

Multi-tasking maggots in superbug showdown

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Blowfly larvae

Scientists at Swansea University (Wales, UK) have discovered a new type of antibiotic in maggot secretions that can tackle up to 12 different strains of MRSA, as well as *E. coli* and *C. difficile*. The research was funded by leading charity Action Medical Research, with support from the Rosetrees Trust.

The antibiotic, named Seraticin™, is derived from the maggot secretions of the common green bottle fly (*Lucilia sericata*) and scientists hope to develop it into an injection, pill or ointment.

So far, they have purified Seraticin™ and undertaken the study of its structure and the mechanism by which it prevents infection. The next steps will be to complete the identification of the compound and develop

a way to synthesise it. It can then be tested on human cells and eventually in clinical trials in order to determine its medical effectiveness and properties as a novel antibiotic.

MRSA infections cause suffering, amputations and death, not to mention the estimated £1 billion cost to the NHS. Between 2002 and 2006, 6,201 deaths in England and Wales involved MRSA and 15,683 deaths in England and Wales involved *C. difficile*. The rapid rise in antibiotic-resistant bacteria means that scientists urgently need to find a solution.

Using live maggots on infected wounds is an age-old method of tackling infection and they work with amazing speed. It's not uncommon for someone to suffer from chronic infected wounds for 18 months, despite all sorts of conventional treatment, but when maggots are applied to the same wound they can often begin to clear infection in just a few days. They have even been known to save people from having limbs amputated.

Dr Yolande Harley of Action Medical Research said: "The discovery of a potential new antibiotic is an exciting advance. It could mean a possible novel treatment for people with chronic wounds that are infected with MRSA or other bugs. By developing the pure antibiotic into a formula, such as a cream, it could reduce the contact patients need to have with live maggots to heal wounds. It could also offer a potential treatment, such as an injection or pill, for internal infections like *C. difficile*."

Professor Norman Ratcliffe, a principal researcher on the project at Swansea University, said: "It has been a huge team effort to get to this level and I am delighted with our progress; however there is more to do if we are to realise the maximum benefits from this discovery. It takes approximately 20 mugs of maggots to yield just one drop of purified Seraticin™ at present. Thus, the next stage will be to confirm its exact

identity using mass spectrometry and nuclear magnetic resonance analyses in order for us to produce this chemically on a larger scale. “

Dr Alun Morgan of ZooBiotic Ltd, based in Wales, that supplied the maggots for the project, said: “Maggots are great little multi-taskers. They produce enzymes that clean wounds, they make a wound more alkaline which may slow bacterial growth and finally they produce a range of antibacterial chemicals that stop the bacteria growing.”

Source: Swansea University

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