Searching for the source of rising lung disease

There are bugs in Queensland, thought to be harmless, that are making more and more people sick. Found in soil and water, the bugs can lead to infections and a chronic lung disease known as non-tuberculous mycobacteria (NTM) disease.

A growing problem

NTM disease is rising dramatically. Projections show cases could more than triple in the next 20 years — up to 6,446 cases per year in Queensland alone. Often undetected in early stages, it can cause chronic coughing, fatigue, weight loss, night sweats and coughing up of blood.

While NTM usually affects the elderly and immune compromised, clinicians are seeing more younger, healthier patients with this disease. Our Respiratory Research Unit, led by Associate Professor Rachel Thomson, aims to discover why this is happening.

Searching for Answers

"There are a lot of questions no one has answers to yet. How have the bugs gotten into the water? Have they come from the natural environment to water systems and household dust or have humans contaminated the environment? Why are younger people picking it up more and what is it about their immune systems that put them at risk?" Assoc Prof Thomson says.

The search for answers has taken the team out of the laboratory and into the community. They are now taking water and soil samples from across the greater Brisbane region.

Understanding leads to treatments

Assoc Prof Thomson hopes their investigations can lead to ways of reducing the infection rate and addressing the source of the bug in homes and water.

"At the moment, we can treat a patient and clear their infection. But they are at risk of reinfection, because the bugs are in our environment. We are trying to understand what is happening in the environment so we can reduce exposure and subsequently reinfection," Assoc Prof Thomson says.

NEWS FLASH: Assoc Prof Thomson is a lead investigator of the NHMRC – Medical Research Futures Funded FORMAT trial (Finding the Optimum Regimen for M. abscessus Treatment).

This novel study design means a combination of drugs can be tested and evaluated with new medications introduced during the trial. The Australian team are leading the world and will roll out this trial in multiple international sites.

The unit recently received funding from the US Cystic Fibrosis Foundation and from generous GMRF donors. This has enabled the unit to bring on a research officer and PhD student.

"The support contributes to a range of aspects of our work, such as our researchers' salaries and our lab consumables. This funding enables us to conduct several projects at the one time and maximise our impact."

Find out more at: www.gallipoliresearch.com.au/respiratory

Knowledge is key to new treatments

Meet the newest members of the Respiratory Research Unit who are helping build our knowledge of serious lung diseases

Mark Clayton: Investigating NTM bugs in Brisbane water

Mark joined the Respiratory Research Unit in July 2020. He shares his thoughts on first-impressions of GMRF, his project and how he hopes to change lives through research.

Starting my PhD is somewhat of a change of direction for me. I did my undergrad in microbial biotechnology and Honours at the University of Queensland's Australian Institute for Bioengineering and Nanotechnology. I worked in quality assurance for a local pharmaceutical company. I hadn't worked in respiratory diseases, but I was eager to investigate infectious bacteria and do research that would help people have better lives.

My literature review has opened my eyes to an escalating problem. There is a gap in research on how NTM bacteria in our water relates to infection. It is daunting, but I am excited to contribute to better understanding this bacteria.

There are questions that need answering! As part of my project I hope to define the extent of the NTM bug in the drinking water distribution system. Strains known to cause human infections have been detected in drinking water, but we don't know if this is a cause of infections.

We have a clear path forward. This understanding will inform our work with our collaborators. We aim to develop intervention strategies for reducing colonisation and development of biofilms in water supply pipes. These strategies could then be trialed in the homes of those at higher risk of contracting the disease.

First impressions of GMRF are fantastic! The team is very welcoming and GMRF has great facilities. I love that the experts are right there and are happy to help out. On my first day here I was put straight into the labs with experienced researchers. It's great!

Mark's PhD project is made possible by the Pacific Golf Club Patron's Scholarship.

Jordyn Woodward: Helping build a Bronchiectasis Registry

Jordyn joined GMRF in 2018 as a Clinical Trials Assistant. She's now in the Respiratory Research Unit working on a project into bronchiectasis, a common condition causing damage to the lungs.

We are trying to understand and treat a very broad problem. There is not a lot known about bronchiectasis and how it develops. We know it can be caused by NTM, but treatments are limited and it is generally considered a life-time condition.

The Bronchiectasis Registry will build our knowledge. We are part of a national collaborative project with a network of 11 researchers and clinical experts to contribute to a national Bronchiectasis Registry. My role is to add and update patient information on demographics, the types of bacterial infections present overtime and the variety of medications used.

It is exciting to be part of such a practical solution. The more data you have, the better knowledge you have about a disease, which better informs patient care through ongoing research. No database with this level of information currently exists, and the more patient information we add, the more effective treatments will become.

Jordyn's work is made possible by the generous support of Civic Solutions.

The Bronchiectasis Registry aims to:

- Improve patient education and support
- Contribute to improved clinical management
- Provide improved access to clinical trials for those with bronchiectasis
- Gain a better understanding of the economic cost of bronchiectasis