



# Our race to stop global killers before it's too late

## We need better treatments for COVID-19 and Influenza, and the next unknown pandemic virus.

With over 160 million people infected and over 3 million deaths worldwide, the ongoing COVID-19 pandemic has affected us all. Influenza viruses pose a similar threat. Up to 50 million people worldwide lost their lives to the 1918 flu pandemic.

In severe COVID-19 and Influenza infection, it is not the virus that kills you, but an unconstrained immune response causing collateral damage to our own body.

Current treatments are vaccines and anti-viral drugs. Vaccines need to be constantly updated because of new strains and variants. Anti-viral drugs are of limited use, they can develop anti-viral resistance, and quickly become ineffective.

## What if we could reprogram the immune system to properly fight the virus, without causing the dangerous anti-viral response?

IMB's Centre for Inflammation & Disease Research is looking at how our immune cells first raise the alarm when there is a viral infection. If this inflammatory alarm is delayed, or inappropriate, the immune system might not be able to defend against the virus. If this 'alarm' is excessive or not switched off, the immune response starts to kill our own cells.

Both scenarios lead to severe disease and death, like we have seen in COVID-19.

This 'alarm' also stops working properly as we get older, or if we have underlying conditions (e.g. diabetes) putting these people at a higher risk of developing severe Influenza and COVID-19.

A treatment for inflammation in severe COVID-19 or Influenza would be a game-changer because the virus can't evade it; it can be used against a wide range of viruses (including new pandemic

threats) and it works best later in an infection, once the patient has sought medical care.

Importantly, because inflammation and our immune response is an integral part of our defence against infection, we need to develop new selective drugs— so that they fix the inflammatory alarm without turning it off completely.

## Impact and outcomes

By identifying new, selective drug targets for intervention, we will have a new way of working with our immune system to protect us against infection and prevent any collateral damage from an over-exuberant immune response.

These new drugs will be a cornerstone of future pandemic preparedness.

***We aim to understand exactly how inflammation is triggered by viruses like Influenza and SARS-CoV-2. This will save lives by protecting people across the globe in the next viral pandemic.***

# Researcher profile

## Dr Larisa Labzin

Dr Labzin a molecular biologist who loves the challenge of working on viruses that are far too small to easily see. The area of research that has her enthralled is innate immunity: how our cells detect and respond to viruses. She investigates how innate immune cells collect various bits of information about the virus, like a detective, and put that information together to send the right kind of warning signal to the rest of the immune system. With that knowledge, her team can work out what our cellular immune detectives get wrong and develop the kind of treatments to help our immune cells get it right.

Dr Labzin's team use a combination of molecular and cell biology techniques to unpick these questions. They look at human immune cells called macrophages under cutting edge microscopes to visualise how these cells respond to the virus. Dr Labzin and her team work in dedicated high containment facilities (PC3) to analyse what SARS-CoV-2 does during infection. The team are developing new tools to help us understand how these cells sense viral infection in unprecedented detail.

Dr Labzin is passionate about science communication and as an expert viral immunologist has been significantly involved in public engagement during the COVID-19 pandemic. This includes school visits and panel discussions. Dr Labzin regularly is called on as an expert both in Australian and internationally by renowned media outlets to explain all aspects of viruses, vaccines and immunity.

## Your opportunity to support game changing research at IMB

Here are just a few ways that giving to UQ's Institute for Molecular Bioscience research can help transform how we save lives from the impact of infection.

\$2,500	Could provide life saving protective equipment for researchers to safely investigate COVID-19 virus for up to 6 months.
\$10,000	Enables analysis of patients who have had COVID-19 or Influenza to learn more about their inflammatory profiles and body's response.
\$50,000	Provides scientific resources and vital equipment for 12 months to identify the inflammation defence in against viruses in human immune cells
\$100,000	Empowers and fast tracks our efforts to identify how inflammation is triggered during viral infections, and potentially translate drug solutions faster.

We welcome your suggestions for other ways to support IMB's research and help accelerate the translation of discoveries into patient benefits.

## For more information contact:

### Kamyra Laurenson

Director, Advancement, Institute for Molecular Bioscience

**E** k.laurenson@uq.edu.au

**M** +61 429 518 792

**T** +61 7 3346 2185

**W** imb.uq.edu.au/donate



*“While I am driven by intellectual curiosity and a fascination with viruses and the immune system, my real motivator is to improve quality of life and save lives through my research. Never has this been more prescient than during this COVID-19 pandemic, and I am honoured to be able to help solve this global problem.”*

## Dr Larisa Labzin

*Institute for Molecular Bioscience*



**#1** Australian research institute, based on the Nature Index



**1454** international collaborators from 48 countries



**>20%** of patent families at UQ are derived from IMB research