# AREAS FOR INNOVATION IN MRI ENHANCEMENT

## **METAL-BASED**

Gadolinium Manganese Iron

### **METAL-FREE**

Chemical exchange saturation transfer (CEST) Organic radical contrast agents (ORCAs)

#### Gadolinium

Gd-based agents are in development to increase relaxivity and potentially enable a reduction in dose

#### Manganese

Alternative to GBCAs with a comparable relaxivity

#### **CEST**

**ORCAs** 

Magnetic interaction of

Diamagnetic molecules with exchangeable protons in amine, amide, and hydroxyl groups

Favorable for imaging metastatic disease, long intravascular half-life, superior CE-MRA, superparamagnetic property

#### Iron

unpaired electrons on organic radical molecules and nearby water protons to modulate MR contrast

#### Image processing

The fields of radiomics, machine learning, and AI have made substantial progress but lack the clinical studies proving reproducibility