

Resolving the 2.1 ppm Allylic Fatty Acid Resonance with Magnetic Resonance Spectroscopy (MRS) at 3 T



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Introduction

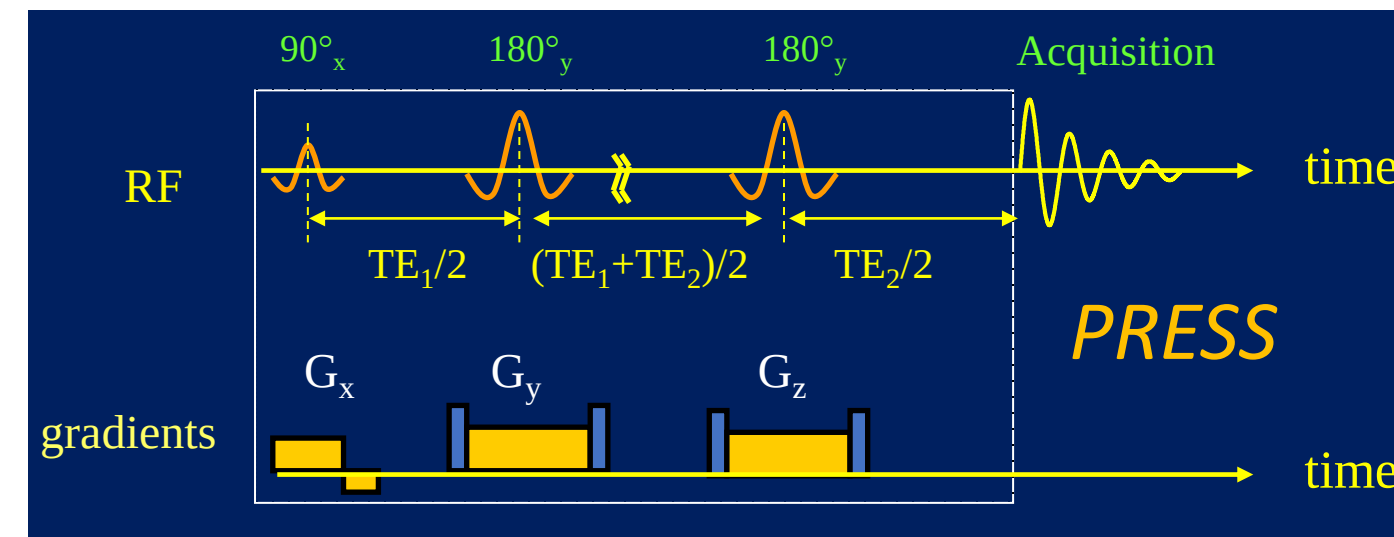
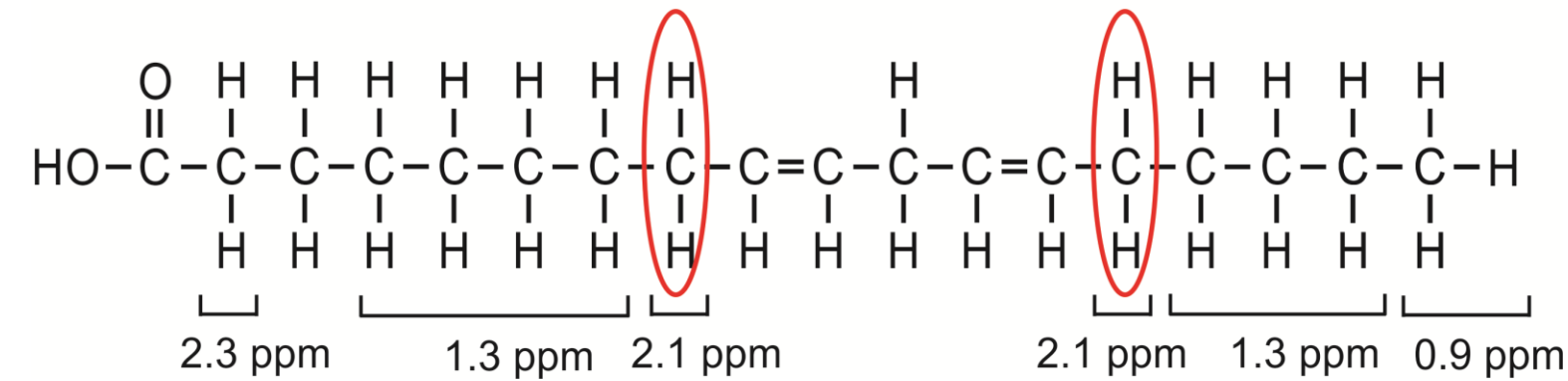
- Fat unsaturation measures can be obtained *in vivo* through the ≈ 2.1 ppm allylic resonance.
- At clinical field strengths, the resonance overlaps with that of the ≈ 2.3 ppm protons with standard short echo time (TE) methods.

Purpose: Determine TE times for two commonly employed *in-vivo* MRS sequences, PRESS and STEAM, that resolve the 2.1 ppm fat resonance from that at 2.3 ppm at 3 T.

Methods

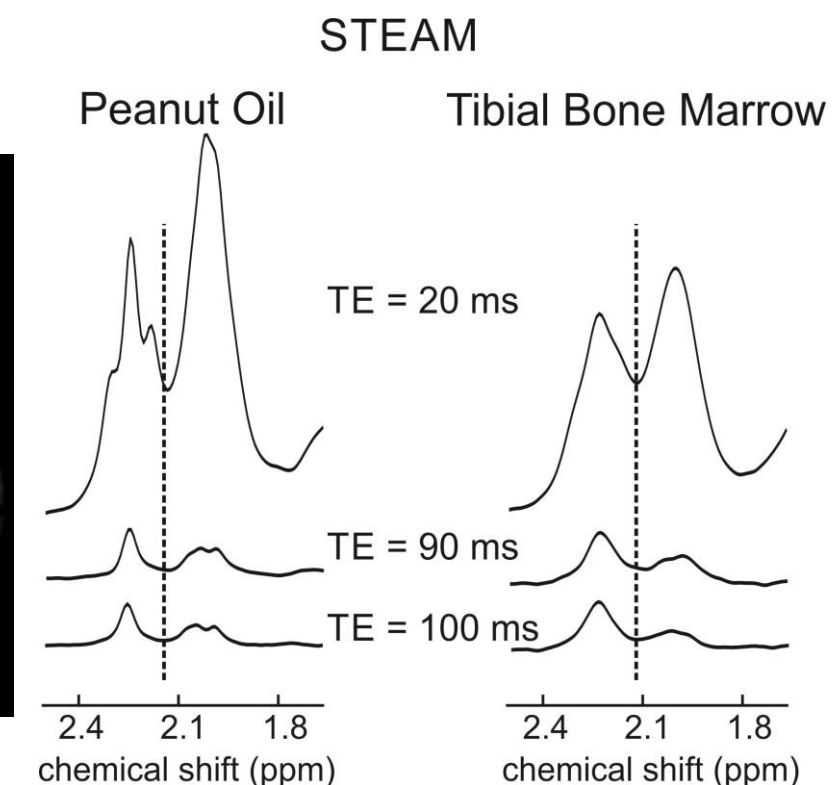
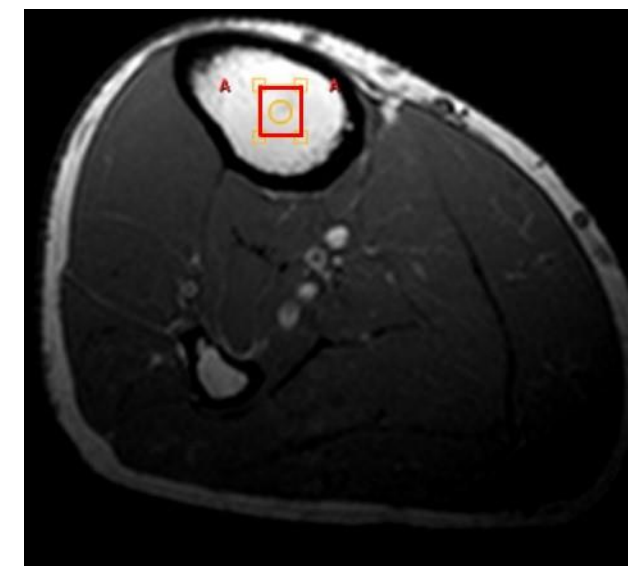
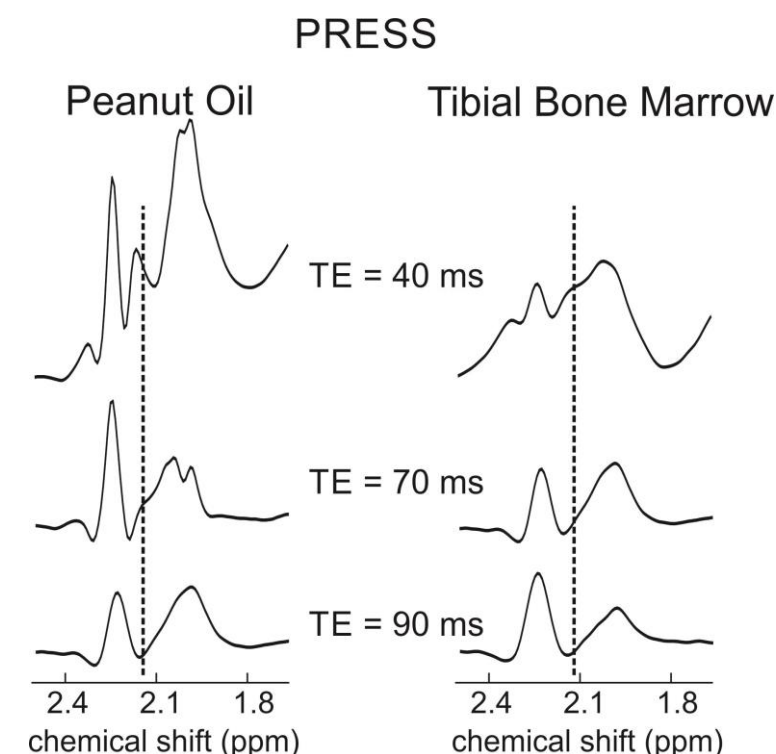
- Spectra were acquired from peanut oil with a PRESS sequence ($TE_1 = 17$ ms) and a STEAM (TM = 20 ms) sequence at 3 T at a number of TEs.
- *In vivo* spectra were obtained from tibial bone marrow of a healthy volunteer.

Linoleic acid



Results and Discussion

- PRESS with total TE values of 70 ms and 90 ms and STEAM with TE values of 90 ms and 100 ms resolve the allylic resonance from that at 2.3 ppm at 3 T.
- PRESS spectra are better resolved and yield higher signal than those of STEAM.
- However, the STEAM spectra do not exhibit negative side lobes. A TE of 100 ms was previously shown to be suitable for resolving the olefinic resonance from that of water at 3 T¹, rendering it suitable for quantifying multiple resonances.



References

1. Journal of Magnetic Resonance Imaging, 2015; 41:481-486

Acknowledgments

We are grateful to the Natural Sciences and Engineering Research Council of Canada for funding.