Genome mapped in battle to beat superbugs

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A Queensland scientist has completed the world's first gene decoding of a superbug bacteria resistant to all commercially-available antibiotics.

University of Queensland's School of Chemistry and Molecular Biosciences postdoctoral researcher Dr Brian Forde said mapping the genome would lead to the tailored treatment of infections, reducing hospital time and costs for patients.

"Increasing antibiotic resistance in the number-one global health issue today," he said.

"As more people use antibiotics the more the bugs or bacteria they treat become resistant to those antibiotics.

"We are seeing bacteria in hospitals rapidly evolve to become resistant to an antibiotic in response to treatment."

Dr Forde's team used a state-of-the-art process called Single Molecule Real Time (SMRT) to decode the complete genome of the antibiotic-resistant superbug known as 'Klebsielle pneuomoniae', which causes infections such as pneumonia and meningitis.

"We were able to find the specific locations in that genome where antibiotic resistance was happening," Dr Forde said.

He said hospitals could use the SMRT process to test bacteria and quickly determine which antibiotics they are resistant to.

"This means they could then treat patients with antibiotics that will work against that bacteria rather than using a broad spectrum of antibiotics," he said.

"This is good news for the patient as they will heal sooner and it is good news for global health as it means less indiscriminate use of antibiotics leading to further resistance.

"I am excited by the tangible results of my research which has a real chance of changing how we approach and use antibiotics.

"Without antibiotics, even simple medical procedures and infections, like a sore throat, could become life threatening.

"We need to tailor our use of antibiotics to prevent this from happening."

Dr Forde, who is one of 10 2016 Queensland Fresh Science finalists, said the process already worked at a research level.

"It would be great to see the process used at a clinical level throughout hospitals in the next couple of years," he said.

Queensland Chief Scientist Dr Geoff Garrett congratulated Dr Forde and his team on their innovative process to map the genome of the antibiotic-resistant superbug.

"By turning to science, we can help our medical practitioners deliver the best treatment possible and this science is making real advancement towards antibiotic resistance, which is a fight we need to win," he said.

Provided by University of Queensland