

# New antibiotic hailed as great hope against resistant bugs

By Sarah Knapton, Science Editor

THE first new antibiotic to be discovered in nearly 30 years has been hailed as a “paradigm shift” in the fight against the growing resistance to such drugs.

Teixobactin has been found to be effective against many common bacterial infections such as tuberculosis, septicaemia and *Clostridium difficile*, and could be available to patients within five years.

But, more importantly, it could pave the way for a new generation of antibiotics because of the way it was discovered.

Scientists have always believed that the soil was teeming with new and potent antibiotics because bacteria in dirt have developed novel ways to fight off other microbes. But 99 per cent of soil microbes will not grow in laboratory conditions.

Now a team from Northeastern University in Boston, Massachusetts, has discovered a way of using an electronic chip to grow the microbes in soil and isolate their antibiotic chemical compounds.

The researchers discovered that one compound, Teixobactin, is highly effective against common bacterial infections *C. difficile*, *Mycobacterium tuberculosis* and *Staphylococcus aureus*.

Prof Kim Lewis, the director of the antimicrobial discovery centre, said: “Apart from the immediate implementation, there is also, I think, a paradigm shift in our minds because we have been operating on the basis that resistance development [to antibiotics] is inevitable and that we have to focus on introducing drugs faster than resistance.

“Teixobactin shows how we can adopt an alternative strategy and develop compounds to which bacteria are not resistant.” The first antibiotic, penicillin, was

discovered by Alexander Fleming in 1928, and more than 100 compounds have been found since, but no new class has been found since 1987.

The lack of new drugs, coupled with overprescribing, has led to bacteria becoming increasingly resistant to modern medicines. Dame Sally Davies, the Government’s Chief Medical Officer, has said antibiotic resistance is “as big a risk as terrorism”.

The World Health Organisation has also classified antimicrobial resistance as a “serious threat” to every region of the world that “has the potential to affect anyone, of any age, in any country”.

However, the new discovery offers hope that many new antibiotics could be found to fight bacterial infections.

Crucially, the scientists believe that bacteria will not become resistant to Teixobactin for at least 30 years because of its multiple methods of attack. Testing on mice has already shown that the antibiotic works well at clearing infections, without side effects. The team is now concentrating on increasing production so that it can be tested on humans.

“Right now we can deliver a dose that cures mice and a variety of models of infection, and we can deliver 10 mg per kilogram, so it correlates well with human usage,” he added.

The breakthrough was heralded by scientists who said it could be a “game-changer”. Prof Mark Woolhouse, of the University of Edinburgh, said: “Any report of a new antibiotic is auspicious, but what most excites me about the paper is the tantalising prospect that this discovery is just the tip of the iceberg.”

The research was published in the journal *Nature*.