

Scientists uncover route to tumour's energy supply

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Cancer Research UK scientists have discovered how blocking a key enzyme, which helps convert glucose into energy, could provide a new way to kill prostate cancer cells, according to a study published in the journal *Cancer Discovery* today (Thursday).

Glucose is an important source of energy for all cells. <u>Cancer cells</u> divide much more rapidly than normal cells, and as a result they use up much more <u>glucose</u>. But this also triggers the production of free radicals – destructive molecules that build up and cause DNA damage.

The researchers, based at Cancer Research UK's London Research Institute, found that an enzyme called PFKFB4 is essential for balancing these two processes – making sure the cell's energy needs are met without allowing free radicals to build up and trigger cell death.

Study leader Dr Almut Schulze, said: "Our study suggests that PFKFB4 acts to fine tune the process by which cells convert glucose into energy. Blocking this enzyme in prostate cancer cells grown in the lab stalled growth and triggered a catastrophic build-up of <u>free-radicals</u>, suggesting that it could be a suitable drug target. Importantly, this route to energy production is common to many different types of cancer, suggesting that drugs to target it could potentially be used to treat a variety of cancers."

The researchers investigated the effect of blocking 222 different enzymes and other proteins involved in regulating energy production, on the survival of advanced prostate cancer cells growing in the lab. They



compared this to healthy cells to pinpoint which proteins were key to the survival of the cancer cells.

This revealed two genes – PFKFB4 and PRKAB1 – that showed similar affects across all three cancer cell lines analysed, both of which are known to be more active in <u>prostate cancer</u> cells that have spread, compared to those from the original tumour. Of these two genes, only PFKFB4 was shown to prevent tumour growth when inactivated in mice.

Dr Julie Sharp, senior science information manager at Cancer Research UK, said: "This study highlights the fine line that cancer cells must tread between producing enough <u>energy</u> and limiting damage in order to survive. Finding ways to disrupt this delicate balance is a promising avenue of research that will hopefully pave the way for an exciting new generation of cancer drugs in the future."

More information: Ros S. et al, Functional metabolic screen identifies 6-phosphofructo-2-kinase/fructose-2-6-biphosphatase 4 (PFKFB4) as an important regulator of prostate cancer cell survival (2012), *Cancer Discovery*, doi: 10.1158/2159-8290.CD-11-0234

Provided by Cancer Research UK

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