

MRI scanners can steer tumor busting viruses to specific target sites within the body

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Scientists from the University of Sheffield have discovered MRI scanners, normally used to produce images, can steer cell-based, tumour busting therapies to specific target sites in the body.

Magnetic resonance imaging (MRI) scanners have been used since the 1980s to take detailed images inside the body - helping doctors to make

a [medical diagnosis](#) and investigate the staging of a disease.

An international team of researchers, led by Dr Munitta Muthana from the University of Sheffield's Department of Oncology, have now found MRI scanners can non-invasively steer cells, which have been injected with tiny super-paramagnetic [iron oxide nanoparticles](#) (SPIOs), to both primary and secondary tumour sites within the body.

This targeted approach is extremely beneficial for patients as it dramatically increases the efficiency of treatment and drug doses could potentially be reduced - helping to alleviate side effects.

Revolutionary cell-based therapies, which exploit modified [human cells](#) to treat diseases such as cancer, have advanced greatly over recent years. However, targeted application of cell-based therapy in specific tissues, such as those lying deep in the body where injection is not possible, has remained problematic.

The new research suggests MRI scanners are the key to administering treatments directly to both primary and secondary tumours wherever they are located in the body.

The study, published today (date) in *Nature Communications* shows that cancer mouse models injected with immune cells carrying SPIOs and armed with the cancer killing oncolytic virus (OV) which infects and kills cancer cells, showed an 800 per cent increase in the effects of the therapy.

Dr Munitta Muthana, from the University of Sheffield, said: "Our results suggest that it is possible to use a standard MRI scanner to naturally deliver cell-based therapies to both primary and [secondary tumours](#) which would normally be impossible to reach by injection.

"This not only increases the therapeutic efficacy but also decreases the risk of unwanted side effects.

"The beauty of using the MRI scanner to administer the therapy is that you can also use it for its original purpose providing a real-time image-guide to ensure the treatment has gone where it is needed."

More information: *Nature Communications*, [DOI: 10.1038/ncomms9009](https://doi.org/10.1038/ncomms9009)

Provided by University of Sheffield

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