

Abstract Submitted  
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**Carbon-13 NMR Spectroscopy of Aberrant Beta-Galactosidase  
and Arginase Activities in Cancer**

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—*abstract*—\pard Hyperdrive metabolism is a common occurrence in cancer as more nutrients and raw materials are required to sustain rapid proliferation and growth, non-invasive detection methods for assessing such abnormal metabolic activities could potentially provide definitive diagnostic information of said disease. In this study, we have investigated the feasibility of carbon-13 labeled lactose ureide and arginine as potential biomarkers for the early detection of cancer. In particular, we used  $^{13}\text{C}$  nuclear magnetic resonance (NMR) spectroscopy to track the metabolism of two human cancer cell lines with  $^{13}\text{C}$ -lactose ureide and  $^{13}\text{C}$ -arginine, respectively: 1)  $^{13}\text{C}$ -lactose ureide in living MCF-7 breast cancer cells which have upregulated beta-galactosidase activity, and 2)  $^{13}\text{C}$ -arginine metabolism in HuH7 hepatocarcinoma cells. NMR data on the metabolic results will be discussed in view of their potential as non-invasive, in-vivo biomarkers for cancer. This study is supported by the Welch Foundation grant AT-1877-20180324, DOD grants W18XWH-17-1-0303 and W81XWH-19-1-0741, Cancer Prevention and Research Institute of Texas (CPRIT) grant RP180716, and the UTD Collaborative Biomedical Research Award (CoBRA).\pard-/abstract-\

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