



Improved Phantom for Iron and Fat Quantification MRI

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WARF: P150328US01

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a more accurate water-fat-iron phantom.

Overview

The ability to quantify fat concentration in the body has become increasingly important given the rise in obesity and related comorbidities. Likewise, the ability to quantify iron concentration is important for monitoring patients receiving treatment for hemochromatosis (an iron overload disorder) as well as routine blood transfusions (i.e., hemosiderosis).

Since fat and iron often coexist in organs such as the liver, pancreas and bone marrow, MRI-based quantification techniques have developed rapidly over the past decade to meet this challenge. Validating these techniques using MR phantoms is a critical prerequisite to their widespread clinical translation. However, current phantom designs for fat and iron do not accurately replicate the signal behavior observed *in vivo* and therefore are not reliable.

The Invention

UW–Madison researchers have designed a phantom that accurately reflects *in vivo* MRI signal behavior in the presence of both fat and iron. The key innovation is that the new phantom is constructed using a lipid emulsion substrate with superparamagnetic iron oxide (SPIO) particles that are proportionately larger than the fat particles, such that the field from those particles encompasses the entirety of the fat signals.

Applications

- Quality assurance/calibration phantom for MR systems, specifically for fat-iron quantification imaging protocols

Key Benefits

- More accurate and reliable
- Constructed with commercially available materials
- Designed to achieve a wide range of fat and iron concentrations

Stage of Development

Initial experiments have demonstrated that the larger microspheres result in single R^2 signal decay behavior that closely mimics that of water and fat *in vivo*.

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Additional Information

For More Information About the Inventors

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Related Technologies

- [See WARF reference number P120356US01 for information about the researchers' improved method for detecting iron overload with MRI.](#)

Tech Fields

- [Medical Imaging : MRI](#)

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867

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