

Light, chemistry, action -- a new technique to target skin cancers?

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Targeted photodynamic therapy can completely eradicate some models of cancer, according to the latest research by UK and Swiss scientists, published in the current issue of the *British Journal of Cancer*.

The team – including researchers from the University of Hull and ETH Zurich – linked light-sensitive [molecules](#) with antibodies that target tumour [blood vessels](#). When irradiated with light, the molecules create particles known as reactive oxygen species, which in high numbers cause irreparable damage to cells.

By ensuring the light-sensitive molecules were targeted at the tumour blood vessels, the researchers could starve the tumour of oxygen and nutrients and cause it to disappear completely, with no re-growth during the following 100 days.

"There are already drugs in clinical use which target tumour blood vessels, but these only inhibit growth rather than completely kill the tumour," explains Dr Ross Boyle, from Hull's Department of Chemistry, who designs and creates the light-sensitive molecules used in the research.

"By using this form of targeted photodynamic therapy, we were able to completely kill the tumour in our models. Though this is still a long way from being used on patients, it does hold exciting potential for the treatments of some of the most common skin cancers."

However, the tumour was only completely eradicated when 'natural killer cells' – a key part of the immune system – were present. When the production of these was blocked, the tumour reduced in size, but did not disappear. The team believe further research is needed to determine the exact role of the immune system in the process.

Targeting light-sensitive molecules to a tumour site ensures that the treatment should be more effective even at smaller doses, improving outcomes and reducing potential side effects to patients. The technique could potentially replace more invasive forms of treatment such as surgery and radiotherapy.

Dr Boyle and his colleagues are now applying for further funding to move the research closer to clinical trials.

Provided by University of Hull

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