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Cancer vaccine implant 'can attack and kill tumours'

The implant is placed under the skin

An implant placed under the skin can instruct the immune system to attack and kill cancer cells, at least in mice, say researchers.

It is the first "cancer vaccine" delivered in the form of a plastic implant that can destroy tumours, say the Harvard University team.

It works by attracting certain immune cells and showing them what the tumour in question looks like.

Cancer Research UK said that vaccine research was showing "real promise".

Cancer cells are good at evading the immune system because the body does not recognise them as "foreign".

Plastic disc

The idea of a vaccine to create an immune attack against a tumour is not a new one and there are versions currently in clinical trials.

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>
> Dr Joanna Owens, Cancer Research UK

But most other studies have looked at removing immune cells from the body, reprogramming them to recognise the individual's cancer and then returning them.

In the latest study, researchers developed an 8mm plastic disc that releases chemicals that attract a specific type of immune cell called a dendritic cell.

Immune cells can access the disc, which is implanted just under the skin. Once inside, they

are exposed to proteins found on the surface of the cancer cells to be targeted.

With this information, the dendritic cells move on to the lymph nodes where they tell another type of immune cell, known as T cells, to hunt down and kill the cancer cells.

In mice with skin cancer, the implant was shown to successfully eliminate the tumours, the journal Science Translational Medicine reported.

Healthy tissue

The researchers believe such implants could one day be used alongside chemotherapy and surgery to treat cancer.

In theory, the fact the immune system only targets the specific cancer cells avoids causing damage to healthy tissue and it is hoped the technique might produce long-term resistance reducing the chance of relapse.

For use in humans, the structure of the implant itself would need little modification but researchers said the immune activation components would need to be altered.

Study leader Professor David Mooney, an expert in bioengineering, said the technique was a "major step forward" in cancer vaccine design.

"Inserted anywhere under the skin - much like the implantable contraceptives that can be placed in a woman's arm - the implants activate an immune response that destroys tumour cells," he said.

Dr Joanna Owens, science information manager at Cancer Research UK, said research into therapeutic cancer vaccines was beginning to show "real promise".

"This study provides some useful insights into how we can effectively train the immune system to recognise and destroy cancer cells.

"The use of an implant to deliver the vaccine is particularly interesting and the results look encouraging but more research is needed to see if the technology can be scaled up and adapted for use in people."