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Bin He

Distinguished McKnight University Professor of
 Biomedical Engineering
 Medtronic-Bakken Chair for Engineering in Medicine

Director, [Institute for Engineering in Medicine](#)

Director, [Center for Neuroengineering](#)



- B.S., Electrical Engineering, Zhejiang University, 1982
- M.S., Electrical Engineering, Tokyo Institute of Technology, 1985
- Ph.D., Bioelectrical Engineering, Tokyo Institute of Technology, 1988
- Postdoctoral Fellowship in Biomedical Engineering, Harvard University - M.I.T., 1991

Biography [Top](#)

Dr. Bin He received his BS in Electrical Engineering from Zhejiang University in 1982, and PhD in Bioelectrical Engineering from Tokyo Institute of Technology, Japan, a Nobel Prize winning campus in 1988, both with the highest honors. He completed a postdoctoral fellowship in Biomedical Engineering at Harvard University - M.I.T. After working as a Research Scientist at M.I.T., he was on the faculty of Electrical Engineering and Bioengineering at the University of Illinois at Chicago, where he was named a University Scholar by the President of the University of Illinois. From January 2004, he has been a Professor of Biomedical Engineering and Director of Biomedical Functional Imaging and Neuroengineering Laboratory at the University of Minnesota. Later he was appointed as a Distinguished McKnight University Professor and Medtronic-Bakken Chair for Engineering in Medicine. He serves as Director of the Institute for Engineering in Medicine, Director of the Center for Neuroengineering, Director of the NSF IGERT Neuroengineering Training Program, as well as Director of the NIH Neuroimaging Training Program, at the University of Minnesota. Dr. He also serves as Director of Graduate Studies of PhD Minor in Neuroengineering, and served as Director of Undergraduate Studies in Biomedical Engineering from 2004-2006.

Dr. He's research interests include neuroengineering, functional biomedical imaging, cardiovascular engineering, and biomedical instrumentation. He has published over 230 articles in peer-reviewed core international journals including *Neuron*, *Brain*, *Journal of Neuroscience*, *Proceedings of the IEEE*, *NeuroImage*, *Human Brain Mapping*, *Nanomedicine*, *Heart Rhythm*, *Epilepsia*, *Applied Physics Letters*, *American Journal of Physiology*, *Journal of Neural Engineering*, and various *IEEE Transactions*, including *IEEE Transactions on Biomedical Engineering*, *IEEE Transactions on Medical Imaging*, and *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. He has also delivered over 40 plenary and keynote talks in various international conferences and workshops. Dr. He's research has been featured by *Nature*, *New York Times*, *BBC*, *CNN*, *NBC*, *CBS*, *ABC*, *Scientific American*, *Economist*, *New Scientist*, *US News*, *NPR*, among others. A [video](#) describing his work on mind controlled flying robot has been viewed ~900,000 times.

Dr. He has been named the recipient of 2017 IEEE Technical Field Award of Biomedical Engineering, and is a recipient of the Academic Career Achievement Award and the Distinguished Service Award from the IEEE Engineering in Medicine and Biology Society, the Outstanding Research Award from the International Federation of Clinical Neurophysiology, the Established Investigator Award from the American Heart Association, and the CAREER Award from the National Science Foundation, among others. He is an elected Fellow of the International Academy of Medical and Biological Engineering, IEEE, the American Institute for Medical and Biological Engineering, and the Institute of Physics. Dr. He serves as an Associate Editor or Editorial Board Member of multiple international journals in the field of biomedical engineering, and is the Editor-in-Chief of *IEEE Transactions on Biomedical Engineering*. He has served as the General Chair of the International Annual Conference of IEEE Engineering in Medicine and Biology Society (2009), Chair of the IEEE EMBS Forum on Grand Challenges in Neuroengineering (2010), Co-Chair of Scientific Committee of the World Congress on Medical Physics and Biomedical Engineering (2012), Chair of IEEE Life Sciences Grand Challenges Conference (2012), Chair of IEEE EMBS International Conference on Neural Engineering (2013), Chair of NSF Workshop on Mapping and Engineering the Brain (2013), and Chair of IEEE EMBS BRAIN Grand Challenges Conference (2014). He is a past president of the International Society of Bioelectromagnetism and of the International Society for Functional Source Imaging, and was the 2009-2010 President of IEEE Engineering in Medicine and Biology Society, consisting of 10,000+ members worldwide. He has been a Member of the NIH BRAIN Multi-Council Working Group.

Dr. He has been fortunate to be associated with talented graduate and undergraduate students, and postdoctoral associates, many of whom have taken faculty positions in academia in the US, Canada, Japan, China and Korea, and in major corporations. Many of his PhD students received competitive fellowship awards from various funding agencies or the University, or paper competition awards in international conferences.

Research Interests [Top](#)

Dr. Bin He's major research interests are in the field of neuroengineering and biomedical imaging. His research programs are funded by NIH (NIBIB, NCCIH, NINDS, NHLBI, NEI, OD), NSF, and ONR, among other sponsors. The active research programs in Dr. He's lab are as follows.

Multimodal Functional Neuroimaging: Dr. He and his students have developed a unified theory for multimodal neuroimaging integrating the BOLD functional MRI and electrophysiological imaging. Hemodynamic neuroimaging, such as BOLD functional MRI, has high spatial resolution at mm scale but very slow in time. Electrophysiological neuroimaging has high temporal resolution at ms scale but limited spatial resolution. It has been a major frontier in the functional neuroimaging research to attempt to greatly enhance spatio-temporal resolution by integrating functional MRI with electrophysiological imaging. Dr. He and colleagues have developed a rigorous theory on neurovascular coupling, which provides a principled way of integrating BOLD functional MRI signals with electrophysiological signals for event-related paradigms. The theory has been tested in human visual system and revealed a dramatic improvement in performance in imaging human visual information pathways. Dr. He and his students have further developed new algorithms to integrate fMRI and EEG/MEG signals for oscillatory brain activity. Currently both theoretical and experimental studies are actively pursued in Dr. He's lab to further develop the high resolution spatio-temporal functional neuroimaging modality, and to study the sensory, motor and cognitive functions of the brain using EEG/fMRI.

Functional Neuroimaging of Epilepsy: Dr. He and colleagues have made significant contributions to high-resolution electrophysiological neuroimaging aiding neurosurgical planning in epilepsy patients. Due to the limited spatial resolution of scalp EEG, it is widely practiced in clinical settings that invasive intracranial recordings are obtained, by placing electrode sensors directly on the surface of or within the brain, to aid neurosurgical planning in patients with intractable epilepsy. Dr. He and his students have developed an innovative epilepsy source imaging methodology, in which causal interactions among sources are identified and imaged from noninvasive EEG recordings. Such imaging provides high spatial resolution in imaging distributed brain sources within the 3-dimensional brain volume and reveals neural interactions and connectivity embedded in the brain networks. Dr. He and colleagues have further developed an ICA based seizure imaging methodology and conducted a rigorous validation study in a group of epilepsy patients to image epileptogenic brain, and demonstrated high consistence between the imaged seizure sources and the epileptogenic zones determined by well established clinical procedures in the same patients. Active research is currently being pursued to further establish electrophysiological neuroimaging as a noninvasive tool aiding surgical planning in epilepsy patients. Other than EEG/MEG neuroimaging, Dr. He and his colleagues are also pursuing functional MRI mapping of epileptogenic zone from fMRI. This line of work is carried in collaboration with Mayo Clinic and University of Minnesota Medical Center.

Electrical Properties Imaging: An important research program in Dr. He's lab is the development and investigation of novel approaches for noninvasive imaging of electrical properties of biological tissues, including bioimpedance imaging. Dr. He and colleagues have proposed and developed a new approach called magnetoacoustic tomography with magnetic induction (MAT-MI) by integrating ultrasound and biomagnetism, in order to obtain high resolution image of electrical impedance of biological tissue. In the MAT-MI approach, the object is placed in a static magnetic field and a pulsed magnetic field. The pulsed magnetic field induces eddy current in the object. Consequently, the object emits ultrasonic waves through the Lorentz force produced by the combination of the eddy current and the static magnetic field. The acoustic waves are then collected by the detectors located around the object for image reconstruction. MAT-MI takes the advantage of excellent contrast of electrical impedance and the high spatial resolution of ultrasound. The recent work demonstrates that the MAT-MI approach can achieve mm spatial resolution in imaging electrical impedance, which represents a significant advancement in comparison with the spatial resolution of conventional electrical impedance imaging approach, and may play a critically important role in early detection of breast cancer. Along the similar line, Dr. He and his colleagues have been developing a MR based electrical properties tomography (EPT) approach using B1 mapping of MR technology to reconstruct subject specific electrical properties distributions. EPT not only has great potential for clinical applications in cancer detection and diagnosis but also promises to provide subject specific SAR mapping, helping managing safety concerns in high or ultrahigh field MRI systems. The EPT project is carried in collaboration with CMRR investigators.

Cardiac Electrical Tomography: Dr. He and colleagues have pioneered the development of electrophysiological cardiac tomography in assessing dynamic cardiac functions. The electrocardiographic inverse imaging problem has historically been solved using point dipole sources, epicardial potentials, or heart surface activation patterns. Dr. He and colleagues have developed cardiac electrical tomography techniques in his lab to image electrical functional information throughout the 3-dimensional volume of the heart from noninvasive electrocardiographic measurements. In collaboration with collaborators at the University of Alabama at Birmingham and the University of Minnesota Medical School, Dr. He and colleagues have validated this cardiac electrical tomography technology in animal models including rabbits, dogs, and swine where simultaneous intracardiac or intracavity potentials are measured together with body surface potential mapping. Currently pilot clinical studies are being carried out to test the efficacy and clinical applications of the cardiac electrical tomography techniques developed in Dr. He's lab. The establishment of such imaging techniques promises to greatly impact the management of cardiac arrhythmia, a leading cause of public health problem in US and developed countries.

Brain-Computer Interface: Dr. He has made pioneering contributions to noninvasive brain-computer interface (BCI) research. This work is aimed at developing novel techniques for effectively decoding the intention of human subjects and controlling external device, which may ultimately benefit patients suffering from neurological disorders such as spinal cord injuries or stroke. Dr. He and his colleagues have developed a time-frequency-spatial approach to extract the extremely weak signals accompanying the "thought" of a human subject using an array of electrode sensors placed over the scalp. This method takes the "signatures" of each individual subject and uses them for optimal decoding of the intention of the human subject. Dr. He has proposed the concept of electrophysiological neuroimaging based BCI – an idea to estimate "virtual" intracranial signals from the noninvasive EEG recordings for substantially improving

the performance of noninvasive EEG based BCI. Dr. He and his colleagues have been aggressively investigating the mechanisms associated with motor imagery based BCI by using advanced neuroimaging techniques to delineate the brain sources accompanying motor imagery. Recently, Dr. He and his students have developed a 3-dimensional continuous brain-computer interface system to allow human subjects to control the flight of a flying robot from noninvasive brain waves. Click the [video](#) to see the mind controlled flying robot.

Neuromodulation: Dr. He and his colleagues are actively pursuing noninvasive neuromodulation modalities including transcranial focused ultrasound (tFUS), transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), and transcranial alternate current stimulation (tACS). Current interest ranges from basic studies of mechanisms of tFUS, TMS and tDCS/tACS by means of dynamic brain mapping, to clinical investigations in patients with stroke and schizophrenia. Other than treatment purposes, Dr. He and his students are pursuing perturbation based imaging in which neuromodulation is used to perturb the central nervous systems and responses measured using various neuroimaging methods for better understanding of brain circuits, networks and functions.

Selected Awards and Recognition [Top](#)

- IEEE Technical Field Award of Biomedical Engineering, 2017
- Elected to Chair-Elect, International Academy of Medical and Biological Engineering, 2015
- Academic Career Achievement Award, IEEE Engineering in Medicine and Biology Society, 2015
- Distinguished Service Award, IEEE Engineering in Medicine and Biology Society, 2014
- Outstanding Research Award, International Federation of Clinical Neurophysiology, 2012
- Fellow, International Academy of Medical and Biological Engineering, 2012
- Medtronic-Bakken Chair for Engineering in Medicine, 2012
- Co-Chair, IEEE Life Sciences Project Team, 2011-2013
- President, IEEE Engineering in Medicine and Biology Society (EMBS), 2009 - 2010
- Distinguished McKnight University Professorship, 2009
- President, International Society for Functional Source Imaging, 2007-2008
- Fellow, American Institute of Medical and Biological Engineering, 2005
- Fellow, IEEE, 2004
- President, International Society of Bioelectromagnetism, 2002-2005
- American Heart Association Established Investigator Award, 2001
- National Science Foundation CAREER Award, 1999
- University of Illinois University Scholar Award, 1999

Editorial Activities (active) [Top](#)

- Editor-in-Chief, [IEEE Transactions on Biomedical Engineering](#) (2013-Present).
- Senior Editor, [IEEE Transactions on Neural Systems and Rehabilitation Engineering](#) (2012-Present).
- Section Editor, [Brain Topography](#) (2007-Present).
- Academic Editor, [PLOS ONE](#) (2014-Present).
- Editorial Board Member, [Current Opinion in Biomedical Engineering](#) (2016-Present).
- Editorial Board Member, [TECHNOLOGY](#) (2013-Present)

Selected Conference Activities [Top](#)

- International Program Committee Chair, IEEE EMBS Annual International Conference, 2020.
- Conference Chair, IEEE EMBS BRAIN Grand Challenges Conference, 2014.
- Conference Co-Chair, IEEE International Symposium on Biomedical Imaging, 2014.
- Chair, NSF Workshop on Mapping and Engineering the Brain, 2013.
- Conference Chair, Minnesota Neuromodulation Symposium, 2013-Present.
- Conference Chair, IEEE EMBS International Conference on Neural Engineering, 2013.
- Conference Chair, IEEE Life Sciences Grand Challenges Conference, 2012.
- Co-Chair, Scientific Committee, World Congress on Medical Physics and Biomedical Engineering, 2012.
- Chair, Steering Committee, IEEE EMBS Forum on Grand Challenges in Neuroengineering, 2010.
- Conference Chair, the Annual International Conference of IEEE Engineering in Medicine and Biology Society, 2009.

Publications [Top](#)

Edited Books

- He B (Ed): "Neural Engineering," Second Edition, Springer, 2013.
- Sigg D, Iaizzo P, Yang X, He B (eds): Cardiac Electrophysiology Methods and Models, Springer, 2010.
- He B (Ed): "Neural Engineering," Kluwer Academic/Plenum Publishers, 2005.
- He B (Ed): "Modeling & Imaging of Bioelectrical Activity: Principles and Applications," Kluwer Academic Publishers, 2004.

Books Chapters

- Michel C, He B: "EEG Mapping and Source Imaging," In: D. Schomer, F. Lopes da Silva (eds): *Niedermeyer's Electroencephalography*, 7th edition. Wolters Kluwer & Lippincott Williams & Wilkins, Philadelphia, in press.
- He B, Gao S, Yuan H, Wolpaw J: "Brain-Computer Interface," In He B (Ed): *Neural Engineering*, Springer, pp. 87-151, 2013.
- He B and Ding L: "Electrophysiological Neuroimaging," In He B (Ed): *Neural Engineering*, Springer, 499-544, 2013.
- Ding M and He B: "Exploring Functional and Causal Connectivity in the Brain," In He B (Ed): *Neural Engineering*, Springer, 545-564, 2013.
- Michel C, He B: "EEG Mapping and Source Imaging," In: D. Schomer, F. Lopes da Silva (eds): *Niedermeyer's Electroencephalography*, 6th edition. Wolters Kluwer & Lippincott Williams & Wilkins, Philadelphia, Chapter 55, pp. 1179-1202, 2011.
- He B, Liu C: "Noninvasive Electrophysiological Imaging of Cardiac Electric Activity," In: Sigg, Iaizzo, Yang, He (eds): *Cardiac Electrophysiology Methods and Models*, Springer, 357-374, 2010.
- He B, Hori J, Babiloni F: "EEG Inverse Problems," In Akay M (Ed): *Wiley Encyclopedia in Biomedical Engineering*, John Wiley & Sons, Inc., Vol. 2, 1355-1363, 2006.
- Y Okamoto, He B: "ECG Inverse Problems," In Akay M (Ed): *Wiley Encyclopedia in Biomedical Engineering*, John Wiley & Sons, Inc., Vol. 2, 1275-1283, 2006.
- He B, Lian J: "Electrophysiological Neuroimaging," In He B (Ed): *Neural Engineering*, Kluwer Academic/Plenum Publishers, 221-262, 2005.
- Vallabhaneni A, Wang T, He B: "Brain Computer Interface," In He B (Ed): *Neural Engineering*, Kluwer Academic/Plenum Publishers, 85-122, 2005.
- He B: "Electrocardiographic Tomographic Imaging," In He B (Ed): *Modeling and Imaging of Bioelectric Activity – Principles and Applications*, Kluwer Academic/Plenum Publishers, 161-182, 2004.
- He B, Lian J: "Body Surface Laplacian Mapping of Bioelectric Sources," In He B (Ed): *Modeling and Imaging of Bioelectric Activity – Principles and Applications*, Kluwer Academic/Plenum Publishers, 183-212, 2004.
- He B, Yao D, Wu D: "Imaging Brain Electrical Activity," In JC Lin (Ed): *Advances in Electromagnetic Fields in Living Systems*, Vol. 3, Plenum Publishers, 73-120, 2000.
- He B, Wu D: "On the Feasibility of Solving Electrocardiographic Inverse Problems using Laplacian ECG," In P Johnston (Ed): *Computational Inverse Problems in Electrocardiography*, WIT Press, 89-118, 2000.
- Rosenbaum D, He B, & Cohen RJ: "New approaches for evaluating cardiac electrical activity: Repolarization alternans and body surface Laplacian imaging," In: *Cardiac Electrophysiology*, Zipes & Jalife Eds., 1187-1197, 1995.

Articles Published in Peer-reviewed Journals since 2004

2017

1. Aarabi A, He B: "Seizure prediction in patients with focal hippocampal epilepsy," *Clinical Neurophysiology*, in press.
2. Roy A, Jamison K, He S, Engel S, He B: "Deactivation in the posterior mid-cingulate cortex reflects perceptual transitions during binocular rivalry: Evidence from simultaneous EEG-fMRI," *NeuroImage*, 152: 1-11, 2017.
3. Liu J, Shao Q, Wang Y, Adriany G, Bischof J, Van de Moortele P-F, He B: "In vivo imaging of electrical properties of an animal tumor model with an 8-channel transceiver array at 7 T using electrical properties tomography," *Magnetic Resonance in Medicine*, in press.
4. Petrichella S, Johnson N, He B: "The Influence of Corticospinal Activity on TMS-Evoked Activity and Connectivity in Healthy Subjects: A TMS-EEG Study," *PLoS ONE*, 12(4): e0174879. <https://doi.org/10.1371/journal.pone.0174879>, 2017.
5. Case M, Zhang H, Mundahl J, Datta Y, Nelson S, Gupta K, He B: "Characterization of functional brain activity and connectivity using EEG and fMRI in patients with sickle cell disease," *NeuroImage: Clinical*, 14: 1-17, 2017.

2016

1. Meng J, Zhang S, Bekyo A, Olsoe J, Baxter B, He B: "Noninvasive Electroencephalogram Based Control of a Robotic Arm for Reach and Grasp Tasks," *Scientific Reports* 6, 38565, doi:10.1038/srep38565, 2016.
2. Sohrabpour A, Ye S, Worrell G, Zhang W, He B: "Noninvasive Electromagnetic Source Imaging and Granger Causality Analysis: An Electrophysiological Connectome (eConnectome) Approach," *IEEE Transactions on Biomedical Engineering*, 63: 2474-2487, 2016.
3. He B: "Focused Ultrasound Help Realize High Spatiotemporal Brain Imaging?—A Concept on Acousto-Electrophysiological Neuroimaging," *IEEE Transactions on Biomedical Engineering*, 63: 2654-2656, 2016.
4. Yu K, Sohrabpour A, He B: "Electrophysiological Source Imaging of Brain Networks Perturbed by Low-intensity Transcranial Focused Ultrasound," *IEEE Transactions on Biomedical Engineering*, 63: 1787-1794, 2016.
5. Sohrabpour A, Lu Y, Worrell G, He B: "Imaging Brain Source Extent from EEG/MEG by Means of an Iteratively Reweighted Edge Sparsity Minimization (IRES) Strategy," *NeuroImage*, 142: 27-42, 2016.
6. Baxter B, Edelman B, Nesbitt N, He B: "Sensorimotor Rhythm BCI with Simultaneous High Definition-Transcranial Direct Current Stimulation Alters Task Performance," *Brain Stimulation*, 9: 834-841, 2016.
7. Zhang CH, Sohrabpour A, Lu Y, He B: "Spectral and spatial changes of brain rhythmic activity in response to the sustained thermal pain stimulation," *Human Brain Mapping*, 37: 2976-2991, 2016.

8. Yu K, Shao Q, Ashkenazi S, Bischof J, He B: "In Vivo Electrical Conductivity Contrast Imaging in a Mouse Model of Cancer Using High-frequency Magnetoacoustic Tomography with Magnetic Induction (hfMAT-MI)," *IEEE Transactions on Medical Imaging*, 35: 2301-2311, 2016.
9. Liu J, Van de Moortele PF, Zhang X, Wang Y, He B: "Simultaneous Quantitative Imaging of Electrical Properties and Proton Density from B1 Maps Using MRI," *IEEE Transactions on Medical Imaging*, 35: 2064-2073, 2016.
10. Zhou Z, Jin Q, Yu L, Wu L, He B: "Noninvasive Imaging of Human Atrial Activation during Atrial Flutter and Normal Rhythm from Body Surface Potential Maps," *PLoS ONE* 11(10): e0163445. doi:10.1371/journal.pone.0163445, 2016.
11. Li X, Yu K, He B: "Magnetoacoustic tomography with magnetic induction (MAT-MI) for imaging electrical conductivity of biological tissue: A tutorial review," *Physics in Medicine and Biology*, 61: R249-R270, 2016.
12. Zhou Z, Jin Q, Chen LY, Yu L, Wu L, He B: "Noninvasive Imaging of High Frequency Drivers and Reconstruction of Global Dominant Frequency Maps in Patients with Paroxysmal and Persistent Atrial Fibrillation," *IEEE Transactions on Biomedical Engineering*, 63(6): 1333-1340, 2016.
13. Mariappan L, Shao Q, Jiang C, Yu K, Ashkenazi S, Bischof J, He B: "Magneto acoustic tomography with short pulsed magnetic field for in-vivo imaging of magnetic iron oxide nanoparticles," *Nanomedicine: Nanotechnology, Biology, and Medicine*, 12(3): 689-699, 2016.
14. Edelman B, Baxter B, He B: "EEG Source Imaging Enhances the Decoding of Complex Right Hand Motor Imagery Tasks," *IEEE Transactions on Biomedical Engineering*, 63(1): 4-14, 2016.
15. Katyal S, Engle S, He B, He S: "Active neural signals for the initiation of binocular rivalry," *Journal of Vision*, 16, 18. doi:10.1167/16.3.18, 2016.
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2. Wu X, Zhang XT, Tian J, Schmitter S, Hann B, Strupp J, Pfeuffer J, Hamm M, Wang D, Nistler J, He B, Vaughan JT, Ugurbil K, Van de Moortele PF: "Comparison of radiofrequency body coils for MRI at 3 Tesla: a simulation study using parallel transmission on various anatomical targets," *NMR in Biomedicine*, 28(10): 1332-1344, 2015.
3. Zhang H, Sha Z, Mundahl J, Liu S, Lu Y, Henry TR, He B: "Thalamocortical relationship in epileptic patients with generalized spike and wave discharges - a multimodal imaging study," *NeuroImage: Clinical*, 9: 117-127, 2015.
4. He B, Baxter B, Edelman B, Cline C, Ye W: "Noninvasive brain-computer interfaces based on sensorimotor rhythms," *Proceedings of the IEEE*, 103(6): 907-925, 2015.
5. Yu L, Zhou Z, He B: "Temporal Sparse Promoting Three Dimensional Imaging of Cardiac Activation," *IEEE Transactions on Medical Imaging*, 34(11): 2309-2319, 2015.
6. Shan H, Xu H, Zhu S, He B: "A novel channel selection method for optimal classification in different motor imagery BCI paradigms," *BioMedical Engineering OnLine*, 14:93. doi:10.1186/s12938-015-0087-4, 2015.
7. Han C, Pogwizd SM, Yu L, Zhou Z, Killingsworth CR, He B: "Imaging Cardiac Activation Sequence during Ventricular Tachycardia in a Canine Model of Nonischemic Heart Failure," *American Journal of Physiology-Heart and Circulatory Physiology*, 308(2): H108-114, 2015 (Cover article).
8. Zhou Z, Han C, Yang T, and He B: "Noninvasive Imaging of 3-dimensiona Myocardial Infarction from the Inverse Solution of Equivalent Current Density in Pathological Hearts," *IEEE Transactions on Biomedical Engineering*, 62(2):468-476, 2015.
9. Sohrabpour A, Lu Y, Kankirawatana P, Blount J, Kim H, He B: "Effect of EEG Electrode Number on Epileptic Source Localization in Pediatric Patients," *Clinical Neurophysiology*, 126(3):472-480, 2015 (Cover article).
10. Jamison KW, Roy AV, He S, Engel SA, He B: "SSVEP Signatures of Binocular Rivalry During Simultaneous EEG and fMRI," *Journal of Neuroscience Methods*, 243:53-62, 2015.
11. Liu J, Zhang XT, Schmitter S, Van de Moortele PF, He B: "Gradient-based electrical properties tomography (gEPT): A robust method for mapping electrical properties of biological tissues in vivo using magnetic resonance imaging," *Magnetic Resonance in Medicine*, 74(3):634-646, 2015.

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1. Zhang XT, Van de Moortele PF, Liu J, Schmitter S, He B: "Quantitative Prediction of RF Induced Local Heating Derived from B1 Maps in MRI: A Phantom Validation at 7T," *Applied Physics Letters*, 105, 244101, 2014 (cover article).
2. Cassidy K, You A, Doud A, He B: "The impact of mind-body awareness training on the early learning of a brain-computer interface," *Technology*, 2(3): 254-260, 2014.
3. Xu H, Lu Y, Zhu S, He B: "Assessing Dynamic Spectral Causality by Lagged Adaptive Directed Transfer Function and Instantaneous Effect Factor," *IEEE Transactions on Biomedical Engineering*, 61(7): 1979-1988, 2014.
4. Mariappan L, Hu G, He B: "Magnetoacoustic tomography with magnetic induction for high-resolution bioimpedance imaging through vector source reconstruction under the static field of MRI magnet," *Medical Physics*, 41, 022902, 2014.
5. Zhang H, Lu Y, Brinkmann B, Welker K, Worrell G, He B: "Lateralization and Localization of Epilepsy Related Hemodynamic Foci Using Presurgical fMRI," *Clinical Neurophysiology*, S1388-2457(14)00221-1, 2014.
6. Roy A, Baxter B, He B: "High definition transcranial direct current stimulation induces both acute and persistent changes in broadband cortical synchronization: a simultaneous tDCS-EEG study," *IEEE Transactions on Biomedical Engineering*, 61(7): 1967-1978, 2014.

7. Sun J, Tang Y, Lim KO, Wang J, Tong S, Li H, He B: "Abnormal Dynamics of EEG Oscillations in Schizophrenia Patients on Multiple Time Scales," IEEE Transactions on Biomedical Engineering, 61(6): 1756-1764, 2014.
8. Aarabi A & He B: "Seizure Prediction in Hippocampal and Neocortical Epilepsy Using a Model-based Approach," Clinical Neurophysiology, 125(5):930-940, 2014.
9. Yuan H & He B: "Brain-Computer Interfaces Using Sensorimotor Rhythms: Current State and Future Perspectives," IEEE Transactions on Biomedical Engineering, 61(5): 1425-1435, 2014 (Cover article).
10. Zhang XT, Liu J, He B: "Magnetic Resonance Based Electrical Properties Tomography: A Review," IEEE Reviews in Biomedical Engineering, 7: 87-96, 2014.
11. Lu Y, Worrell G, Zhang H, Yang L, Brinkmann B, Nelson C, He B: "Noninvasive Imaging of the High Frequency Brain Activity in Focal Epilepsy Patients," IEEE Transactions on Biomedical Engineering, 61(6): 1660-1667, 2014.
12. Zhou L, Zhu S, He B: "A Reconstruction Algorithm of Magnetoacoustic Tomography with Magnetic Induction for Acoustically Inhomogeneous Tissue," IEEE Transactions on Biomedical Engineering, 61(6): 1739-1746, 2014.

2013

1. LaFleur K, Cassady K, Doud A, Shades K, Rogin E, He B: "Quadcopter control in three-dimensional space using a noninvasive motor imagery based brain-computer interface," Journal of Neural Engineering, 10: 046003, 2013 (*Featured in Nature; downloaded over 50,000 times*).
2. Zhang XT, Schmitter S, Van de Moortele PF, Liu J, He B: "From Complex B1 Mapping to Local SAR Estimation for Human Brain MR Imaging Using Multi-channel Transceiver Coil at 7T," IEEE Transactions on Medical Imaging, 32(6): 1058-1067, 2013.
3. Han C, Pogwizd S, Killingsworth C, Zhou Z, He B: "Noninvasive cardiac activation imaging of ventricular arrhythmias during drug-induced QT prolongation in the rabbit heart," Heart Rhythm, 10(10):1509-1515, 2013.
4. He B, Coleman T, Genin GM, Glover G, Hu X, Johnson N, Liu T, Makeig S, Sajda P, Ye K: "Grand Challenges in Mapping the Human Brain: NSF Workshop Report," IEEE Transactions on Biomedical Engineering, 60(11): 2983-2992, 2013.
5. Liu J, Zhang XT, Van de Moortele PF, Schmitter S, He B: "Determining electrical properties based on B(1) fields measured in an MR scanner using a multi-channel transmit/receive coil: a general approach," Physics in Medicine and Biology, 58(13):4395-4408, 2013.
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7. Lai D, Sun J, Li Y, He B: "Usefulness of ventricular endocardial electric reconstruction from body surface maps to noninvasively localize ventricular ectopic activity in patients," Physics in Medicine and Biology, 58, 3897-3909, 2013.
8. He B, Baird R, Butera R, Datta A, George S, Hecht B, Hero A, Lazzi G, Lee RC, Liang J, Neuman M, Peng GCY, Perreault EJ, Ramasubramanian M, Wang MD, Wikswo J, Yang GZ, Zhang YT: "Grand Challenges in Interfacing Engineering with Life Sciences and Medicine," IEEE Transactions on Biomedical Engineering, 60(3): 589 – 598, 2013.
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10. Zhang X, de Moortele PFV, Schmitter S and He B: "Complex B1 mapping and electrical properties imaging of the human brain using a 16-channel transceiver coil at 7T," Magn Reson Med. 69: 1285 – 1296, 2013.
11. Mariappan L & He B: "Magnetoacoustic tomography with magnetic induction: Bioimpedance reconstruction through vector source imaging," IEEE Transactions on Medical Imaging, 32(3):619-627, 2013.
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13. Gultepe E, He B: "A Linear/nonlinear characterization of Resting State Brain Networks in fMRI Time series," Brain Topography, 26(1): 39-49, 2013.

2012

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Invited Plenary/Keynote Talks in International Conferences/Workshops since 2004 [Top](#)

1. Electrophysiological Neuroimaging and Brain-Computer Interfaces, BRAIN Plenary Symposium Lecture, 38th Annual International Conference of IEEE EMBS, Orlando, August 2016.
2. Mapping and Interfacing with the Human Brain, Plenary Lecture, IEEE International Joint Conference on Neural Networks, Vancouver, Canada, July 2016.
3. Mapping Brain Electrophysiological Connectome, Symposium Lecture, Annual Meeting of the Organization for Human Brain Mapping, Geneva, Switzerland, June 2016.
4. Imaging and Modulating the Human Brain, 2nd BRAIN Initiative Investigators Meeting, Bethesda, Dec 2015.

5. Bioelectricity and the Brain: From EEG to BCI, Opening Keynote Lecture, International Conference on Basic and Clinical Multimodal Imaging, Utrecht, Netherlands, September 2015.
6. Dynamic Seizure Imaging and Localization from EEG and High Frequency Activity, International Workshop on Seizure Prediction, Invited Workshop Lecture, Melbourne, Australia, August 2015.
7. Noninvasive Brain-Computer Interface: Challenges and Opportunities, Symposium Lecture, 7th IEEE EMBS International Conference on Neural Engineering, Montpellier, France, April 2015.
8. BRAIN Initiative and Dynamic Brain Mapping, Keynote Lecture, International Workshop on Brain Technology Initiative, Shanghai, China, December 2014.
9. Mapping and Decoding Brain Dynamics in vivo, Plenary Lecture, IEEE EMBS BRAIN Grand Challenges Conference, Washington DC, November 2014.
10. Dynamic Mapping and Interfacing with the Human Brain, Theme Keynote Lecture, IEEE EMBS Annual International Conference, Chicago, August 2014.
11. Mind Controlled Medical Devices, Keynote Lecture, MD & M Minneapolis Conference, Minneapolis, October 2013.
12. High-resolution dynamic neuroimaging of brain activity, NSF Workshop on Mapping and Engineering the Brain, Arlington, August 2013.
13. Engineering the future of medicine, Plenary Lecture, Design of Medical Devices Conference, Minneapolis, April 2013.
14. Spatio-Temporal Three-dimensional Cardiac Electric Imaging, Symposium Lecture, The 33rd Annual Scientific Sessions of the Heart Rhythm Society, Boston, May 2012.
15. Challenges and Opportunities in Neuroengineering: Understanding and Interfacing with the Brain, Keynote Lecture, Design of Medical Devices Conference, Minneapolis, April 2012.
16. EEG source and connectivity imaging of epilepsy, Symposium Lecture, American Clinical Neurophysiology Society Annual Meeting, San Antonio, February 2012.
17. Functional Neuroimaging, Keynote Lecture, Yangtze River International Conference on the Applications of Medical Imaging Physics & The 6th National Annual Meeting of Medical Imaging Physics, Hangzhou, China, October 2011.
18. Dynamic Integration of EEG with fMRI in Event Related Paradigms and Resting States, Workshop on Multimodal Functional Neuroimaging Integrating EEG, MEG and fMRI: Why and How, 17th Annual Meeting of Organization on Human Brain Mapping, Quebec City, Canada, June 2011 (800+ attended the workshop).
19. EEG-based Navigational Control of Virtual Helicopter in 3-D Space, DARPA Biologically-driven Navigation (BioNav) Workshop, Arlington, May 2011.
20. Spatio-Temporal Functional Neuroimaging of Brain Activity, Plenary Lecture, 5th IEEE EMBS International Conference on Neural Engineering, Cancun, April 2011.
21. Electrical Source and Impedance Imaging: Challenges and Opportunities, Keynote Lecture, Workshop on MR-based Impedance Imaging, Seoul, Korea, December 2010.
22. Imaging and Interacting with the Brain: Challenges and Opportunities, Plenary Lecture, Annual Conference of Chinese Society of Biomedical Engineering, Beijing, China, December 2010.
23. Toward High-resolution Spatio-temporal Functional Brain Imaging, Keynote Lecture, IEEE – EMBS Forum on Grand Challenges in Neuroengineering, Bethesda, May 2010.
24. XIVth Conference on Electrical Impedance and the 11th Conference on Biomedical Applications of Electrical Impedance Tomography, Plenary Lecture, Gainesville, April 2010.
25. Emerging Frontiers in Biomedical Engineering and Functional Neuroimaging, Plenary Lecture, Chinese Conference on Biomedical Engineering, Chongqing, China, October 2009.
26. Neuroengineering: Opportunities and Challenges to Reverse Engineer the Brain, Second International Conference on BioMedical Engineering and Informatics and the Second International Congress on Image and Signal Processing, Keynote Lecture, Tianjin, China, October 2009.
27. Functional Imaging of Brain and Heart Activity. Plenary Lecture, Joint Meeting of the 7th International Symposium on Noninvasive Functional Source Imaging & 7th International Conference on Bioelectromagnetism, Rome, Italy, May 2009.
28. Electrophysiological Sensing and Imaging of Cardiac Activity, The Xiangshan Science Conferences 346th Session, Beijing, China, April 2009.
29. Multimodal Functional Neuroimaging Integrating fMRI and EEG, NIH Blueprint Workshop on Non-invasive Imaging of Brain Structure and Function, Washington DC, September, 2008.
30. Multimodal Neuroimaging of Brain Activity and Connectivity, Grand Challenges in Neuroscience Workshop, Institute of Medicine of the National Academies, Washington DC, June 2008.
31. Functional Neuroimaging of Dynamic Brain Activity, Keynote Lecture, 5th International Conference on Information Technology and Applications in Biomedicine, Shenzhen, China, May 2008.
32. Electrophysiological Neuroimaging of Cortical Sources, Symposium Lecture, World Congress on Neuromodulation, Acapulco, Dec 2007.
33. Electrophysiological Neuroimaging: Past, Present and Future, Keynote Lecture, Joint Meeting of the 6th International Symposium on Noninvasive Functional Source Imaging of Brain and Heart and the International Conference on Functional Biomedical Imaging, Hangzhou, China, October 2007.
34. Electrophysiological Imaging of Brain and Cardiac Electrical Activity, Keynote Lecture, The 6th International Conference on Bioelectromagnetism, Aizu, October 2007.
35. Electrocardiographic Imaging: From 2-dimension towards 3-dimension, Plenary Lecture, Joint Meeting of 5th International Conference on Bioelectromagnetism and 5th International Symposium on Noninvasive Functional Source Imaging within the Human Brain and Heart, Minneapolis, May 2005.
36. From High-resolution EEG to Electrophysiological Neuroimaging, Plenary Lecture, 15th International Congress on Brain Electromagnetic Topography, Tokyo, April 2004.

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