## BIOGRAPHICAL SKETCH

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| NAME | POSITION TITLE |
|---|---|
| Jinyuan Zhou | Associate Professor of Radiology and Oncology |
| eRA COMMONS USER NAME (credential, e.g., agency login)<br>jzhou1 | |

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | MM/YY | FIELD OF STUDY |
|---|---|---|---|
| Fujian University, Fuzhou, China | Bachelor | 1979-83 | Physics |
| Wuhan Institute of Physics, The Chinese Academy of Sciences, Wuhan, China | Ph.D. | 1993-96 | Solid-State NMR Spectroscopy |
| Department of Radiology, Johns Hopkins University School of Medicine, Baltimore, USA | Postdoctoral | 1997-99 | *in vivo* MRI |

### A. Personal Statement

My research interest over the past 14 years has focused on developing novel *in vivo* MRI methodologies to study various human diseases such as cancer and stroke. I have a strong background in MRI physics. As a Postdoctoral Research Fellow at Johns Hopkins University, I developed the non-invasive blood flow and blood volume MRI techniques for functional MR studies of the brain. My recent work is on the development of the novel chemical exchange saturation transfer (CEST) technology. Together with my colleagues, we laid the groundwork for the CEST theoretical understanding and developed many key technologies for *in vivo* CEST imaging on animals and humans. Particularly, we invented the APT approach for brain pH imaging and tumor protein imaging. My initial paper on brain pH imaging was published in *Nature Medicine* in 2003 and my most recent paper on tumor treatment effects was published in *Nature Medicine* in 2011. I am most excited about the availability of this proposed PET-MR scanner which will nicely complement my research interests in the field of cacer biology and treatment in rodent models brain cancer.

### B. Positions and Honors

**Positions and Empolyment**

| | |
|---|---|
| 86-90 | Research Associate, Wuhan Institute of Physics, the Chinese Academy of Sciences |
| 90-95 | Instructor, Wuhan Institute of Physics, the Chinese Academy of Sciences |
| 95-97 | Assistant Professor, Wuhan Institute of Physics, the Chinese Academy of Sciences |
| 99-01 | Research Associate, Department of Radiology, Johns Hopkins University School of Medicine |
| 01-09 | Assistant Professor of Radiology, Johns Hopkins University School of Medicine |
| 09-Present | Associate Professor of Radiology and Oncology, Johns Hopkins University School of Medicine |

**Awards and Honors**

| | |
|---|---|
| 1994 | Second-Class Young Scientist Award of Tianjuan Wang Foundation |
| 1995 | Second-Class Graduate Scholarship of Wuhan Institute of Physics |
| 1996 | First-Class Graduate Scholarship of Wuhan Institute of Physics |
| 1996 | First-Class Hong Kong Yilida Scholarship of the Chinese Academy of Sciences |
| 1996 | Outstanding Presidential Scholarship of the Chinese Academy of Sciences |
| 1997 | Second-Class Natural Science Prize of the Chinese Academy of Sciences |
| 2003 | Award for Scientific Excellence, Division of MR Research, Department of Radiology, Johns Hopkins University |

**Other Experience and Professional Memberships**

| | |
|---|---|
| 1998 | Member, International Society of Magnetic Resonance in Medicine (ISMRM) |
| 2002 | Member, International Society for Cerebral Blood Flow and Metabolism |
| 2006 | Member, American Association for Cancer Research (AACR) |
| 2011 | Member, Radiological Society of North America (RSNA) |

**C. Selected Peer-reviewed Publications** (Selected from more than 65 peer-reviewed publications)

**Most relevant to the current application**


1. Jinyuan Zhou, Jean-Francois Payen, David A. Wilson, Richard J. Traystman, and Peter C. M. van Zijl. Using the Amide Proton Signals of Intracellular Proteins and Peptides to Detect pH Effects in MRI. Nature Med. 2003; 9, 1085-1090.
2. Jinyuan Zhou, Jaishri O. Blakeley, Jun Hua, Mina Kim, John Laterra, Martin G. Pomper, and Peter C. M. van Zijl. : Magn. Reson. Med. 2008; 60, 842-849. PMCID:PMC2579754.
3. Zhibo Wen, Shuguang Hu, Fanheng Huang, Xianlong Wang, Linglang Guo, Xianyue Quan, Silun Wang, and Jinyuan Zhou. MR Imaging of High-Grade Brain Tumors Using Endogenous Protein and Peptide-Based Contrast. NeuroImage; 2010; 51, 616-622. PMCID:PMC2856810.
4. Guang Jia, Ronney Abaza, JoAnna Williams, Debra Zynger, Jinyuan Zhou, Zarine Shah, Mitva Patel, Steffen Sammet, Lai Wei, Robert Bahnson, and Michael Knopp. Amide Proton Transfer MR Imaging of Prostate Cancer: A Preliminary Study. J. Magn. Reson. Imaging. 33, 647-654 (2011). Not NIH Funded.
5. Jinyuan Zhou, Erik Tryggestad, Zhibo Wen, Bachchu Lal, Tingting Zhou, Rachel Grossman, Silun Wang, Kun Yan, De-Xue Fu, Eric Ford, Betty Tyler, Jaishri Blakeley, John Laterra, and Peter C.M. van Zijl. Differentiation between glioma and radiation necrosis using molecular magnetic resonance imaging of endogenous proteins and peptides. Nature Med. 2011; 17, 130-134 . NIHMS233577.


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


6. Jinyuan Zhou and Peter van Zijl. Chemical Exchange Saturation Transfer imaging and Spectroscopy. Progr. NMR Spectr.; 2006; 48, 108-135.
7. Craig K. Jones, Michael J. Schlosser, Peter C. M. van Zijl, Martin G. Pomper, Xavier Golay, and Jinyuan Zhou. Amide Proton Transfer Imaging of Human Brain Tumors at 3T. Magn. Reson. Med. 2006; 56, 585-592.
8. Phillip Zhe Sun, Jinyuan Zhou, Weiyun Sun, Judy Huang, and Peter C. M. van Zijl. Delineating the Boundary between the Ischemic Penumbra and Regions of Oligaemia Using pH-weighted Magnetic Resonance Imaging (pHWI). J. Cereb. Blood Flow Metab. 2007; 27, 1129-1136.
9. Phillip Zhe Sun, Jinyuan Zhou, Judy Huang, and Peter C. M. van Zijl. Simplified Quantitative Description of Amide Proton Transfer (APT) Imaging During Acute Ischemia. Magn. Reson. Med. 2007; 57, 405-410.
10. Jun Hua, Craig K. Jones, Jaishri Blakeley, Peter C.M. van Zijl, and Jinyuan Zhou. Quantitative Description of the Asymmetry of Magnetization Transfer in the Human Brain. Magn. Reson. Med. 2007; 58, 786-793.
11. Amandeep Salhotra, Bachchu Lal, John Laterra, Phillip Zhe Sun, Peter C. M. van Zijl, and Jinyuan Zhou. Amide Proton Transfer Imaging of 9L Gliosarcoma and Human Glioblastoma Xenografts. NMR Biomed. 2008; 21, 489-497. PMCID:PMC2943209.
12. Manus J. Donahue, Jaishri O. Blakeley, Jinyuan Zhou, Martin G. Pomper, John Laterra, Peter C.M. van Zijl. Evaluation of Human Brain Tumor Heterogeneity using MRI with Multiple T1-based Signal Weighting Approaches. Magn. Reson. Med. 2008; 59, 336-344. PMCID:PMC2860187.
13. Mina Kim, Joseph Gillen, Jinyuan Zhou, and Peter C.M. van Zijl. Water Saturation Shift Referencing (WASSR) for chemical exchange saturation transfer experiments. Magn. Reson. Med. 2009; 61, 1441-1450. PMCID:PMC2860191.
14. He Zhu, Craig K. Jones, Peter C. M. van Zijl, Peter B. Barker, and Jinyuan Zhou. Fast 3D Chemical Exchange Saturation Transfer (CEST) Imaging of the Human Brain. Magn. Reson. Med. 2010; 64, 638-644. PMCID:PMC2932772. [Available on 2011/9/1].
15. Xuna Zhao, Zhibo Wen, Fanheng Huang, Shilong Lu, Xianlong Wang, Shuguang Hu, Donglin Zu, and Jinyuan Zhou. Saturation Power Dependence of Amide Proton Transfer (APT) Image Contrasts in Human Brain Tumors and Stroke at 3T. Magn. Reson. Med. 2011;65:doi: 10.1002/mrm.22891. NIHMS270244.


**D. Research Support**

**Ongoing Research Support**

2P50CA103175-06A2 (Bhujwalla) 09/22/11-07/31/16

NCI JHU ICMIC Program

This center grant funds an *in vivo* Cellular and Molecular Imaging Center at Johns Hopkins. The program consists of four research components, four developmental projects, one career development award and four resources.

1 R01 EB009731 (Zhou) 07/01/09-06/30/13

NIH/NIBIB
Amide Proton Transfer (APT) MRI of Human Brain Tumors at 3T and 7T
The goal is to determine the feasibility of APT-MRI for diagnosing heterogeneous aspects of human gliomas. This includes assessment of specificity and sensitivity for separating out tumor from edema and high- from low-grade together with APT-based image-guided biopsy for histological evaluation.

5 P41 RR15241-10 (van Zijl, KKI) 09/30/01-08/31/16
Resource for Quantitative Functional MRI
The goal is to provide state-of-the-art MRI and MRS data acquisition and image processing technology and unique MR expertise to facilitate the biomedical research of NIH-funded neuroscientists at several institutions in Maryland and throughout the USA.

1 R01 EB015032-01 (van Zijl) 08/01/11-07/31/15
Novel Approaches for CEST Labeling, Detection, Quantification and Translation
The goal is to develop MRI approaches for detecting and quantifying CEST agents for the drug delivery and gene expression in animals and humans.

**Completed Research Support Within the Last Three Years**

1 R21EB009112 (Zhou) 08/01/09-07/31/11
High Resolution DT-MRI for differentiation of malignant glioma from radiation necrosis
The goal is to define the water diffusion patterns associated with rat glioma models and histologically confirmed radiation-induced necrosis after focal radiation to the caudate-putamen in healthy rats *in vivo* using high resolution DTI at 4.7T.

Dana Foundation (Zhou) 07/01/07-06/30/10
MR imaging of mobile proteins for human brain tumor detection
This pilot study is to test the feasibility of quantitative APT imaging for characterizing human brain tumors.

1 R21 EB05252-01 (Bulte) 09/15/05-08/31/10
NIH/NIBIB
Developing a CEST Reporter Gene
The grant aims to develop a new MRI reporter gene that provides endogenous CEST contrast based on amide proton transfer and that can be used for MR detection of transfected cells.

5 R01 EB02634 (van Zijl) 06/10/92-07/31/10
NIH/NINDS
Functional Magnetic Resonance Studies of the Brain
The major goal is to design new NMR Methods for a multi-modality stroke exam. These methods will be developed on the animal scanner and then transferred to the human scanner.