

## Ralph Hurd

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### Publications

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#### PUBLICATIONS

- **The Circulatory Arrest Recovery Ammonia Problem (CARAP) Hypothesis: a 1H-MRS study of brain metabolism during neonatal cardiopulmonary bypass surgery.** *The Journal of thoracic and cardiovascular surgery*  
Spielman, D., Gu, M., Liu, H., Liu, S. C., Hurd, R., Riemer, K., Okamura, K., Shibata, M., Shuttleworth, P., Kleiman, Z., Epperson, K., Epperson, K., Hanley, et al  
2025
- **Detection of elevated succinate in brain during circulatory arrest in a piglet model: A 3T 1H MR spectroscopy study.** *Magnetic resonance in medicine*  
Hurd, R. E., Gu, M., Okamura, K., Shibata, M., Ono, Y., Haidar, M., Riemer, R. K., Hanley, F. L., Spielman, D. M.  
2024
- **Investigating the origin of the 13C lactate signal in the anesthetized healthy rat brain in vivo after hyperpolarized [1-13C]pyruvate injection.** *NMR in biomedicine*  
Zhu, M., Jhajharia, A., Josan, S., Park, J. M., Yen, Y., Pfefferbaum, A., Hurd, R. E., Spielman, D. M., Mayer, D.  
2023: e5073
- **Deuterium metabolic imaging for 3D mapping of glucose metabolism in humans with central nervous system lesions at 3T.** *Magnetic resonance in medicine*  
Adamson, P. M., Datta, K., Watkins, R., Recht, L. D., Hurd, R. E., Spielman, D. M.  
2023
- **1H-MRS neurometabolites and associations with neurite microstructures and cognitive functions in amnesic mild cognitive impairment.** *NeuroImage. Clinical*  
Gozdas, E., Hinkley, L., Fingerhut, H., Dacorro, L., Gu, M., Sacchet, M., Hurd, R., Hosseini, S. M.  
2022; 36: 103159
- **Proton MRS Assessment of Neonatal Brain Metabolism During Cardiopulmonary Bypass (CPB) Surgery.** *NMR in biomedicine*  
Spielman, D. M., Gu, M., Hurd, R. E., Riemer, K., Okamura, K., Hanley, F. L.  
2022
- **Hyperpolarized NMR study of the impact of pyruvate dehydrogenase kinase inhibition on the pyruvate dehydrogenase and TCA flux in type 2 diabetic rat muscle.** *Pflugers Archiv : European journal of physiology*  
Park, J. M., Josan, S., Hurd, R. E., Graham, J., Havel, P. J., Bendahan, D., Mayer, D., Chung, Y., Spielman, D. M., Jue, T.  
2021
- **Association between Anterior Cingulate Neurochemical Concentration and Individual Differences in Hypnotizability.** *Cerebral cortex (New York, N.Y. : 1991)*  
DeSouza, D. D., Stimpson, K. H., Baltusis, L. n., Sacchet, M. D., Gu, M. n., Hurd, R. n., Wu, H. n., Yeomans, D. C., Williams, N. n., Spiegel, D. n.  
2020
- **Detection of Metabolic Changes using Hyperpolarized C-13 MRI in a Negative F-18-FDG PET Rat Brain Cancer Model**  
Lauritzen, M., Datta, K., Merchant, M., Jang, T., Hurd, R., Liu, S., Recht, L., Spielman, D.  
SOC NUCLEAR MEDICINE INC.2019
- **Methodological consensus on clinical proton MRS of the brain: Review and recommendations.** *Magnetic resonance in medicine*  
Wilson, M., Andronesi, O., Barker, P. B., Bartha, R., Bizzi, A., Bolan, P. J., Brindle, K. M., Choi, I., Cudalbu, C., Dydak, U., Emir, U. E., Gonzalez, R. G., Gruber, et al

2019

- **Pulse sequence considerations for quantification of pyruvate-to-lactate conversion k(PL) in hyperpolarized C-13 imaging** *NMR IN BIOMEDICINE*  
Chen, H., Gordon, J. W., Bok, R. A., Cao, P., von Morze, C., van Criekinge, M., Milshteyn, E., Carvajal, L., Hurd, R. E., Kurhanewicz, J., Vigneron, D. B., Larson, P. Z.  
2019; 32 (3)
- **Pulse sequence considerations for quantification of pyruvate-to-lactate conversion kPL in hyperpolarized 13 C imaging.** *NMR in biomedicine*  
Chen, H., Gordon, J. W., Bok, R. A., Cao, P., von Morze, C., van Criekinge, M., Milshteyn, E., Carvajal, L., Hurd, R. E., Kurhanewicz, J., Vigneron, D. B., Larson, P. E.  
2019: e4052
- **Comparison of dynamic brain metabolism during antegrade cerebral perfusion versus deep hypothermic circulatory arrest using proton magnetic resonance spectroscopy.** *The Journal of thoracic and cardiovascular surgery*  
Hanley, F. L., Ito, H. n., Gu, M. n., Hurd, R. n., Riemer, R. K., Spielman, D. n.  
2019
- **Reversed metabolic reprogramming as a measure of cancer treatment efficacy in rat C6 glioma model.** *PLoS one*  
Datta, K. n., Lauritzen, M. H., Merchant, M. n., Jang, T. n., Liu, S. C., Hurd, R. n., Recht, L. n., Spielman, D. M.  
2019; 14 (12): e0225313
- **PKM2 activation sensitizes cancer cells to growth inhibition by 2-deoxy-D-glucose** *ONCOTARGET*  
Tee, S., Park, J., Hurd, R. E., Brimacombe, K. R., Boxer, M. B., Massoud, T. F., Rutt, B. K., Spielman, D. M.  
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- **PKM2 activation sensitizes cancer cells to growth inhibition by 2-deoxy-D-glucose.** *Oncotarget*  
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- **In vivo assessment of intracellular redox state in rat liver using hyperpolarized [1-C-13]Alanine** *MAGNETIC RESONANCE IN MEDICINE*  
Park, J. M., Khemtong, C., Liu, S., Hurd, R. E., Spielman, D. M.  
2017; 77 (5): 1741-1748
- **C]Alanine.** *Magnetic resonance in medicine*  
Park, J. M., Khemtong, C., Liu, S., Hurd, R. E., Spielman, D. M.  
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- **GABA editing with macromolecule suppression using an improved MEGA-SPECIAL sequence.** *Magnetic resonance in medicine*  
Gu, M., Hurd, R., Noeske, R., Baltusis, L., Hancock, R., Sacchet, M. D., Gotlib, I. H., Chin, F. T., Spielman, D. M.  
2017
- **Hyperpolarized (13) C-lactate to (13) C-bicarbonate ratio as a biomarker for monitoring the acute response of anti-vascular endothelial growth factor (anti-VEGF) treatment.** *NMR in biomedicine*  
Park, J. M., Spielman, D. M., Josan, S., Jang, T., Merchant, M., Hurd, R. E., Mayer, D., Recht, L. D.  
2016; 29 (5): 650-659
- **Volumetric spiral chemical shift imaging of hyperpolarized [2-(13) c]pyruvate in a rat c6 glioma model.** *Magnetic resonance in medicine*  
Park, J. M., Josan, S., Jang, T., Merchant, M., Watkins, R., Hurd, R. E., Recht, L. D., Mayer, D., Spielman, D. M.  
2016; 75 (3): 973-984
- **Handheld Electromagnet Carrier for Transfer of Hyperpolarized Carbon-13 Samples** *MAGNETIC RESONANCE IN MEDICINE*  
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2016; 75 (2): 917-922
- **Assessing inflammatory liver injury in an acute CCl4 model using dynamic 3D metabolic imaging of hyperpolarized [1-C-13]pyruvate** *NMR IN BIOMEDICINE*  
Josan, S., Billingsley, K., Orduna, J., Park, J. M., Luong, R., Yu, L., Hurd, R., Pfefferbaum, A., Spielman, D., Mayer, D.  
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- **Hyperpolarized 13C NMR observation of lactate kinetics in skeletal muscle.** *journal of experimental biology*  
Park, J. M., Josan, S., Mayer, D., Hurd, R. E., Chung, Y., Bendahan, D., Spielman, D. M., Jue, T.  
2015; 218: 3308-3318
- **The feasibility of assessing branched-chain amino acid metabolism in cellular models of prostate cancer with hyperpolarized [1-(13)C]-ketoisocaproate.** *Magnetic resonance imaging*  
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Billingsley, K. L., Josan, S., Park, J. M., Tee, S. S., Spielman-Sun, E., Hurd, R., Mayer, D., Spielman, D.  
2014; 27 (3): 356-362
- **Clinical Proton MR Spectroscopy in Central Nervous System Disorders** *RADIOLOGY*  
Oz, G., Alger, J. R., Barker, P. B., Bartha, R., Bizzi, A., Boesch, C., Bolan, P. J., Brindle, K. M., Cudalbu, C., Dincer, A., Dydak, U., Emir, U. E., Frahm, et al  
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Cunningham, C. H., Viqueira, W. D., Hurd, R. E., Chen, A. P.  
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- **In vivo investigation of cardiac metabolism in the rat using MRS of hyperpolarized [1-(13)C] and [2-(13)C]pyruvate.** *NMR in biomedicine*  
Josan, S., Park, J. M., Hurd, R., Yen, Y., Pfefferbaum, A., Spielman, D., Mayer, D.  
2013; 26 (12): 1680-1687
- **Exchange-Linked Dissolution Agents in Dissolution-DNP C-13 Metabolic Imaging** *MAGNETIC RESONANCE IN MEDICINE*  
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- **Effects of isoflurane anesthesia on hyperpolarized (13)C metabolic measurements in rat brain.** *Magnetic resonance in medicine*  
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- **Measuring mitochondrial metabolism in rat brain in vivo using MR Spectroscopy of hyperpolarized [2-(13)C]pyruvate.** *NMR in biomedicine*  
Park, J. M., Josan, S., Grafendorfer, T., Yen, Y., Hurd, R. E., Spielman, D. M., Mayer, D.  
2013; 26 (10): 1197-1203
- **Metabolic Imaging of Patients with Prostate Cancer Using Hyperpolarized [1-C-13]Pyruvate** *SCIENCE TRANSLATIONAL MEDICINE*  
Nelson, S. J., Kurhanewicz, J., Vigneron, D. B., Larson, P. E., Harzstark, A. L., Ferrone, M., Van Criekinge, M., Chang, J. W., Bok, R., Park, I., Reed, G., Carvajal, L., Small, et al  
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- **Perfusion and diffusion sensitive C-13 stimulated-echo MRSI for metabolic imaging of cancer** *MAGNETIC RESONANCE IMAGING*  
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2013; 26 (6): 607-612
- **Metabolic response of glioma to dichloroacetate measured in vivo by hyperpolarized C-13 magnetic resonance spectroscopic imaging** *NEURO-ONCOLOGY*  
Park, J. M., Recht, L. D., Josan, S., Merchant, M., Jang, T., Yen, Y., Hurd, R. E., Spielman, D. M., Mayer, D.  
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- **Hyperpolarized 13C metabolic imaging using dissolution dynamic nuclear polarization** *JOURNAL OF MAGNETIC RESONANCE IMAGING*  
Hurd, R. E., Yen, Y., Chen, A., Ardenkjaer-Larsen, J. H.  
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- **Metabolite kinetics in C6 rat glioma model using magnetic resonance spectroscopic imaging of hyperpolarized [1-13C]pyruvate** *MAGNETIC RESONANCE IN MEDICINE*  
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- **Application of hyperpolarized [1-13C]lactate for the in vivo investigation of cardiac metabolism** *NMR IN BIOMEDICINE*  
Mayer, D., Yen, Y., Josan, S., Park, J. M., Pfefferbaum, A., Hurd, R. E., Spielman, D. M.  
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- **Fast volumetric imaging of ethanol metabolism in rat liver with hyperpolarized [1-13C]pyruvate** *NMR IN BIOMEDICINE*  
Josan, S., Spielman, D., Yen, Y., Hurd, R., Pfefferbaum, A., Mayer, D.  
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- **Simultaneous investigation of cardiac pyruvate dehydrogenase flux, Krebs cycle metabolism and pH, using hyperpolarized [1,2-C-13(2)]pyruvate in vivo** *NMR IN BIOMEDICINE*  
Chen, A. P., Hurd, R. E., Schroeder, M. A., Lau, A. Z., Gu, Y., Lam, W. W., Barry, J., Tropp, J., Cunningham, C. H.  
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- **Spectral-spatial excitation for rapid imaging of DNP compounds** *NMR IN BIOMEDICINE*  
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- **Quantification of in vivo metabolic kinetics of hyperpolarized pyruvate in rat kidneys using dynamic C-13 MRSI** *NMR IN BIOMEDICINE*  
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- **In vivo MRSI of hyperpolarized [1-C-13]pyruvate metabolism in rat hepatocellular carcinoma** *NMR IN BIOMEDICINE*  
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- **In vivo application of sub-second spiral chemical shift imaging (CSI) to hyperpolarized C-13 metabolic imaging: Comparison with phase-encoded CSI** *JOURNAL OF MAGNETIC RESONANCE*  
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- **Kinetic modeling of hyperpolarized C-13(1)-pyruvate metabolism in normal rats and TRAMP mice** *JOURNAL OF MAGNETIC RESONANCE*  
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