Medical Xpress

Scientists pinpoint bladder cancer patients to benefit from 'tumour-softening'

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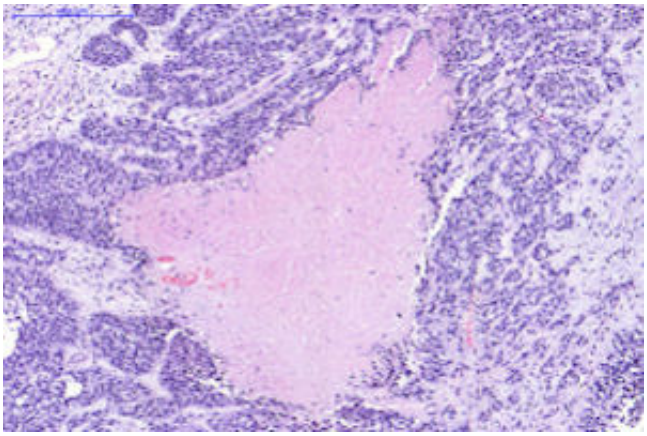

Bladder cancer

Scientists in Manchester have identified a protein that could help doctors decide which bladder cancer patients would benefit from a treatment that makes radiotherapy more effective, according to a study published in the *British Journal of Cancer* (BJC), today (Wednesday).

The team from The University of Manchester, funded by the Medical Research Council, found that patients whose bladder tumour had high levels of a protein, called 'HIF-1α', were more likely to benefit from having carbogen – oxygen mixed with carbon dioxide gas – and nicotinamide tablets at the same time as their radiotherapy. The treatment, called 'CON', makes radiotherapy more effective.

By comparing levels of HIF-1α in tissue samples from 137 patients who had radiotherapy on its own or with CON, the researchers found the protein predicted which patients benefited from having CON. High levels of the protein were linked to better survival from the disease when patients had radiotherapy and CON. Patients with low protein levels did not benefit from having CON with their radiotherapy.

The HIF-1α protein indicates low oxygen levels in tumour cells – a state known as 'hypoxia'. The CON treatment works by adding oxygen to the oxygen-deprived tumour cells which makes them more sensitive to the radiotherapy.

Study author, Professor Catharine West, a Cancer Research UK scientist at The University of Manchester, said: "Although we have another biomarker that can predict responsiveness to CON and radiotherapy in bladder cancer patients, our findings tell us a bit more about the characteristics of bladder cancer tumours and how they may respond to this treatment."

"But we desperately need to do more work to find ways to treat those patients who won't see as much benefit from this.

"And it's exactly this type of vital research that we and other scientists will be doing at the Manchester Cancer Research Centre – bringing together a wide range of expertise to revolutionise cancer treatment."

Around 65 people are diagnosed with bladder cancer in Manchester every year**. There are around 25 deaths from the disease every year***.

Nell Barrie, senior science communications manager at Cancer Research UK, said: "This fascinating new finding could help doctors adapt their treatments to patients with bladder cancer as well as shedding more light

on the disease.

"Deaths from bladder cancer are falling in the UK, but more work needs to be done so that this trend continues. More research is needed to helps us find new and better ways to fight bladder cancer."

More information: Hunter, BA et al. "Expression hypoxia-inducible factor-1α predicts benefit from hypoxia modification in invasive bladder cancer" (2014) *British Journal of Cancer*. DOI: 10.1038/bjc.2014.315

Provided by University of Manchester