G. ALLAN JOHNSON, PROFESSOR OF RADIOLOGY, DIAGNOSTIC PHYSICS AND BIOMEDICAL ENGINEERING

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Education:

PhD, Duke University, 1974
Ph.D., Duke University, 1974

Specialties:

Medical Imaging

Research Interests: *Medical Physics*

I have spent the last thirty one years engaged in building and applying advanced imaging technologies ranging from work on the first CT scanner installed at Duke (1974) to installation of the world's first high filed (1.5 T) clinical MRI system (1983). I continue to serve the medical center in commissioning new imaging technologies. Since 1983 my research has focused on extending the resolution of magnetic resonance imaging from the clinical domain, typically with voxels of 1 x 1 x 1 mm to the microscopic domain required for basic research in small animal models with voxels 125,000X smaller. The Center for In Vivo Microscopy was founded in 1985 and continues today with generous support from the National Center for Research Resources (P41 RR005959). The Center currently supports 6 state-of-the-art imaging systems for small animal imaging: 3 MRI systems (2, 7, and 9.4 T), a micro x-ray system, a micro- CT system, and a microPET system. The Center has embarked on an aggressive program to expand these modalities into molecular imaging with support from NCI (R24 CA092656)

Areas of Interest:

magnetic resonance histology
magnetic resonance imaging
small animal imaging

Representative Publications (More Publications)

A Badea, GA Johnson, RW Williams, *Genetic dissection of the mouse CNS using magnetic resonance microscopy.*, Current opinion in neurology, England, vol. 22 no. 4 (August, 2009), pp. 379-86 [abs].

A Badea, GA Johnson, RW Williams, *Genetic dissection of the mouse brain using high-field magnetic resonance microscopy.*, NeuroImage, United States, vol. 45 no. 4 (May, 2009), pp. 1067-79 [abs].

A Petiet, GA Johnson, Active Staining of Mouse Embryos for Magnetic Resonance Microscopy. In: Hewitson Tim D & Darby Ian A (editors), Histology Protocols (Methods in Molecular Biology), Springer- Humana Press. Totowa, NJ. USA, in press, 2009 .

AA Ali, AM Dale, A Badea, GA Johnson, *Automated segmentation of neuroanatomical structures in multispectral MR microscopy of the mouse brain.*, NeuroImage, United States, vol. 27 no. 2 (August, 2005), pp. 425-35 [abs].

M Cyr, MG Caron, GA Johnson, A Laakso, *Magnetic resonance imaging at microscopic resolution reveals subtle morphological changes in a mouse model of dopaminergic hyperfunction.*, NeuroImage, United States, vol. 26 no. 1 (May, 2005), pp. 83-90 [abs].

W Maï, CT Badea, CT Wheeler, LW Hedlund, GA Johnson, *Effects of breathing and cardiac motion on spatial resolution in the microscopic imaging of rodents.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 53 no. 4 (April, 2005), pp. 858-65 [abs].
BT Chen, AT Yordanov, GA Johnson, *Ventilation-synchronous magnetic resonance microscopy of pulmonary structure and ventilation in mice.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 53 no. 1 (January, 2005), pp. 69-75 [abs].
C Badea, LW Hedlund, GA Johnson, *Micro-CT with respiratory and cardiac gating.*, Medical physics, United States, vol. 31 no. 12 (December, 2004), pp. 3324-9 [abs].
BT Chen, GA Johnson, *Dynamic lung morphology of methacholine-induced heterogeneous bronchoconstriction.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 52 no. 5 (November, 2004), pp. 1080-6 [abs].
AC Brau, LW Hedlund, GA Johnson, *Cine magnetic resonance microscopy of the rat heart using cardiorespiratory-synchronous projection reconstruction.*, Journal of magnetic resonance imaging : JMRI, United States, vol. 20 no. 1 (July, 2004), pp. 31-8 [abs].
X Zhang, M Tengowski, L Fasulo, S Botts, SA Suddarth, GA Johnson, *Measurement of fat/water ratios in rat liver using 3D three-point dixon MRI.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 51 no. 4 (April, 2004), pp. 697-702 [abs].
TM Yelbuz, X Zhang, MA Choma, HA Stadt, M Zdanowicz, GA Johnson, ML Kirby, *Images in cardiovascular medicine. Approaching cardiac development in three dimensions by magnetic resonance microscopy.*, Circulation, United States, vol. 108 no. 22 (December, 2003), pp. e154-5 .
X Zhang, TM Yelbuz, GP Cofer, MA Choma, ML Kirby, GA Johnson, *Improved preparation of chick embryonic samples for magnetic resonance microscopy.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 49 no. 6 (June, 2003), pp. 1192-5 [abs].
BT Chen, AC Brau, GA Johnson, *Measurement of regional lung function in rats using hyperpolarized 3helium dynamic MRI.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 49 no. 1 (January, 2003), pp. 78-88 [abs].
GA Johnson, GP Cofer, B Fubara, SL Gewalt, LW Hedlund, RR Maronpot, *Magnetic resonance histology for morphologic phenotyping.*, Journal of magnetic resonance imaging : JMRI, United States, vol. 16 no. 4 (October, 2002), pp. 423-9 [abs].
GA Johnson, GP Cofer, SL Gewalt, LW Hedlund, *Morphologic phenotyping with MR microscopy: the visible mouse.*, Radiology, United States, vol. 222 no. 3 (March, 2002), pp. 789-93 [abs].
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LW Hedlund, GA Johnson, *Mechanical ventilation for imaging the small animal lung.*, ILAR journal / National Research Council, Institute of Laboratory Animal Resources, United States, vol. 43 no. 3 (2002), pp. 159-74 [abs].
HE Möller, LW Hedlund, XJ Chen, MR Carey, MS Chawla, CT Wheeler, GA Johnson, *Measurements of hyperpolarized gas properties in the lung. Part III: (3)He T(1).*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 45 no. 3 (March, 2001), pp. 421-30 [abs].
GA Johnson, GP Cofer, LW Hedlund, RR Maronpot, SA Suddarth, *Registered (1)H and (3)He magnetic resonance microscopy of the lung.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, United States, vol. 45 no. 3 (March, 2001), pp. 365-70 [abs].
H Benveniste, K Kim, L Zhang, GA Johnson, *Magnetic resonance microscopy of the C57BL mouse brain.*, NeuroImage, UNITED STATES, vol. 11 no. 6 Pt 1 (June, 2000), pp. 601-11 [abs].
H Benveniste, G Einstein, KR Kim, C Hulette, GA Johnson, *Detection of neuritic plaques in Alzheimer's disease by magnetic resonance microscopy.*, Proceedings of the National Academy of Sciences of the United States of America, UNITED STATES, vol. 96 no. 24 (November, 1999), pp. 14079-84 [abs].
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XJ Chen, HE Möller, MS Chawla, GP Cofer, B Driehuys, LW Hedlund, JR MacFall, GA Johnson, *Spatially resolved measurements of hyperpolarized gas properties in the lung in vivo. Part II: T * (2).*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, UNITED STATES, vol. 42 no. 4 (October, 1999), pp. 729-37 [abs].

SE Hurlston, WW Brey, SA Suddarth, GA Johnson, *A high-temperature superconducting Helmholtz probe for microscopy at 9.4 T.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, UNITED STATES, vol. 41 no. 5 (May, 1999), pp. 1032-8 [abs].
M Viallon, GP Cofer, SA Suddarth, HE Möller, XJ Chen, MS Chawla, LW Hedlund, Y Crémillieux, GA Johnson, *Functional MR microscopy of the lung using hyperpolarized 3He.*, Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine, UNITED STATES, vol. 41 no. 4 (April, 1999), pp. 787-92 [abs].
RR Maronpot, RC Sills, GA Johnson, *Applications of magnetic resonance microscopy.*, Toxicologic pathology, United States, vol. 32 Suppl 2 , pp. 42-8 [abs].
RC Sills, DL Morgan, DW Herr, PB Little, NM George, TV Ton, NE Love, RR Maronpot, GA Johnson, *Contribution of magnetic resonance microscopy in the 12-week neurotoxicity evaluation of carbonyl sulfide in Fischer 344 rats.*, Toxicologic pathology, United States, vol. 32 no. 5 , pp. 501-10 [abs].
H Benveniste, H Qui, LW Hedlund, F D'Ercole, GA Johnson, *Spinal cord neural anatomy in rats examined by in vivo magnetic resonance microscopy.*, Regional anesthesia and pain medicine, UNITED STATES, vol. 23 no. 6 , pp. 589-99 [abs].

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