Resource Summary Report

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Center for Magnetic Resonance Research

RRID:SCR_003148
Type: Tool

Proper Citation

Center for Magnetic Resonance Research (RRID:SCR_003148)

Resource Information

URL: http://www.cmrr.umn.edu/

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Description: Biomedical technology research center that focuses on development of unique magnetic resonance (MR) imaging and spectroscopy methodologies and instrumentation for the acquisition of structural, functional, and biochemical information non-invasively in humans, and utilizing this capability to investigate organ function in health and disease. The distinctive feature of this resource is the emphasis on ultrahigh magnetic fields (7 Tesla and above), which was pioneered by this BTRC. This emphasis is based on the premise that there exists significant advantages to extracting biomedical information using ultrahigh magnetic fields, provided difficulties encountered by working at high frequencies corresponding to such high field strengths can be overcome by methodological and engineering solutions. This BTRC is home to some of the most advanced MR instrumentation in the world, complemented by human resources that provide unique expertise in imaging physics, engineering, and signal processing. No single group of scientists can successfully carry out all aspects of this type of interdisciplinary biomedical research; by bringing together these multi-disciplinary capabilities in a synergistic fashion, facilitating these interdisciplinary interactions, and providing adequate and centralized support for them under a central umbrella, this BTRC amplifies the contributions of each of these groups of scientists to basic and clinical biomedical research. Collectively, the approaches and instrumentation developed in this BTRC constitute some of the most important tools used today to study system level organ function and physiology in humans for basic and translational research, and are increasingly applied world-wide. CMRR Faculty conducts research in a variety of areas including: * High field functional brain mapping in humans; methodological developments, mechanistic studies, and neuroscience applications * Metabolism, bioenergetics, and perfusion studies of human pathological states (tumors, obesity, diabetes, hepatic encephalopathy, cystic fibrosis, and psychiatric disorders) * Cardiac bioenergetics under normal and pathological conditions * Automated magnetic field shimming methods that are critical for spectroscopy and ultrafast imaging at high magnetic fields * Development of high field magnetic resonance imaging and spectroscopy techniques for anatomic,

physiologic, metabolic, and functional studies in humans and animal models * Radiofrequency (RF) pulse design based on adiabatic principles * Development of magnetic resonance hardware for high fields (e.g. RF coils, pre-amplifiers, digital receivers, phased arrays, etc.) * Development of software for data analysis and display for functional brain mapping.

Abbreviations: CMRR

Synonyms: NMR Imaging and Localized Spectroscopy

Resource Type: access service resource, biomedical technology research center, service resource, training resource

Keywords: mri, imaging, magnetic resonance spectroscopy, clinical, core facility, in vivo, brain mapping

Funding: NCRR ;
NIH Blueprint for Neuroscience Research ;
NIBIB ;
W. M. Keck Foundation

Availability: Free, Freely available

Resource Name: Center for Magnetic Resonance Research

Resource ID: SCR_003148

Alternate IDs: nif-0000-00563

Record Creation Time: 20220129T080217+0000

Record Last Update: 20260821T193655+0000

Ratings and Alerts

No rating or validation information has been found for Center for Magnetic Resonance Research.

No alerts have been found for Center for Magnetic Resonance Research.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 5 mentions in open access literature.

Listed below are recent publications. The full list is available at NIF .

Welbourne LE, et al. (2021) The transverse occipital sulcus and intraparietal sulcus show neural selectivity to object-scene size relationships. Communications biology, 4(1), 768.

Alfaro-Almagro F, et al. (2021) Confound modelling in UK Biobank brain imaging. NeuroImage, 224, 117002.

Legon W, et al. (2020) A retrospective qualitative report of symptoms and safety from transcranial focused ultrasound for neuromodulation in humans. Scientific reports, 10(1), 5573.

Chu SH, et al. (2018) Function-specific and Enhanced Brain Structural Connectivity Mapping via Joint Modeling of Diffusion and Functional MRI. Scientific reports, 8(1), 4741.

Chandra S, et al. (2016) Effects of Dorzolamide on Retinal and Choroidal Blood Flow in the DBA/2J Mouse Model of Glaucoma. Investigative ophthalmology & visual science, 57(3), 826.