

# CURRICULUM VITAE

## Christopher Pawela PhD

Associate Professor  
Department of Biomedical Engineering

### OFFICE ADDRESS:

Translational and Biomedical Research Center  
8701 Watertown Plank Rd  
Milwaukee, WI 53226

### EDUCATION:

1998 B.S., University of Wisconsin, Madison, WI  
2003 M.S., University of Wisconsin, Madison, WI  
2008 PhD., Medical College of Wisconsin, Milwaukee, WI

### POSTGRADUATE TRAINING AND FELLOWSHIP APPOINTMENTS:

1996 - 1997 Undergraduate Independent Study, Department of Plant Pathology, University of Wisconsin-Madison, WI  
1998 - 2000 Independent Computer Consultant, Scientific Supercomputing, Madison, WI  
1999 - 2000 Faculty/Teaching Assistant, Department of Chemistry, University of Wisconsin-Madison, WI  
2000 - 2001 Project Assistant, Department of Chemistry, University of Wisconsin-Madison, WI  
2001 - 2002 Teaching Assistant, Computing Center, Department of Chemistry, University of Wisconsin-Madison, WI  
2002 - 2003 Graduate Research Fellow, Department of Chemistry, University of Wisconsin-Madison, WI  
2003 - 2008 Graduate Research Associate, Department of Biophysics, Medical College of Wisconsin, Milwaukee, WI

### FACULTY APPOINTMENTS:

2008 - 2015 Assistant Professor, Department of Plastic Surgery, Medical College of Wisconsin, Milwaukee, WI  
2008 - 2019 Secondary Appointment, Assistant Professor, Department of Biophysics, Medical College of Wisconsin, Milwaukee, WI  
2011 - Present Faculty Member, Center for Imaging Research, Medical College of Wisconsin, Milwaukee, WI  
2011 - Present Faculty Member, Neuroscience Research Center, Medical College of Wisconsin, Milwaukee, WI  
2014 - Present Faculty Member, Cancer Center, Medical College of Wisconsin, Milwaukee, WI  
2015 - 2019 Assistant Professor (Primary Appointment), Anesthesiology, Medical College of Wisconsin, Milwaukee, WI  
2015 - 2019 Research Associate (Worker without Compensation (WOC)), Zablocki Veterans Administration Medical Center, Milwaukee, WI  
2017 - 2019 Assistant Professor (Secondary Appointment), Biomedical Engineering, Medical College of Wisconsin, Milwaukee, WI  
2017 - Present Graduate School Faculty and Qualified Primary Dissertation Mentor, Graduate School of Biomedical Sciences, Medical College of Wisconsin, Milwaukee, WI  
2017 - Present Graduate Program Faculty Member, Biophysics, Medical College of Wisconsin, Milwaukee, WI  
2018 - Present Graduate Program Faculty Member, Biomedical Engineering, Medical College of Wisconsin, Milwaukee, WI  
2019 - Present Associate Professor, Biomedical Engineering, Medical College of Wisconsin, Milwaukee, WI

- 2019 - 2021 Associate Professor (Primary Appointment), Anesthesiology, Medical College of Wisconsin, Milwaukee, WI
- 2019 - Present Research Scientist (Worker without Compensation (WOC)), Zablocki Veterans Administration Medical Center, Milwaukee, WI
- 2019 - Present Associate Professor (Secondary Appointment), Biophysics, Medical College of Wisconsin, Milwaukee, WI
- 2021 - Present Associate Professor (Secondary Appointment), Anesthesiology, Medical College of Wisconsin, Milwaukee, WI
- 2021 - Present Associate Professor (Primary Appointment), Biomedical Engineering, Medical College of Wisconsin, Milwaukee, WI

**ADMINISTRATIVE APPOINTMENTS:**

- 2000 - 2001 Acting Director, Computing Center, Department of Chemistry, University of Wisconsin-Madison, WI
- 2000 - 2001 Member, Faculty Computer Committee, University of Wisconsin, Madison
- 2021 - Present Committee Member, Institutional Animal Care and Use Committee, Zablocki Veterans Administration Medical Center

**AWARDS AND HONORS:**

- 1997 Research Scholarship in Plant-Microbe Interactions, University of Wisconsin-Madison, Department of Plant Pathology
- 2002 - 2003 Graduate Research Fellowship, Computational Chemistry, University Industrial Relations, University of Wisconsin-Madison
- 2010 Conference Chairman, Second Biennial Conference on Resting-State Functional Brain Connectivity, Milwaukee, WI
- 2010 Featured in two Milwaukee Journal Sentinel Articles, Article #1: Brain Conference Convenes in Wauwatosa. September 14, 2010. Article #2: Scientists Trade Insights on the Brain. September 17, 2010.
- 2010 Featured in the Chronicle of Higher Education, Article Title: To Fight Diseases, Colleges Push Effort to Create Better Brain Maps. Nov. 7, 2010
- 2011 Featured Story in MCW Alumni News. Title: Links in a Brain. Spring 2011
- 2015 Best Abstract Award, International Neuromodulation Society
- 2017 - 2018 Outstanding Graduate School Educator, Medical College of Wisconsin

**MEMBERSHIPS IN HONORARY AND PROFESSIONAL SOCIETIES:**

- 2000 - Present American Association for the Advancement of Science
- 2004 - Present International Society for Magnetic Resonance in Medicine
- 2008 - Present Society for Neuroscience
- 2008 - Present Organization for Human Brain Mapping
- 2009 - Present The Peripheral Nerve Society
- 2016 - Present International Society for Cerebral Blood Flow & Metabolism (Member)

**EDITORSHIPS/EDITORIAL BOARDS/JOURNAL REVIEWS:**

- Journal Review
  - 2009 - Present Journal of Biomedical Optics
  - 2009 - Present Journal of Magnetic Resonance Imaging
  - 2009 - Present Neuroimage
  - 2010 - Present Cerebral Cortex
  - 2010 18th ISMRM Scientific Meeting and Exhibition Abstracts
  - 2010 - Present NMR in Biomedicine
  - 2010 - Present Journal Cerebral Blood Flow and Metabolism
  - 2010 - 2019 Brain Connectivity.
  - 2011 19th ISMRM Scientific Meeting and Exhibition Abstracts
  - 2011 - Present Journal of Neuroscience
  - 2013 - Present Biological Psychiatry
  - 2014 - Present Journal of Neurophysiology
  - 2015 - Present Psychopharmacology

2017 Neuropsychopharmacology  
2018 Magnetic Resonance in Medicine  
Ad-Hoc Reviewer  
2014 23rd ISMRM Scientific Meeting and Exhibition Abstracts  
2016 Brain & BrainPET 2017 Abstracts  
2017 Proceedings of the National Academy of Sciences

**NATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:**

2010 Moderator, Session: fMRI in Genetics & pHMRI, 17th ISMRM Scientific Meeting and Exhibition  
2010 - Present Founding and Editor-in-Chief, Brain Connectivity. Mary Ann Liebert, Inc.  
2011 Reviewer, 18th ISMRM Scientific Meeting and Exhibition Abstracts  
2017 - Present Member, New Jersey Commission on Brain Injury Research  
2018 Panel Member, Topics in Biological, Physiological, and Behavioral Adaptations to Spaceflight, National Aeronautics and Space Administration (NASA)  
2020 Panel Member, Neurovascular-Oxidative Stress / Space Biology, National Aeronautics and Space Administration (NASA)  
2020 Panel Member, Space Radiation CNS / NASA Human Exploration Research Opportunities (HERO), National Aeronautics and Space Administration (NASA)

**INTERNATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:**

2008 - Present Member, Executive Committee, Society for Brain Connectivity  
2008 International Organizing Committee Member, Workshop on Connectivity in the Resting Brain  
2010 Moderator, fMRI in Genetics & pHMRI, 18th ISMRM Scientific Meeting and Exhibition  
2010 Conference Chairman, Second Biennial International Conference on Resting-State Functional Connectivity  
2012 International Organizing Committee Member, Third Biennial International Conference on Resting-State Functional Connectivity  
2013 Moderator, Session: fMRI Connectivity: Applications, 21th ISMRM Scientific Meeting and Exhibition  
2014 - 2016 Chairman, Executive Committee, Society for Brain Connectivity  
2014 International Organizing Committee Member, Fourth Biennial Conference on Resting-State / Brain Connectivity  
2016 - 2018 Secretary, Executive Committee, Society for Brain Connectivity  
2016 International Organizing Committee Member, Fifth Biennial Conference on Resting-State / Brain Connectivity  
2018 International Organizing Committee Member, Sixth Biennial Conference on Resting-State / Brain Connectivity  
2018 Session Moderator, Sixth Biennial Conference on Resting-State / Brain Connectivity  
2021 International Organizing Committee Member, Seventh Biennial Conference on Resting-State / Brain Connectivity

**RESEARCH GRANTS/AWARDS/CONTRACTS/PROJECTS:**

**Active**

**Peer Review**

Title:	Identifying Molecular Mechanisms Underlying TBI – A Path to Novel Therapeutic Opportunities
Source:	Advancing a Healthier Wisconsin
Role:	Co-Investigator (5% Effort)
PI:	Amadou Camara Ph.D., MCW Anesthesiology
Dates:	07/01/2017 - 06/30/2022
Direct Funds:	\$1,000,000

Title:	Developing Cone-Dominant Retinal Disease Models as a Resource for Translational Vision Research
--------	---

Source: NIH U24 National Eye Institute (NEI)  
Role: Co-Investigator (10% Effort)  
PI: Joseph Carroll Ph.D., MCW  
Ophthalmology  
Dates: 09/01/2018 - 08/31/2023  
Direct Funds: \$6,250,219

**Pending**

**Peer Review**

Title: Preclinical Behavioral and Magnetic Resonance Imaging Studies to Model Long-Term Cognitive Recovery Following Mild Traumatic Brain Injury (mTBI)  
Source: Department of Veterans Affairs Rehabilitation Research & Development Service (RR&D) SPiRE Grant  
Role: Principal Investigator (2/8ths Effort)  
Dates: 10/01/2021 - 09/30/2023  
Direct Funds: \$230,000

Title: Neuroaugmentation Approaches to Improve CNS/PNS Connectivity and Outcome Following Peripheral Nerve Injury and Repair  
Source: Department of Veterans Affairs Rehabilitation Research & Development Service (RR&D) VA Merit Award  
Role: Principal Investigator  
Dates: 12/01/2021 - 11/30/2025  
Direct Funds: \$1,200,000

**Prior**

**Peer Review**

Title: Computer Hardware Research Grant  
Source: Intel Corporation  
Role: Principle Investigator  
Dates: 01/01/2000 - 01/01/2003  
Direct Funds: \$150,000

Title: Computer Hardware Research Grant  
Source: AMD Corporation  
Role: Principle Investigator  
Dates: 05/01/2001 - 03/01/2007  
Direct Funds: \$80,000

Title: Graduate Research Fellowship  
Source: University of Wisconsin Industrial Relations  
Role: Supercomputing Research Fellow  
PI: Dr. Robert Hamers, Chemistry, UW-Madison  
Dates: 05/01/2002 - 05/01/2003  
Direct Funds: \$35,000

Title: fMRI Technology and Analysis  
Source: R01 - National Institute of Biomedical Imaging  
Role: Graduate Student  
PI: Dr. James S. Hyde, Biophysics  
Dates: 04/01/2003 - 04/01/2007  
Direct Funds: \$300,000 (per year)

Title: MCW Plastic Surgery Faculty Startup Package  
Source: Medical College of Wisconsin Intramural  
Role: Funds Principal Investigator  
Dates: 07/01/2008 - 06/30/2010  
Direct Funds: \$92,000

Title: fMRI Technology and Analysis  
Source: R01 - National Institute of Biomedical Imaging  
Role: Co-investigator (20% Effort)  
PI: Dr. James S. Hyde, Biophysics  
Dates: 05/01/2009 - 07/31/2015  
Direct Funds: \$450,000 (per year)

Title: New Paradigms in Diagnosis and Treatment of Peripheral Nerve Injury Using Functional Magnetic Resonance Imaging and Robotics  
Source: MCW - Injury Research Center  
Role: Principle Investigator (10% Effort)  
Dates: 06/01/2009 - 05/31/2011  
Direct Funds: \$80,000

Title: fMRI Technology and Analysis  
Source: NIH R01 - National Institute of Biomedical Imaging and Bioengineering (NIBIB)  
Role: Co-Investigator (25% Effort)  
PI: James Hyde Ph.D., MCW Biophysics  
Dates: 08/01/2009 - 07/31/2016  
Direct Funds: \$3,618,970

Title: fMRI in Peripheral Nerve Injury  
Source: Advancing a Healthier Wisconsin  
Role: Principle Investigator (25% Effort)  
Dates: 06/01/2011 - 05/31/2014  
Direct Funds: \$383,000

Title: fMRI in Peripheral Nerve Injury  
Source: Advancing a Healthier Wisconsin  
Role: Principal Investigator (25% Effort)  
Dates: 06/01/2011 - 05/31/2015

Title: Cross C7 Nerve Transfer  
Source: R01 - National Institute of Neurological Disorders and Stroke  
Role: Co-Investigator (20% Effort)

PI: Dr. Ji-Geng Yan  
 Dates: 02/01/2012 - 01/31/2016  
 Direct Funds: \$225,000 (per year)

Title: Optogenetic-fMRI: A New Integrated  
 Technology for Lab and Clinic  
 Source: John and Jeanne Byrnes CTSI Award  
 Role: Co-investigator (5% Effort)  
 PI: Dr. Edgar DeYoe, Radiology  
 Dates: 04/01/2012 - 03/31/2013  
 Direct Funds: \$100,000

Title: Optogenetic-fMRI: A New Integrated  
 Technology for Lab and Clinic  
 Source: John and Jeanne Byrnes Clinical &  
 Translational Science Institute (CTSI)  
 Award  
 Role: Co-Investigator (5% Effort)  
 Dates: 10/01/2012 - 09/30/2014  
 Direct Funds: \$100,000

Title: Neurophysiological Effects of  
 Stimulating the Dorsal Root Ganglion  
 Source: Spinal Modulation, Inc. (Recently  
 purchased by St. Jude Medical)  
 Role: Consultant  
 PI: Quinn Hogan M.D., MCW  
 Anesthesiology  
 Dates: 01/01/2015 - 12/31/2015  
 Direct Funds: \$30,000

Title: FMRI Studies of Cerebrovascular  
 Structure and Function in Low-Renin  
 Hypertension  
 Source: NIH R56 National Institute of  
 Neurological Disorders and Stroke  
 (NINDS)  
 Role: Principal Investigator (30% Effort)  
 Dates: 09/30/2015 - 09/29/2018  
 Direct Funds: \$469,306

Title: Persisting Functional CNS Changes  
 Following Peripheral Nerve Repair  
 Source: Department of Veterans Affairs  
 Rehabilitation Research & Development  
 Service (RR&D) SPiRE Grant  
 Role: Co-Investigator (50% Effort)  
 PI: Quinn Hogan M.D., MCW  
 Anesthesiology  
 Dates: 01/15/2016 - 06/30/2019  
 Direct Funds: \$200,000

Title: Determining Efficacy of Burst versus  
 Continuous Spinal Cord Stimulation  
 Patterns in Rats using Functional  
 Magnetic Resonance Imaging of the  
 CNS Pain Matrix

Source:	Abbott Laboratories
Role:	Co-Investigator
PI:	Quinn Hogan M.D., MCW Anesthesiology
Dates:	01/15/2017 - 06/30/2019
Direct Funds:	\$100,000
Title:	Harnessing T-junction filtering: bidirectional control of sensory neuron impulse traffic
Source:	NIH R01 National Institute of Neurological Disorders and Stroke (NINDS)
Role:	Co-Investigator (20% Effort)
PI:	Quinn Hogan M.D., MCW Anesthesiology
Dates:	09/15/2017 - 07/31/2022
Direct Funds:	\$2,258,231

#### **INVITED LECTURES/WORKSHOPS/PRESENTATIONS:**

##### **Local**

MCW Neuroscience Program Lecture. Title: New Paradigms in the Diagnosis and Treatment of Peripheral Nerve Injury. What Can We Learn from Functional Imaging Studies in an Animal Model?, 2008

MCW Plastic Surgery Grand Rounds. Title: New Paradigms in the Diagnosis and Treatment of Peripheral Nerve Injury, 2009

MCW Physical Medicine and Rehabilitation Grand Rounds. Title: New Paradigms in the Diagnosis and Treatment of Peripheral Nerve Injury. What Can We Learn from Functional Imaging Studies in an Animal Model?, 2009

MCW Neurology Grand Rounds. Title: Detecting Brain Reorganization Following Peripheral Nerve Injury with Functional Magnetic Resonance Imaging (fMRI) and Functional Connectivity MRI (fcMRI), 2010

New Paradigms in the Diagnosis and Treatment of Peripheral Nerve Injury, MCW CTSI Research-in-Progress Seminar Series, 2011

MCW Plastic Surgery Grand Rounds. Title: fMRI Update, 2011

What Can We Learn from Preclinical Functional Magnetic Resonance Imaging (fMRI) in Rats., MCW Department of Biophysics Seminar Series, Milwaukee, Wisconsin, 2014

Using Neuromodulation to Block Chronic Pain: What can we learn from small animal neuroimaging studies?, MCW Department of Biophysics Seminar Series, Milwaukee, Wisconsin, 2018

Neuroaugmentation in the Context of Peripheral Nerve Injury and Repair, MCW / Marquette Graduate Seminar Series, Milwaukee, Wisconsin, 2021

##### **National**

Visiting Professor, Yale University, Departments of Diagnostic Radiology and Biomedical Engineering, Title: Detecting Brain Reorganization with fMRI in Response to Peripheral Nerve Injury, 2011

Keynote Speaker, FMRI in Peripheral Nerve Injury, Rehabilitation Engineering Research Center (RERC) on Technologies for Children with Orthopedic Disabilities. State of the Science (SOS) Symposium on Imaging Technologies, Shriners Hospital, Chicago, Illinois, 2014

##### **International**

Workshop on Connectivity in the Resting Brain, Magdeburg, Germany. Title: Detection of Brain Plasticity Following Peripheral Nerve Injury by fcMRI, 2008

Pushing the Spatial Resolution of BOLD Imaging, the FMRI Cortical Representation of Rat Fingers at 9.4T, International Society for Magnetic Resonance in Medicine, 10th Annual Meeting, Stockholm, Sweden, 2010

Second Biennial Conference on Resting-State Brain Connectivity, Milwaukee, WI. Title: Detecting Brain Reorganization with fcMRI in Response to Peripheral Nerve Injury, 2010

Can we use fMRI and fcMRI as a diagnostic tool to distinguish a phenotype?, Third Biennial Conference on Resting-State Brain Connectivity, Magdeburg, Germany, 2012  
Functional Connectivity in Animal Brain using MRI, XXVIth International Symposium on Cerebral Blood Flow, Metabolism, and Function, Shanghai, China, 2013  
Physiologic Manipulations of Functional Connectivity in Rat, Fourth Biennial Conference on Resting-State / Brain Connectivity, Boston, MA, 2014  
The Effects of Peripheral and Central Nervous System Modulation on the BOLD Signal in Preclinical Animal Models, Fifth Biennial Conference on Resting-State / Brain Connectivity, Vienna, Austria, 2016

**PEER REVIEWED WORKSHOPS/PRESENTATIONS:**

**International**

International Society for Magnetic Resonance in Medicine, Annual Meeting, Title: Pushing the spatial resolution of BOLD imaging, the fMRI cortical representation of rat fingers at 9.4T, 2010

**COMMITTEE SERVICE:**

**Medical College of Wisconsin**

2010 - 2013 Faculty Representative, Medical College of Wisconsin, Admissions Committee  
2010 - Present Member, Fundraising Committee, Biophysics, Medical College of Wisconsin  
2011 - 2014 Faculty Representative, Medical College of Wisconsin, Research Affairs Committee  
2018 Director, Visiting Professor Program, Anesthesiology Research, Medical College of Wisconsin

**MEDICAL COLLEGE TEACHING ACTIVITIES:**

**Graduate Student Education**

2009 Lecture, Titled: Functional Imaging in Animal Models, Biophysics 239, Functional MRI Contrast Mechanisms and Applications  
2010 Advanced Graduate Level Neuroscience, Functional Imaging Lectures  
2011 Lecture, Titled: Preclinical BOLD studies, Biophysics 03239, Functional MRI Contrast Mechanisms and Applications  
2011 Biophysics Journal Club. Topic: Resting-State Functional Connectivity  
2012 Lecturer, Advanced Graduate Level Systems Neuroscience  
2014 Lecturer, M4 integrative selective course #265-M4442, Introduction to Medical Imaging  
2016 Lecturer, M4 integrative selective course #265-M4D442, Introduction to Medical Imaging  
2017 Lecturer, M4 integrative selective course #265-M4D442, Introduction to Medical Imaging  
2018 Course Director, Biophysics 03239, Function MRI Contrast Mechanisms and Applications  
2018 Assistant Instructor, Pediatric Anesthesia Fellow Journal Club, MCW Anesthesiology (Single Event)  
2019 Course Director, Biophysics 03297, Journal Club  
2020 Course Director, Biophysics 03239, Function MRI Contrast Mechanisms and Applications

**EXTRAMURAL TEACHING:**

**Medical Student Education**

1999 - 2001 University of Wisconsin, Chemistry 110: Advanced Analytical Chemistry

**Graduate Student Education**

2012 Medical College of Wisconsin - BME, Lecturer, Biophysics 239, Functional MRI Contrast Mechanisms and Applications

**MCW STUDENTS, FACULTY, RESIDENTS AND CLINICAL/RESEARCH FELLOWS MENTORED:**

**Undergraduate Students**

Meera Krishna, Medical College of Wisconsin, 2019 Summer Research Program for Undergraduates (SPUR) Research Mentor

**Medical Students**



Maraika Robinson, Medical College of Wisconsin, 2017 Medical Student Summer Research Fellowship (NIH T32 Grant)

Zan Khan, Medical College of Wisconsin, 2017 Medical Student Summer Research Fellowship (NIH T32 Grant)

### **Graduate Students**

#### **PhD Committees**

Rupeng Li, Medical College of Wisconsin, 2008 - 2010

Jiaqing Tong, Medical College of Wisconsin, 2010 - 2013

Siveshigan Pillay, Medical College of Wisconsin, 2010 - 2013

Alexander Tate, Medical College of Wisconsin, 2021 - Present

#### **PhD Students Advised**

Kyle Johnson, Medical College of Wisconsin, 2018

### **Postdoctoral Students**

Dr. Rebecca Ray, PhD, MCW, 2011 Research Advisor

### **Clinical/Research Fellows**

Maida Parkins, MD, MCW, 2008 Research Mentor

Patrick Hettinger, MD, MCW, 2009 Research Mentor

J.B. Stephenson IV, MD, MCW, 2010 Research Mentor

Nick Flugstad, MD, MCW, 2011 Research Mentor

## **EXTRAMURAL STUDENTS, FACULTY, RESIDENTS, AND CLINICAL/RESEARCH FELLOWS MENTORED:**

### **Medical Students**

Kevin Simonelic, University of Miami, Leonard M. Miller School of Medicine, 2008 Research Mentor

### **Graduate Students**

#### **MS Students Advised**

Shancheng Bao, Marquette University, Department of Bioengineering, 2010

Andrew Theriault, Marquette University, Department of Bioengineering, 2010 - 2011

#### **PhD Committees**

Benjamin Kalinosky, Marquette University, 2010 - 2016

Kaleb Vinehout, Marquette University, 2016 - Present

## **BIBLIOGRAPHY**

### **Refereed Journal Publications/Original Papers**

1. ) Cho, Y.R., Pawela, C.P., Li, R., Kao, D., Schulte, M.S., Runquist, M.L., Yan, J.-G., Matloub, H.S., Jaradeh, S.S., Hudetz, A.G., Hyde, J.S. Refining the sensory and motor ratunculus of the rat upper extremity using fMRI and direct nerve stimulation. *Magn. Reson. Med.* 58(5):901-909 (2007).
2. ) Pawela, C.P., Biswal, B.B., Cho, Y.R., Kao, D.S., Li, R., Jones, S.R., Schulte, M.L., Matloub, H.S., Hudetz, A.G., Hyde, J.S. Resting-state functional connectivity of the rat brain. *Magn. Reson. Med.* 59(5):1021-1029 (2008).
3. ) Cho, Y.R., Jones, S.R., Pawela, C.P., Li, R., Kao, D.S., Schulte, M.L., Runquist, M.L., Yan, J.-G., Hudetz, A.G., Jaradeh, S.S., Hyde, J.S., Matloub, H.S. Cortical brain mapping of peripheral nerves using functional magnetic resonance imaging in a rodent model. *J. Reconstr. Microsurg.* 24(8):551-557 (2008).
4. ) Pawela, C.P., Hudetz, A.G., Ward, B.D., Schulte, M.L., Li, R., Kao, D.S., Mauck, M.C., Cho, Y.R., Neitz, J., Hyde, J.S. Modeling of region-specific fMRI BOLD neurovascular response functions in rat brain reveals residual differences that correlate with the differences in regional evoked potentials. *Neuroimage* 41(2):525-534 (2008).
5. ) Pawela, C.P., Biswal, B.B. Hudetz, A.G., Schulte, M.L., Li, R., Cho, Y.R., Matloub, H.S., Hyde, J.S. A protocol for use of medetomidine anesthesia in rats for extended studies using task-induced BOLD

- contrast and resting-state functional connectivity. *Neuroimage* 46(4):1137-1147 (2009).
6. ) Pawela, C.P., Biswal, B.B., Hudetz, A.G., Li, R., Jones, S.R., Cho, Y.R., Matloub, H.S., and Hyde, J.S. Interhemispheric neuroplasticity following limb deafferentation detected by resting-state functional connectivity magnetic resonance imaging (fcMRI) and functional magnetic resonance imaging (fMRI). *Neuroimage* 49: 2467-2478 (2010).
  7. ) Long-term vascular access ports as a means of sedative administration in a rodent fMRI survival model. P.C. Hettinger, R. Li, J.G. Yan, H.S. Matloub, Y.R. Cho, C.P. Pawela, D.B. Rowe, J.S. Hyde. *J Neurosci Methods*. June 24, 2011
  8. ) Hettinger, P.C., Li, R., Yan, J.-G., Cho, Y.R., Sanger, J., Dzwierzynski, W., Pawela, C.P., Hyde, J.S., Matloub, H.S. Refining the sensory and motor ratunculus of the rodent upper extremity: evaluation of the C7 nerve root using fMRI and direct nerve stimulation. *Hand* (2011) 6:194-201.
  9. Feng Y, Li K, Roth E, Chao D, Mecca CM, Hogan QH, Pawela C, Kwok WM, Camara AKS, Pan B. Repetitive Mild Traumatic Brain Injury in Rats Impairs Cognition, Enhances Prefrontal Cortex Neuronal Activity, and Reduces Pre-synaptic Mitochondrial Function. *Front Cell Neurosci*. 2021;15:689334. PMID: PMC8383341
  10. Mecca CM, Chao D, Yu G, Feng Y, Segel I, Zhang Z, Rodriguez-Garcia DM, **Pawela CP**, Hillard CJ, Hogan QH, Pan B. Dynamic Change of Endocannabinoid Signaling in the Medial Prefrontal Cortex Controls the Development of Depression After Neuropathic Pain. *J Neurosci*. 2021 Sep 01;41(35):7492-7508. PMID: PMC8412994
  11. Saber M, Schwabe D, Park HJ, Tessmer J, Khan Z, Ding Y, Robinson M, Hogan QH, **Pawela CP**. Tonic, Burst, and Burst Cycle Spinal Cord Stimulation Lead to Differential Brain Activation Patterns as Detected by Functional Magnetic Resonance Imaging. *Neuromodulation*. 2021 Jun 02.
  12. Pawela C, Brunson RK, Williams TA, Porter M, Dale RC, Mohammad SS. The neuropsychological profile of children with basal ganglia encephalitis: a case series. *Dev Med Child Neurol*. 2017 Apr;59(4):445-448.
  13. **Pawela CP**, Kramer JM, Hogan QH. Dorsal root ganglion stimulation attenuates the BOLD signal response to noxious sensory input in specific brain regions: Insights into a possible mechanism for analgesia. *Neuroimage*. 2017 Feb 15;147:10-18.
  14. Pawela C, DeYoe E, Pashaie R. Intracranial Injection of an Optogenetics Viral Vector Followed by Optical Cannula Implantation for Neural Stimulation in Rat Brain Cortex. *Methods Mol Biol*. 2016;1408:227-41.
  15. Biswal B, Pawela C, Grist T, Meyerand ME, Nencka AS, DeYoe EA, Li SJ, Rowe DB, Kiviniemi V, Cox RW, Bodurka J, Ogawa S, Koretsky A, Hu X, Kim SG. Personal reflections on James S. Hyde. *Brain Connect*. 2014 Nov;4(9):631-5. PMID: PMC4238237
  16. Li C, Li Z, Ward BD, Dwinell MR, Lombard JH, Hudetz AG, **Pawela CP**. Enhancement of resting-state fcMRI networks by prior sensory stimulation. *Brain Connect*. 2014 Nov;4(9):760-8. PMID: PMC4238242
  17. Li Z, Ward BD, Dwinell MR, Lombard JH, **Pawela CP**. fMRI and fcMRI phenotypes map the genomic effect of chromosome 13 in Brown Norway and Dahl salt-sensitive rats. *Neuroimage*. 2014 Apr 15;90:403-12.
  18. Li R, Hettinger PC, Machol JA, Liu X, Stephenson JB, **Pawela CP**, Yan JG, Matloub HS, Hyde JS. Cortical plasticity induced by different degrees of peripheral nerve injuries: a rat functional magnetic resonance imaging study under 9.4 Tesla. *J Brachial Plex Peripher Nerve Inj*. 2013 May 09;8(1):4. PMID: PMC3659007
  19. Hettinger PC, Li R, Yan JG, Cho YR, Sanger J, Dzwierzynski W, **Pawela CP**, Hyde JS, Matloub HS. Refining the sensory and motor ratunculus of the rodent upper extremity: evaluation of the C7 nerve root using fMRI and direct nerve stimulation. *Hand (N Y)*. 2011 Jun;6(2):194-201. PMID: PMC3092895
  20. Cho YR, **Pawela CP**, Li R, Kao D, Schulte ML, Runquist ML, Yan JG, Matloub HS, Jaradeh SS, Hudetz AG, Hyde JS. Refining the sensory and motor ratunculus of the rat upper extremity using fMRI and direct nerve stimulation. *Magn Reson Med*. 2007 Nov;58(5):901-9. PMID: PMC2519801
  21. **Pawela CP**, Hudetz AG, Ward BD, Schulte ML, Li R, Kao DS, Mauck MC, Cho YR, Neitz J, Hyde JS. Modeling of region-specific fMRI BOLD neurovascular response functions in rat brain reveals residual differences that correlate with the differences in regional evoked potentials. *Neuroimage*. 2008 Jun;41(2):525-34. PMID: PMC2483240
  22. **Pawela CP**, Biswal BB, Cho YR, Kao DS, Li R, Jones SR, Schulte ML, Matloub HS, Hudetz AG, Hyde JS. Resting-state functional connectivity of the rat brain. *Magn Reson Med*. 2008 May;59(5):1021-9.

PMCID: PMC2562321

23. Cho YR, Jones SR, **Pawela CP**, Li R, Kao DS, Schulte ML, Runquist ML, Yan JG, Hudetz AG, Jaradeh SS, Hyde JS, Matloub HS. Cortical brain mapping of peripheral nerves using functional magnetic resonance imaging in a rodent model. *J Reconstr Microsurg*. 2008 Nov;24(8):551-7. PMCID: PMC2577710
24. **Pawela CP**, Biswal BB, Hudetz AG, Schulte ML, Li R, Jones SR, Cho YR, Matloub HS, Hyde JS. A protocol for use of medetomidine anesthesia in rats for extended studies using task-induced BOLD contrast and resting-state functional connectivity. *Neuroimage*. 2009 Jul 15;46(4):1137-47. PMCID: PMC2693293
25. **Pawela CP**, Biswal BB, Hudetz AG, Li R, Jones SR, Cho YR, Matloub HS, Hyde JS. Interhemispheric neuroplasticity following limb deafferentation detected by resting-state functional connectivity magnetic resonance imaging (fcMRI) and functional magnetic resonance imaging (fMRI). *Neuroimage*. 2010 Feb 01;49(3):2467-78. PMCID: PMC2818026
26. Pawela C, Biswal B. Brain connectivity: a new journal emerges. *Brain Connect*. 2011;1(1):1-2. PMCID: PMC3621355
27. Hettlinger PC, Li R, Yan JG, Matloub HS, Cho YR, **Pawela CP**, Rowe DB, Hyde JS. Long-term vascular access ports as a means of sedative administration in a rodent fMRI survival model. *J Neurosci Methods*. 2011 Sep 15;200(2):106-12. PMCID: PMC3156352
28. Saber M, Schwabe D, Park HJ, Tessmer J, Khan Z, Ding Y, Robinson M, Hogan QH, **Pawela CP**. Tonic, Burst, and Burst-Cycle Spinal Cord Stimulation Lead to Differential Brain Activation Patterns as Detected by Functional Magnetic Resonance Imaging. *Neuromodulation*. 2022 Jan;25(1):53-63.

#### **Editorials, Letters to Editor, Other**

1. ) Brain Connectivity: A New Journal Emerges. Editorial. May 2011. C.P. Pawela, B.B. Biswal. *Brain Connectivity* 1:1-2.

#### **Abstracts**

1. ) Pawela, C.P., Hudetz, A.G., Hyde, J.S. Propofol infusion with physiological monitoring improves success for BOLD fMRI in rats. *Proc. Intl. Soc. Mag. Reson. Med.* 13 (2005):1045.
2. ) Kounev, V.J., Hyde, J.S., Kern, M., Sengupta, J., Pawela, C.P., Prah, D.E., Paulson, E., Shaker, R. Feasibility and reproducibility of functional magnetic resonance imaging in medetomidine sedated rodents. *Digestive Disease Week, American Gastroenterology Association Meeting, Los Angeles, CA, 2006.*
3. ) Kounev, V., Pawela, C.P., Shaker, R., Hyde, J.S. Graded fMRI response in rat rectal distention model. *Proc. Intl. Soc. Mag. Reson. Med.* 14:3273 (2006).
4. ) Cho, Y.R., Pawela, C.P., Li, R., Schulte, M.L., Yan, J-G., Jaradeh, S., Matloub, H., Hyde, J.S. Cortical brain mapping of the rat forelimb using fMRI at 9.4T by direct nerve stimulation. *Proc. Intl. Soc. Mag. Reson. Med.* 15:3217 (2007).
5. ) Pawela, C.P., Cho, Y.R., Li, R., Yan, J-G., Jaradeh, S., Matloub, H., Hyde, J.S. Mapping single digit cortical representation in the rat using systematic nerve transection and fMRI at 9.4T. *Proc. Intl. Soc. Mag. Reson. Med.* 15:3215 (2007).
6. ) Pawela, C.P., Schulte, M.L., Cho, Y.R., Li, R., Hudetz, A.G., Hyde, J.S. Comparing rodent forepaw stimulation under two levels of Domitor anesthesia using laser Doppler and fMRI at 9.4T. *Proc. Intl. Soc. Mag. Reson. Med.* 15:3216 (2007).
7. ) Schulte, M.L., Pawela, C.P., Cho, Y.R., Li, R., Hudetz, A.G., Hyde, J.S. Detecting responses to single light flashes in the rodent brain using laser Doppler and fMRI at 9.4T. *Proc. Intl. Soc. Mag. Reson. Med.* 15:3214 (2007).
8. ) Cho, Y.R., Pawela, C.P., Li, R., Hyde, J.S., Runquist, M., Matloub, H., Jaradeh, S. fMRI based cortical representation of musculocutaneous, ulnar and median nerve in rats by direct nerve stimulation. *World Society of Reconstructive Microsurgery, Athens, Greece, 2007.*
9. ) Cho, Y.R., Pawela, C.P., Li, R., Schulte, M.L., Yan, J-G., Jaradeh, S., Matloub, H., Hyde, J.S. Cortical brain mapping of the rat forelimb using fMRI at 9.4T by direct nerve stimulation. *Plastic Surgery Research Council, 52nd Annual Meeting, Stanford, CA, 2007.*
10. ) Mauck, M.C., Kuchenbecker, J., Pawela, C.P., Hyde, J.S., Neitz, M., Neitz, J. Functional magnetic resonance imaging of neural activity in rat CNS in responses to chromatic stimuli. *OSA Fall Vision Meeting, Berkeley, CA, 2007.*
11. ) Jones, S.R., Li, R., Pawela, C.P., Shefchik, D.L., Yan, J-G., Matloub, H.S., Hyde, J.S. Cortical plasticity of

- the brain after median nerve transection using fMRI at 9.4T by direct nerve stimulation. *Proc. Intl. Soc. Mag. Reson. Med.* 16:2441 (2008).
12. ) Li, R., Jones, S.R., Pawela, C.P., Shefchik, D.L., Yan, J.-G., Jaradeh, S.S., Matloub, H.S., Hyde, J.S. Functional MRI detection of acute and chronic brain plasticity following median and ulnar nerve transection using direct nerve stimulation at 9.4T. *Proc. Intl. Soc. Mag. Reson. Med.* 16:2441 (2008).
  13. ) Pawela, C.P., Shefchik, D.L., Cho, Y. R., Li, R., Jones, S.R., Yan, J.-G., Jaradeh, S.S., Matloub, H.S., Hyde, J.S. Pushing the spatial resolution of BOLD imaging, the fMRI cortical representation of rat fingers at 9.4T. *Proc. Intl. Soc. Mag. Reson. Med.* 16:162 (2008).
  14. ) Pawela, C.P., Mauck, M.C., Kuchenbecker, J., Hudetz, A.G., Neitz, J., Hyde, J.S. Functional magnetic resonance imaging of neural activity in rats CNS in response to chromatic stimuli. *Proc. Intl. Soc. Mag. Reson. Med.* 16:2447 (2008).
  15. ) Jones, S.R., Li, R., Pawela, C.P., Shefchik, D.L., Matloub, H.S., Yan, J.-G., Jaradeh, S.S., Hyde, J.S. Cortical plasticity of the brain after median nerve transection using fMRI at 9.4T by direct nerve stimulation. American Society for Surgery of the Hand, 63rd Annual Meeting, Chicago, IL, Sept. 2008.
  16. ) Hyde, J.S., Pawela, C.P., Biswal, B.B., Li, R., Cho Y.R. High resolution fcMRI: Degrees of correlation within the rat brain finger representation. *Proc. Intl. Soc. Mag. Reson. Med.* 17: 3696 (2009).
  17. ) Hudetz, A.G., Biswal, B.B., Li, R., Hyde, J.S., Pawela C.P. Manipulation of BOLD resting-state functional connectivity and task related BOLD fMRI signal by different anesthetic dosages. *Proc. Intl. Soc. Mag. Reson. Med.* 17: 1653 (2009).
  18. ) Li, R., Jones, S.R., Pawela, C.P., Parkins, M.A., Shefchik, D.L., Bosbous, M., Yan, J.-G., Jaradeh, S.S., Matloub, H.S., Hyde, J.S., Functional MRI study on brain plasticity induced by different peripheral nerve injury patterns: What makes the difference? *Proc. Intl. Soc. Mag. Reson. Med.* 17: 125 (2009).
  19. ) Li, R., Jones, S.R., Pawela, C.P., Shefchik, D.L., Ludwig, M.A., Bosbous, M., Yan, J.-G., Jaradeh, S.S., Matloub, H.S., Hyde, J.S. fMRI evaluation of innovative implantable electrode for peripheral nerve stimulation animal model. *Proc. Intl. Soc. Mag. Reson. Med.* 17: 2511 (2009).
  20. ) Parkins, M.A., Li, R., Matloub, H.S., Yan, J.-G., Pawela, C.P., Hyde, J.S. A peripheral nerve repair model using fMRI in rats. *Proc. Intl. Soc. Mag. Reson. Med.* 17: 1680 (2009).
  21. ) Pawela, C.P., Biswal, B.B., Li, R., Hudetz, A.G., Hyde, J.S. Deafferentation induced cross-hemispheric brain plasticity detected by resting-state functional connectivity magnetic resonance imaging. *Proc. Intl. Soc. Mag. Reson. Med.* 17: 692 (2009).
  22. ) Pawela, C.P., Ward, B.D., Li, R., Biswal, B.B., and Hyde, J.S., Analyzing task activated BOLD fMRI signal voxel area and intensity measurements with bootstrap power analysis. *Proc. Intl. Soc. Mag. Reson. Med.* 17: 1732 (2009).
  23. ) Parkins, M.A., Li, R., Matloub, H.S., Yan, J.-G., Hyde, J.S., Pawela, C.P. A peripheral nerve repair model using fMRI in rats [abstract]. Joint Meeting of the American Society for Peripheral Nerve, the American Association for Hand Surgery, and the American Society for Reconstructive Microsurgery, Boca Raton, Florida, Jan. 8-10, 2009 [received the Most Outstanding Paper Award].
  24. ) Parkins, M.A., Li, R., Matloub, H.S., Yan, J.-G., Hyde, J.S., Pawela, C.P. A peripheral nerve repair model using fMRI in rats [abstract]. Midwestern Association of Plastic Surgeons 47th Annual Meeting, Chicago, IL, April 18-19, 2009 [First Place Resident's Basic Science Presentation Award].
  25. ) Parkins, M.A., Li, R., Matloub, H.S., Yan, J.-G., Hyde, J.S., Pawela, C.P. A peripheral nerve repair model using fMRI in rats [abstract]. The Plastic Surgery Research Council 54th Annual Meeting, Pittsburgh, PA, May 27-30, 2009.
  26. ) Pawela, C.P., Biswal, B.B., Li, R., Hudetz, A.G., Hyde, J.S. Detection of Brain Plasticity Following Peripheral Nerve Injury using fMRI. Meeting of the Peripheral Nerve Society, Wurzburg, Germany, Abstract 362, July 2009.
  27. ) Hettlinger, P.C., Li, R., Yan, J.-G., Matloub, H.S., Cho, Y.R., Runquist, M.L., Pawela, C.P., Hyde, J.S. Long term vascular access ports as a means of anesthetic administration in survival fMRI studies in rats. *Proc. Intl. Soc. Magn. Reson. Med.* 18:1074, 2010.
  28. ) Hettlinger, P.C., Li, R., Yan, J.-G., Matloub, H.S., Cho, Y.R., Runquist, M.L., Pawela, C.P., Hyde, J.S. Refining the sensory and motor ratunculus of the rodent upper extremity: Evaluation of the C7 nerve root using fMRI and direct nerve stimulation. *Proc. Intl. Soc. Magn. Reson. Med.* 18:1205, 2010.
  29. ) Li, R., Hettlinger, P.C., Cho, Y.R., Pawela, C.P., Yan, J.-G., Jesmanowicz, A., Hudetz, A.G., Matloub, H.S., Hyde, J.S. Detecting single cortical column activation under super high spatial resolution at 9.4T using single-shot half k-space GR-EPI. *Proc. Intl. Soc. Magn. Reson. Med.* 18:1090, 2010.
  30. ) Li, R., Hettlinger, P.C., Cho, Y.R., Pawela, C.P., Parkins, M.A., Jones, S.R., Yan, J.-G., Jesmanowicz, A.,

- Hudetz, A.G., Matloub, H.S., Hyde, J.S. fcMRI plasticity following rat median nerve injury and repair at 9.4T. *Proc. Intl. Soc. Magn. Reson. Med.* 18:12, 2010.
31. ) Pawela, C.P., Biswal, B.B., Li, R., Hudetz, A.G., Matloub, H.S., Hyde, J.S. The utility of fMRI in measuring brain plasticity. *Proc. Intl. Soc. Magn. Reson. Med.* 18:1200, 2010.
  32. ) Pawela, C.P., Biswal, B.B., Li, R., Hudetz, A.G., and Hyde, J.S. Restoration of Interhemispheric Resting-State Connectivity in S1FL Following Median Nerve Injury and Surgical Repair. *Proc. Intl. Soc. Mag. Reson. Med.* 19: 3687, 2011.
  33. ) Li, R., Stephenson, J.B., Pawela, C.P., Yan, J.G., Nencka, A.S., Hudetz, A.G., Matloub, H.S., and Hyde, J.S. ICA Analysis of Brachial Plexus Injury in an Animal Model Reveals Rapid Brain Plasticity in 9.4 T. *Proc. Intl. Soc. Mag. Reson. Med.* 19: 2580, 2011.
  34. ) Li, R., Bishop, P., Jesmanowicz, A., Nencka, A., Stephenson, J.B., Pawela, C.P., Yan, J.-G., Hudetz, A.G., Matloub, H.S., Hyde, J.S. Improving whole brain coverage and signal-to-noise ratio using novel intra-oral and over head surface coil array in rat under 9.4T *Proc. Intl. Soc. Mag. Reson. Med.* 19:1822, 2011.
  35. ) Stephenson, J.B., Li, R., Hettinger, P.C., Runquist, M., Pawela, C.P., Yan, J.-G., Matloub H.S., J.S. Hyde. Comparing results of median nerve stimulation between healthy and C7 donor rats utilizing BOLD fMRI at 9.4 T *Proc. Intl. Soc. Mag. Reson. Med.* 19: 1582, 2011.
  36. ) Stephenson, J.B. Inducing trans-hemispheric cortical plasticity following contralateral C7 nerve transfer: A rat fMRI survival study. The Midwestern Association of Plastic Surgeons 49th Annual Scientific Meeting, Chicago, IL, May 15-16, 2011 [Best Basic Science Research, Second Place Award].