

# Discovery could improve radiotherapy for wide range of cancers

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Cancer Research UK scientists have discovered how giving a class of drugs called AKT inhibitors in combination with radiotherapy might boost its effectiveness across a wide range of cancers, according to a study published in the *Journal of Clinical Investigation* today.

Tumours often grow so quickly that some of the cells do not have access to the body's blood supply, causing them to become oxygen-starved. This rapid growth usually sends signals to the cells to die, but in cancers with faults in a gene called p53—present in at least half of all cancers—this signal is blocked meaning the cells carry on growing.

In this study, the researchers found that six genes that help protect the body against cancer were less active in oxygen-starved cancer cells when p53 was also faulty.

In the absence of two of these genes—PHLDA3 and INPP5D—a gene called AKT becomes permanently switched on preventing the [cells](#) from dying despite being oxygen-starved.

When drugs designed to block AKT were given to mice with tumours and lab-grown [cancer cells](#) lacking p53, the radiotherapy killed more [tumour cells](#).

Importantly, lower activity in these genes was also linked to poorer survival in patients with a variety of different cancers. This suggests that adding AKT inhibitors to radiotherapy could be an effective way to treat many cancers.

Study leader Dr. Ester Hammond, a Cancer Research UK scientist at the University of Oxford, said, 'this exciting discovery sheds light on the role of oxygen starvation in cancer development and suggests that drugs already being trialled in cancer patients could potentially boost the effectiveness of radiotherapy across a range of cancers. We hope that this important piece of the jigsaw will support ongoing efforts to develop drugs that enhance radiotherapy, so that even more patients can benefit from this cornerstone of cancer treatment.'

Eleanor Barrie, Cancer Research UK's senior science information

manager, said, 'advances in how we give radiotherapy and use it in combination with other treatments have the potential to improve survival for thousands of cancer patients. More than half of all [cancer patients](#) receive [radiotherapy](#) as part of their treatment, so anything that can be done to improve its effectiveness is potentially great news for patients.'

**More information:** Leszczynska et al, Hypoxia-induced p53 modulates both apoptosis and radiosensitivity via AKT, *J Clin Invest* (2015), [DOI: 10.1172/JCI80402](https://doi.org/10.1172/JCI80402)

Provided by Cancer Research UK

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