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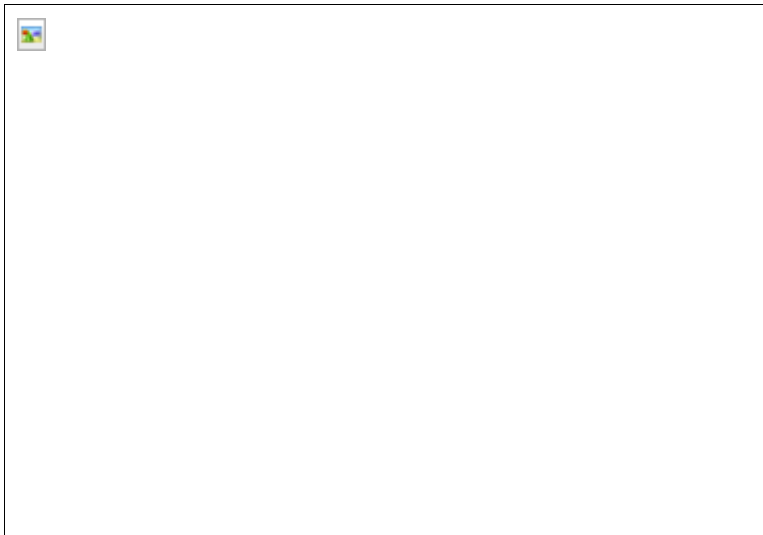
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From The Times

August 11, 2009

## Bee venom destroys cancer cells in tests on mice



Hannah Devlin

6 COMMENTS | RECOMMEND? (9)

Bee venom can be engineered to target tumours and could prove an effective future treatment for cancer, a study has found.

During a trial, the poisonous chemical in a bee's sting, melittin, was attached to tiny molecules or "nanoparticles" that then attack and destroy cancer cells, leaving healthy cells intact. The carrier particles, dubbed "nanobees", were also effective in targeting pre-cancerous cells.

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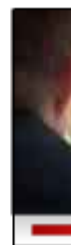
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Nanobees could eventually replace conventional therapy for certain types of cancer, according to scientists behind the study, which is published today in the *Journal of Clinical Investigation*. They said that the treatment would have fewer side-effects than chemotherapy.

“The nanobees fly in, land on the surface of cells and deposit their poisonous cargo,” said Professor Samuel Wickline, a specialist in nanomedicine at Washington University in St Louis, who led the research.

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The treatment was tested on two groups of mice with cancerous tumours. One group had melanoma skin cancer, the other had been implanted with human breast-cancer cells. After four to five injections of the nanobees, the breast-cancer tumours were 25 per cent smaller, and the

melanoma tumours were 88 per cent smaller, compared with untreated mice.

The carrier particles used in the study have already been approved for clinical use in various other medical applications. The team plans to begin human trials with the nanobees next year.

They predict that the treatment could be effective in treating a wide range of cancers and that it would have fewer side-effects than chemotherapy. They say the treatment could also be more effective than chemotherapy, because it is more targeted. With chemotherapy, patients are given the largest tolerable dose of medication, but because nanobees specifically attack tumours, doses could be much lower.

Melittin works by attaching itself to the surface of cells and ripping holes in the membrane. “In high enough concentration it can destroy any cell it comes into contact with,” said Professor Paul Schlesinger, a cell biologist at Washington University and a co-author of the paper.

Most cancer treatments target DNA, but cancer cells are frequently able to adapt and develop resistance to DNA damage. It is much harder for cells to defend against damage to the membrane, however, making melittin an attractive treatment.

Despite the high toxicity of the bee venom, the mice suffered few side-effects and there appeared to be little damage to non-cancerous cells.

Leaky blood vessels around tumours mean that nanoparticles build up there in high enough quantities to do damage. A chemical tag enhanced this effect by increasing nanobees' affinity for cancerous cells compared with normal cells.

“It's like molecular Velcro,” Professor Wickline said. “The toxin doesn't come off the bee until it finds its target.”



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Sarah Vine

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If the melittin had been injected into the bloodstream in its normal form it would lead to widespread destruction of red blood cells. But following the nanobee injection, the blood count of mice was normal, and they showed no signs of organ damage.

A concern with some nanomedicines is that nanoparticles are left circulating in the body after treatment. They are biologically inert, meaning they are do not get metabolised and cleared from circulation in the normal way.

The spherical nanobeas, which are about six millionths of an inch in diameter, are, however, quickly cleared from the system after treatment. They are made of perfluorocarbon, an inert non-toxic compound used in artificial blood. Once the melittin has been removed from the nanobee, it dissolves and is evaporated in the lungs.

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**YOUR COMMENTS**

6 Comments (Displaying 1-6)

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**Neil Hughes wrote:**

You conspiracy theorists really do get everywhere dont you!

August 12, 2009 9:39 PM BST

RECOMMEND? (1)

**Ros Roberts wrote:**

The above off-topic and probably untrue comments again make the point that we really also need a Discommend button.

August 12, 2009 11:09 AM BST

RECOMMEND? (2)

**Paul Padley wrote:**

Re Royal Rife; all objects have a natural frequency of vibration at which they will absorb energy to the point of destruction - bit like the soprano shattering a wine glass. This is real science not pseudo science. I am surprised that no one is researching this way of killing cancers.

August 12, 2009 10:47 AM BST

RECOMMEND? (1)

**Ed Beaseley wrote:**

We should all know most cancers and bacteria were eliminated by 1934. The name is Royal Rife and was desposed of by Big Pharma .Money comes before the value of life.

August 12, 2009 3:57 AM BST

RECOMMEND? (3)

**Desmond MacDonald wrote:**

And, this inept government does nothing whilst our bee population decreases year on year!



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FERTILITY FILE

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I wonder what the bees could do for NuLab MP's? I can but imagine!

August 11, 2009 6:19 PM BST

RECOMMEND? (2)

**Seymour Legs wrote:**

You have just got to love bees haven't you.I mean they produce honey for a start which is good for you and is a natural anti-biotic as used by the Egyptians.Now they are going to save us all from cancer.....bless their stripey little cotton socks.

August 11, 2009 3:53 PM BST

RECOMMEND? (12)



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