Mitochondrial activity in lung tumors predicts response to drug inhibitor

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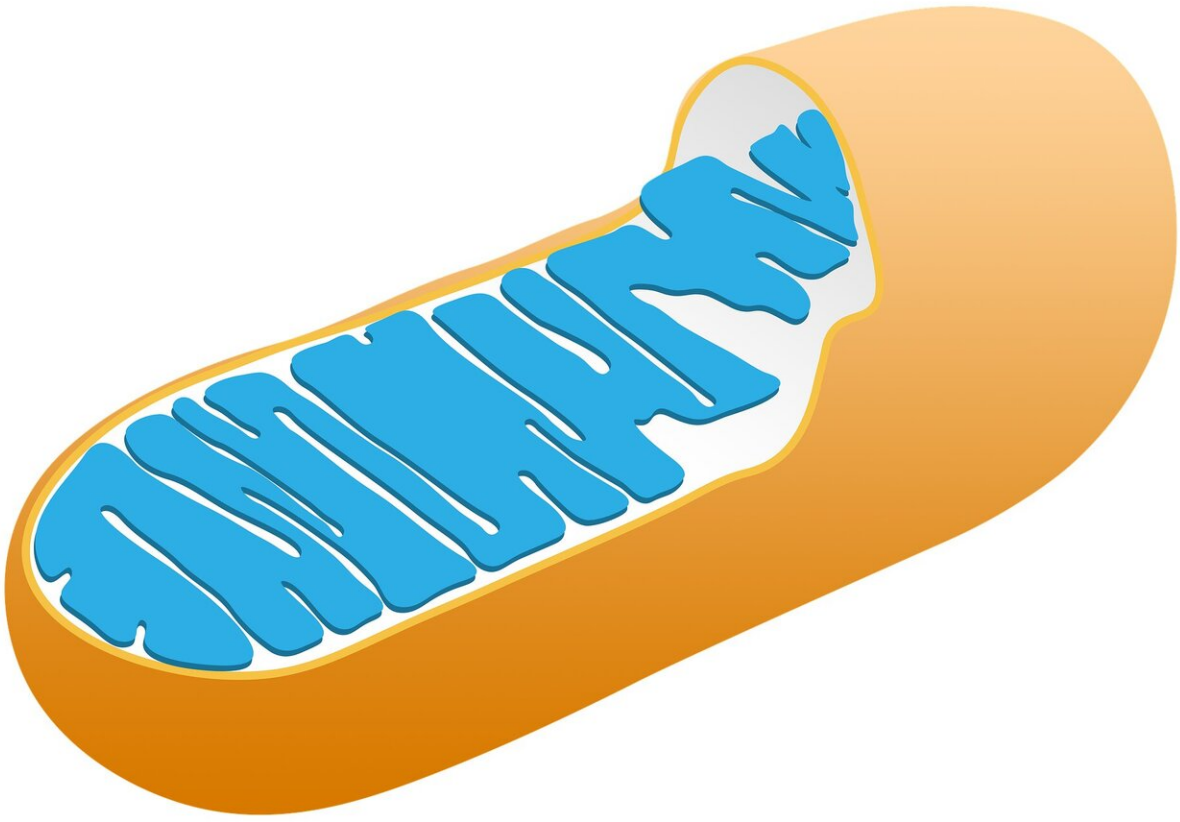

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Researchers at the UCLA Jonsson Comprehensive Cancer Center and David Geffen School of Medicine at UCLA have identified a new biomarker using a noninvasive imaging method that tracks mitochondrial activity in lung tumors. The level of activity could potentially predict which individuals with lung cancer will respond favorably to a complex I inhibitor that targets mitochondrial function and who may be resistant to current therapies. Prior to this study, there has not been a noninvasive way to track mitochondrial activity in lung tumors.

Mitochondria, often referred to as the powerhouse of cells, play a crucial role in sustaining the growth and survival of cancer cells. However, there has not been an effective method to get clear images of mitochondria activity in animals without killing the organism. The challenge for scientist has been to find a noninvasive way to capture an image of the mitochondria in a live organism to better understand how lung tumors may be utilizing the mitochondria to advance their growth.

The team used a voltage-sensitive positron emission tomography (PET) probe, known as 18F-BnTP, to detect mitochondria activity in mouse models of lung cancer. Mice bearing lung tumors were injected with the tracer and lung tumors were scanned using PET imaging. After imaging, the tumors were then surgically removed so the function and activity of the mitochondria could be analyzed.

The findings could help scientists better understand mitochondrial activity in live tumors and shows the level of activity plays a key role in determining if a person's tumor would respond to a complex I inhibitor, potentially guiding treatment decisions for people with lung cancer. The study also demonstrates that PET imaging can successfully be used as a

noninvasive method to read mitochondrial activity in lung tumors.

The study is published online in *Nature*.

The study's senior author is David Shackelford, associate professor of pulmonary and critical care medicine at the David Geffen School of Medicine at UCLA and a member of the Jonsson Cancer Center. The first author is Dr. Milica Momcilovic, a senior research scientist at the Geffen School of Medicine.

More information: In vivo imaging of mitochondrial membrane potential in non-small cell lung cancer, *Nature* (2019). DOI: 10.1038/s41586-019-1715-0 , nature.com/articles/s41586-019-1715-0

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