Abstract Submitted
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Tracking leucine metabolism in prostate cancer cells via ^{13}C NMR spectroscopy[1] CHRISTOPHER PARISH, PETER NIEDBALSKI, FATEMEH KASHAMI, QING WANG, LLOYD LUMATA, University of Texas at Dallas — Nuclear magnetic resonance (NMR) spectroscopy is relatively insensitive due to the weak magnetic moments of nuclei, especially those with low gyromagnetic ratio (γ) such as ^{13}C (γ = 10.705 MHz/T). Fortunately, a technique known as dynamic nuclear polarization (DNP) enhances the NMR signals by transferring the much higher electron (γ = 28,000 MHz/T) polarization to nuclei. Furthermore, the invention of dissolution DNP in 2003 has expanded DNP's large signal enhancement (more than 10,000-fold) to the biomedical realm. Significantly, dissolution DNP allows real-time tracking of metabolism via labeling the relevant substrate with ^{13}C. This study examined the real-time prostate cancer cell enzyme kinetics involved in the metabolism of [1-^{13}C] alpha-ketoisocaproate [α-KIC] into [1-^{13}C] leucine and vice versa. Results of *in vitro* conventional 13C NMR of cell extracts and hyperpolarized 13C NMR of living prostate cancers cells will be discussed in the context of biochemical kinetics and possible diagnostic application.

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