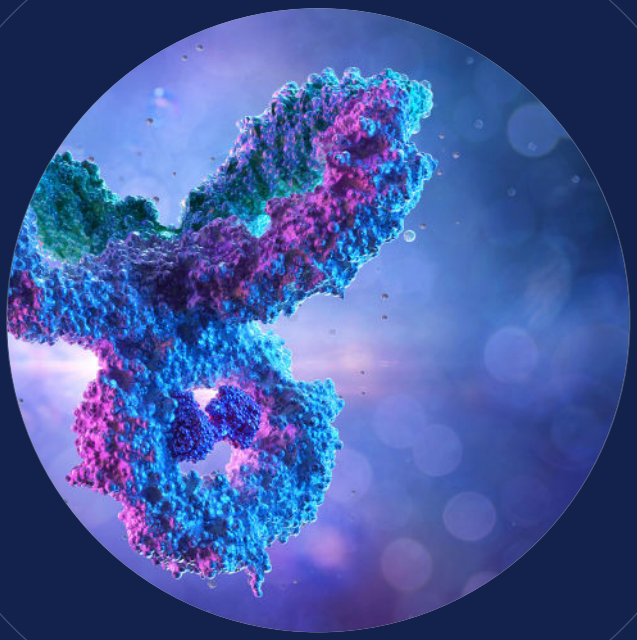

10 YEARS:
10 STORIES OF IMPACT

CASE STUDY 7

BANDIT: suppressing the destruction of beta cells

Often in those newly diagnosed with type 1 diabetes (T1D), there remains some level of beta cell function and thus insulin production. Using drugs to protect the remaining beta cells from immune system attack may help people to produce insulin for longer.

The Australian Type 1 Diabetes Clinical Research Network (T1DCRN) funded a world-first clinical trial showing that a commonly prescribed rheumatoid arthritis drug called baricitinib can preserve the body's own insulin production and suppress the progression of T1D in those newly diagnosed with the condition.

Australian Type 1 Diabetes Clinical Research Network

JDRF IMPROVING LIVES. CURING TYPE 1 DIABETES.

WHAT PROBLEM DO WE NEED TO SOLVE?

In T1D, the immune system mistakenly attacks insulin-producing beta cells in the pancreas, meaning that those with well-established T1D can no longer produce their own insulin.

However, in people who are newly diagnosed, a small number of beta cells can still be alive and producing insulin (called the 'honeymoon period' of T1D). Using therapies to protect the remaining beta cells from further immune attack may help people produce insulin for longer, minimising how much insulin they have to inject as well as resulting in better long-term health outcomes.

Committed to a world without T1D, JDRF funded the Australian BANDIT trial (Baricitinib in New Onset Type 1 Diabetes) to test whether the use of baricitinib could slow down the progression of T1D in those who were newly diagnosed.

The results of the BANDIT trial were released in the prestigious *New England Journal of Medicine*.

WHAT WAS FUNDED BY THE T1DCRN, AND WHY?

For over 30 years, a team at St Vincent's Institute (SVI), led by **Professors Thomas Kay and Helen Thomas**, have been investigating the mechanisms in T1D that lead the immune system to attack beta cells.

Committed to finding new treatments for T1D, in 2020, JDRF awarded this team over $3.7 million in T1DCRN funding to undertake a clinical trial to test baricitinib, a drug which inhibits a signalling protein called Janus kinase (JAK) and which is currently used to treat rheumatoid arthritis, COVID and alopecia.

This protein may be implicated in causing the inflammation and damage that immune cells illicit on beta cells in T1D. Therefore, inactivating JAK with baricitinib may protect beta cells from autoimmunity. BANDIT was the first trial in the world to test baricitinib in this way.

The SVI team had previously shown that baricitinib was able to delay T1D progression in pre-clinical studies, and the

"Our BANDIT trial has determined that baricitinib can preserve beta cell function and insulin production in people recently diagnosed with type 1 diabetes. This suggests that if given early enough baricitinib may allow people with type 1 diabetes to be significantly less dependent on insulin treatment.

Professor Thomas Kay, Principal Investigator, BANDIT trial

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It’s good to be part of this trial, to help researchers find new treatments for people with T1D. Participating has also been really helpful in having access to closer monitoring and support, via the clinical trial team, in the early stages of my diagnosis.

Lucy, first T1D participant signed up to the BANDIT trial, picture with BANDIT team member

T1DCRN funding was critical to testing if this was also the case in newly diagnosed people with T1D.

The significant T1DCRN investment in establishing ATIC infrastructure (case study 6) was key to allowing the BANDIT trial to proceed.

WHAT WAS INVOLVED IN THE BANDIT STUDY?

The BANDIT study was a world-first, phase 2 clinical trial which recruited 91 people aged 10 to 30 years who were newly diagnosed with T1D in the previous 100 days.

Participants were either provided baricitinib in tablet form, once daily for 48 weeks, or a placebo.

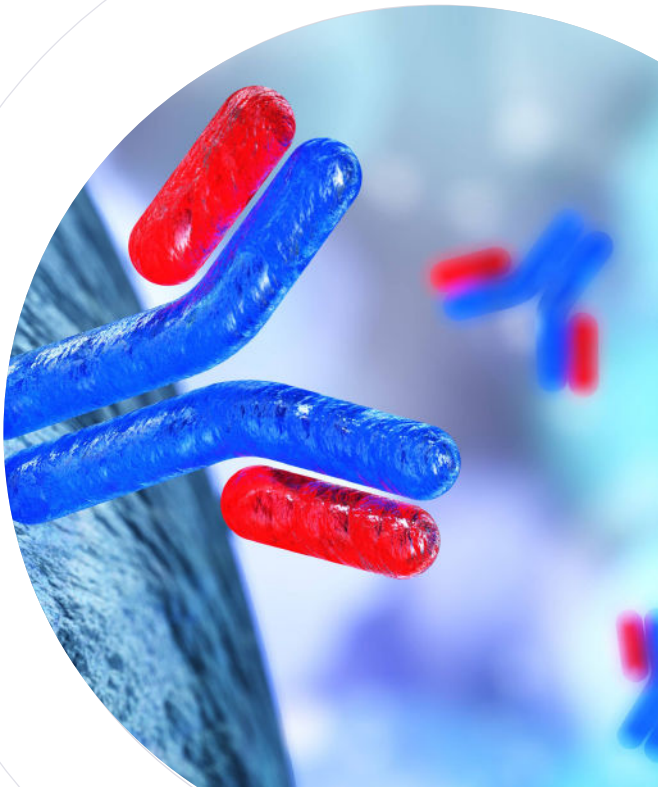
The trial primarily investigated the level of C-peptide (a sign of insulin production) at 48 weeks. It also investigated the need for injected insulin, how well blood sugar levels were controlled via continuous blood glucose monitoring and levels of HbA1c (a marker of longer-term control of blood sugar levels).

WHAT DID THE TRIAL SHOW?

The BANDIT trial demonstrated that taking baricitinib led to a stabilising of C-peptide levels and hence sustained insulin production at 48 weeks compared to the placebo group.

Additionally, it showed that compared to those taking the placebo, those who took baricitinib:

- needed to inject less insulin



- had less blood glucose variability and more Time In Range (a measure of how much time is spent in the 'safe' blood glucose zone)
- had the same long term blood glucose control (as evidenced by HbA1c) as this was controlled for in the study.

The study also showed that taking baricitinib posed no additional safety concerns compared to the placebo.

WHAT DOES THIS MEAN?

These breakthrough findings suggest that baricitinib may preserve beta cell function in those newly diagnosed. This indicates that baricitinib could be safely used to suppress the progression of T1D.

More beta cell function should lead to better and easier blood glucose management and may in turn lower rates of long-term complications for those with T1D.

> JDRF focuses on funding research with the biggest potential for immediate impact for our community, and these results show an important step towards novel type 1 diabetes treatments. We're proud to have supported a clinical trial that builds on many years of work led by the team at SVI – a demonstration of translational research in action with clear pathway to reduce burden of people living with T1D.
>
> **Dr Dorota Pawlak,** JDRF Australia Chief Scientific Officer