ADVERTISING FEATURE

Infectious disease prevention

Research is winning the war on bugs

An Australian healthcare company is leading the fight against the deadly global threat of antibiotic resistance.

Genetic Signatures' CEO Dr John Melki in the company's Newtown lab with senior field applications specialist Angela Elmore, above, and with senior principal research scientist Dr Rohan Baker, inset.

They've been described as the biggest threat facing humanity. So-called superbugs, or antibiotic-resistant bacteria that are invulnerable to even the most powerful drugs medical science can muster, are on the rise, with predictions they could kill more than 10 million people a year globally by 2050.

However, as the world's brightest scientific minds contemplate the horrors of a return to the pre-antibiotic era, when common infections and minor injuries were frequently fatal, a Sydney–based healthcare company has developed ground-breaking technology that promises to be a powerful weapon in the global war on bugs.

Founded by a group of CSIRO alumni, Genetic Signatures (ASX: GSS) has developed world-first technology that significantly simplifies genetic detection of microbial organisms by reducing the four bases of nucleic acid that make up DNA to just three. The company has used this patented 3base™ technology, to develop a suite of diagnostic tests that enable laboratories and hospitals to detect a significantly wider array of infectious organisms, in a fraction of the time and with much greater accuracy than was previously possible.

In a clinical trial conducted by Sydney's St Vincent's Hospital, Genetic Signatures' test for gastroenteritis pathogens, including Salmonella and Giardia, produced results in four hours, compared to 120 hours with traditional methods, and identified 44 infections that the conventional tests missed.

The implications for medical science and its war on bugs are enormous, with the World Health Organisation estimating that infectious diseases kill 17 million people around the globe each year.

"When you think of infectious disease as a major killer worldwide, to us it's a preventable death," says Genetic Signature's CEO John Melki, a molecular biologist. "If you can more quickly and accurately detect the cause of infection, you can administer the treatment more quickly or … you can stop the spread to healthy individuals."

As an ever-expanding number of anti-microbial drugs are rendered ineffective against superbugs, Melki explains that rapid identification of infected patients is increasingly critical so those affected can be isolated and treated before the infection spreads. He says the company has invested heavily in developing its superbug test to a point where accurate test results can be achieved in just one to two hours. "By allowing more rapid detection we can allow for more effective treatment and cut the mortality rate," he says

To date, Melki and his team have released four distinct detection kits under its EasyScreen™ brand name, targeting respectively: enteric (gastroenteritis-causing) pathogens, respiratory viruses, sexually transmitted infections and superbugs. Three more tests – for mosquito-borne viruses including Zika and Ross River Fever; viral and bacterial meningitis; and bacterial respiratory infections – are in the pipeline.

Melki says the company fast-tracked the release of its superbug test in response to mounting global fears about antibiotic resistance. "Microbiologists are really concerned," he says. "We're seeing reports now of bacteria that are resistant to all common antibiotics, so we fast-tracked this kit to give us regulatory approvals in Australia and all across the EU."

Full regulatory approval of the kit for sale in Europe in April this year is just one of a string of significant milestones the company has achieved since listing on the Australian stock market it in 2015. A stream of new product releases, multiple patent issues, inroads to international markets – plus a sales boost thanks to Australia's worst flu season on record – lifted company revenues 39 per cent to $2.8 million last financial year.

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> Dr John Melki
> CEO Genetic Signatures

Last month (August), Genetic Signatures announced its biggest deal to date, a contract with a leading Australian pathology service to supply its respiratory diagnostic test, which identifies such common infections as influenza A and B, and rhinovirus.

Melki says the lab could use as many as 1000 tests a day in the flu season, and an average of 100 to 200 a day during non-peak times.

But he says the growth to date barely hints at the company's potential as it eyes off the huge international molecular diagnostics market, estimated to be worth US$6 billion, and predicted to double in size by 2022.

"Currently about 95 per cent of our revenue comes from our domestic base," he says. "We have a huge opportunity to expand offshore and transform virus detection in these major markets. We've proven our clinical utility here in Australia, and we are now poised for growth. We're ready to capitalise."

The company has already established distributors in Italy, Poland and Ireland, and is taking a direct sales approach into the vast US healthcare market, where it has started supplying testing reagents, prior to full FDA approval for its complete diagnostic kits. Meanwhile, it has begun selling Flavivirus and Alphavirus kits, which detect deadly mosquito-borne viruses, into Kenya for research purposes.

However, while the commercial outlook is bright, reflected by an almost 50 per cent leap in the share price over the past 12 months, Melki says that's not what gets him and his team out of bed in the morning. "Ultimately we're driven by saving lives," he says. "It's in that context that we do what we do."