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Imaging life and death - using MRI to detect cellular function and metabolism

For patients, specific non-invasive imaging strategies for early-stage disease characterization and evaluation of response to therapy are not available at a satisfactory level so far, creating a pressing need for innovative technologies. The goal of my research is to develop novel non-invasive magnetic resonance imaging biomarkers for the characterization of tissue physiology, metabolism and response to therapy. Here, I will present recent developments from our group on pH-sensitive hyperpolarized molecules, multimodal metabolic imaging and advanced diffusion MRI techniques for detection of early cell death. Their translation from preclinical discoveries to clinical implementation will be covered and their potential clinical value will be discussed.