Curriculum Vitae Bang-Bon Koo, Ph.D. 778 Harrison Ave, Boston, MA 02118 R919 office: 617-358-3528 <u>bbkoo@bu.edu</u> <u>koobangbon@gmail.com</u> Nov 05, 2018

Academic Training:

2/2002 B.S.	Physics, Hanyang University, Rep. of Korea
	(Minor in Electronic and Computer Engineering)
2/2004 M.S.	Biomedical Engineering, Hanyang University, Rep. of Korea
8/2008 Ph.D.	Biomedical Engineering, Hanyang University, Rep. of Korea

Additional Training:

12/2006-06/2007	Visiting	Scholar,	Center	for	Biomedical	Imaging,	Department	of	Anatomy	and
	Neurobic	ology, Bos	ton Univ	rsit	y Medical Ca	mpus, Bost	ton, MA			
10/2008-09/2010	Research	fellow,	Center	for	Biomedical	Imaging,	Department	of	Anatomy	and
	Neurobic	ology, Bos	ton Univ	rsit	y Medical Ca	mpus, Bost	ton, MA			

Academic Appointments:

 10/2008-10/2017: Research Associate, Department of Anatomy and Neurobiology, Boston University School of Medicine, Boston, MA
02/2018- : Assistant Professor, Department of Anatomy and Neurobiology, Boston University School of Medicine, Boston, MA

Hospital Appointments or Other Employment:

~	production production	
	10/2008-09/2013	3: Research Associate, Multimodal Whole Animal Imaging Core, National Emerging
		Infectious Disease Laboratory (NEIDL), Boston University Medical Campus, Boston,
		MA
	10/2013-10/2017	7: Core Operations Director, Multimodal Whole Animal Imaging Core, National Emerging
		Infectious Disease Laboratory (NEIDL), Boston University Medical Campus, Boston,
		MA
	10/2014-	: Spivack Faculty, The Spivack Center for Clinical & Translational Neuroscience, Boston
		University School of Medicine, Boston, MA
	11/2017-	: NEIDL faculty, Boston University Medical Campus, Boston, MA
	02/2018-	: Faculty Affiliate, Rafik B. Hariri Institute for Computing and Computational Science &
		Engineering, Boston University, Boston MA

Honors:

2003	Excellent Poster Award at the Korean Society for Human Brain Mapping
2009	Trainee award at Human Brain Mapping, funded by National Institutes of Health

Teaching Experience and Responsibilities:

- 2007-2013 Daniel Solomon (MR post processing, BU Anatomy and Neurobiology), Adnan Virani (MR postprocessing, BU Masters in Biomedical Imaging thesis), Geunwon Kim (fMRI processing, BU Masters in Biomedical Imaging), Sahil Jain (Cortical surface modeling, BU Masters in Biomedical Imaging), Hua Ning (Cortical surface modeling, BU Masters in Biomedical Imaging), Katherine Kim and Mohammed Hussain (BU Anatomy and neurobiology internship, Upenn), Corinna Bauer (MR postprocessing, BUSM Phd student), Kiri Choi (CBI internship, Washington University), Chad W. Farris (MR postprocessing, BUSM MD/Ph.D. Thesis).
- 2013-2014 Lauren Zajac (MR postprocessing, BU Masters in Biomedical Imaging student), Philip Montenigro (Brain Network Analysis, BU MD PhD candidate) Shannon Browne (MR postprocessing, BU MBI, thesis advisor/reader), Andy Ellison (MR postprocessing, BU Masters in Biomedical Imaging student), Kevin Arndt and Nadine Heyworth (Histology – MR comparison, MS and Ph.D. Student). Olivia M Farr (MR postprocessing, Beth Israel Deaconess Medical Center – Postdoc) Jonathan Kim (MR postprocessing, Beth Israel Deaconess Medical Center – MD fellow)
- 2014-2015 : IM680, Programming for Biomedical Data/Image Processing IM655, Directed Study Masters in Biomedical Imaging, BU
- 2014-2017 Faye Mckenna (BU MBI, thesis advisor/reader, Journal publication), Xuanzi He (BU Masters in Biomedical Imaging, thesis advisor/reader), Mirabelle Lindquist (BU Masters in Biomedical Imaging, thesis advisor/reader), Craig Detheridge (BU Masters in Biomedical Imaging, thesis advisor/reader) Daniel Farrar (MR post-processing, BUSM MD/PhD course) Samantha Calderazzo (MRI&Histology fusion, BUSM anatomy ms course) Jake Kapoosuzian, Sung Hong, Marianne Walters, Fiona Moran (BU Mechanical Eng. Student, BU EPIC project on MRI animal bedding system)
- 2018- Khlifa Alnaim (BU biomedical engineering) Alekha Kolli (BU 7yr acc medical path) Jasmine Cheng (BU neuroscience) Wendy Guo (BU neuroscience) Nada Naguib (BU Biomedical Eng) Clara Zundel (BU Ph.D. Student)

(Several mentoring works listed above yielded journal and/or conference publications – Marked as '&' in the Bibliography)

Other Professional Activities:

Professional Societies: Memberships, Offices, and Committee Assignments:

- 2004- Member of Human Brain Mapping
- 2010- Member of Society for Molecular Imaging
- 2011- Member of Society for Neuroscience
- 2015- Member of International Society of Magnetic Resonance in Medicine

Editorial Boards:

- 2011- present Reviewer, International Journal of Imaging Systems and Technology, Wiley
- 2012- present Reviewer, Neurobiology of Aging, Elsevier
- 2013- present Reviewer, Neuroimage: Clinical, Elsevier
- 2015- present Reviewer, European Neurology
- 2015- present Reviewer, Journal of the Neurological Sciences
- 2015- present Reviewer, Journal of Supercomputing

Other Support:

Current:

9/2017-8/2020 W81XWH-17-1-0440, **PI: Koo**, Computer Aided Decoding of Brain-Immune Interactions in Gulf War Illness (GWI): A Joint Embedding on Brain Connectomic and Immunogenetic Markers,

Total Cost: \$ 666,189

Role: Principal Investigator

10/2008-06/2020 Core 5 ISS-SAL 9500305795, PI:Corley (BUSM), National Emerging Infectious Diseases Laboratories Operations,

Total Cost: \$ 8,500,000

Role: NEIDL faculty

09/2013-08/2018 W81XWH-13-2-0072, PI: Sullivan (BU-SPH), Brain-Immune Interactions as the Basis of Gulf War Illness: Consortium Development,

Total Cost: \$ 4,784,133 (1year extension)

Role: co-Investigator

09/2106-08/2020 NIH-NILBI R01, PI:Kranmik (BUSM), Necrosis in Pulmonary TB

Role: co-Investigator

12/2017-11/2022 NIH - NIA R01 PI:Katherine L. Tucker (UMASS), Dietary Quality, Cognitive Decline and Brain Health in Puerto Rican Adults

Total Cost: \$3,843,666

Role: BU site PI. Subcontracting for project year 2 is being negotiated.

Past:

9/2014-8/2015 AG043478 PI: Moss, Role of Curcumin on Age-Related Cognitive Decline in the Rheuse Monkey

Role: co-Investigator

9/2013-8/2015 AG043640 PI: Rosene, Histopathology, Neuroimaging and Mechanism of Myelin Damage in Aging Monkey Brain.

Role: co-Investigator

6/2014-4/2016 Pfizer, PI: Thomas, The establishment of good practices for human drug trials.

Role: consultant on MRI imaging protocol design and pipelining of functional/structural brain mapping

12/2006-12/2007 Korea Research Foundation Grant funded by Korean Government (MOEHRD), **PI: Koo**, International Research Collaboration Grant, Total Cost: \$35,000

Role: Principal Investigator

Invited Lectures and Conference Presentations:

Regional/Local:

03/2013-06/2017 Dept. of Nephrology at Tufts Medical Center Beth Israel Deaconess Medical Center Dept. of Radiology at Tufts Medical Center

International:

 12/2007- Dept. of Neurology, Samsung Medical Center, Seoul Korea; Dept. of Rehabilitation Medicine, Samsung Medical Center, Seoul Korea; Dept. of Neurology, St. Mary's Hospital, Catholic Univ., Seoul Korea; Korean Society for Human Brain Mapping; Dept. of Neurosurgery, Seoul National Univ. Hospital; Dept. of Psychiatry, Seoul National Univ. Hospital; Lab of Tissue Engineering, Korea Institute of Radiological and Medical Science

Bibliography:

Original, Peer Reviewed Articles:

- Koo BB, Lee JM, Kim JS, Lee JS, Kim IY, Kim JJ, Lee DS, Kwon JS, Kim SI. (2003) Developing a Korean Standard Brain Atlas on the basis of Statistical and Probabilistic Approach and Visualization tool for Functional image analysis. Korean J Nucl Med 37(3):162-170
- Lee JS, Lee DS, Kim YK, Kim JS, Lee JM, Koo BB, Kim JJ, Kwon JS, Yoo TW, Chang KH, Kim SI, Kang H, Kang E, Chung JK, Lee MC. (2004) Quantification of Brain Images Using Korean Standard Templates and Structural and Cytoarchitectonic Probabilistic Maps. Korean J Nucl Med 38(3):241-252
- Koo BB, Lee JM, Kim JS, Kim IY, Kim SI. (2005) A Novel Automatic Algorithm for Selecting a Target Brain using a Simple Structure Analysis in Talairach Coordinate System, Journal of biomedical engineering research, 26 (3) 129-132
- 4. Kim HP, Lee JM, Lee DS, Koo BB, Kim JJ, Kim IY, Kwon JS, Yoo TW, Chang KH, Kim SI. Development of a group_specific average brain atlas: a comparison study between Korean and Occidental groups. J Biomed Eng Res. 2005;26:7–13.
- 5. Koo BB, Lee JM, Kim HP, Shin YW, Kim IY, Kwon JS, Kim SI. (2005): Representative brain selection using a group-specific tissue probability map. Magnetic Resonance Imaging 23(7):809-15.
- 6. Yoon U, Lee JM, **Koo BB**, Shin YW, Lee KJ, Kim IY, Kwon JS, Kim SI. (2005): Quantitative analysis of group-specific brain tissue probability map for schizophrenic patients. Neuroimage 26(2):502-12.

- 7. Koo BB, Lee JM, Kim JS, Kim IY, Kwon JS, Kim SI, Fully automatic hybrid registration method based on point feature detection without user intervention, SPIE Medical Imaging 6144, 61442N1-8
- Koo BB, Lee JM, Kim JS, Park JS, Kwon JS, Lee MD, Kim SI, (2008). Assessing spatial probabilistic distributional differences in the common space between schizophrenics and normal controls based on a novel automated probabilistic pattern analysis method, International Journal of Imaging Systems and Technology (IJIST), Volume 18 Issue 5-6, Pages 310-324
- 9. Koo BB, Hua N, Choi CH, Ronen I, Lee JM, Kim DS. A framework to analyze partial volume effect on gray matter mean diffusivity measurements. Neuroimage. *Cover paper* 2009 Jan 1; 44(1):136-44.
- Shon YM, Kim YI, Koo BB, Lee JM, Kim HJ, Kim WJ, Ahn KJ, Yang DW. Group-specific regional white matter abnormality revealed in diffusion tensor imaging of medial temporal lobe epilepsy without hippocampal sclerosis. Epilepsia. 2010 Apr; 51(4):529-35.
- Choi CH, Lee JM, Koo BB, Park JS, Kim DS, Kwon JS, Kim IY. Sex differences in the temporal lobe white matter and the corpus callosum: a diffusion tensor tractography study. Neuroreport. 2010 Jan 6; 21(1):73-7.
- 12. Koo BB, Choi K, Ronen I, Lee JM, Kim DS. Quantitative mapping of diffusion characteristics under the cortical surface. Magn Reson Imaging. 2010 Oct; 28(8):1175-82.
- Kim CH, Koo BB, Chung CK, Lee JM, Kim JS, Lee SK. Thalamic changes in temporal lobe epilepsy with and without hippocampal sclerosis: a diffusion tensor imaging study. Epilepsy Res. 2010 Jun; 90(1-2):21-7.
- 14. **Koo BB**, Kim DS. Computer-based morphometry of brain. International Journal of Imaging Systems and Technology. 2010; 20(2):117-125.
- Yoon B, Shim YS, Hong YJ, Koo BB, Kim YD, Lee KO, Yang DW. Comparison of diffusion tensor imaging and voxel-based morphometry to detect white matter damage in Alzheimer's disease. J Neurol Sci. 2011 Mar 15; 302(1-2):89-95.
- Kim CH, Chung CK, Koo BB, Lee JM, Kim JS, Lee SK. Changes in language pathways in patients with temporal lobe epilepsy: diffusion tensor imaging analysis of the uncinate and arcuate fasciculi. World Neurosurg. 2011 Mar-Apr; 75(3-4):509-16.
- Koo BB, Schettler SP, Murray DE, Lee JM, Killiany RJ, Rosene DL, Kim DS, Ronen I. Age-related effects on cortical thickness patterns of the Rhesus monkey brain. Neurobiol Aging. 2012 Jan; 33(1):200. e23-31.
- Koo BB, Bergethon P, Qiu WQ, Scott T, Hussain M, Rosenberg I, Caplan LR, Bhadelia RA. Clinical prediction of fall risk and white matter abnormalities: a diffusion tensor imaging study. Arch Neurol. 2012 Jun; 69(6):733-8.
- Koo BB, Oblak AL, Zhao Y, Farris CW, Bowley B, Rosene DL, Killiany RJ. Hippocampal network connections account for differences in memory performance in the middle-aged rhesus monkey. Hippocampus. 2013 Dec; 23(12):1179-88.
- 20. Bauer CM, Heidary G, **Koo BB**, Killiany RJ, Bex P, Merabet LB. Abnormal white matter tractography of visual pathways detected by high-angular-resolution diffusion imaging (HARDI) corresponds to visual dysfunction in cortical/cerebral visual impairment. J AAPOS. 2014 Aug; 18(4):398-401.
- 21. Farr OM, Fiorenza C, Papageorgiou P, Brinkoetter M, Ziemke F, Koo BB[&], Rojas R, Mantzoros CS. Leptin therapy alters appetite and neural responses to food stimuli in brain areas of leptin-sensitive subjects without altering brain structure. J Clin Endocrinol Metab. 2014 Dec; 99(12):E2529-38. (&: Advisor and/or thesis reader of the 1st author)

- 22. McKenna F, Koo BB[&], Killiany R. Comparison of ApoE-related brain connectivity differences in early MCI and normal aging populations: an fMRI study. Brain Imaging Behav. 2016 Dec; 10(4):970-983. (&: Advisor and/or thesis reader of the 1st author)
- 23. Naeser MA, Martin PI, Ho MD, Krengel MH, Bogdanova Y, Knight JA, Yee MK, Zafonte R, Frazieri J, Hamblin MR, Koo BB (2015) Red/near-infrared light-emitting diode therapy for traumatic brain injury, SPIE DSS Defense+Security, Proc. SPIE 9467, Micro- and Nanotechnology Sensors, Systems, and Applications VII, 94670M, doi: 10.1117/12.2176345.
- 24. He X, Koo BB*[&], Killiany RJ. Edited Magnetic Resonance Spectroscopy Detects an Age-Related Decline in Nonhuman Primate Brain GABA Levels. Biomed Res Int. 2016; 2016:6523909. (*corresponding author / &: Advisor and/or thesis reader of the 1st author)
- 25. Won YI, Chung CK, Kim CH, Park CK, **Koo BB**, Lee JM, Jung HW. White Matter Change Revealed by Diffusion Tensor Imaging in Gliomas. Brain Tumor Res Treat. 2016 Oct; 4(2):100-106.
- 26. Naeser MA, Martin PI, Ho MD, Krengel MH, Bogdanova Y, Knight JA, Yee MK, Zafonte R, Frazier J, Hamblin MR, Koo BB. Transcranial, Red/Near-Infrared Light-Emitting Diode Therapy to Improve Cognition in Chronic Traumatic Brain Injury. Photomed Laser Surg. 2016 Dec; 34(12):610-626.
- Bauer CM, Hirsch GV, Zajac L, Koo BB, Collignon O, Merabet LB. Multimodal MR-imaging reveals large-scale structural and functional connectivity changes in profound early blindness. PLoS One. 2017; 12(3):e0173064.
- 28. Zajac LE, Koo BB[&], Bauer CM, Killiany R (2017) Seed Location Impacts Whole-Brain Structural Network Comparisons between Healthy Elderly and Individuals with Alzheimer's Disease, Brain Sciences 7(4) (&: Advisor and/or thesis reader of the 1st author)
- 29. Drew DA, **Koo BB**, Bhadelia R, Weiner DE, Duncan S, Mendoza-De Garza M, Gupta A, Tighiouart H, Scott T, Sarnak MJ (2017) White matter damage in maintenance hemodialysis patients: a diffusion tensor imaging study BMC nephrology 18(1) 213
- Farrar DC, Mian AZ, Budson AE, Moss MB, Koo BB[&], Killiany RJ. Retained executive abilities in mild cognitive impairment are associated with increased white matter network connectivity. Eur Radiol. 2017 (&: Advisor and/or thesis reader of the 1st author)
- Bauer CM, Zajac LE, Koo BB, Killiany RJ, Merabet LB (2017) Age-related changes in structural connectivity are improved using subject-specific thresholding. Journal of Neuroscience Methods 288, 45-56
- 32. Koo BB*[&], Michalovicz LT, Calderazzo S, Kelly KA, Sullivan K, Killiany RJ, O'Callaghan JP. Corticosterone potentiates DFP-induced neuroinflammation and affects high-order diffusion imaging in a wrat model of Gulf War Illness. Brain Behav Immun. 2017 Aug 04. (*1st and corresponding author / &: Advisor and/or thesis reader of the 2nd author - Calerazzo)
- 33. Koo BB*&, Calderazzo S, Bowley BGE, Kolli A, Moss MB, Rosene DL, Moore TL. Long-term effects of curcumin in the non-human primate brain. Brain Res Bull. 2018 Sep; 142:88-95.

Web Publications and Videos:

1. Koo BB, Mortazavi F, Killiany R (2015) Center for Biomedical Imaging at Boston University. International Society of Magnetic Resonance in Medicine Showcase

2. Koo BB, Mortazavi F, Killiany R (2016) Center for Biomedical Imaging at Boston University. International Society of Magnetic Resonance in Medicine Showcase

Case Reports, Reviews, Chapters, and Editorials:

Textbook Chapters:

 Naeser MA, Martin PI, Ho MD, Krengel MH, Bogdanova Y, Knight JA, Yee MK, Zafonte R, Koo BB, Roubil JG, Hamblin MR (2016). Handbook of LLLT, chap. 39. Low Level Light Therapy for Rehabilitation in Traumatic Brain Injury and Stroke, including Chronic Aphasia. Pan Stanford Publishing