

# TAKING THE INTERNATIONAL LEAD IN THE DISCOVERY OF NEW ANTIBIOTICS

The discovery of penicillin in 1928 by Alexander Fleming changed medicine forever and has saved the lives of millions of people over the last 90 years. But in recent decades a steady increase in bacteria resistant to antibiotics has become a serious threat to global public health.

Associate Professor Michael Nissen, Director of Scientific Affairs and Public Health at *GlaxoSmithKline (GSK)*, explains some of the unique challenges facing the medical research community in tackling antimicrobial resistance and the role of leading pharmaceutical companies, such as GSK, who are at the forefront of developing new treatments.



>> Pictured above Associate Professor Michael Nissen from GSK.

With the rise of resistance to the most widely used antibiotics, there is a global drive to use existing treatments more effectively and find new antibiotics from organic and synthetic sources. Australia is part of this global effort with the Federal Government recently announcing that \$5.9 million from the *Medical Research*

*Future Fund* will support research into antimicrobial usage and resistance.

## AUSTRALIA TAKES THE LEAD

“Australia has developed world levels of medical care and expertise, with both highly sophisticated clinical and scientific capabilities. This is allowing the research community to explore the impact of antibiotic resistance in hospitals and the wider community in Australia.”

Associate Professor Nissen explains that antimicrobial resistance can be slowed by more targeted and prudent use of antibiotics in hospitals and the wider community. Australia has one of the highest use-rates per capita in the world, which is giving bacteria plenty of opportunity to adapt.

“Australia has all the infrastructure to play a major role in tackling this global problem and Government investment and initiatives are certainly welcome

“Bacteria have highly effective defence mechanisms, giving them the ability to mutate over time and become resistant to many of the medicines available to treat them. Resistance has been fuelled by the widespread misuse of antibiotics.”

According to the Australian Commission on Safety and Quality in Healthcare, antimicrobial stewardship programs have been shown to decrease inappropriate antimicrobial usage, improve patient outcomes and reduce adverse consequences of antimicrobial use.

“Many Australian hospitals are adopting antimicrobial stewardship programs which guide doctors on choosing the right antibiotic, dosage, and duration of treatment.”

## NEW MEDICINES ARE NEEDED

However, better use of antibiotics is only half the strategy to tackle this problem. New medicines are needed. Due to the level of scientific complexity and long development process, antibiotics are expensive to research and bringing new antibiotics to market requires significant investment. According to the Association of the British Pharmaceutical Industry (ABPI), it can take over 12 years to discover and develop a new medicine and typically costs more than \$1.5 billion to do all of the research necessary for a medicine to be licensed for use.

“Tackling antibiotic resistance is a challenge GSK wants to be part of solving, but one company cannot do it alone. Due to the various complexities of researching new antibiotics, we believe taking a more open-minded approach to sharing information is key,” said Associate Professor Nissen.

The Innovative Medicines Initiative, or New Drugs for Bad Bugs, is Europe’s largest public-private partnership aiming to improve the drug development process. The first projects have been funded jointly by the IMI and five pharmaceutical and biotechnology companies, including GSK.

There is also the Biomedical Advanced Research and Development Authority (BARDA) in the United States. This unique partnership provides flexibility for GSK to work both on studies already underway within their organisation and on new research across multiple molecules. This partnership means if a molecule fails – as often happens in drug development – it is possible to switch focus without having to establish a new agreement with the US Department of Health and Human Services.

Here in Australia, researchers at GSK continue to work alongside their global allies to support these initiatives. “GSK has a long heritage and expertise in antibiotics going back 40 years and we are committed to ongoing research to address the problem of antimicrobial resistance. But collaboration is absolutely key in overcoming the unique challenge we face,” said Associate Professor Nissen.

Interview with Associate Professor Michael Nissen, Director, Scientific Affairs and Public Health, *GlaxoSmithKline (GSK)*