

Scientists strike blow in superbugs struggle

Scientists from The University of Manchester have pioneered new ways of tweaking the molecular structure of antibiotics – an innovation that could be crucial in the fight against powerful super bugs.

The work, led by chemical biologist Dr Jason Micklefield in collaboration with geneticist Professor Colin Smith, is published online today (Wednesday 5 December 2007) and will appear in next issue of the *Journal of the American Chemical Society*.

Using funding from the UK's Biotechnology and Biological Sciences Research Council (BBSRC), scientists working in The School of Chemistry and the Manchester Interdisciplinary Biocentre have paved the way for the development of new types of antibiotics capable of fighting increasingly resistant bacteria.

Micklefield, Smith and colleagues were the first to engineer the biosynthesis of lipopeptide antibiotics of this class back in 2002.

They have now developed methodologies for altering the structure of these antibiotics, such as mutating, adding and deleting components.

This innovation provides access to thousands of lipopeptide variants that cannot be produced easily in any other way.

Dr Micklefield said: "The results from this work are essential in the development of the next generation of lipopeptide antibiotics, which are critical to combat emerging super bugs that have acquired resistance to other antibiotics.

"The potent activity of this class of antibiotics against pathogens that are resistant to all current antibiotic treatments makes them one of the most important groups of antibiotics available.

"Our work relies on interdisciplinary chemical-biology, spanning chemistry through to molecular genetics. It follows the tradition of pioneering work in natural product biosynthesis and engineering that has come out of the UK."

Scientists in Manchester have been doing work on calcium dependant antibiotics (CDA), which belong to the same family of acidic lipopeptides as daptomycin.

In 2003 daptomycin became the first new structural class of natural antibiotic to reach hospitals in more than 30 years.

But researchers say there is already evidence that bacteria are evolving and becoming resistant to daptomycin – leading to the emergence of dangerous new super bugs.

Dr Micklefield added: "If we are to successfully fight and control potent new super bugs in the future, we need to be developing the next generation of antibiotics now."

Source: University of Manchester

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