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# Intellectual Property Status:

Patent Pending

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# A Dual CT/MRI Nanoparticle Contrast Agent

#### AzTE Case # M10-067

## **Invention Description**

Non-invasive imaging systems, such as MRI and CT, have become an essential part of modern medicine for obtaining the information necessary to diagnose various diseases. MRI contrast agents have been tested in imaging cancers of the liver, the spleen, and the gastrointestinal tract as well as in imaging cardiovascular diseases.

Researchers at the Biodesign Institute of Arizona State University have developed a new contrast agent that can be used for both CT scanning and MRI imaging. The contrast agent is a tungsten-iron ferritin nanoparticle with spin lattice (T1) and spin-spin (T2) relaxivities of 4,497 mM<sup>-1</sup>s<sup>-1</sup> and 458,143 mM<sup>-1</sup>s<sup>-1</sup> per particle, respectively. The nanoparticle has a visibility in CT at concentrations of 20mM of tungsten.

Several previous techniques have relied on unloading native ferritin and re-incorporation of iron into the core, often resulting in a polydisperse sample. Simplifying the technique, the present contrast agent uses a commercially available horse spleen apoferritin to create a monodisperse and homogenous solution. The solution contains magnetic properties that can be utilized for magnetic resonance imaging of molecular events.

# **Potential Applications**

- Magnetic resonance imaging contrast
- Enhancement agents
- Non-invasive imaging of drug delivery

### **Benefits and Advantages**

- High-relaxivity and functional contrast agents for MRI
- Labels malignant cells allowing for specific tissue targeting