Magnetic resonance spectroscopy of the brain.

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Abstract
Proton magnetic resonance (MR) spectroscopy of the brain is a non-invasive, in vivo technique that allows investigation into regional chemical environments. Its complementary use with MR imaging sequences provides valuable insights into brain tumour characteristics, progression and response to treatment. Additionally, its sensitivity to brain dysfunction in the presence of apparently normal structural imaging has galvanised interest in its use as a biomarker of neurodegenerative disorders such as Alzheimer's disease. Accordingly, its integration into clinical imaging protocols within many neuroscience centres throughout the world is increasing. This growing attention is encouraging but if the potential of MR spectroscopy is to be realised, fundamental questions need to be addressed, such as reproducibility of the technique and the biochemistry that underpins the neurometabolites measured. Failure to resolve these issues will continue to hinder the extent and accuracy of conclusions that can be drawn from its data. In this review we discuss the issues regarding MR spectroscopy in the brain with particular attention paid to its technique. Key examples of current clinical applications are provided and future directions are discussed.

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