

# AREAS FOR INNOVATION IN MRI ENHANCEMENT

## METAL-BASED

### Gadolinium

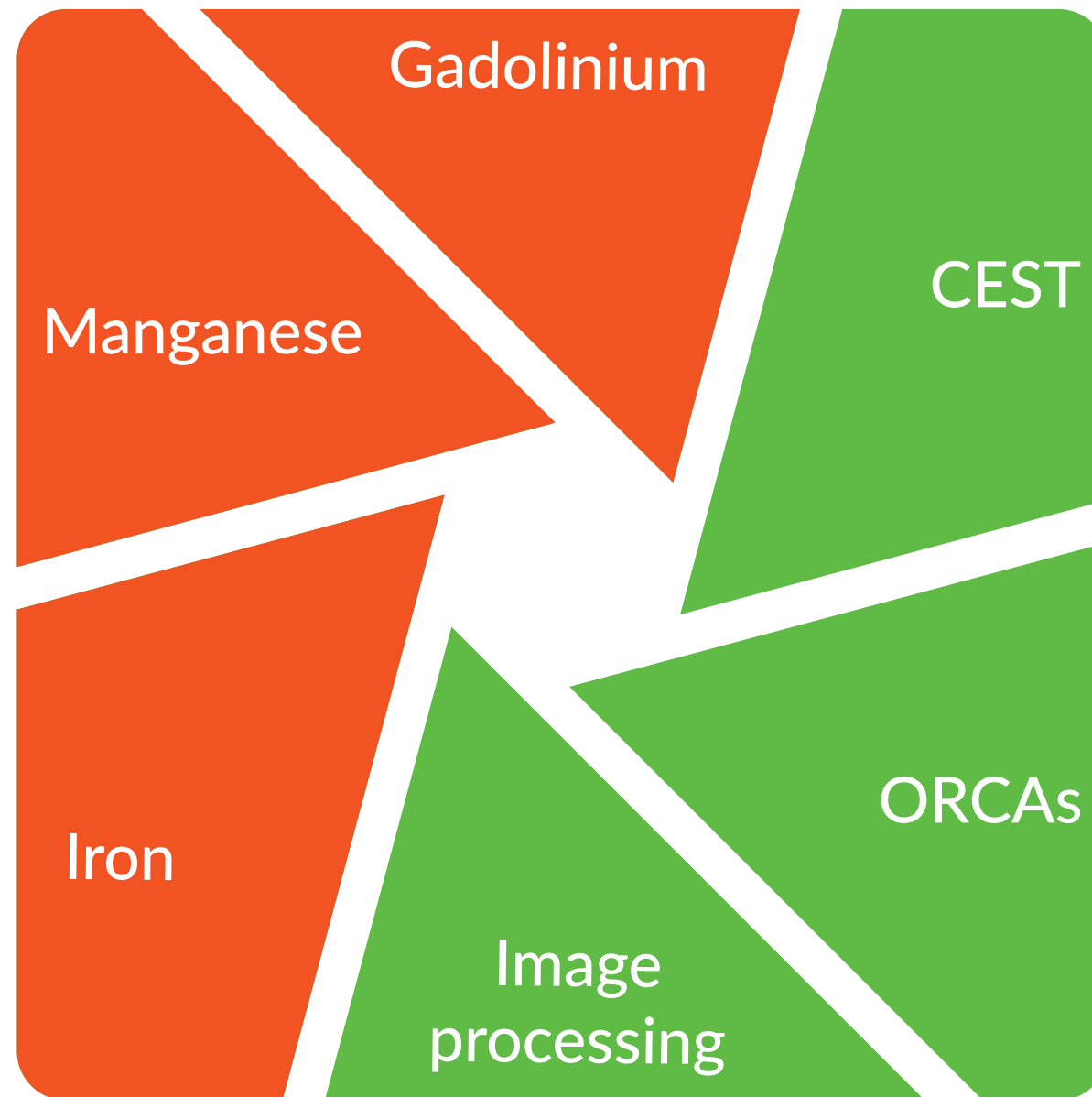
Gd-based agents are in development to increase relaxivity and potentially enable a reduction in dose

### Manganese

Alternative to GBCAs with a comparable relaxivity

### Iron

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



## METAL-FREE

### CEST

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

### ORCAs

Magnetic interaction of 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