

BIOGRAPHICAL SKETCH

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NAME Choi, In-Young	POSITION TITLE Assistant Professor		
eRA COMMONS USER NAME IYCHOI			
EDUCATION/TRAINING (<i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i>)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Seoul National University, Seoul, S. Korea	B.S.	1992	Nutrition / Physics (minor)
Seoul National University, Seoul, S. Korea	B.S.	1994	Physics
University of Minnesota, Minneapolis, Minnesota	Ph.D.	2000	Medical Physics
University of Minnesota, Minneapolis, Minnesota	Postdoctoral	2001	Medical Physics

A. Positions and Honors.

Research and Professional Experience:

1997 - 2000 Research Assistant, University of Minnesota School of Medicine, Minneapolis, Minnesota
2000 - 2001 Postdoctoral Research Associate, University of Minnesota School of Medicine, Minneapolis, Minnesota
2001 - 2005 Senior Research Scientist, The Nathan Kline Institute, Orangeburg, New York
2005 - Present Assistant professor, University of Kansas Medical Center, Kansas City, Kansas

Awards and Other Professional Activities:

1999 - 2000 International Society for Magnetic Resonance in Medicine (ISMRM) student stipend award
2000 American Society for Neurochemistry Young Investigator Travel Award
2001 Brain Energy Metabolism 2001 Young Scientist Travel Award
2001 Joint Annual Meeting ISMRM-ESMRM student stipend award
2001 - Present Associate member of International Society for Neurochemistry
2002 - Present Full member of New York Academy of Sciences
2002 - Present Full member of International Society of Cerebral Blood Flow and Metabolism (ISCBFM)
2002 - Present Full member of International Society for Magnetic Resonance in Medicine (ISMRM)
2002 Second Wierzbica conference – Glutamate, glutamine and GABA in the CNS, Young Scientist Award
2002 American Society for Neurochemistry Young Investigator Award
2003 International Society for Neurochemistry (ISN) Travel Grant Award
2003 - Present Regular member of Society for Neuroscience (SFN)
2003 Invited speaker of “The Second International Conference on Biomedical Spectroscopy”, “Biomedical engineering seminar of the University of California San Francisco”, “ISMRM, The Dynamic MR spectroscopy study group session”, “Minnesota Workshops on High Field Magnetic Resonance and Functional Brain Imaging” etc.
2005 International Society for Neurochemistry and the European Society for Neurochemistry, Travel Grant Award
2007 Shared Biomedical Research Instrument Grant Award, RI
2007 KUMC Faculty Travel Awards, Travel Scholarship for AFAR's Biomarkers of Aging and Diseases of Aging conference

Reviewer of Neurobiology of Aging, Magnetic Resonance in Medicine, NMR in Biomedicine, Neurochemical Research, Journal of Psychiatry and Neuroscience, Conference proceedings of International Society for Magnetic Resonance in Medicine, Editor of handbook of Neurochemistry and Molecular Neurobiology, Vol 4. Neural Metabolism In Vivo.

B. Selected peer-reviewed publications (in chronological order).

1. **I.-Y. Choi**, I. Tkac, K. Ugurbil, R. Gruetter, "Noninvasive measurements of [1-¹³C]glycogen concentrations and metabolism in rat brain *in vivo*" *J. Neurochem.* 73:1300 – 1308 (1999)
2. I. Tkac, Z. Starcuk, **I.-Y. Choi**, R Gruetter, "*In vivo* ¹H NMR spectroscopy of rat brain at 1 ms echo time" *Magn. Reson. Med.* 41:649 – 656 (1999)
3. J. Pfeuffer, J., I. Tkac, **I.-Y. Choi**, H. Merkle, K. Ugurbil, M. Garwood, R. Gruetter, "Localized *in vivo* ¹H NMR Detection of Neurotransmitter Labeling in Rat Brain during Infusion of [1-¹³C] D-Glucose" *Magn. Reson. Med.* 41:1077 – 1083 (1999)
4. **I.-Y. Choi**, I. Tkac, R. Gruetter, "Single-shot, three-dimensional "non-echo" localization method for *in vivo* NMR spectroscopy" *Magn. Reson. Med.* 44:387 – 394 (2000)
5. R. Gruetter, E. R. Seaquist, and **I.-Y. Choi**, "Non-invasive measurements of brain glycogen during hypoglycemia using localized *in vivo* ¹³C NMR" *Diabetes* 49:A65 Suppl. 1 (2000)
6. **I.-Y. Choi** and R. Gruetter, "Neuronal synthesis rates of N-acetyl-L-aspartic acid in the rat brain *in vivo*" *J Neurochem* 78 (Suppl. 1):159 (2001)
7. **I.-Y. Choi**, S.-P. Lee, S.-G. Kim, R. Gruetter, "*In vivo* measurements of brain glucose transport using a reversible Michaelis-Menten model and comparison with cerebral blood flow changes during hypoglycemia" *J Cereb Blood Flow Metab* 21:653 – 663 (2001)
8. **I.-Y. Choi**, H. Lei, R. Gruetter, "Effect of deep pentobarbital anesthesia on neurotransmitter metabolism *in vivo*: On the correlation of total glucose consumption with glutamatergic action." *J Cereb Blood Flow Metab* 22(11):1343 – 1351 (2002)
9. **I.-Y. Choi**, C. Wu, D. Okar, A. J. Lange, R. Gruetter, "Elucidation of the role of fructose 2,6-bisphosphate in the regulation of glucose fluxes in mice using *in vivo* ¹³C NMR measurements of hepatic carbohydrate metabolism." *Euro J Biochem* 269 (18):4418 – 4426 (2002)
10. **I.-Y. Choi**, R. Gruetter, "*In vivo* ¹³C NMR assessment of brain glycogen concentration and turnover in the awake rat" *Neurochem int* 1331:1 – 6 (2003)
11. **I.-Y. Choi**, E. R. Seaquist, R. Gruetter, "Effect of hypoglycemia on brain glycogen metabolism *in vivo*" *J Neurosci Res* 72(1):25 – 32 (2003)
12. R. Gruetter, G. Adriany, **I.-Y. Choi**, P.-G. Henry, H. Lei, G. Öz, "Localized *in vivo* ¹³C NMR Spectroscopy of the Brain" *NMR Biomed* 16:313 – 338 (2003)
13. **I.-Y. Choi**, S.-P. Lee, D. N. Guilfoyle, J. A. Helpert, "*In vivo* NMR studies of neurodegenerative diseases in transgenic and rodent models" *Neurochemical Res* 28(7): 987 – 1001 (2003)
14. **I.-Y. Choi**, "Regional distribution of glutathione in the human brain *in vivo*" *J Neurochem*, 87 (Suppl. 1):161 (2003)
15. **I.-Y. Choi**, S.-P. Lee, H. Merkle and J. Shen, "Single-shot two-echo technique for simultaneous measurement of GABA and creatine in the human brain *in vivo*" *Magn Reson Med* 51:1115 – 1121 (2004)
16. J. Shen, J. Yang, **I.-Y. Choi**, S. S. Li, and Z. Chen, "A new strategy for *in vivo* spectral editing. Application to GABA editing using selective homonuclear polarization transfer spectroscopy" *J Magn Reson* 170(2):290 – 298 (2004)
17. **I.-Y. Choi**, R. Gruetter, "Dynamic or inert metabolism? Turnover of N-acetyl-aspartate and glutathione from [1-¹³C] D-glucose in the rat brain *in vivo*" *J Neurochem* 91(4):778 – 787 (2004)
18. **I.-Y. Choi**, S.-P. Lee and J. Shen, "*In vivo* single-shot three-dimensionally localized multiple quantum spectroscopy of GABA in the human brain with improved spectral selectivity" *J Magn Reson* 172(1):9 – 16 (2005)
19. G. Öz, I. Tkáč, L. R. Charnas, **I.-Y. Choi**, K. J. Bjoraker, E. G. Shapiro and R. Gruetter, "Assessment of adrenoleukodystrophy lesions by high field MRS in non-sedated pediatric patients" *Neurology* 64(3):434 – 441 (2005)
20. **I.-Y. Choi**, S.-P. Lee and J. Shen, "Selective homonuclear Hartmann-Hahn transfer method for *in vivo* spectral editing in the human brain" *Magn Reson Med* 53:503 – 510 (2005)
21. **I.-Y. Choi**, S.-P. Lee, H. Merkle and J. Shen, "*In vivo* detection of gray and white matter differences in GABA concentration in the human brain" *NeuroImage* 33:85-93 (2006)
22. **I.-Y. Choi**, S.-P. Lee, M. Garwood and K. Ugurbil, H. Merkle, "Simple partial volume transceive coils for *in vivo* ¹H MR studies at high magnetic fields" *Concepts in Magn Reson Part B: Magn Reson*

C. Research Support

Ongoing Research Support

1 R21 DK081079-01 Choi (PI) 04/01/08 – 03/31/10
NIH

Quantitative *in vivo* biomarkers of oxidative stress in diabetes

The goals of this study are to develop and characterize direct, objective *in vivo* biomarkers of oxidative stress occurring in diabetes mellitus.

Role: Principal Investigator

No Number Lynch (PI) 10/01/07 - 09/30/08

National Multiple Sclerosis Foundation

Glutathione as a measure of oxidative stress in magnetic resonance spectroscopy (MRS) in brains of multiple sclerosis patients

Specific Aims: The goal of this study is to measure glutathione in the brains of patients with secondary progressive multiple sclerosis (SPMS) to understand the role of oxidative stress in the disease.

Role: Co-Investigator

No Number Michaelis, (PI) 07/01/08 – 06/30/10

KCALSI

MRI/MRS of Alcohol, Mitochondria, & Oxidative Stress in Hyperglutamatergic Mice

The goals of this study are to combine longitudinal, *in vivo* measurements using magnetic resonance imaging (MRI) and spectroscopy (MRS) to obtain a more dynamic view of changes with age and chronicity of exposure to ethanol.

Completed Research Support

1 R03 AG0022193 Choi (PI) 05/01/03 - 04/31/05
NIH/NIA

Quantitative measure of oxidative stress in human brain

Specific Aims: This project aims for a non-invasive and quantitative measurement of glutathione in the human brain *in vivo* to provide a quantitative measure of oxidative stress in aging and neurodegeneration.

Role: Principal Investigator

8 R01 EB0031504 Choi (PI) 09/07/99 - 08/31/05

NIH/NIBIB

Multiple quantum chemical shift imaging of GABA in brain

Specific Aims: To develop chemical shift imaging techniques for mapping GABA concentrations and homo-nuclear editing techniques for measuring GABA synthesis rate in the brain *in vivo*.

Role: Principal Investigator

No Number Choi (PI) 01/01/07 – 12/31/07

University of Kansas Medical Center Research Institute

Shared Biomedical Research Instrument Grant Award

The goal of this proposal is to establish an accurate biochemical analysis method by equipping a high-energy microwave fixation system for collaborative research efforts in neuroscience and neurobiology throughout the Kansas area (KUMC and KU in Lawrence).

Role: Principal Investigator

No Number Choi (PI) 04/01/05 - 12/31/07

American Health Assistance Foundation

Antioxidant defense in Alzheimer's brain *in vivo*

Specific Aims: This project aims to investigate the effect of Alzheimer's disease on the regional distribution of cerebral GSH content in the human brain *in vivo*, which may provide a quantitative measure of oxidative stress in Alzheimer's disease.

Role: Principal Investigator

No Number

Choi (PI)

08/01/07 - 03/31/08

GCRC CReFF Pilot Grant (NCRR NIH, 1M01RR023940-01 General Clinical Research Center, PI: B. F. Atkinson)

Hyperglycemia and oxidative stress in the human brain with diabetes

Specific Aims: The major goal of this study is to characterize non-invasive biomarkers of oxidative stress in the living brains of type 2 diabetic patients.

Role: Principal Investigator

No Number

Brooks (PI)

02/02/04 – 06/30/08

Siemens Medical Solutions

Imaging Studies at 3 Tesla (Reproducibility of Spectroscopic Imaging)

The major goals of this project are to evaluate and develop magnetic resonance spectroscopic imaging acquisition software for use in specific patient groups.

Role: Co-Investigator