Non-invasive imaging instead of repeated biopsy in active monitoring of prostate cancer

6 April 2014

Your body's cells have two major interconnected energy sources: the lipid metabolism and the glucose metabolism. Most cancers feed themselves by metabolizing glucose, and thus can be seen in Positron Emission Topography (PET) scans that detect radiolabeled glucose. However, prostate cancers tend to use the lipid metabolism route and so cannot be imaged in this way effectively.

A University of Colorado Cancer Center study being presented today at the American Association for Cancer Research (AACR) Annual Meeting 2014 describes a novel method to "manipulate the lipid metabolism in the cancer cell to trick them to use more radiolabeled glucose, the basis of PET scanning," says Isabel Schlaepfer, PhD, investigator at the CU Cancer Center Department of Pharmacology, and recipient of a 2014 Minority Scholar Award in Cancer Research from AACR.

The current study used the clinically safe drug etomoxir to block prostate cancer cells' ability to oxidize lipids. With the lipid energy source removed, cells switched to glucose metabolism and both cells and mouse models roughly doubled their uptake of radiolabeled glucose.

"Because prostate cancer can be a slow-growing disease, instead of immediate treatment, many men choose active surveillance – they watch and wait. But that requires repeated prostate biopsies. Instead, now we could use this metabolic technique to allow PET imaging to monitor prostate cancer progression without the need for so many biopsies," says Schlaepfer.

Schlaepfer also points out possible therapeutic application of the technique: while immediately useful for imaging, it may be that cutting off a prostate cancer cell's ability to supply itself with energy from lipids could make it difficult for these cells to survive.

Provided by University of Colorado Denver