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Improved and adjustable hyperpolarized magnetic resonance imaging (MRI) method

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BRIEF DESCRIPTION

Researchers at UCSF and Stanford have developed an improved method for hyperpolarized magnetic resonance imaging (MRI) and magnetic resonance spectroscopic imaging (MRSI) that increases the observation window while minimally disturbing substrates, allowing for optimal imaging of both substrates and metabolic products. This method can also be tailored to control the parameters required for optimal imaging of individual compounds

FULL DESCRIPTION

Background
Magnetic resonance imaging (MRI) is a powerful, non-invasive and safe medical procedure allowing detailed imaging of internal structures for the diagnosis of injuries and disease. Unlike CT scans and X-rays, which use ionizing radiation, MRI utilizes magnetic fields and radio waves. MRI and MRSI with hyperpolarized substrates distinctively allows for the localized metabolic imaging of a sample or area of a patient to detect cellular activity, with higher sensitivity than conventional approaches. Changes in molecular markers, such as metabolites, can indicate both the progression and specificity of a disease. The current limitations of hyperpolarized MRI/MRSI are narrow observation windows (limited to several minutes for 13C pyruvate substrate) and low resolution.

Invention
Researchers at UCSF and Stanford have developed an improved hyperpolarized MRI/MRSI method that increases the observation window and maximizes the signal. The method minimally perturbs the substrates, allowing for greater conversion from substrates to products. Furthermore, the newly designed multiband excitation pulses can be modified to meet the imaging needs of specific compounds.

ADVANTAGES

- ▶ Increased observation window.
- ▶ Minimally perturbs substrates, allowing optimal observation of both substrates and products.
- ▶ Flexibility: multiband excitation pulses can be tailored based on specific imaging needs.

APPLICATIONS

- ▶ Metabolic MRI/MRSI diagnostic exams.
- ▶ Dynamic imaging of hyperpolarized substrates and metabolic products for research and clinical use.

PATENTS AND PARTNERSHIP OPPORTUNITIES

For more information please refer to US Patent No: 7795868. Non-exclusive licenses are available.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,795,868	09/14/2010	2011-002

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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OTHER INFORMATION

KEYWORDS

MRI, diagnostic imaging,

MRSI, magnetic resonance imaging

- CATEGORIZED AS**
- ▶ Medical
 - ▶ Diagnostics
 - ▶ Imaging

RELATED CASES

2011-002-0

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