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Treatment responses to immune checkpoint inhibitor therapy evaluated by MRI

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Abstract

Although immune checkpoint blockade (ICB) therapy has been widely used as a promising treatment option, the evaluation for its efficacy relies on the change in tumor size, which can delay the clinical decision-making because strong immune response often causes temporary tumor swelling called pseudo-progression. Thus, developing new imaging approach to evaluate the early physiological changes inside of the treated tumor is of great importance. Our laboratory is equipped with Electron Paramagnetic Resonance (EPR) scanner and hyperpolarized ^{13}C MRI capable of in vivo oximetry and metabolic imaging, respectively. By using these imaging modalities as well as conventional ^1H MRI, we identified useful functional/metabolic imaging biomarkers for early detection of the therapeutic effect of ICB therapy.

Anti-cancer effect in parts of the body that were not the direct target of local therapy is called abscopal effect. Although abscopal effect induced by local radiation therapy is rarely observed, the occurrence is much higher when combined with ICB treatment. We are investigating functional/metabolic factors affecting the occurrence of abscopal effect by ICB+radiation therapy in an ongoing study. The results from this study will also be presented.
