Regional forskningskonferanse 2017
Mal for abstracts

Sammendraget skal ha maksimum 250 ord.
Ferdig utfylt mal må lagres før den sendes til nina.slind@stolav.no innen 7. april.
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Tittel:
Robust detection of 2-hydroxyglutarate at 7T high field with a fully adiabatic LASER sequence

Formål:
Accumulation of 2-HG metabolite in glioma patients that harbor isocitrate dehydrogenase (IDH) mutation is associated with improved clinical outcome and response to treatment[1]. Therefore, unambiguous and robust detection of this oncometabolite can benefit accurate gliomas stratification and targeted therapy. In this work we aimed to optimize a fully adiabatic LASER sequence that can compensate better the B1 inhomogeneity for robust detection of 2-HG at high field 7T.

Metode:
2HG, Glu, and Gln spectra were simulated for different echo timings of a LASER[2] sequence at 7T. The best timing combinations for LASER sequence, i.e. TE1,TE2 and TE3 combination, were searched (Fig.1) by simulations to provide a unique behavior of 2-HG resonances compared with simultaneous decreased amplitude and/or opposite modulation of the neighboring metabolite resonances. The candidate timing intervals in our LASER sequence were verified experimentally on phantoms containing 10mM 2-HG and identical concentration of Glu and Gln, and 20mM of glycine.

Resultat:
A LASER sequence with TE=90ms (TE1/TE2/TE3=15/45/30ms) provided a large negative 2-HG resonance at 2.25ppm well separated from those of overlapped resonances. The same 2HG resonance pattern was observed in MR spectra obtained from phantoms

applying the same timing intervals(Fig.2), accompanied with reduced levels of overlapping peaks Glu and Gln(Fig.3).

Konklusjon:

The proposed sequence timing of our LASER sequence may provide unambiguous detection of 2-HG at 7T clinical scanner. Our preliminary results from simulations and phantoms are currently under investigation in patients. Further, this technique provides a great opportunity to monitor the effect of new anti-cancer drugs that target mutant-IDH enzymes.

References:

1. Yan, H. et al. *New Engl J of Med* (2009).
2. Andronesi, O.C. et al. *JMR* (2010).