Our findings caution against the use of indiscriminate mitochondrial inhibitors for cancer treatment.

Ilya Boykov
Mentor: Kelsey Fisher-Wellman
Department of Physiology

In situ quantification of mitochondrial bioenergetics reveals disparate OXPHOS kinetics between mouse colorectal cancer cells and healthy tissues

Ilya N Boykov1,2, Margaret Am Nelson1,2, Kelsey L McLaughlin1,2, James T Hagen1,2, Hannah S Coalsin1,2, McLane M Montgomery1,2, Kelsey H Fisher-Wellman1,2

1Department of Physiology, Brody School of Medicine, East Carolina University, Greenville, United States.
2East Carolina Diabetes and Obesity Institute, East Carolina University, Greenville, United States.

For references and more data scan here: fisherwellmanlab.com

RESULTS

In situ quantification of mitochondrial bioenergetics reveals disparate OXPHOS kinetics between mouse colorectal cancer cells and healthy tissues

Our findings caution against the use of indiscriminate mitochondrial inhibitors for cancer treatment.

Figure 1: Mitochondrial complex enrichment depicted as % of max content for each complex. Statistics: two-way ANOVA in relationship to colon. *P<0.0332

Figure 3: Complex IV proteome. We investigated intrinsic differences in the mitochondrial proteome across the groups. In this figure we depict complex IV proteins per group. N=4/group

Figure 4: AOM-DSS colorectal cancer mouse model. Respiration data from the PCR titration and FCCP titration protocol in permeabilized tumor and colon strips (normal). Data was normalized to wet weight of tissue. Statistics: two-way ANOVA N=8/Group *P<0.05

Results: Despite minimal differences between CRC and normal mouse colon, in cardia myofibers, both total respiratory capacity and OXPHOS conductance were >5-fold higher when adjusted to total protein and >2-fold when adjusted to mitochondrial protein.