Distinguishing Immunotherapy Resistant and Sensitive Melanoma Xenografts Using ^{13}C-MRS of Hyperpolarized Pyruvate and ^{1}H-NMR Metabolomics

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Session Title: Novel Imaging Modalities and Applications

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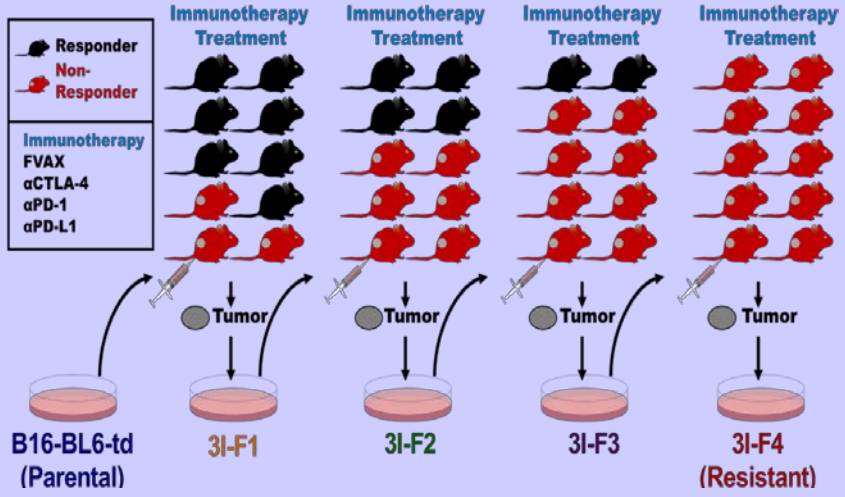
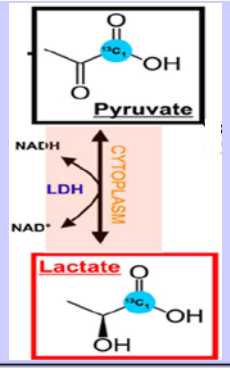
THE UNIVERSITY OF TEXAS MD Anderson Cancer Center

Immunotherapy has been a great success for some cancer patients, helping their own immune systems attack the cancer cells. But these treatments do not always help. We have been researching for answers as to why some have great responses to immunotherapy and others don't by employing preclinical mouse model of B16 melanoma.

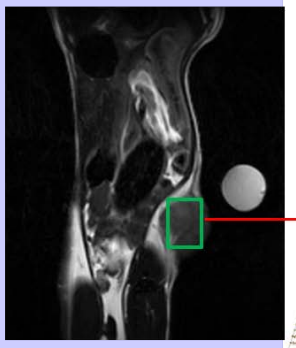
Experimental Design & Key Results

Evolve Immunotherapy Resistant Strains of B16 Melanoma

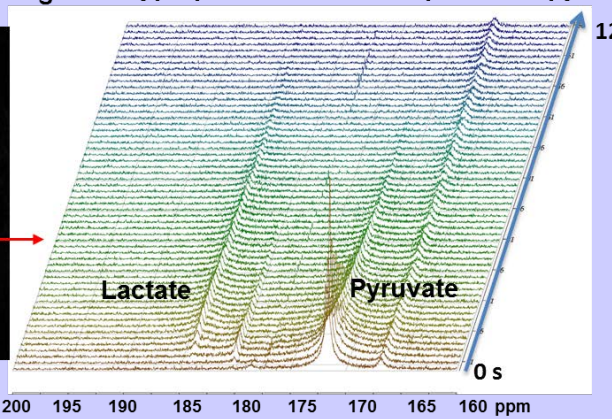


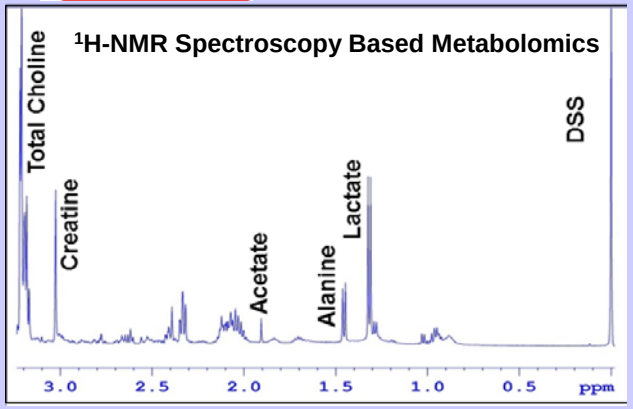


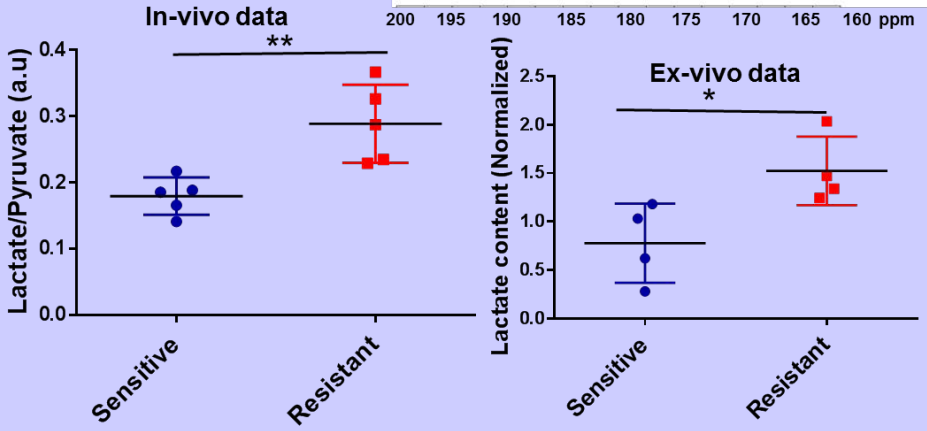
T_2-weighted Coronal MR Image



Hyperpolarized ^{13}C-MR Spectroscopy







Our experimental data suggest that checkpoint blockade immunotherapy resistant tumors acquired hypermetabolic state with upregulated glycolysis and acidic microenvironment to evade the immune response.

Resistant tumors show significantly higher glycolytic metabolism and downstream lactate production.

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