# ALBERTA DIABETES INSTITUTE ISLETCORE PROGRAM ANNUAL REPORT 2023





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Content by Tina Dafoe and Patrick MacDonald

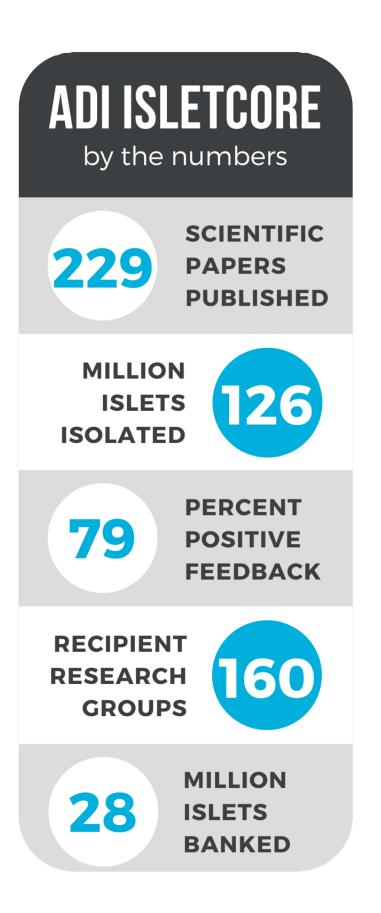
Design by Tina Dafoe

Published by the Alberta Diabetes Institute IsletCore

The University of Alberta respectfully acknowledges that we are located on Treaty 6 territory, a traditional gathering place for diverse Indigenous peoples including the Cree, Blackfoot, Métis, Nakota Sioux, Iroquois, Dene, Ojibway/ Saulteaux/Anishinaabe, Inuit, and many others whose histories, languages, and cultures continue to influence our vibrant community.

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### **DIRECTOR'S MESSAGE**

In 2023, we continued our strong recovery from COVID-19, returning to pre-pandemic levels of activity. In fact, we distributed over 8.2 million islet equivalents for research in 2023—a record for us—and celebrated a big milestone with the processing of our 500<sup>th</sup> pancreas!

Our program has undergone some personnel changes over the past year. Most notably, our long-time Associate Director, Dr. Jocelyn Manning Fox, retired! Much of the success of this program since its



inception is due to Joss's efforts; many of you have corresponded with her throughout the years and we all wish Joss the best! We are fortunate that Tina Dafoe has taken on an expanded role with ADI IsletCore and that others, such as Aliya Spigelman, have taken on additional responsibilities as a result. Finally, we thank Chris Peacocke for his contributions to the program's administration over the past year.

We thank our External Advisory Board (Raghu Mirmira, Lena Eliasson, Debbie Thurmond, and Vincent Poitout) for their guidance, one outcome of which is the development of our business plan. This has taken shape over 2023 and will be completed this year. One of our challenges has been in managing the growth of our program; as part of this business planning, we are working towards improvements in internal governance and a review of our cost-recovery model to ensure sustainability for us and our recipients.

As always, we thank the University of Alberta, the Faculty of Medicine and Dentistry, the Alberta Diabetes Institute, and the Clinical Islet Program for their continued support. We also thank Organ Procurement Organizations across Canada, particularly the Human Organ Procurement and Exchange (HOPE) program, BC Transplant, the Trillium Gift of Life Network (TGLN), and Transplant Québec for their tireless efforts. Finally, we are indebted to organ donors and their families for their selfless gifts in support of diabetes research.

This year, our focus will be on replacing some of our processing equipment and continuing to refine our internal structures and processes. One exciting development for our users is the upcoming release of our new web portal with expanded access to data and analysis tools, developed with a fantastic team of CIHR, JDRF, and Diabetes Canada-funded collaborators! We look forward to another productive year and continuing to serve the pancreas, islet, and diabetes research community in 2024 and beyond.

A. MAN

Patrick MacDonald Director, ADI IsletCore Canada Research Chair in Islet Biology

### **TEAM MEMBERS**



#### Dr. Patrick MacDonald • Director

Pat established ADI IsletCore in 2010. In addition to directing the program, he is a Professor of Pharmacology. In his spare time, he likes to run, play ice hockey, and spend time with his family.

#### Tina Dafoe • Program Coordinator

Tina has been with ADI IsletCore for ten years and oversees the program's operations, finances, and customer service. Her other passions include snuggling her two kids, playing sports, and baking.





#### Christopher Peacocke • Program Support

Chris joined ADI IsletCore in 2022. He has a background in finance, policy and procedure development, and communications. In his free time, he is an amateur birdwatcher and cookbook collector.

#### James Lyon • Technical Director

James has 29 years of experience isolating human islets. He is a devoted family man who spends his free time riding his bike, playing guitar, and directing and coaching a youth cycling program in Edmonton.





#### Nancy Smith • Tissue Specialist

A member of the MacDonald Lab since 2007, Nancy became the second ADI IsletCore islet isolation lead in 2019. Outside of the lab, she enjoys knitting and camping with her husband and two daughters.

#### Aliya Spigelman • Technician

A former student in the MacDonald Lab, Aliya became a technician in 2011. She performs hormone secretion assays for ADI IsletCore. In her free time, she enjoys figure skating and getting outdoors with her family.





#### Austin Bautista • Technician

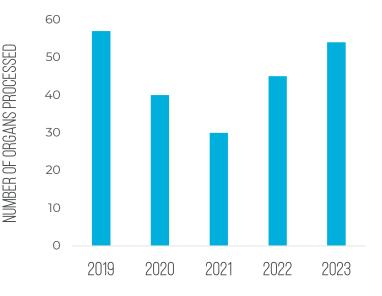
Austin has been a part of ADI IsletCore since 2013. He assists with isolations and performs functional characterization of islets. His favourite pastimes are alpine skiing, ultimate frisbee, and video games.

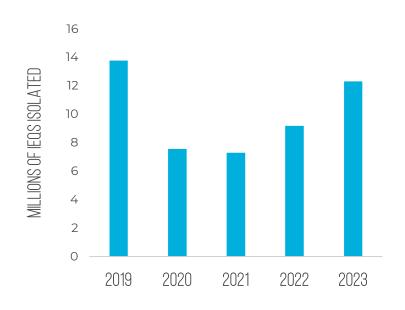
### **ISOLATION & DISTRIBUTION**

### Organs Processed

By the end of 2023, ADI IsletCore received a total of 524 human donor pancreases for islet isolation, with 54 being processed this year.

This year saw two pediatric donors, while our oldest donors were in their 70s. Three of the 54 organs came from donors with type 2 diabetes and we received 34 pancreases from male donors and 20 from female donors. The average age of this year's donors was 49, and the average BMI was 26.8. Of the 54 donations made this year, 41 were NDD, 10 were DCD, and 3 were MAID.





### Islets Isolated

From the 524 organs received since our inception in 2010, we have isolated almost 126 million islet equivalents (IEQs). This year, we isolated a over 12 million islet equivalents, a significant jump from the 9.2 million we isolated last year.

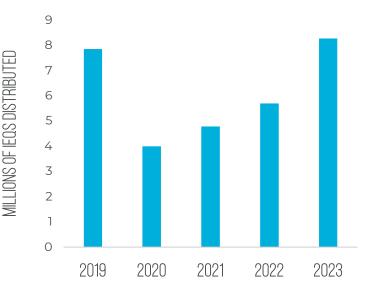
The success of our islet culture also improved this year; our average loss before shipment came in at 19% in 2023, compared to 24% the year prior.

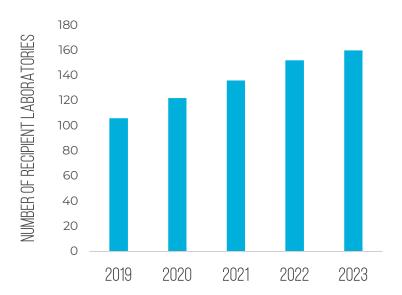
### **ISOLATION & DISTRIBUTION**

### Islets Distributed

To date, we have distributed over 63 million islet equivalents for research. In 2023 alone, we saw a record 8.27 million islet equivalents go out the door.

Any surplus islets that remain after distribution are biobanked for our recipients' future use. In 2023, we cryopreserved over 734 thousand islet equivalents and snap-froze another 584 thousand.





### **Recipient Laboratories**

We distribute islets to a network of recipient laboratories that has now grown to 160 groups after signing up an additional eight groups in 2023.

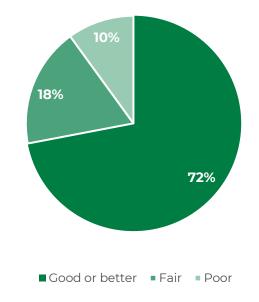
Our current recipient base consists of 42 groups from Canada, 80 from the USA, 36 from Europe, and 2 from Asia. The vast majority of our distribution network is comprised of researchers working in academia (151), with nine of our recipients working in industry.

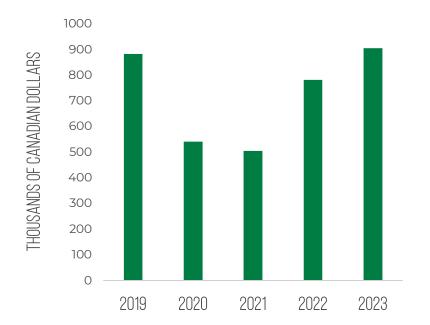
### **MEASURES OF SUCCESS**

### User Feedback

It is important to us that ADI IsletCore continues to provide high-quality research tissue. Our focus on research-only islet isolation allows us to provide preparations with high purity and function to our network of recipients.

In 2023, overall positive user feedback—meaning an excellent or good preparation quality rating remained consistent with last year at 72%. It is worth noting, however, that our response rate was only 38% this year, so this number may not fully capture our users' perception of islet quality.





### Cost-Recovery

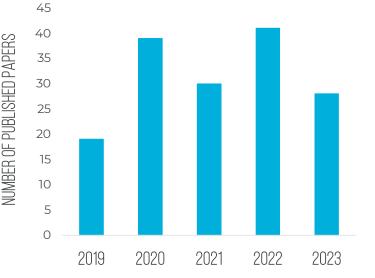
This year, our cost-recovery income continued to recover from COVID-19 effects. Our budget remains balanced and we are wellpositioned for sustainability going forward. As part of our business planning, we are reevaluating our cost-recovery structure to ensure both long-term viability and affordability for our users.

We have also reinitiated plans that were put on hold during the pandemic to reinvest in ADI IsletCore infrastructure, replacing aging islet isolation and processing equipment that we initially inherited when the program launched to ensure uninterrupted service and islet quality.

### **MEASURES OF SUCCESS**

### **Research Outputs**

ADI IsletCore is continually leading to the generation of new diabetes-related knowledge. Significant contributions in diabetes, islet, and pancreatic research are enabled by access to the tissue provided by our program. This is something we take pride in and use to fuel our desire for improvement.



ADI IsletCore has contributed to more than 229 published original

research papers to date, with 28 published in 20 different scientific journals this year alone. Access to our research tissue and related data also continues to contribute to successful funding applications for many of our recipient laboratories and has been acknowledged in proceedings at diabetes research conferences across the world.



### Longevity

2023 marked our thirteenth year of operations and we celebrated our 500<sup>th</sup> islet isolation in July!

Six of our seven team members have a decade or more of service with ADI IsletCore under their belts, which is a testament to the positive working environment and passion for what we do. Our tight-knit team is proud of the way our program continues to flourish and is committed to furthering ADI IsletCore's success in the future.

### **CONTACT US**

Our goal is to promote and facilitate human islet research. If you would like to join our human islet distribution list, please get in touch!

#### Dr. Patrick MacDonald

ADI IsletCore Director ⊠: pmacdonald@ualberta.ca X: @bcellorg

#### Tina Dafoe

ADI IsletCore Program Coordinator ⊠: tdafoe@ualberta.ca

For more information, please visit our website at bcell.org/adi-isletcore.

# WHAT WE OFFER

at ADI IsletCore



### **FRESH ISLETS**

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High purity, research-grade human islets from donors with and without diabetes at cost-recovery pricing.



### **FROZEN ISLETS**

Cryopreserved and snap-frozen human islets for expression, -omics, and select functional studies.



### **BLOCKS & SLIDES**

Paraffin-embedded pancreas biopsies and isolated islets. Custom fixation available upon request.

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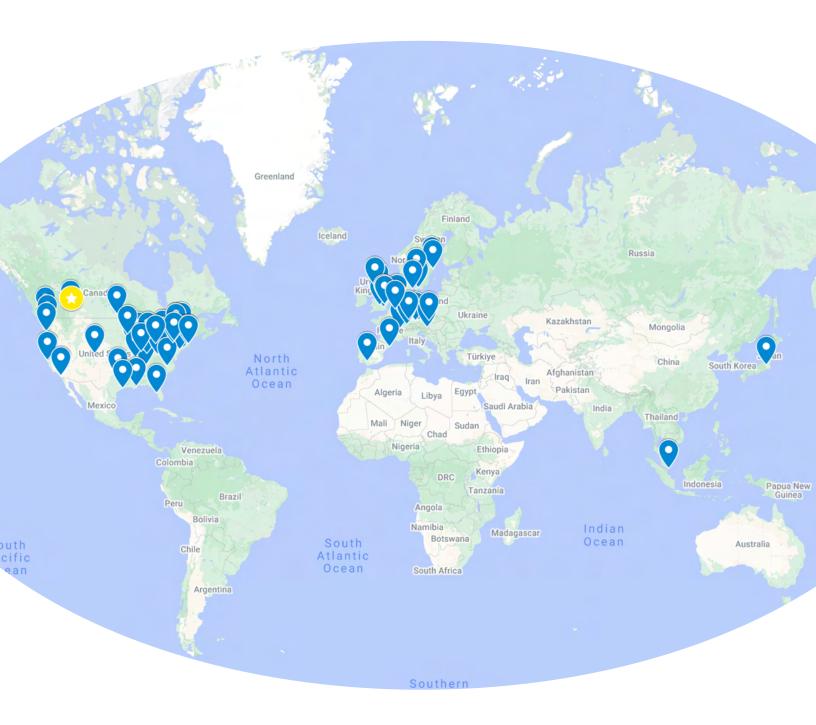
### **TISSUE SAMPLES**

Samples of intestine, spleen, adipose, lymph nodes, and blood. Custom processing available upon request.



### **FUNCTIONAL DATA**

Whole islet insulin secretion and single beta-cell function assays performed on every preparation.



### ALBERTA DIABETES INSTITUTE ISLETCORE

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