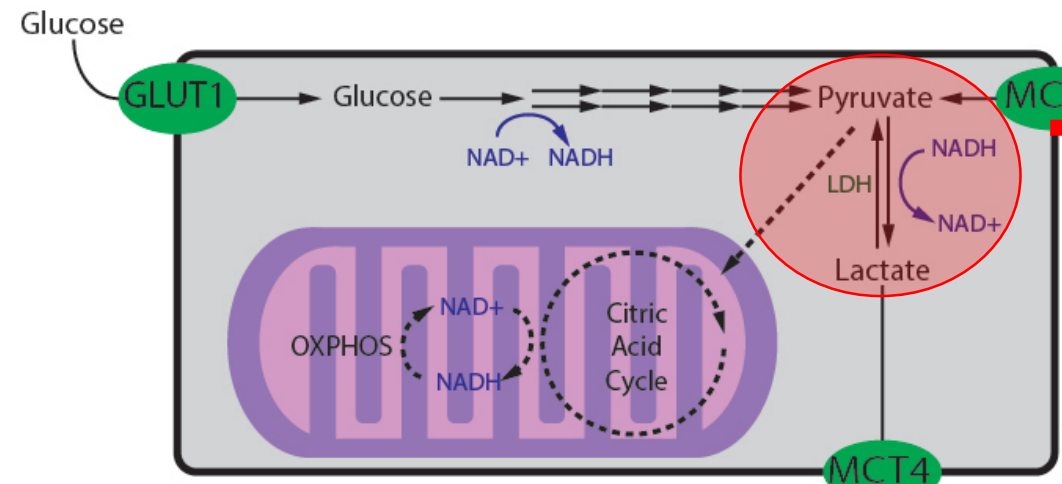# Analysis of closed-form pharmacokinetic modeling and doxycycline to quantify tumor metabolism variations using hyperpolarized [1-13C]-pyruvate magnetic resonance imaging
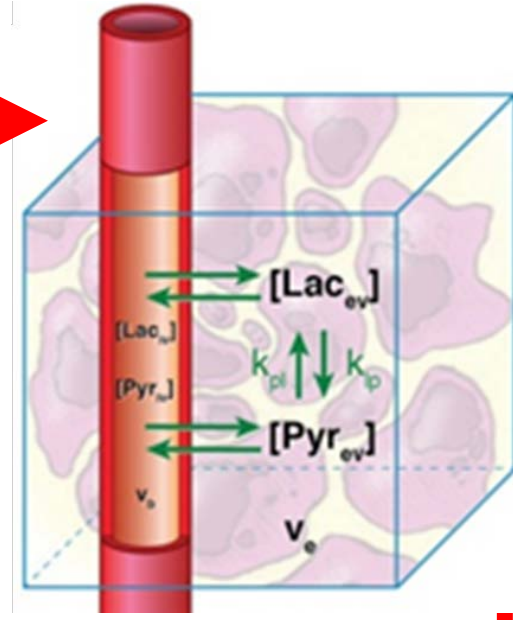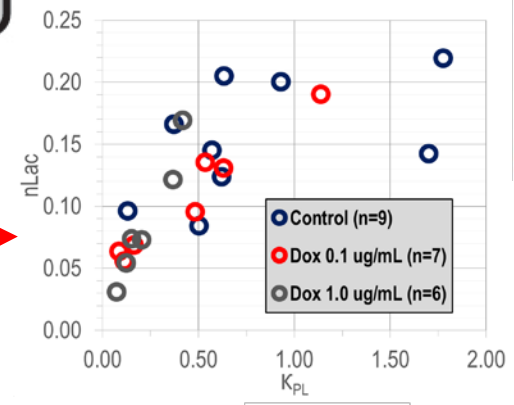

Hyperpolarized [1-13C]-pyruvate is a probe of aerobic glycolysis via the conversion of pyruvate-to-lactate

1.) We want to understand tumor metabolism (i.e., aerobic glycolysis)

Doxycycline is used to reduce K_{pl} (conversion of pyr-to-lac); K_{lp} is zero

2.) Can we alter tumor metabolism to improve pharmacokinetic modeling?

3.) _Doxycycline_ (antibiotic) may suppress tumor metabolism by inhibiting LDH, thereby providing control over this process

4.) This effect was tested _in vitro_ using _Doxycycline_ and anaplastic thyroid carcinoma cells in a 300 MHz NMR spectrometer

6.) Conclusion: This methodology can serve as a fundamental approach to robustly probe tumor metabolism using hyperpolarized [1-13C]-pyruvate imaging

5.) Increasing doxycycline dose reduces K_{pl}

By: Joshua Niedzielski, PhD
Session: Emerging and Preclinical Modalities
Date: 7/29/2018
Time: 4-6 pm