

## Scientist urges action to halt deadly superbug

HK team decodes rogue enzyme that is 'almost incurable' - and spreading

Ng Yuk-hang

Updated on Apr 04, 2011

Hong Kong scientists have decoded the genetic make-up of an "almost incurable" super-drug-resistant bug.

The findings prompted a warning to the city's authorities to take precautions before it is too late.

NDM-1 is a rogue enzyme that makes bacteria resistant to drugs. Researchers from the University of Hong Kong studied the genetic make-up of an *E coli* bacterium that carried NDM-1, which emerged in 2008 and is resistant to almost all antibiotics. It was first detected in people who visited South Asia and has spread to more than 20 countries and regions.

Medical tourism and rising international travel were mainly to blame, said the head of the university's centre for infection, Professor Ho Pak-leung, who carried out the study.

"Hong Kong is small and crowded," Ho said. "Any transmission of infectious diseases and superbugs will greatly affect the city. That is why we need to deal with NDM-1 before it becomes a big problem."

*E coli* that carry the enzyme become resistant to nearly all classes of antibiotics and "will become almost incurable", Ho said. It is also easy for the enzyme to jump from one bacterium to another, thus spreading the resistance.

Unlike previous superbug-making enzymes, which prosper through the use of "big gun" antibiotics, even the most common antibiotics such as penicillin could facilitate the spread of NDM-1, he said.

NDM-1 can make bacteria "addicted". That means bacteria would have to die to get rid of the enzyme.

And NDM-1 is difficult to fight as it is impossible to be destroyed by exposure to ultraviolet light. In Ho's experiment, NDM-1 was put under UV light for 24 hours with another superbug-producing enzyme called ESBL. While ESBL was destroyed, NDM-1 survived intact, Ho said.

The genetic make-up of the NDM-1-carrying *E coli* was similar to bacteria found in Lebanon, Poland, Spain and on the mainland, suggesting it was a product of globalisation.

The study, which was funded by the Food and Health Bureau, was recently published in the science journal *PLoS ONE*. NDM-1 has been discovered in only two patients in Hong Kong - one last year and one in 2009.

Superbugs usually pose no threat to healthy adults but can attack the body easily when people have injuries or undergo surgery.

The Hospital Authority announced a set of measures last August to contain the spread of superbugs, but Ho said only a few were implemented. Among them was a requirement to screen all public hospital patients who had received treatment overseas. This was how last year's case was detected.

The Hospital Authority has also introduced two stronger antibiotics that can kill more superbugs.

But Ho said a lot of work still had to be done, for example giving reminder pamphlets to patients who are prescribed antibiotics to finish their treatment, and stepping up education for medical workers.

He said the health authorities should increase transparency on superbug infections and announce statistics regularly.

Hongkongers should protect themselves from catching NDM-1-carrying bacteria by maintaining good personal hygiene, such as washing hands before cooking and eating, especially overseas.

They should also think twice about medical tourism.