faculty Medical Physicist, Division of Medical Physics (80% effort)

07/2014- Faculty Medical Physicist, Division of Medical Physics (100% effort)

**VI. CONSULTING ACTIVITIES**

***Local***

**Diagnostic Radiology Systems**

Lexington, Kentucky

09/2004 ACR Accreditation Consulting

**Health South MRI**

Lexington, Kentucky

12/2004 ACR Accreditation Consulting

***State/Regional***

**Richmond Open MRI**

Richmond, Kentucky

11/2004 ACR Accreditation Consulting

**Reddy and Lessenbery, PSC**Glasgow, Kentucky

09/2006 ACR Accreditation Consulting

**Winchester Open MRI**

Winchester, Kentucky

12/2006 ACR Accreditation Consulting

**Dupont High Field MRI**

Louisville, Kentucky

04/2007 ACR Accreditation Consulting

**Professional MRI**

Richmond, Kentucky

04/2007 ACR Accreditation Consulting

**Portland MRI**

Bardstown, Kentucky

06/2008 ACR Accreditation Consulting

**Twin Lakes MRI**

Albany, Kentucky

04/2011 ACR Accreditation Consulting

**VI. CONSULTING ACTIVITIES *- cont***

***State/Regional*** *-* ***cont***

**Advanced Imaging and Open MRI**

Berea, Kentucky & Monticello, Kentucky

09/2012 ACR Accreditation Consulting

**Ellis & Badenhausen Orthopedics**

Louisville, Kentucky

09/2013 ACR Accreditation Consulting

**Louisville Bone & Joint Specialists**

Louisville, Kentucky

11/2013 ACR Accreditation Consulting

***National/International***

 Not Applicable

**VII. TEACHING ACTIVITIES**

**University Faculty**

 **University of Kentucky College of Medicine**

**University of Kentucky Medical Center**

Lexington, Kentucky

07/2012- Conferences for Radiology Residents & Fellows

01/2013-05/2014        RAS 647 Physics of Diagnostic Imaging I (11 75-minute Lectures)

05/2013-                      RAS 545 Radiation Hazards and Protection (1 75-minute Lecture)

07/2013-06/2015 Interdisciplinary Conferences - Cardiovascular Medicine

07/2013- Core Examination Board Reviews for 3rd- & 4th-Year Radiology Residents

08/2013-12/2014        RAS 648 Physics of Diagnostic Imaging II (9 75-minute Lectures)

08/2015-                      RAS 648 Physics of Diagnostic Imaging II (22 75-minute Lectures)

01/2018-                      RAS 711 Introduction to Research in Medical Physics (3 60-minute Lectures)

**Professional Course/Program Faculty**

**International Society for Magnetic Resonance in Medicine (ISMRM)**

Seattle, Washington

05/2006 “Functional Imaging of Articular Cartilage”

**VIII. ADVISING ACTIVITIES**

**Student & Trainee Advising**

**University of Kentucky College of Medicine**

Lexington, Kentucky

**Post-Graduate Physicians (Radiology Residents & Fellows)**

2014-2015 Aurora Luna, MD

2014-2015 Xiaoqin (Jennifer) Wang, MD

2015- Aurela Clark, MD

2015- Roberto Galuppo Monticelli, MD

2015- Przemyslaw Ignaciuk, MD

2016- Qiong Han, MD

2017- Leanne Lin, MD

 **Post-Doctoral Fellows**

1999-2008 Zhijie Liao, PhD

2007 Liang Xuan, PhD

 **Medical Physics Masters Candidates**

2014-2016 Efran Akbari, BS

2014-2016 Gary Ge, BS

 **Undergraduate Students**

09/2016 Elona Ryspayeva

 Dave Stapleton

**Directed Student Learning**

 **University of Kentucky**

Lexington, Kentucky

**Undergraduate Students**

2015 C J Norsigian

 Research Undergraduate Experience (summer program)

2016 R Dylan Lawless

 Minor in Biomedical Engineering

 **Paul Lawrence Dunbar High School**

Lexington, Kentucky

**Math, Science and Technology Program (MTSC)**

2003-2005 Katie Grisanti

2009-2011 Sandy Huang

2014-2016 Amina Anwar

**VIII. ADVISING ACTIVITIES *-* *cont***

**Thesis & Dissertation**

**University of Kentucky**

Lexington, Kentucky

1999-2001 Churn Poh, MS

 MS in Mechanical Engineering, 2001

 Thesis: *Characterization of Fluid Transport in Artificial Kidneys:*

 *an MRI Approach*

1999-2001 Bao Zhang, MS

MS in Mechanical Engineering, 2001

Thesis: *Measurement of the Shear Modulus of Tissue-Like Materials Using Magnetic Resonance Elastography*

2002-2004 Jayaroop Gulapalli, MS

MS in Electrical Engineering, 2004

 Thesis: *Diffusion Tensor Imaging as a Method of Monitoring Recovery from Spinal Cord Injury*

2003-2004 Meris Greges, MS

MS in Biomedical Engineering, 2004

 Thesis: *The Relationship Between MR Imaging and Kinematics of Rats with a Moderate Spinal Cord Injury*

2005-2007 Sarah Pachtman, MS

MS in Biomedical Engineering, 2007

 Thesis: *Magnetic Resonance Imaging to Detect Iron and its*

 *Relationship to Alzheimer’s Disease: A Voxel-Based Relaxometry Study*

2005-2007 Donghui Zhong, PhD

 PhD in Pharmacy Science, 2007

Thesis: *Nanoparticles as Signaling Agents for Magnetic Resonance Imaging and Scintillation Counting*

2009-2011 Megan Phillips, MS

 MS in Biomedical Engineering, 2011

 Thesis: *Diffusion Tensor Imaging for Characterization of Aging and*

 *Parkinson’s Disease*

2019 Scott William Thalman, PhD

 PhD in Biomedical Engineering, 2019

Thesis: *Calibrated Short TR Recovery MRI for Rapid Measurement of Brain-Blood Partition Coefficient and Correction of Quantitative Cerebral Blood Flow*

**Master Oral Defense**

06/2019 Allison Palmiero, Medical Physics

06/2019 Zac Pearson, Medical Physics

06/2019 Justin Visek, Medical Physics

**VIII. ADVISING ACTIVITIES *-* *cont***

**Faculty Mentoring**

 **University of Kentucky**

 Lexington, Kentucky

 **Department of Radiology**

2016 Creation of Faculty Practice Module, “Research in Radiology – What Every Radiologist Should Know”

09/2018 Created Mandatory Faculty Professional Development Module, “Writing Scientific Papers”, with Dr. Riham El Khouli

**Invited Referee for Academic Appointment, Promotion or Tenure**

 Not Applicable

**IX. ADMINISTRATIVE ACTIVITIES & UNIVERSITY SERVICE**

**University**

 **University of Kentucky**

 Lexington, Kentucky

***Administration & Clinical Operations***

2016- Member, Search Committee for Chair

F. Joseph Halcomb III, MD Department of Biomedical Engineering

2013- Director, Quality Assurance, Magnetic Resonance Imaging & Spectroscopy Center (MRISC)

 ***Education & Research***

2013- Member, Institutional Review Board

**College**

**University of Kentucky College of Medicine**

 Lexington, Kentucky

***Administration & Clinical Operations***

2015- Member, Clinical Title Series Subcommittee

***Education & Research***

07/2015- Course Director, RAS 648 Physics of Diagnostic Imaging II

01/2018-Associate Director, PhD Program in Radiation and Radiological Medical Physics

**Medical Center**

**University of Kentucky Medical Center/UK HealthCare**

Lexington, Kentucky

***Education & Research***

2014- Member, Cardiovascular Imaging Research Team (CVIRT)

**IX. ADMINISTRATIVE ACTIVITIES & UNIVERSITY SERVICE *- cont***

**Department**

**University of Kentucky Medical Center**

Department of Radiology

Lexington, Kentucky

***Administration & Clinical Operations***

2011-2017 Member, Imaging Technology Committee

2012- Director, Research

2013- Member, Clinical Practice & Quality Improvement MR Subcommittee

Quality, Safety & Compliance Committee

2013- Member, Communications Committee

2014- Member, Informatics & Information Technology Committee

2015- Member, Clinical Practice & Quality Improvement US Subcommittee

 Quality, Safety & Compliance Committee

***Education & Research***

2012-2017 Chair, Research Committee

2017- Co-Chair, Research Committee

**X. SPECIAL ASSIGNMENTS**

Not Applicable

**XI. HONORS & AWARDS**

1976-1979 Dean's Honor List, University of Western Ontario

1977 & 1978 J. G. McIntosh Scholarships, University of Western Ontario

1979 Raymond Compton Dearle Gold Medal, University of Western Ontario

1979-1981 J. C. McLennan Scholarships, University of Toronto

1979-1981 Natural Sciences and Engineering Research Council of Canada

Postgraduate Scholarships, University of Toronto

1986-1987 Medical Research Council Studentship, University of Toronto

1988 University of Toronto Open Scholarship, University of Toronto

1990 Blue Ribbon Award for Poster, Annual Meeting of Society of Magnetic Resonance Imaging, Washington, DC

**XII. PROFESSIONAL ACTIVITIES, PUBLIC SERVICE & PROFESSIONAL DEVELOPMENT**

**Memberships**

1985- International Society of Magnetic Resonance in Medicine (ISMRM)

1993- American Association of Physicists in Medicine (AAPM)

**Positions Held**

***Local***

Not Applicable

***State/Regional***

Not Applicable

***National/International***

 **International Society of Magnetic Resonance in Medicine (ISMRM)**

2004-2006; 2008-2009; 2011- Annual Meeting: Abstract Reviewer

2010- Member, Historical Archives Committee

 **Radiological Society of North America (RSNA)**

2013- Vice Chairs of Research

2017-2022 Member, Scientific Program Committee

12/2017- Member, Quantitative Imaging Biomarkers Alliance MSK Committee

 **American Board of Medical Physics**

04/2017;07/2018 Panelist, Oral Board Examinations

06/2019- Member, Board of Directors

**Advisory Groups**

Not Applicable

**Review Panels**

Not Applicable

**Editorial Boards**

Not Applicable

**XII. PROFESSIONAL ACTIVITIES, PUBLIC SERVICE & PROFESSIONAL DEVELOPMENT *- cont***

**Journal Peer-Reviewing**

2000 IEEE Transactions on Medical Imaging

2000-2013 Journal of Neuroscience Methods

2001- Journal of Magnetic Resonance Imaging

2003-2013 Magnetic Resonance in Medicine

2006- Magnetic Resonance Imaging

2007 Nanomedicine

2008 MAGMA

2011 Molecular Basis of Disease

2016- Medical Physics

**Other Reviewing Activities**

 **Grant Reviewer**

2004 *ad hoc* Reviewer, National Science Foundation

2006 Dutch Technology Foundation, Stichting voor de Technische Wetenschappen (STW)

2006 State of Ohio SEEDs Grants Program

2006-2007 National Institutes of Health Study Section, ZRG SBIB-J 51 R

2010 The Wellcome Trust, United Kingdom, Major Equipment Proposal

 Review

2012 Natural Sciences and Engineering Research Council of Canada

2012 Pennsylvania Department of Health

2015 Radiological Society of North America (RSNA) Resident and Fellow Research Awards

2016;2017 National Science Foundation, Section on Biomechanics and Mechanobiology

2016 Veterans Affairs, Aging & Neurodegenerative Diseases Research Panel

**Media Contributions**

Not Applicable

**XII. PROFESSIONAL ACTIVITIES, PUBLIC SERVICE & PROFESSIONAL DEVELOPMENT *- cont***

**Professional Development**

**American Association of Physicists in Medicine (AAPM)**

2013 Ohio River Valley Chapter, Spring Educational Symposium, Erlanger, KY

2014 Ohio River Valley Chapter, Annual Meeting, Columbus, IN

**International Society of Magnetic Resonance in Medicine (ISMRM)**

2013 Annual Meeting, Salt Lake City, UT

2014 Annual Meeting, Milan, Italy

2015 Annual Meeting, Toronto, Canada

2016 Annual Meeting, Suntec City, Singapore

2017 Annual Meeting, Honolulu, HI

2018 Annual Meeting, Paris, France

2019 Annual Meeting, Montreal, QC, Canada

**Radiological Society of North America (RSNA)**

11/2013;11/2014;

11/2015;11/2016;

11/2017;11/2018 Annual Meeting, Chicago, IL

10/2013;10/2015;

10/2017;10/2019 Creating and Optimizing the Research Enterprise (CORE), Oak Brook, IL

**Human Subjects Protection Symposium**

10/2014-10/2016 Annual Meeting, Covington, KY

**XIII. SPEAKING ENGAGEMENTS**

***Local***

**University of Kentucky**

Lexington, Kentucky

**Department of Radiology**

10/2008 “Measuring the Iron Concentration in the Brain”

 **Biomedical Engineering Seminar**

03/2017 “Measuring Tissue Perfusion with MR Imaging”

***State/Regional***

**University of Louisville**

 Louisville, Kentucky

**Department of Radiology**

08/2012 “Using Convection Enhanced Delivery to Treat Neurodegenerative Disease”

 **Vanderbilt University**

Nashville, Tennessee

**Institute of Imaging Science**

03/2014 “Using Convection Enhanced Delivery to Treat Neurodegenerative Disease”

***National/International***

 **Johns Hopkins University**

 Baltimore, Maryland

**Department of Radiology**

08/2005 “Measuring the Concentration of Iron in the Brain with MRI”

**Radiological Society of North America (RSNA)**

Oak Brook, Illinois

**Creating and Optimizing the Research Enterprise (CORE)**

10/2015 “Behavioral Research by Radiologists”

10/2019 “How I Do It; Teaching Research Skills”

**Radiological Society of North America (RSNA)**

Chicago, Illinois

**Annual Meeting**

11/2018 Session Moderator, “SSC12 – Physics (MR: New Techniques, System, Evaluation)”

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS**

**A. PUBLICATIONS**

**Peer-Reviewed Original Research in Professional, Scientific or Educational Journals**

1. **Hardy PA**, Bronskill MJ, Henkelman RM. Signal Strength on a 0.15-T Magnetic Resonance Imager. Med Phys. 1985;12(5):581-5.
2. Kroeker RM, Mcveigh ER, **Hardy PA**, Bronskill MJ, Henkelman RM. In Vivo Measurements of NMR Relaxation Times. Magn Reson Med. 1985;2(1):1-13.
3. Henkelman RM, **Hardy PA**, Poon PY, Bronskill MJ. Optimal Pulse Sequence for Imaging Hepatic Metastases. Radiology. 1986;161(3):727-34.
4. Balbaa IS, **Hardy PA**, San-Martin A, Coulter PG, Machester FD. The Effect of Lattice Distortions on the X-Ray Measurements of Lattice Parameters for PdHx. J. Phys. F. Metals. 1987;17(10):2041-48.
5. Chen JC, **Hardy PA**, Clauberg M, Joshi JG, Parravano J, Deck JH, Henkelman RM, Becker LE, Kucharczyk W. T2 Values in the Human Brain: Comparison with Quantitative Assays of Iron and Ferritin. Radiology. 1989;173(2):521-6.
6. **Hardy PA**, Henkelman RM. Transverse Relaxation Rate Enhancement Caused by Magnetic Particulates. Magn Reson Imaging. 1989;7(3):265-75.
7. **Hardy PA**, Kucharczyk W, Henkelman RM. Cause of Signal Loss in MR Images of Old Hemorrhagic Lesions. Radiology. 1990;174(2):549-55.
8. Bristow RG, **Hardy PA**, Hill RP. Comparison Between in Vitro Radiosensitivity and in Vivo Radioresponse in Murine Tumor Cell Lines. II: in Vivo Radioresponse Following Fractionated Treatment and in Vitro/in Vivo Correlations. Int J Radiat Oncol Biol Phys. 1990;18(2):331-45.
9. **Hardy PA**, Bronskill MJ, Belanger MJ, Henkelman RM. Use of Magnetic Particles for Sensitizing MR Images to Blood Flow. J Magn Reson Imaging. 1991;1(4):431-40.
10. **Hardy PA**, Henkelman RM. On the Transverse Relaxation Rate Enhancement Induced by Diffusion of Spins through Inhomogeneous Fields. Magn Reson Med. 1991;17(2):348-56.
11. Henkelman RM, **Hardy PA**, Bishop JE, Poon CS, Plewes DB. Why Fat is Bright in RARE and Fast Spin-Echo Imaging. J Magn Reson Imaging. 1992;2(5):533-40.
12. Piraino DW, **Hardy PA**, Schils JP, Richmond BJ, Tkach JA, Belhobek GH. Fast Spin-Echo Imaging of the Knee: Factors Influencing Contrast. J Magn Reson Imaging. 1993;3(6):835-42.
13. Chen JC, **Hardy PA**, Kucharczyk W, Clauberg M, Joshi JG, Vourlas A, Dhar M, Henkelman RM. MR of Human Postmortem Brain Tissue: Correlative Study Between T2 and Assays of Iron and Ferritin in Parkinson and Huntington Disease. Am J Neuroradiol. 1993;14(2):275-81.
14. **Hardy PA**, Hinks RS, Tkach JA. Separation of Fat and Water in Fast Spin-Echo MR Imaging with the Three-Point Dixon Technique. J Magn Reson Imaging. 1995;5(2):181-5.
15. Lingamneni A, **Hardy PA**, Powell KA, Pelc NJ, White RD. Validation of Cine Phase-Contrast MR Imaging for Motion Analysis. J Magn Reson Imaging. 1995;5(3):331-8.
16. **Hardy PA**. Intervertebral Disks on MR Images: Variation in Signal Intensity with the Disk-to-Magnetic Field Orientation. Radiology. 1996;200(1):143-7.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**A. PUBLICATIONS *- cont***

**Peer-Reviewed Original Research in Professional, Scientific or Educational Journals *- cont***

1. Liu P, Henkelman M, Joshi J, **Hardy PA**, Butany J, Iwanochko M, Clauberg M, Dhar M, Mai D, Waien S, Olivieri N. Quantification of Cardiac and Tissue Iron by Nuclear Magnetic Resonance Relaxometry in a Novel Murine Thalassemia-Cardiac Iron Overload Model. Can J Cardiol. 1996;12(2):155-64.
2. **Hardy PA**, Recht MP, Piraino D, Thomasson D. The Optimization of a Double Echo Steady State Free Precession Sequence for Cartilage Imaging. J Magn Reson Imaging. 1996;6:329-35.
3. **Hardy PA**, Yue GH. Measurement of Magnetic Resonance T2 for Physiological Experiments. J Appl Physiol. 1997;83(3):904-11.
4. Yue GH, Bilodeau M, **Hardy PA**, Enoka RM. Task-Dependent Effect of Limb Immobilization on the Fatigability of the Elbow Flexor Muscles in Humans. Exp Physiol. 1997;82:567-92.
5. **Hardy PA**, Recht MP, Piraino DW. Fat Suppressed MRI of Articular Cartilage with a Spatial-Spectral Excitation Pulse. J Magn Reson Imaging. 1998;8(6):1279-87.
6. **Hardy PA**, Poh CK, Huang Z, Liao Z, Gao D. Non-Invasive Measurement of Counter-Current Flows in a Hemodialyzer Using Fourier-Velocity Magnetic Resonance Imaging. Adv Heat Mass Trans Biotech. 1999;363:135-40.
7. Kao PF, Davis BL, **Hardy PA**. Characterization of the Calcaneal Fat Pad in Diabetic and Non-Diabetic Patients Using Magnetic Resonance Imaging. Magn Reson Imaging. 1999;17(6):851-7.
8. **Hardy PA**, Newmark R, Liu YM, Meier D, Norris S, Piraino DW, Shah A. The Influence of the Resolution and Contrast on Measuring the Articular Cartilage Volume in Magnetic Resonance Images. Magn Reson Imaging. 2000;18(8):965-72.
9. Greenfeaf JE, Simonson SR, Stocks JM, Evans J, Knapp CF, Cowell SA, Pemberton KN, Wilson HW, Vener JM, Evetts JN, **Hardy PA**, Grindeland RE, Hinghofer-Szalkay H, Smith SM, Ziegler M, Brown D, Evans D, Moore FB, Quach DT. Effect of Exercise Training and +Gz Acceleration Training on Men. NASA Technical Memorandum 2001-210926. 2001.
10. **Hardy PA**, Nammalwar P, Kuo S. Measuring the Thickness of Articular Cartilage from MR Images. J Magn Reson Imaging. 2001;13(1):120-6.
11. Andersen AH, Zhang Z, Barber T, Rayens WS, Zhang J, Grondin R, **Hardy PA**, Gerhardt GA, Gash DM. Functional MRI Studies in Awake Rhesus Monkeys: Methodological and Analytical Strategies. J Neurosci Methods. 2002;118(2):141-52.
12. **Hardy PA**, Zhang B, Gao D, Mitchell RJ. Measurement of the Shear Modulus of Tissue-like Materials Using Magnetic Resonance Elastography. Adv Heat Mass Trans Biotech. 2002;373:1-5.
13. **Hardy PA**, Poh C, Liao Z, Clark W, Gao D. The Use of Magnetic Resonance Imaging to Measure the Local Ultrafiltration Rate in Hemodialyzers. J Membrane Science. 2002;204: 195-205.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**A. PUBLICATIONS *- cont***

**Peer-Reviewed Original Research in Professional, Scientific or Educational Journals *– cont***

1. Poh CK, **Hardy PA**, Liao Z, Huang Z, Clark WR, Gao D. Effect of Spacer Yarns on the Dialysate Flow Distribution of Hemodialyzers: A Magnetic Resonance Imaging Study. Am Soc Art Int Organs J. 2003;49(4):440-8.
2. Poh C, **Hardy PA**, Liao Z, Huang Z, Clark W, Gao D. Effect of Flow Baffles on the Dialysate Flow Distribution in Hollow-Fiber Hemodialyzers: A Non-Intrusive Experimental Study Using MRI. J Biomech Eng. 2003;125:481-9.
3. Liao Z, Zhang W, **Hardy PA**, Poh CK, Huang Z, Kraus MA, Clark WR, Gao D. Kinetic Comparison of Different Acute Dialysis Therapies. Artif Organs. 2003;27(9):802-7.
4. Liao Z, Poh CK, Huang Z, **Hardy PA**, Clark WR, Gao D. A Numerical and Experimental Study of Mass Transfer in the Artificial Kidney. J Biomech Eng. 2003;125(4):472-80.
5. Liao Z, Klein E, Poh CK, Huang Z, **Hardy PA**, Morti S, Clark WR, Gao D. A Modified Equivalent Annulus Model for the Hollow Fiber Hemodialyzer. Int J Artif Organs. 2004;27(2):110-7.
6. **Hardy PA**, Ridler AC, Chiarot CB, Plewes DB, Henkelman RM. Imaging Articular Cartilage Under Compression-Cartilage Elastography. Magn Reson Med. 2005;53(5): 1065-73.
7. **Hardy PA**, Gash D, Yokel R, Andersen A, Ai Y, Zhang Z. Correlation of R2 with Total Iron Concentration in the Brains of Rhesus Monkeys. J Magn Reson Imaging. 2005;21(2):118-27.
8. Mattingly B, Talwalkar V, Tylkowski C, Stevens DB, **Hardy PA**, Pienkowski D. Three-Dimensional in Vivo Motion of Adult Hind Foot Bones. J Biomech. 2006;39(4):726-33.
9. Roche C, Mattingly B, Talwalkar V, Tylkowski C, Stevens DB, **Hardy PA**, Pienkowski D. Tarsal Shape, Size, and Articulating Surface Morphology in Adolescent Surgically Treated Clubfoot and Their Contralateral Normal Foot. J Pediatr Orthop. 2006;26(3):329-35.
10. Zhang Z, Andersen AH, Ai Y, Loveland A, **Hardy PA**, Gerhardt GA, Gash DM. Assessing Nigrostriatal Dysfunctions by Pharmacological MRI in Parkinsonian Rhesus Macaques. Neuroimage. 2006;33(2):636-43.
11. Joseph JE, Powell DK, Andersen AH, Bhatt RS, Dunlap MK, Foldes ST, Forman E, **Hardy PA**, Steinmetz NA, Zhang Z. fMRI in Alert, Behaving Monkeys: An Adaptation of the Human Infant Familiarization Novelty Preference Procedure. J Neurosci Methods. 2006;157(1):10-24.
12. Zhu D, White RD, **Hardy PA**, Weerapreeyakul N, Sutthanut K, Jay M. Biocompatible Nanotemplate-Engineered Nanoparticles Containing Gadolinium: Stability and Relaxivity of a Potential MRI Contrast Agent. J Nanosci Nanotechnol. 2006;6(4):996-1003.
13. Cass WA, Grondin R, Andersen A, Zhang Z, **Hardy PA**, Hussey-Andersen LK, Rayens WS, Gerhardt GA, Gash DM. Iron Accumulation in the Striatum Predicts Aging-Related Decline in Motor Function in Rhesus Monkeys. Neurobiol Aging. 2007;28(2):258-71.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**A. PUBLICATIONS *- cont***

**Peer-Reviewed Original Research in Professional, Scientific or Educational Journals *- cont***

1. Gold BT, Powell DK, Liang X, **Hardy PA**. Speed of Visual Word Recognition Correlates with Diffusion Anisotropy in Left Parietal and Left Frontal White Matter: Evidence from Diffusion Tensor Imaging. Neuropsycologia. 2007;45(11):2439-46.
2. Zhu D, Lu X, **Hardy PA**, Leggas MJ, Jay M. Nanotemplate-Engineered Nanoparticles Containing Gadolinium for Magnetic Resonance Imaging of Tumors. Invest Radiol. 2008;43(2):129-40.
3. **Hardy PA**, Andersen AH. Calculating T2 in Images from a Phased Array Receiver. Magn Reson Med. 2009;61(4):962-9.
4. Stiles D, Zhang Z, Ge P, Nelson B, Grondin R, Ai Y, **Hardy PA**, Nelson PT, Guzaev AP, Butt MT, Charisse K, Kosovrasti V, Tchangov L, Meys M, Maier M, Nechev L, Manoharan M, Kaemmerer WF, Gwost D, Stewart GR, Gash DM, Sah DW. Widespread Suppression of Huntington with Intrastriatal Convection Enhanced Delivery of siRNA in the Non-Human Primate. Exp Neurol. 2012;233(1): 463-71.
5. Dan M, Scott DF, **Hardy PA**, Wydra RJ, Hilt JZ, Yokel RA, Bae Y. Block Copolymer Cross-Linked Nanoassemblies Improve Particle Stability and Biocompatibility of Superparamagnetic Iron Oxide Nanoparticles. Pharm Res. 2013;30(2):552-61.
6. **Hardy PA**, Keeley D, Schorn G, Forman E, Ai Y, Venugopalan R, Zhang Z, Luke H, Bradley L. Convection Enhanced Delivery of Different Molecular Weight Tracers of Gadolinium-Tagged Polylysine. J Neurosci Methods. 2013;219(1):169.
7. Fan XT, Zhao F, Ai Y, Andersen A, **Hardy PA**, Ling F, Gerhardt GA, and Zhang Z, Quintero JE. Cortical Glutamate Levels Decrease in a Non-Human Primate Model of Dopamine Deficiency. Brain Res. 2014;1552:34-40.
8. Noehren B, Andersen A, Feiweier T, Damon B, **Hardy PA**. Comparison of Twice Refocused Spin Echo Versus Stimulated Echo Diffusion Tensor Imaging for Tracking Muscle Fibers. J Magn Reson Imaging. 2015;41(3):624-32 2014 Feb 19. [Epub Ahead of Print]
9. Andersen AH, **Hardy PA**, Forman E, Gerhardt GA, Gash DM, Grondin RC, Zhang Z. Pharmacologic MRI (phMRI) as a Tool to Differentiate Parkinson's Disease-related from Age-related Changes in Basal Ganglia Function. Neurobiol Aging. 2015;36(2):1174-82.
10. Fan X, Nelson B, Ai Y, Stiles D, Gash DM, **Hardy PA**, Zhang Z. Continuous Intraputamenal Convection-Enhanced Delivery in Adult Rhesus Macaques. J Neurosurg. 2015;123(6):1569-77.
11. Noehren B, Andersen A, **Hardy PA**, Johnson DL, Ireland ML, Thompson KL, Damon B. Cellular and Morphological Alterations in the Vastus Lateralis Muscle as the Result of ACL Injury and Reconstruction. J Bone Joint Surg Am. 2016 Sep;98(18):1541-7.
12. Grondin R, Ai Y, **Hardy PA**, Butt MT, Nelson BD, Lemmon JD, Bumcrot D, Gash DM, Gerhardt GA, Zhang Z. Continuous Intranigral Infusion is not Associated with Observable Behavioral Deficits or Marked Pathology: A Preclinical Safety Study. J Neurosurg. 2017 Apr;126(4):1253-62; Epub 2016 May.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**A. PUBLICATIONS *- cont***

**Peer-Reviewed Original Research in Professional, Scientific or Educational Journals *- cont***

1. Zhang J, **Hardy PA**, DiSantis DJ, Oates ME. Hands-on Physics Education of Residents in Diagnostic Radiology. Acad Radiol. 2017 Jun; 24:677-81; Epub Ahead of Print 2017 Mar 1.
2. Yu JJ, Spieler BM, Chan TL, Johnson EM, Gulani V, Sandler KL, Narayana PA, Mar WA, Brian JM, Ng CK, **Hardy PA**. Promoting Collaborations Between Radiologists and Scientists. Acad Radiol. 2018 Jan;25(1):9-17.
3. Zhang R, Andersen AH, **Hardy PA**, Forman E, Evans A, Ai Y, Yue G, Gash DM, Grondin R, Zhang Z. Objectively Measuring Effects of Electro-acupuncture in Parkinsonian Rhesus Monkeys. Brain Res. 2018:1678:12-9.
4. Degnan AJ, Ghobadi EH, **Hardy P**, Krupinski E, Scali EP, Stratchko L, Ulano A, Walker E, Wasnik AP, Auffermann WF. Perceptual and Interpretive Error in Diagnostic Radiology –Causes and Potential Solutions. Acad Radiol (in press 2019).
5. Ayoob AA, **Hardy PA**, Waits T, Brooks M. Development of a Web-based Curriculum to Prepare Diagnostic Radiology Residents during Post-Graduate Year 1 by Promoting Learning via Spaced Repetition and Interim Testing: If You Build It, Will They Come? Acad Radiol. 2019 Aug;26(8):1112-7.
6. Erickson LN, Lucas KCH, Davis KA, Jacobs CA, Thompson KL, **Hardy PA**, Andersen AH, Fry CS, Noehren BW. Effect of Blood Flow Restriction Training on Quadriceps Muscle Strength, Morphology, Physiology, and Knee Biomechanics Before and After Anterior Cruciate Ligament Reconstruction: Protocol for a Randomized Clinical Trial. Phys Ther. 2019 Aug 1;99(8):1010-9.
7. Degnan AJ, Ghobadi EH, **Hardy P**, Krupinski E, Scali EP, Stratchko L, Ulano A, Walker E, Wasnik AP, Auffermann WF. Perceptual and Interpretive Error in Diagnostic Radiology-Causes and Potential Solutions. Acad Radiol. 2019 Jun;26(6):833-45.

**Non-Peer-Reviewed Articles, Editorials, Reviews in Professional, Scientific or Educational Journals**

1. Wood ML, **Hardy PA**. Proton Relaxation Enhancement. J Magn Reson Imaging. 1993;3(1):149-56.
2. Adams S, Martinson N, Recht M, **Hardy PA**. Double-Echo Stir Imaging in the Musculoskeletal System. Protocols in MRI. 1995;1:1-3.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**A. PUBLICATIONS *- cont***

**Books, Book Chapters, Monographs**

* 1. **Hardy PA**, Barnett GH. Spatial Distortion in Magnetic Resonance Imaging: Impact on Stereotactic Localization. In: Gildenberg PL, Tasker RR, eds. *Textbook of Stereotactic and Functional Neurosurgery*. New York, NY: McGraw-Hill; 1998:271-80.
	2. Poh CK, **Hardy PA**, Clark WR, Gao D. Nonintrusive Characterization of Fluid Transport Phenomena in Hollow-Fiber Membrane Modules Using MRI. An Innovative Experimental Approach. In: Bhattacharyya D, Butterfield DA, eds. *New Insights into Membrane Science and Technology: Polymeric, Inorganic, and Biofunctional Membranes*. Amsterdam, The Netherlands: Elsevier Science BV; 2003:89-122.

**Letters, Book Reviews, Lay Press**

Not Applicable

**Electronic Media**

Not Applicable

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS**

**Local/State/Regional Meetings**

1. May 1991. **Hardy PA**, White RD. The Use of Magnetic Resonance Imaging for Measuring Blood Flow. Cleveland Clinic Foundation Research Day, Cleveland, OH. Poster.
2. October 2003. **Hardy PA**, Zhang Z, Yokel R, Grondin R, Yi A, Anderson A, Rouault T, Gash D. Measuring the Accumulation of Iron in the Basal Ganglia with Magnetic Resonance Imaging. University of Kentucky Mini-Aging Symposium, Lexington, KY. Poster.
3. March 2004. Gullapalli J, Fugaccia I, Anderson KJ, Grisanti K, Jung R, Scheff SW, **Hardy PA**. Magnetic Resonance Imaging Evolution of Spinal Cord Injury. Kentucky Science and Technology Corporation, Louisville, KY. Poster.
4. March 2004. Gullapalli J, Fugaccia I, Anderson KJ, Grisanti K, Jung R, Scheff SW, **Hardy PA**. Anisotropic Diffusion Coefficient Characterizes Spinal Cord Injury. Annual Meeting of the Bluegrass Society for NeuroScience, Lexington, KY. Poster.
5. June 2002. Gullapalli J, Fugaccia I, Anderson KJ, Grisanti K, Jung R, Scheff SW, **Hardy**

**PA**. Diffusion Magnetic Resonance Imaging for Characterization of Spinal Neurotrauma. Annual Meeting of Kentucky Spinal Cord and Brain Injury Research Trust, Lexington, KY. Poster.

1. March 2013. **Hardy PA**,Forman E, Evans A, Corbly C, Zhang Z, Joseph J. A Novel Use of Thermoplastic Masks: Restraint of Rhesus Monkeys During Functional MRI. Ohio Valley Chapter of the American Association of Physicists in Medicine, Erlanger, KY. Poster.
2. April 2013. **Hardy PA**, Nobblitt B, Lee JT. Non-Invasive Quantification of Hepatic Fat Using MR Imaging and MR Spectroscopy. Spring Conference of University of Kentucky Center for Clinical and Translational Science, Lexington, KY. Poster.
3. August 2013. Bradley L, Brown C, Sunthankar K, Fountain A, **Hardy PA**. Dependence of Gel Strength Towards Developing in Vitro Gel Mimics for Modeling Convection Enhanced Delivery. Annual Kentucky Innovation and Entrepreneurship Conference, Lexington, KY. Poster.
4. November 2014. **Hardy PA**, Lee JT. Increasing Body Mass Index Reduces Liver Perfusion. Ohio Valley Chapter of American Association of Physicists in Medicine, Columbus, IN. Poster.
5. April 2015. Anwar A, Leung SW, **Hardy PA**. Developing a Method to Quantify Cardiac Perfusion. Center for Clinical and Translational Science Spring Conference, Lexington, KY. Poster.
6. July 2015. Norsigian CJ, **Hardy PA**, Bradley LH. In Vitro Models for Convection Enhanced Delivery to the Putamen. Research Experience for Undergraduates (REU), Boone Center, University of Kentucky, Lexington, KY. Poster and Podium. ***First prize***.
7. April 2016. Anwar A, Leung SW, **Hardy PA**. Vascular Permeability Effects on Tissue Perfusion: an MRI Phantom Study. Center for Clinical and Translational Science Spring Conference, Lexington, KY. Poster.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS** ***- cont***

**Local/State/Regional Meetings** ***- cont***

1. April 2016. Hickey A, **Hardy PA**, Andersen A, Damon B, Johnson D, Ireland ML, Noehren B. Alterations in Quadriceps Morphology Following an Anterior Cruciate Ligament Reconstruction: An MRI Based Assessment. Center for Clinical and Translational Science Spring Conference, Lexington, KY. Poster.
2. June 2016. Davis M, Green J, Latham B, **Hardy PA**, Lee JT. Troubleshooting Magnetic

Resonance Elastography (MRE). Third Annual Department of Radiology Quality & Safety Poster Forum, Lexington, KY. Poster.

1. June 2016. Clark A, Cheatham E, Yates A, **Hardy PA**, McQuerry KJ, Oates ME.

Department of Radiology CQI Storyboard. Optimizing Intra-operative Sentinel Lymph Node Mapping in Early Breast Cancer: Should Tc-99m Tilmanocept (Lymphoseek) Replace

 Traditional Filtered Tc-99m Sulfur Colloid as the New Standard? Third Annual Department of Radiology Quality & Safety Forum, UK HealthCare, Lexington, KY. Electronic Poster.

1. June 2016. Han Q, Yates A, Anaskevich L, **Hardy PA**, Merhar G. Decreasing Aborted

 Magnetic Resonance Imaging (MRI) Examinations Through Simulation. Third Annual

 Department of Radiology Quality & Safety Poster Forum, Lexington, KY. Electronic Poster.

1. June 2016. Ignaciuk P, Cheatham E, **Hardy PA**, McQuerry KJ, Yates A, Oates ME.

 Department of Radiology CQI Storyboard. Optimizing Pre-operative Sentinel Lymph Node

 Mapping in Melanoma: Traditional Filtered Tc-99m Sulfur Colloid versus New Tc-99m

 Tilmanocept (Lymphoseek). Third Annual Department of Radiology Quality & Safety

 Forum, UK HealthCare, Lexington, KY. Electronic Poster. ***Winner, Second Annual***

 ***Graduate Medical Education (Resident) Quality Improvement/Patient Safety (QIPS)***

 ***Poster Forum****.* Quarterly UKHC Quality Report, Pavilion A Auditorium, Chandler Medical

Center, Lexington, KY. Podium.

1. September 2016. Grondin R, Ai Y, Huetti P, Pomerleau F, Quintero J, **Hardy PA**, Butt M, Sehgal V, Bumcrot D, Gash DM, Zhang Z, Gerhardt G. Therapeutic Development of a Novel siRNA Compound Targeting Alphasynuclein. Kentucky Neuroscience Clinical-Translational Research Symposium, Lexington, KY. Poster.
2. March 2017. Stapleton D, Wang X, **Hardy PA**. Design a New Headrest for Breast MRI Biopsy. Center for Clinical and Translational Science Conference, Lexington, KY. Poster.
3. May 2017. Kinner J, Anaskevich L, Ferrin S, Kelley A, **Hardy PA**, Zhang J. Reducing the Rate of X-ray Image Rejection Through Technologist Training. 4th Annual Department of Radiology Quality & Safety Forum. Lexington, KY. Poster.
4. May 2018. Pressman B, Applegate KE, **Hardy PA**. MRI RN Concierge. 5th Annual Department of Radiology Quality & Safety Forum, UK HealthCare, Lexington, KY. Poster.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS *- cont***

**National/International Meetings**

1. August 1984. **Hardy PA**, Bronskill MJ, Henkelman RM. Signal Strength in MR Imaging. Annual Meeting of Society of Magnetic Resonance in Medicine, New York, NY. Podium.
2. June 1985. **Hardy PA**, Henkelman RM. The Use of Specialized Coils to Image Limited Regions of the Body. Annual Meeting of Canadian Association of Radiologists, Toronto, Canada. Podium.
3. March 1986. **Hardy PA**, Bronskill MJ, Henkelman RM. The Mechanism of Superparamagnetic Contrast Agents in Proton Relaxation. Annual Meeting of Society of Magnetic Resonance Imaging, San Antonio, TX. Podium.
4. August 1988. **Hardy PA**, Bronskill MJ, Henkelman RM. Characterization of Magnetic Perturbations and their Effect on MR Images. Annual Meeting of Society of Magnetic Resonance in Medicine, San Francisco, CA. Poster.
5. November 1988. **Hardy PA**, Bronskill MJ, Henkelman RM. The Effect of Mistuning on the Appearance of Hemorrhage. Scientific Assembly and Annual Meeting of Radiological Society of North America, Chicago, IL. Podium.
6. March 1990. **Hardy PA**, Bronskill MJ, Henkelman RM. The Use of Magnetic Particulates for the Determination of the Extent of Perfusion in Tissue. Annual Meeting of Society of Magnetic Resonance Imaging, Washington, D.C. Poster.
7. June 1990. **Hardy PA**, Bronskill MD, Henkelman RM. Magnetic Particles for the Assessment of Perfusion. Annual Meeting of Canadian Organization of Medical Physicists, London, Ontario, Canada. Podium.
8. August 1992. **Hardy PA**. Three-Point Dixon Applied to Fast Spin Echo. Annual Meeting of Society of Magnetic Resonance in Medicine, Berlin, Germany. Poster.
9. August 1993. **Hardy PA**, White RD. A Rapid Method of Measuring Heart Relaxation Times. Annual Meeting of Society of Magnetic Resonance Imaging, New York, NY. Poster.
10. August 1993. Lingamneni A, **Hardy PA**, White RD. The Accuracy of Phase Contrast Imaging for Tracking Motion Assessed Using a Moving Phantom. Annual Meeting of Society of Magnetic Resonance in Medicine, New York, NY. Poster.
11. March 1994. **Hardy PA**, White RD. The Effect of Motion While Imaging with Segmented Cine Acquisitions. Annual Meeting of Society for Magnetic Resonance, Dallas, TX. Podium.
12. August 1994. **Hardy PA**. Improvements in 3D Time-of-Flight Imaging of the Renal Arteries. Annual Meeting of Society of Magnetic Resonance Imaging, San Francisco, CA. Poster.
13. August 1994. **Hardy PA**, Piraino D, Recht MP, Richmond B. The Optimization of DESS Imaging of the Knee. Annual Meeting of Society for Magnetic Resonance, San Francisco, CA. Poster.
14. August 1994. Lingamneni A, **Hardy PA**, White RD. The Accuracy of Phase Contrast Imaging for Tracking Motion Assessed Using a Moving Phantom. Annual Meeting of North American Society for Cardiac Imaging, Dallas, TX. Poster.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS *- cont***

**National/International Meetings** ***- cont***

1. October 1994. Lingamneni A, **Hardy PA**, White RD. The Sensitivity of Segmented Cine Sequences to Motion. Society for Magnetic Resonance Workshop on Cardiovascular MRI, Santa Fe, NM. Poster.
2. August 1995. **Hardy PA**, Tkach J. Dependence of the Appearance of Vertebral Disks on Magnetic Field Orientation. Annual Meeting of Society for Magnetic Resonance, Nice, France. Poster.
3. August 1995. Strum B, Powell K, **Hardy PA**, White RD. Accuracy of Automated Tag Detection in MR Images. Annual Meeting of Society for Magnetic Resonance, Nice, France. Poster.
4. April 1996. Lingamneni A, **Hardy PA**, Powell KA, Laub G, White RD. Development of Breath-Hold Phase Contrast MRI for Myocardial Motion Analysis. Annual Meeting of International Society for Magnetic Resonance in Medicine, New York, NY. Poster.
5. April 1997. **Hardy PA**. Measuring T1 with a Segmented Look Locker Technique.Annual Meeting of International Society for Magnetic Resonance in Medicine, Vancouver, Canada. Poster.
6. April 1997. **Hardy PA.** The Appearance of Articular Cartilage in MR Images. Annual Meeting of International Society for Magnetic Resonance in Medicine, Vancouver, Canada. Podium.
7. April 1997. **Hardy PA**, Piraino D, Recht M. A Spatial-Spectral Excitation Pulse for Fat-Suppressed 3D Imaging of Cartilage. Annual Meeting of International Society for Magnetic Resonance in Medicine, Vancouver, Canada. Poster.
8. April 1997. **Hardy PA**, Yue G. The Measurement of T2 for Physiological Experiments. Annual Meeting of International Society for Magnetic Resonance in Medicine, Vancouver, Canada. Poster.
9. April 1997. Lingamneni A, **Hardy PA**, Powell KA, Laub G, White RD. Design and Validation of a Segmented Multi-Echo Line Phase Contrast Technique for On-Plane Motion Analysis on a Deformable Phantom. Annual Meeting of International Society for Magnetic Resonance in Medicine, Vancouver, Canada. Poster.
10. February 2002. Mattingly B, Talwalkar V, Tylkowski C, Stevens CB, **Hardy PA**, Pienkowski D. Three Dimensional in Vivo Motion of Adult Hind Foot Bones. Meeting of the Orthopedic Research Society, Dallas, TX. Poster.
11. June 2003. **Hardy PA**, Bayya A, Harrison A, Lightfoot R, Bognar A, Jaromczyk J. Measuring the Thickness of Articular Cartilage with Magnetic Resonance and X-Ray Imaging. Arthritis Research Conference, Keystone Resort, Colorado. Poster.
12. July 2003. Zhang B, Beache GM, **Hardy PA**. Biomaterial Mechanical Properties Revealed by Magnetic Resonance Elastography. Annual Meeting of International Society of Magnetic Resonance in Medicine, Toronto, Canada. Podium.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS *- cont***

**National/International Meetings *- cont***

1. July 2003. Zhang Z, Andersen A, **Hardy PA**, Loveland A, Forman E, Gash DM. A Functional MRI Study of Nigrostriatal Dopaminergic Activity in Awake Normal and Parkinsonian Rhesus Monkeys. Annual Meeting of International Society of Magnetic Resonance in Medicine, Toronto, Canada. Poster.
2. November 2003. Gullapalli J, Fugaccia I, Anderson KJ, Grisanti K, Jung R, Scheff SW, **Hardy PA**. Anisotropic Diffusion Coefficient Characterizes Spinal Cord Injury. Annual Meeting of Society of Neurotrauma, Biloxi, MS. Poster.
3. May 2004. Greges MJ, Gullapalli J, Jung R, Fugaccia I, Anderson KJ, Grisanti K, Scheff SW, **Hardy PA**.Diffusion Tensor and Magnetization Transfer Measurements of Spinal Cord Injury. Annual Meeting of International Society of Magnetic Resonance in Medicine, Kyoto, Japan. Podium.
4. May 2004. **Hardy PA**, Zhang Z, Grondin R, Yokel R, Andersen A, Gash DM. Measuring the Iron Content of Gray Matter with T2 and T2\* MR Imaging. Annual Meeting of International Society of Magnetic Resonance in Medicine, Kyoto, Japan. Poster.
5. May 2004. Thacker P, Downs M, Jaromczyk J, **Hardy PA**. Assessing the Accuracy and Interrater Agreement of Segmenting Articular Cartilage. Annual Meeting of International Society of Magnetic Resonance in Medicine, Kyoto, Japan. Poster.
6. September 2004. **Hardy PA**, Jaromczyk J, Thacker P. Visualizing Articular Cartilage Using Expectation Maximization to Compare Segmentation of MR Images by Independent Raters. The International Conference on Computer Vision and Graphics, Warsaw, Poland. Poster.
7. May 2007. Powell DK, **Hardy PA**, Xuan L, Gold B. DTI Fiber Tracking and Fractional Anisotropy-Reaction Time Correlations in Visual Word Recognition. Annual Meeting of International Society for Magnetic Resonance in Medicine, Berlin, Germany. Podium.
8. May 2008. Chebrolu H, Smith CD, **Hardy PA**. Voxel Based Relaxometry of Alzheimer’s Disease. Annual Meeting of International Society of Magnetic Resonance in Medicine, Toronto, Canada. Poster.
9. May 2008. **Hardy PA**, Powell DK, Zhang Z. Correlation of Fractional Anisotropy in Rhesus Monkeys with Age and Motor Function. Annual Meeting of International Society of Magnetic Resonance in Medicine, Toronto, Canada. Poster.
10. May 2008. Pachtman S, Himachandra C, Smith CD, **Hardy PA**. Correlation of Increased R2 with B0 and Cognitive Status. Annual Meeting of International Society of Magnetic Resonance in Medicine, Toronto, Canada. Poster.
11. September 2009. Gash DM, Ai Y, Allen J, Charisse K, Gamba-Vitalo C, Ge P, Grondin R, Gwost D, **Hardy PA**, Kaemmerer W, Kaytor M, Maier M, Shulga-Morskoy S, Nechev L, Nelson B, Nelson PT, Sah DW, Stiles D, Zhang Z. Developing RNAi Therapeutics Targeting Huntingtin with Local CNS Delivery: Non-Human Primate Studies. The World Congress on Huntington’s Disease, Vancouver, Canada. Poster.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS *- cont***

**National/International Meetings *- cont***

1. October 2009. Stiles DK, **Hardy PA**, Nelson B, Zhang Z, Grondin R, Ai Y, Stewart GR, Ge P, Sah DWY, Gwost DU, Gash DM. Convection-Enhanced Delivery of Drugs into the CNS: Confirmation of Distribution Using MRI Contrast Agent in Non-Human Primate. Annual Meeting of Society for Neuroscience, Chicago, IL. Poster.
2. May 2010. **Hardy PA**. Correlation of Fractional Anisotropy and Mean Diffusivity in Rhesus Monkey with Age and Parkinson’s Disease. Annual Meeting of International Society of Magnetic Resonance in Medicine, Stockholm, Sweden. Poster.
3. May 2010. **Hardy PA**, Bradley LH, Zhang Z, Gash D, Keeley D, Kramer B, Schorn G. Gd-Labelled Polylysine as a Tracer for Convective Enhanced Delivery. Annual Meeting of International Society of Magnetic Resonance in Medicine, Stockholm, Sweden. Poster.
4. May 2010. **Hardy PA**, Zhang Z, Gash D, Gwost DU, Stiles D, Nelson BD, Ge P, Sah D. Convection Enhanced Delivery of Drugs to the CNS. Annual Meeting of International Society of Magnetic Resonance in Medicine, Stockholm, Sweden. Poster.
5. October 2012. Zhang Z, **Hardy PA**, Anderson AH, Zhao F, Grondin RC, Wang X. Pharmacological MRI (phMRI) Monitors Therapeutic Effects of Electroacupuncture (EA) in Nonhuman Primates Modeling Human Parkinson’s Disease. Annual Meeting of Society for Neuroscience, New Orleans, LA. Poster.
6. October 2012. **Hardy PA**, Bradley LH, Zhang Z, Ross C, Kubota K, Margaraiz P, Venugopalan R. Tracking the Distribution of GDNF with Tracers of Different Molecular Weight. Society for CNS Interstitial Delivery of Therapeutics, Chicago, IL. Poster.
7. March 2013. Dan M, Dickerson MT, **Hardy PA**, Bae Y, Yokel RA. Superparamagnetic Iron Oxide Loaded Cross-Linked Nanoassemblies Improve Tumor Accumulation and Magnetic Resonance Imaging in Vivo. Annual Meeting of Society of Toxicology, San Antonio, TX. Podium.
8. April 2013. Sunthankar K, Brown C, Fountain A, **Hardy PA**,Bradley L. Dependence of Volume of Distribution on Gel Strength for Convection Enhanced Delivery of Drugs to the Brain. National Council for Undergraduate Research, La Crosse, WI. Poster.
9. September 2013. Grondin R, Ai Y, **Hardy PA**, Butt M, Gerhardt G, Gash D, Bumcrot D, Zhang Z. Targeted Drug Delivery to the Midbrain for Parkinson’s Disease Treatment. Neurodegenerative Conditions Research & Development Conference, Boston, MA. Podium.
10. December 2013. **Hardy PA**. The Use of a Digital Camera to Measure the Luminance of a Medical Monitor. Annual Meeting of Radiological Society of North America, Chicago, IL. Electronic Poster.
11. December 2013. **Hardy PA**, Noblitt B, Lee JT. Quantification of Hepatic Fat Using MR Imaging and Spectroscopy. Annual Meeting of Radiological Society of North America, Chicago, IL. Electronic Poster.
12. March 2014. Grondin R, Ai Y, **Hardy PA**, Butt M, Gerhardt G, Gash D, Bumcrot D, Zhang Z. Toxicology of Targeted Drug Delivery to the Midbrain for Parkinson's Disease Treatment. Annual Meeting of Society of Toxicology, Phoenix, AZ. Poster.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS *- cont***

**National/International Meetings *- cont***

1. May 2014. **Hardy PA**, Andersen A, Feiweier T, Damon B, Noehren B. A Comparison of STEAM and TRSE Diffusion Tensor Imaging for Tracking Muscle Fibers. Annual Meeting of International Society for Magnetic Resonance in Medicine, Milan, Italy. Electronic Poster.
2. May 2014. **Hardy PA**, Sardana V, Spottiswoode B, Sorrell V, Leung S. Distortion of MOLLI Estimates of Myocardial T1 from Fatty Infiltration. Annual Meeting of International Society for Magnetic Resonance in Medicine, Milan, Italy. Electronic Poster.
3. July 2014.Zhang J, DiSantis D, **Hardy PA**, Oates ME. Initial Experience on Physics Rotation of Radiological Residents. Annual Meeting of American Association of Physicists in Medicine, Austin, TX. Poster.
4. March 2016.Lee J, Davis M, Ayoob A, Ganesh H, Dawkins A, **Hardy PA**, Nair R. Trouble Shaking, MR Elastography: Practical Steps to Improving Image Quality and Reliability. Annual Meeting of Society of Abdominal Radiology, Waikoloa, HI. Electronic Exhibit.
5. May 2016. **Hardy PA**, Akbari E. Measuring Magnetic Field Inhomogeneity From Spatial Distortion of Echo Planar Images, Annual Meeting of International Society for Magnetic Resonance in Medicine, Singapore. Electronic Poster.​
6. May 2016. **Hardy PA**,Norsigian CJ, Bradley LH. The Development of Tissue Mimicking Gels, Annual Meeting of International Society for Magnetic Resonance in Medicine, Singapore. Electronic Poster.
7. November 2016. Clark A, Cheatham E, **Hardy PA**, McQuerry KJ, Yates A, Oates ME. Optimizing Intra-operative Sentinel Lymph Node Mapping in Early Breast Cancer: Should Tc-99m Tilmanocept (Lymphoseek) Replace Traditional Filtered Tc-99m Sulfur Colloid as the New Standard? Annual Meeting of Radiological Society of North America, Chicago, IL. Podium. ***RSNA Travel Award for Dr. Clark.***
8. December 2016. Ignaciuk P, Cheatham E, **Hardy PA**, McQuerry KJ, Yates A, Oates ME. Optimizing Pre-operative Sentinel Lymph Node Mapping in Melanoma: Traditional Filtered Tc-99m Sulfur Colloid versus New Tc-99m Tilmanocept (Lymphoseek). Annual Meeting of Radiological Society of North America, Chicago, IL. Podium. ***RSNA*** ***Travel Award for Dr. Ignaciuk.***
9. February 2017. Galuppo Monticelli RR, **Hardy PA**, Bradford E, Haughton C, Polerleau F, Powell DF, Andersen AH, Stice J, Wilson M, Gabriel GE, Raissi D, Krohmer SJ. Novel Device for Percutaneous Locoregional Therapy Using a Single Intratumoral Macroporous Needle Infusion System. Annual Symposium on Clinical Interventional Oncology (CIO)/International Symposium on Endovascular Therapy (ISET), Hollywood, FL. Poster.
10. April 2017. Lawless R, **Hardy PA**, Andersen A, Noehren B. Analysis of T2 Relaxation Times in Vastus Lateralis Muscle after Anterior Cruciate Ligament Injury. Annual Meeting of International Society of Magnetic Resonance in Medicine, Honolulu, HI. Poster.
11. April 2017. Noehren B, Lawless R, **Hardy PA**, Andersen A, Vandsburger M. Evaluation of T1rho Time in the Quadriceps Muscle after an ACL Reconstruction. Annual Meeting of International Society of Magnetic Resonance in Medicine, Honolulu, HI. Electronic Exhibit.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**B. ABSTRACT PRESENTATIONS *- cont***

**National/International Meetings *- cont***

1. July 2017. Kinner J, **Hardy PA**, Anaskevich L, Ferrin S, Kelly A, Zhang J.  Repeat/Reject Analysis: It is a Process Not Just a Number. Annual Meeting of American Association of Physicists in Medicine, Denver, CO. Podium.
2. May 2019. Kim J, Mamoto K, Lartey R, Xu K, Tanaka M, Bahroos E, Winalski C, Link T, **Hardy PA**, Peng Q, Botto-van Bemden A, Liu K, Peters R, Wu C, Li X. Multi-vendor Multi-site T1 and T2 Quantification of Knee Cartilage. Annual Meeting of International Society of Magnetic Resonance in Medicine, Montreal, Canada. Poster.
3. May 2019. Romines MG, Erickson LN, Davis KA, **Hardy PA**, Andersen AH, Jacobs CJ, Noehren B. Differences in T1rho Relaxation Time in the Vastus Lateralis After an ACL Tear. Annual Meeting of American College of Sports Medicine, Orlando FL. Poster.

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES**

**Active**

**Project Title:** Novel pRNA Nanoparticle Delivery as Directed Therapy for Colorectal Cancer Metastasis

**Project Number:** n/a

**Principal Investigator(s):** B. Mark Evers MD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** University of Kentucky

**Source of Funding:** National Cancer Institute**/**National Institutes of Health

**Duration of Project:**  09/25/2015-08/31/2020

**Total Award:** $1,512,116

**Grant Number:** 1R01CA195573-01

**Project Title:** Development of a Web-based Curriculum to Prepare Diagnostic Radiology Residents During their Post-Graduate Year 1 by Promoting Learning via Retrieval Practice and Spaced Repetition

**Project Number:** n/a

**Principal Investigator(s):** Andres R Ayoob, MD

**Role in Project:** Co-I

**Effort:** 5%

**Institution/University:** University of Kentucky

**Source of Funding:** Philips Healthcare/Radiological Society of North America (RSNA) Foundation Education Scholar Grant *(Study Section Score 16)*

**Grant Number:** ESCH1602

**Duration of Project:**07/01/2016-06/30/2019

**Total Award:** $149,798

**Project Title:** The Activation of Brown and Beige Fat and Role in Insulin Sensitivity

**Principal Investigator(s):** Philip A. Kern, MD

**Role in Project:** Co-I

**Effort:** 5%

**Institution/University:** University of Kentucky

**Source of Funding:** National Institute of Diabetes and Digestive and Kidney Diseases

**Duration of Project:**  09/15/2016-08/31/2019

**Total Award:** $544,146

**Grant Number:** 1R01DK112282-01

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES** ***- cont***

**Active *- cont***

**Project Title:** Hyaluronan Administered Early After Anterior Cruciate Ligament Reconstruction (HEALR Trial)

**Principal Investigator(s):** Mary Ireland, MD

**Role in Project:** Co-I

**Effort:** n/a

**Source of Funding:** COM MVP

**Duration of Project:**  08/31/2016 – 07/23/2020

**Total Award:** n/a

**Project / Grant Number:** n/a

**Project Title:** Mechanistic Assessment of Blood Flow Restricted Training for an ACL Injury

**Principal Investigator(s):** Brian Noehren, PhD

**Role in Project:** Co-I

**Effort:** 5%

**Institution/University:** University of Kentucky

**Source of Funding:** National Institute Arthritis Musculoskeletal & Skin

**Duration of Project:**  07/22/2017-06/30/2022

**Total Award:** $1,143,184

**Grant Number:** 1R01 AR071398-01

**Project Title:** Multi Site Multi Vendor Cross Validation of Cartilage T1p and T2 Imaging

**Project Number:** n/a

**Principal Investigator(s):** **Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** 0.36%

**Source of Funding: Arthritis Foundation** through Cleveland Clinic Foundation

**Duration of Project:**  10/01/2017-09/30/2019

**Total Award:** $16,619

**Grant Number:** 1000400263

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES** ***- cont***

**Active *- cont***

**Project Title:** Prospective, Single-Center, Randomized, Triple-Blinded Placebo-Controlled study of IL-1RA Treatment in Patients with Acute ACL Tear and painful Effusions, (EASYACL)

**Principal Investigator(s):** Cale Jacobs, PhD

**Role in Project:** Co-I

**Effort:** 5.0%

**Source of Funding:** Arthritis Foundation

**Duration of Project:**  01/2018 – 12/2020

**Total Award:** $576,177

**Project / Grant Number:** n/a

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive**

**Project Title:** The Relationship Between MR Parameters and Proteoglycan

Concentration in Cartilage

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Ciba Geigy Pharmaceuticals

**Duration of Project:** 12/1993-12/1994

**Total Award:** $23,000

**Grant Number:** n/a

**Project Title:** The Development of Improved Magnetic Resonance Angiographic

 Techniques for Visualizing the Renal Vasculature

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** L C Rosenberg Renal Research Foundation

**Duration of Project:** 07/1994-07/1995

**Total Award:** $5,472

**Grant Number:** n/a

**Project Title:** The Development of MR Methods for Evaluating Osteoarthritis and Rheumatoid Arthritis

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Ciba-Geigy Pharmaceuticals

**Duration of Project:** 11/01/1995-06/01/1996

**Total Award:** $77,000

**Grant Number:** n/a

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** The Effects of Signal-to-Noise and Image Resolution on the

 Precision of Volume Measurements of Articular Cartilage

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Novartis Pharmaceuticals

**Duration of Project:** 12/01/1996-04/01/1997

**Total Award:** $25,880

**Grant Number:** n/a

**Project Title:** Effects of Mental Training on Voluntary Muscle Strength

**Project Number:** n/a

**Principal Investigator(s):** Guang Yue, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Institute of Neurological Diseases and Stroke

**Duration of Project:** 12/01/1996-12/01/1999

**Total Award:** n/a

**Grant Number:** 1R01NS35130-01A1

**Project Title:** The Evaluation of Osteoarthritis in Human Cadaver Knees

 Using MRI

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Procter & Gamble Pharmaceuticals

**Duration of Project:** 02/01/1997-02/01/1998

**Total Award:** $68,600

**Grant Number:** n/a

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Evaluation of Articular Cartilage in Osteoarthritis using Magnetic

 Resonance Imaging

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** The Whitaker Foundation

**Duration of Project:** 07/01/1997-06/30/2000

**Total Award:** $179,140

**Grant Number:** n/a

**Project Title:** Development of Novel Internal-filtration Hemodialyzers: an

Experimental and Theoretical Investigation

**Project Number:** n/a

**Principal Investigator(s):** Dayong Gao, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Baxter Health Care

**Duration of Project:** 01/01/1999-12/31/2002

**Total Award:** n/a

**Grant Number:** n/a

**Project Title:** Aging of Central Dopaminergic Systems in Primates

**Project Number:** n/a

**Principal Investigator(s):** Don Gash, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** National Institute of Aging

**Duration of Project:** 01/02/1999-12/01/2007

**Total Award:** n/a

**Grant Number:** P01AG13494

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** In Vivo 3D Kinematics of the Carpus

**Project Number:** n/a

**Principal Investigator(s):** Philip Blazar, MD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Riordan-Brand Hand Biomechanics Lab.

**Duration of Project:** 07/01/1999-06/30/2000

**Total Award:** $10,000

**Grant Number:** n/a

**Project Title:** Integrative Studies of Physiological Responses to Weightlessness

and Hypotensive Challenges

**Project Number:** WKU522635-00-04 EPSCoR

**Principal Investigator(s):** Charles Knapp, PhD

**Role in Project:** Consultant

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** NASA

**Duration of Project:** 07/01/1999-06/30/2000

**Total Award:** $100,000

**Grant Number:** n/a

**Project Title:** Comparison of Magnetic Resonance Imaging and X-ray Imaging

 for the Measurement of the Thickness and Loss of Cartilage in

 Osteoarthritic Knees

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** The Arthritis Foundation

**Duration of Project:** 07/01/2001-06/30/2004

**Total Award:** $270,000

**Grant Number:** n/a

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Monitoring Recovery from Spinal Cord Injury Using Magnetic

Resonance Imaging

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD** **& Ranu Jung, PhD**

**Role in Project: Co-PIs**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** The Kentucky Science and Engineering Corporation

**Duration of Project:** 05/01/2002-04/01/2004

**Total Award:** $60,000

**Grant Number:** n/a

**Project Title:** A Comparative fMRI Study of Evolutionary Precursors to

Written Language

**Project Number:** BCS-0224240

**Principal Investigator(s):** Jane Joseph, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** National Science Foundation

**Duration of Project:** 09/01/2002-08/30/2005

**Total Award:** n/a

**Grant Number:** n/a

**Project Title:** Restoration of Dopamine Function in Parkinson’s Disease

**Project Number:** P50NS039787

**Principal Investigator(s):** Gregory Gerhardt, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** University of Kentucky Medical Center

**Source of Funding:** NIH/NINDS

**Duration of Project:** 09/1999-01/2012

**Total Award:** $11,191,793

**Grant Number:** 3048106125

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Investigation of the Fluid Dynamics in Toray Hemodialysers Using

CT and MR Imaging

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Toray Industries, Japan

**Duration of Project:** 04/01/2003-03/30/2004

**Total Award:** $30,000

**Grant Number:** n/a

**Project Title:** Neuroimaging of Shape Similarity in Object Recognition

**Project Number:** n/a

**Principal Investigator(s):** Jane Joseph, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** National Institute of Mental Health

**Duration of Project:** 04/01/2003-03/31/2007

**Total Award:** n/a

**Grant Number:** R01MH63817

**Project Title:** Computational Techniques for Nerve Fiber Tracking with

Applications to Aging Disease Studies

**Project Number:** n/a

**Principal Investigator(s):** Jun Zhang, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** University of Kentucky

**Source of Funding:** Faculty Research Support Program

**Duration of Project:** 01/01/2004-12/30/2004

**Total Award:** $20,000

**Grant Number:** n/a

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Measurement of Dialysate Flow Profiles in Asahi Dialyzers

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Asahi-Kasei, Ltd.

**Duration of Project:** 12/01/2004-11/30/2005

**Total Award:** $33,900

**Grant Number:** n/a

**Project Title:** Nanotemplate Engineering of a Stealth MRI Contrast Agent

**Project Number:** n/a

**Principal Investigator(s):** Michael Jay, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** NanMed Pharmaceuticals, Inc.

**Duration of Project:** 09/2006-08/2008

**Total Award:** $58,162

**Grant Number:** 3048042300

**Project Title:** The Relationship of BOLD Effects and DA Degeneration

**Project Number:** n/a

**Principal Investigator(s):** Zhiming Zhang, MD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** National Institute of Neurodegenerative Diseases and Stroke

**Duration of Project:**  02/2007-01/2013

**Total Award:** n/a

**Grant Number:** R01NS050242

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Screening Dopaminergic Trophic Factors in Rat Model Systems

**Project Number:** n/a

**Principal Investigator(s):** Don Gash, PhD

**Role in Project:** Co-I

**Effort:** 10% (1.2 months)

**Institution/University:** n/a

**Source of Funding:** Johnson & Johnson Regenerative Therapeutics

**Duration of Project:** 04/2007-10/2009

**Total Award:** $470,932

**Grant Number:** 3048100000/3047103727

**Project Title:** Utilizing Novel Tracers to Determine the Distribution of

Therapeutic Agents in Vivo

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD** **& Luke Bradley, PhD**

**Role in Project: co-PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Michael J Fox Foundation

**Duration of Project:** 02/01/2009-01/30/2011

**Total Award:** n/a

**Grant Number:** n/a

**Project Title:** A High-Field Small Animal Imager for Biomedical Research

**Project Number:** n/a

**Principal Investigator(s):** Charles Smith, MD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** NIH/NCRR

**Duration of Project:** 06/01/2010-05/31/2011

**Total Award:** n/a

**Grant Number:** S10RR029541

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Voxel-Based Relaxometry Analysis of ADNI Images

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** NIH/NIA

**Duration of Project:**  06/2010-10/2013

**Total Award:** n/a

**Grant Number:** R03AG032099

**Project Title:** The University of Kentucky Nanotechnology Training Center

(UK CNTC)

**Project Number:** 1R25 CA153954-01

**Principal Investigator(s):** B Mark Evers, MD & Bradley Anderson, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** NIH/NCI

**Duration of Project:**  09/01/2010-08/31/2015

**Total Award:** n/a

**Grant Number:** n/a

**Project Title:** A Comparative Developmental Connectivity Study of

Face Processing

**Project Number:** n/a

**Principal Investigator(s):** Jane Joseph, PhD

**Role in Project:** Subcontract PI

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** NIH/NIMH

**Duration of Project:**  11/01/2010-05/31/2013

**Total Award:** n/a

**Grant Number:** R21MH086958

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** siRNA Distribution and Alpha-Synuclein Suppression Following

7-day siRNA Infusion in the Rhesus Substantia Nigra

**Project Number:** 3048108917

**Principal Investigator(s):** Richard Grondin, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Michael J Fox Foundation

**Duration of Project:**  01/10/2012-10/30/2014

**Total Award:** n/a

**Grant Number:** n/a

**Project Title:** Intracranial Delivery of a Newly Diagnosed GDNF Formulation

(GDNFv) in the Adult Non-Human Primate Brain: MPTP

Efficacy Study

**Project Number:** 3048109465

**Principal Investigator(s):** Greg Gerhardt, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** Eli Lilly

**Duration of Project:** 05**/**2012-04/2014

**Total Award:** n/a

**Grant Number:** n/a

**Project Title:** Disturbance of Neuromuscular Control in ACL Injury:
A Functional Neuroimaging Study

**Project Number:** n/a

**Principal Investigator(s):** Brian Noehren, PhD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** College of Health Sciences

**Duration of Project:**  2013-2014

**Total Award:** $4,000

**Grant Number:** n/a

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Ezetimibe-Ursodiol Combination Therapy in the Treatment

of NAFLD

**Project Number:** n/a

**Principal Investigator(s):** Gregory Graf, PhD & Paul Angulo, MD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** n/a

**Source of Funding:** CCTS/University of Kentucky

**Duration of Project:**  09/2013-03/2015

**Total Award:** $50,000

**Grant Number:** n/a

**Project Title:** Large VolumeIntratumoral Injection Device for Therapeutic Liver

 Infusions

**Project Number:** n/a

**Principal Investigator(s): Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** 5%

**Institution/University:** University of Kentucky

**Source of Funding:** National Institutes of Health

**Duration of Project:**  08/31/2015-04/27/2017

**Total Award:** $88,870

**Grant Number:** 1R43CA192850-01

**Project Title:** Curriculum Development for Hands-on Physics Teaching to Radiological Residents

**Project Number:** n/a

**Principal Investigator(s):** Jie Zhang, PhD

**Role in Project:** Co-I

**Effort:** 10%

**Institution/University:** University of Kentucky

**Source of Funding:** Radiological Society of North America (RSNA) Education Scholar

**Duration of Project:**  07/01/2015-06/30/2017

**Total Award:** $150,000

**Grant Number:** ESCH1543

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES *- cont***

**Inactive** ***- cont***

**Project Title:** Early Intraarticular Anti-inflammatory Treatment After ACL Injury and Reconstruction. A Randomized Clinical Trial

**Principal Investigator(s):** Christian Lattermann, MD

**Role in Project:** Co-I

**Effort:** n/a

**Institution/University:** University of Kentucky

**Source of Funding:** Dean, College of Medicine, Multidisciplinary Value Program (MVP), University of Kentucky

**Duration of Project:**  09/15/2016-09/14/2017

**Total Award:** $109,308

**Grant Number:** n/a

**Project Title:** Simulation of Direct Infusion of Small Molecule Chemotherapeutics into Hepatocellular Carcinoma

**Project Number:** IRB# 17-0341-P3K

**Principal Investigator(s):** **Peter A Hardy, PhD**

**Role in Project: PI**

**Effort:** 2.3%

**Source of Funding:** NIH Through Twin Star TDS

**Duration of Project:**  06/02/2017-06/01/2018

**Total Award:** $9,994

**Grant Number:** 1R43CA192850

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**D. NON-SPONSORED RESEARCH PROJECTS**

**Active**

**Project Title:** Using Audience Response System Technology in Radiology Education, Phase 2

**Project Number:** IRB #51114

**Principal Investigator(s):** M Elizabeth Oates, MD

**Role in Project:** Co-I

**Institution/University:** University of Kentucky Medical Center

**Duration of Project:** 08/07/2013**-**07/02/2025

**Project Title:** MR Imaging of Skeletal Muscle

**Project Number:** IRB# 45420

**Principal Investigator(s):** **Peter A Hardy, PhD**

**Role in Project: PI**

**Date Started:** 11/02/2015

**Date To Be Completed:** 08/26/2020

**Institution/University:** University of Kentucky Medical Center

**Project Title:** The Relationship of Small Vessel Disease to Cerebral Perfusion

**Project Number:** IRB# 47921

**Principal Investigator(s):** **Peter A Hardy, PhD**

**Role in Project: PI**

**Date Started:** 01/19/2017

**Date To Be Completed:** 12/09/2019

**Institution/University:** University of Kentucky Medical Center

**Project Title:** Accuracy of Deep Learning Algorithm/Artificial Intelligence in Predicting the Position of Feeding Tubes on Abdominal Xrays

**Project Number:** IRB# 43289

**Principal Investigator(s):** Halemane Ganesh, MD

**Role in Project:** Co-I

**Institution/University:** University of Kentucky Medical Center

**Duration of Project:** 04/18/2018-04/17/2019

**Project Title:** Testing the Reproducibility of MR Imaging in Articular Cartilage

**Project Number:** IRB# 43498

**Principal Investigator(s):** **Peter A. Hardy, PhD**

**Role in Project: PI**

**Institution/University:** University of Kentucky Medical Center

**Duration of Project:** 02/19/18-02/8/2019

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**D. NON-SPONSORED RESEARCH PROJECTS*****- cont***

**Active**

**Project Title:** Errors of Perception in Evaluation of Medical Images by Radiologists

**Project Number:** IRB# 42862

**Principal Investigator(s):** **Peter A. Hardy, PhD**

**Role in Project: PI**

**Institution/University:** University of Kentucky Medical Center

**Duration of Project:** 09/28/2018-09/27/2019

**Inactive**

**Project Title:** Advanced Magnetic Resonance Imaging in Nonalcoholic Fatty Liver Disease

**Project Number:** IRB# 13-0453-F2L

**Principal Investigator(s):** James T Lee, MD

**Role in Project:** Co-I

**Date Started:** 07/10/2013

**Date Completed:** 09/24/2014

**Institution/University:** University of Kentucky Medical Center

**Project Title:** RESOLVE: Diffusion Weighted Imaging for Characterizing

Tumors

**Project Number:** IRB# 14-0692-F2L

**Principal Investigator(s):** Rashmi Nair, MD

**Role in Project:** Co-I

**Date Started:** 12/10/2014

**Date To Be Completed:** 06/18/2018

**Institution/University:** University of Kentucky Medical Center

**Project Title:** Comparative Performance of Two Tc-99m Radiopharmaceuticals

Intraoperative Identification of Sentinel Lymph Nodes in Breast Cancer and in Melanoma

**Project Number:** IRB # 15-0535-P2H (exempt status)

**Principal Investigator(s):** M Elizabeth Oates, MD

**Role in Project:** Co-I

**Date Started:** 09/23/2015

**Date To Be Completed:** 09/09/2018

**Institution/University:** University of Kentucky Medical Center

**XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS *- cont***

**E.** **OTHER CREATIVE ACTIVITIES**

Not Applicable

**XV.** **OTHER ACTIVITIES**

 **Fayette County Public Schools**

 Lexington, Kentucky

2011- Judge, Science Fair

**END OF DOCUMENT**