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Titel des Beitrags: Bolus tracking for improved metabolic imaging of hyperpolarised compounds.

Abstract: Dynamic nuclear polarisation has enabled real-time metabolic imaging of pyruvate and its metabolites. Conventional imaging sequences rely on predefined settings and do not account for intersubject variations in biological parameters such as perfusion. We present a fully automatic real-time bolus tracking sequence for hyperpolarised substrates which starts the imaging acquisition at a defined point on the bolus curve. This reduces artefacts due to signal change and allows for a more efficient use of hyperpolarised magnetisation. For single time point imaging methods, bolus tracking enables a more reliable and consistent quantification of metabolic activity. An RF excitation with a small flip angle is used to obtain slice-selective pyruvate tracking information in rats. Moreover, in combination with a copolarised urea and pyruvate injection, spectrally selective tracking on urea allows obtaining localised bolus tracking information without depleting the pyruvate signal. Particularly with regard to clinical application, the bolus tracking technique could provide an important step towards a routine assessment protocol which removes operator dependencies and ensures comparable results.

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