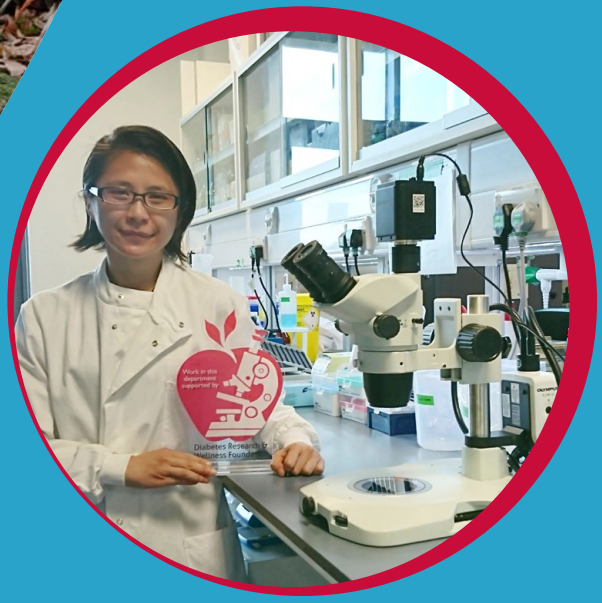
Diabetes Research & Wellness Foundation

Research Strategy 2024-26

Our focus for the future…



amrc
ASSOCIATION OF MEDICAL RESEARCH CHARITIES

CONTENTS

Message from our Chairman and Chief Executive

Mike Gretschel
Co-Founder & Chairman

Sarah Tutton
Chief Executive

As DRWF enters its 26th year, we reflect on the diabetes landscape and the charity's impact over that time.

Since our inception in 1998, we have seen the number of people diagnosed with diabetes more than double. Whilst there have been some incredible advances in treatment and technology which improve quality of life and reduce the risk of complications, the number of people living with diabetes continues to rise at an alarming rate. With more than 5 million people now living with diabetes in the UK, our work is more important than ever.

In the last 25 years we have provided award-winning Diabetes Wellness support programmes, and funded the research that has made inroads into our understanding of cause, treatment, management and cure. As we focus on the future we pause to reflect, rethink and redouble our efforts to ensure that people with diabetes are 'staying well until a cure is found…'

We are a small organisation that exists on voluntary donations and fundraised income. Our supporters are the backbone of the charity, with their generosity and commitment enabling us to provide beneficiary services that make a difference. Together we have -

- Raised over £80 million and spent an average 82p in every £1 on awareness, education and research.
- Developed an International Diabetes Wellness Network with groups in the US, UK, France, Sweden, Finland and Norway, all of whom collaborate on global awareness campaigns and invest in research funding at some of the world's most prestigious institutions.
- Made a significant and longstanding contribution to the UK Islet Transplant Programme, funding the DRWF Human Islet Isolation Facility at the Churchill Hospital, Oxford and 30% of its islet team,
- Secured a Quality in Care Diabetes (QiC) award for an educational Diabetes Wellness programme that informs, inspires and empowers,
- Achieved Patient Information Forum (PiF Tick) accreditation, a quality mark for health and social care information that is relevant, medically evidenced, up-to-date and reliable.

We have yet to achieve our greater vision, the day when diabetes is no longer the threat to life and healthcare systems, that it is today. Until then, we remain focused on providing the practical tools to support self-management, improve health outcomes and quality of life, until the research we fund makes the next big breakthrough…

It would not be possible to do any of this without the ongoing commitment and collaboration of our diabetes community supporters and beneficiaries, healthcare professionals and scientists, third sector organisations and industry partners. All of whom are invested and intent on creating a brighter future for people with diabetes.

THANK YOU!

Research Strategy 2024 - 2026

OUR VISION: **A world without diabetes**

OUR MISSION: To fund diabetes research in the UK & around the world in order to understand the causes, prevention, treatment and management, and provide the support programmes that ensure people with diabetes are ***'staying well until a cure is found...'***

WE DO THIS IN THREE WAYS:

1. We raise awareness of all types of diabetes so that people can take preventative actions where possible.

2. We provide support and tools to promote good self-management, reduce complications and improve quality of life.

3. We fund medical research worldwide that will help establish cause, prevention and treatment, improve management and treatment options and ultimately find a cure.

DRWF Research Strategy

Our vision is for a world free of diabetes, and it is our goal to fund the very best research possible to ensure that we work towards a cure for the disease, investigating better management and treatments and helping people to ***'stay well until that cure is found...'***

The aim of DRWF's Research Strategy is to set out clearly the charity's objectives and priorities for funding research and to outline the organisation's plan for achieving them.

DRWF FUNDS RESEARCH PROJECTS FOCUSED ON:

Each year our goal becomes more important as the number of people diagnosed continues to rise. Figures from the International Diabetes Federation indicate that more than 463 million people are living with diabetes worldwide. By 2030 this number will rise to almost 578 million Diabetes is one of the fastest growing health challenges of the 21st century with the number of adults living with the condition having more than tripled in the last 20 years.

Put simply, it is our ultimate goal to discover a cure for diabetes. We know that this is a long road but we are intent on maximising the potential by funding the highest quality clinical and scientific research at the very best research institutions in the UK and around the world. We are committed to investing in research projects with tangibly beneficial and practical outcomes for people living with diabetes. Our research funding programme and successes are proof of this.

DRWF is a member of the Association of Medical Research Charities (AMRC), a membership body representing the leading UK medical and health research organisations. As a member, we fulfil AMRC's criteria for the use of peer review for allocating funding and support AMRC position statements on the payment of indirect costs in universities and the use of animals in medical research.

Our annual funding round is offered through open competition, and as such, enables funded researchers to access support for both indirect and direct costs of research via the Charity Research Support Fund (CRSF) and NIHR Clinical Research Networks AcoRD agreement.

OUR RESEARCH ADVISORY BOARD IMPLEMENTS FIVE PRINCIPLES OF PEER REVIEW:

ACCOUNTABILITY | BALANCE | INDEPENDENT DECISION MAKING
ROTATION OF SCIENTIFIC ADVISERS | IMPARTIALITY

to ensure that only the highest quality and most effective research receives DRWF funding.

AMRC members are also required to ensure that the researchers they fund adopt good practice in their working methods. Additionally, we are committed to the 3Rs of reduction, replacement and refinement in the use of animals in research.

Through our research funding, we are investing in a brighter future for people with diabetes.

Research Advisory Board

Professor Angela Shore
Chair of the Research Advisory Board
University of Exeter Medical School

Professor Peter Jones
King's College London

Dr Mark Evans
University of Cambridge

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Professor Mirela Delibegovic
University of Aberdeen

Professor Susan Ozanne
University of Cambridge

Professor Ketan Dhatariya
University of East Anglia

Dr Victoria Salem
Imperial College London

Mr John Casey
Royal Infirmary of Edinburgh/ University of Edinburgh

Dr Katharine Owen
Oxford Centre for Diabetes, Endocrinology and Metabolism

DRWF Research Grants

ANNUAL FUNDING ROUND

FELLOWSHIPS

DRWF Research Fellowships are awarded for research related to causes, cures or complications of diabetes. Clinical/ Non-Clinical Fellowships are awarded on alternate years.

Sutherland-Earl Clinical Fellowship

Applications are invited from:

- Medically qualified doctors
- (MBChB or equivalent) working towards a higher degree, ie MD or PhD

DRWF Clinical Research Fellowships cover a period of up to 3 years, in a recognised institution or department within the United Kingdom. Support for the Fellowship is a maximum of £85,000 per year, to include a salary, consumables and some support costs (finite award of £255,000)

The Professor David Matthews Non-Clinical Fellowship

Applications are invited from:

- Post-doctoral researchers working or intending to work in the field of diabetes

DRWF Non-Clinical Research Fellowships cover a period of up to 3 years, in a recognised institution or department within the United Kingdom. Support for this Fellowship is a maximum of £72,000 per year, to include a salary, consumables and some support costs (finite award of £216,000)

PUMP PRIMING GRANTS

Pump Priming grants are small project grants aimed as a steppingstone for young researchers.

- Research Projects – Clinical or Non-Clinical, of one year's duration of up to £20,000

(no-cost extensions may be considered)

INSTITUTIONAL FUNDING

Our research portfolio demonstrates a commitment to support institutions whose aim is to relieve the symptoms of diabetes whilst aiming for a cure. To this end, we have a long-standing commitment to the DRWF Human Islet Isolation Facility at the Churchill Hospital, Oxford. Ongoing contract funding supports 3 key personnel within the facility, which plays a central role in the delivery of a national islet transplant programme.

PARTNERSHIP FUNDING

By combining expertise and resources, we can answer bigger and more complex scientific questions, expanding the breadth of our research portfolio. Working collaboratively with organisations that share our vision, mission and values enables us to maximise opportunity and increase impact. We are open to proposals to work in partnership, and we often collaborate with other DRWF groups to support higher-value, longer-term grant funding awards.

DISCRETIONARY FUNDING

The DRWF Board of Trustee's is open to proposals that do not fall within the eligibility parameters of our annual funding round awards; however these are our priority. On receipt of such a proposal, the Board will consider whether it fits with our over-arching strategy and seek peer-review from relevant experts, provided the charity is satisfied that it is financially viable.

The Impact of DRWF Funding…

One of the ways in which we demonstrate impact from our Fellowship and Pump Priming funding, is through capacity building and the leveraging of further funds to amplify the work that has been conducted by our award recipients.

In 2023 it was wonderful to see two previously funded researchers and one of our Research Advisory Board members receiving a share of a £5 million funding award from the T1 Grand Challenge programme.

The funding marks the start of the Type 1 Diabetes Grand Challenge programme which will provide £50 million towards diabetes research over the coming years. The funding to scientists based around the UK will each solve different problems with the ultimate goal of finding a cure for type 1 diabetes.

The trio of researchers awarded part of the funding are Dr James Cantley (DRWF Pump Priming 2019 and member of the Diabetes Wellness Sverige RAB - ***Investigating the role of Viperin in beta cells as a mechanistic link between enteroviral infection and the development of type 1 diabetes)***, Professor Sarah Richardson (DRWF Non-Clinical Fellowship 2010 ***- Enteroviral infection as a causative factor in human type 1 diabetes)*** and Dr Victoria Salem (DRWF Research Advisory Board member).

The Grand Challenge program is funded by a £5 million donation from the Steve Morgan Foundation as part of the Our Lives, Our Choices, Our Voices aimed at improving the lives of young people aged between 11-25 with type 1 diabetes.

Around a fifth of the 300,000 people in the UK with type 1 diabetes are aged 25 and under, with many feeling the condition is holding them back and adding to their isolation.

Dr James Cantley, at the University of Dundee, will work on developing new drugs to help people living with type 1 diabetes grow back their own beta cells inside their pancreas. The aim of this approach will be to avoid problems with the immune system rejecting transplanted "foreign" donor or lab-made beta cells and allow the pancreas to produce its own insulin again.

Dr Cantley said: *"Regenerating beta cells in the pancreas has the potential to revolutionise the treatment of type 1 diabetes, by replacing cells destroyed by the immune attack, and ultimately leading to stable blood sugar levels and a life free from insulin injections."*

Dr Victoria Salem, of Imperial College London, will work with a state-of-the-art 3D bioprinting to "print" a device that can be implanted into people with type 1 diabetes to deliver a new supply of beta cells. The device will act as a barrier and protect the beta cells sitting inside, by blocking attacking immune cells, while still letting in vital nutrients they need to survive.

Dr Salem said: *"The dream for a cell-based cure for type 1 diabetes is now tantalisingly close - I'm so excited and honoured to be a part of this journey."*

Professor Sarah Richardson, of the University of Exeter, will investigate how and why a person's immune system destroys their own beta cells and how this process may differ between people with type 1 diabetes. Professor Richardson will also study how beta cells can fight back against the immune attack. With this knowledge, researchers could develop an armoury of new treatments that target different lines of the immune system's attack.

Professor Richardson said: *"Ultimately, this will help us tailor existing and emerging therapies to the individual, maximising the benefits for people with type 1 diabetes."*

Dr Victoria Salem

"I was truly honoured to be invited to join the DRWF advisory board. The board represents the best diabetes researchers from across the UK. They all share the passion and values that make DRWF a really wonderful organisation - one which has patients with diabetes at its heart and is suffused with a culture of kindness and research excellence."

Down Syndrome and Diabetes: Unlocking the Mystery

LATEST RESEARCH OFFERS A BIG STEP FORWARD IN UNDERSTANDING THE CONNECTION

While most people are familiar with Down Syndrome (DS), many are unaware that children with DS are four times more likely to develop type 1 diabetes (T1D). What's more, when they do, it tends to strike earlier in their lives.

People with DS have an additional copy of chromosome 21, but it hasn't been clear why this causes them to be at such a heightened risk for developing diabetes. A DRWF-funded study of 116 babies with DS, headed up by Professor Kathleen Gillespie in Bristol, set out to explore the connection. For parents and guardians of children with DS, the findings could offer invaluable insights.

KEY FINDINGS OF THE STUDY

- **Presence of Specific Antibodies:** The research found that antibodies to Bovine Serum Albumin (BSA), a food antigen, were more prevalent in children with DS. Simply put, these antibodies might indicate an increased gut permeability or "leaky gut," which some theories suggest might be related to autoimmunity and the development of T1D.
- **Genetic Predisposition:** Interestingly, children with DS and diabetes possess fewer genetic risk factors for T1D compared to age-matched children without DS. This challenges our understanding of the usual genetic predispositions for diabetes.
- **Increased Autoimmunity to Insulin:** Children with DS exhibited a heightened autoimmunity to insulin, another indicator of their increased risk of T1D.

The research has reinforced the understanding that children with DS are more susceptible to type 1 diabetes and other autoimmune conditions like thyroid autoimmunity. It has further deepened the knowledge on the unique ways this vulnerability manifests in DS compared to the general population.

Why are these findings important? Knowing that children with DS have a higher propensity for type 1 diabetes provides an avenue for early intervention and tailored healthcare. But, beyond that, these findings might give clues about the broader mechanics of diabetes and autoimmunity.

IMPLICATIONS AND FUTURE DIRECTIONS

For decades, autoimmunity in children with DS was a niche topic. But over the past five years, the scientific community's interest in understanding the unique health profile of DS has surged. There are suggestions that children with DS have a heightened response to interferons - proteins that play a critical role in our immune reactions. This heightened response might be the key to their increased risk of autoimmunity. Moreover, this could also explain why some children with DS develop autoimmune reactions while others don't.

The research journey wasn't without its challenges. The study faced a temporary halt due to COVID-19. However, this time was productively used for genetic analysis. The researchers also encountered difficulties with certain laboratory tests, particularly the Fatty Acid Binding Protein 3 test. But they are committed to overcoming these challenges and reattempting the test.

Looking forward, the research team is gearing up to answer a critical question: Why do some DS children develop autoimmunity while others do not? This is at the heart of an upcoming grant application and is set to become a focal point for future studies.

IN CONCLUSION

The puzzle of Down syndrome and diabetes is complex, but we're starting to fit the pieces together. This study has shed light on some critical aspects of why these children are at a higher risk for T1D. As research progresses, we're not only understanding DS better but also getting deeper insights into the enigma that is diabetes. For children with DS and their families, this knowledge offers hope and a path to better, more informed care.

Could our genes hold the key to future diabetes treatments?

EXCITING NEW RESEARCH COULD UNLOCK NEW TREATMENTS FOR DIABETES, AND REDRESS HEALTH INEQUALITIES FACED BY BRITISH BANGLADESHI AND PAKISTANI COMMUNITIES.

Diabetes affects millions worldwide and its prevalence is particularly high among certain communities, such as the British Bangladeshi and Pakistani populations. While most are familiar with type 2 diabetes, the underlying causes and the intricate science behind it can be complex. But what if our genes could offer clues to understanding, preventing, and even treating this condition? A recent study, funded by the Diabetes Research & Wellness Foundation, delved deep into this question.

THE GENES & HEALTH STUDY

The Genes & Health study is a large-scale research project focusing on British Bangladeshi and Pakistani volunteers. Historically, these communities have been underrepresented in research studies. The primary goals of this study are twofold:

- Address the health inequalities faced by these communities, such as higher rates of type 2 diabetes and heart disease.
- Increase the representation of these communities in scientific research.

With over 55,000 volunteers already participating, the study aims to gather insights from 100,000 individuals in total.

THE ROLE OF "KNOCKOUT GENES"

Imagine genes as tiny instruction manuals within our cells. Sometimes, a gene might have a "misprint" or error, causing it not to work properly. These are called "knockout genes." By studying individuals with these genes, researchers have been trying to understand how these rare genetic changes can provide insights into how our body functions and why certain diseases develop.

One of the significant findings from the study revolves around a gene called MC3R. This gene plays a crucial role in how our brain controls our body's development, puberty, and growth during childhood. One volunteer with a "knocked out" MC3R gene had delayed puberty, obesity, type 2 diabetes, and was shorter in height. This discovery could help understand the causes of delayed puberty and the potential roles of this gene in obesity as well as diabetes.

THE POTENTIAL FOR FUTURE TREATMENTS

The study's findings aren't just academic. By understanding the role of these genes in diabetes and metabolism, researchers hope to identify potential targets for future drug treatments. For example, if a specific gene is found to play a significant role in diabetes, drugs could be developed to target that gene's function, potentially offering a new treatment avenue.

The study is currently exploring other genes related to diabetes and obesity. The hope is that these investigations will reveal more genetic causes of these conditions and possibly identify new targets for future drug treatments.

CHALLENGES AND IMPLICATIONS

Like all scientific endeavours, the study faced its share of challenges. From changes in scientific collaboration to the global COVID-19 pandemic, the research team had to adapt and pivot. However, despite these challenges, the study's implications are vast:

- **Scientific Discovery:** The study has uncovered new areas of biology, providing insights into how our bodies work and the potential mechanisms behind diseases like diabetes.
- **Drug Development:** The findings could lead to advances in drug development, offering hope for more effective treatments in the future.
- **Broadening Research:** The success of the Genes & Health study has paved the way for other research projects, expanding our understanding of various diseases and conditions.

THE BIGGER PICTURE

The Genes & Health study is a testament to the power of genetic research. By understanding our genes, we can gain invaluable insights into diseases like diabetes, offering hope for better treatments and a healthier future. For the British Bangladeshi and Pakistani communities, this research represents a step towards addressing health inequalities and ensuring that medical advancements benefit everyone equitably.

"The generous pump-priming award made to me by DRWF at a critical juncture of my career has been invaluable and highly successful. I am very grateful to the DRWF team and those supporting its work financially for making this award possible."

Dr Sarah Finer
Principal Investigator of the study

Researchers at the 'United Through Diabetes' event

United Through Diabetes is a wonderful concept that brings the diabetes community together with healthcare professionals, public health officials, third sector organisations, and industry partners. All of whom are invested and intent on creating a brighter future for people with diabetes. With a full programme of talks, workshops and interactive sessions, this DRWF flagship annual event provides a platform for showcasing the charity's research funding and it's impact for the diabetes community. In 2023, our 25th anniversary year, we were delighted to have past and present funded researchers join UTD to talk about their work, the importance of the charity's funding, and ultimately the outcome of their work for people with diabetes...

Dr Kashyap Patel

Defining heterogeneity of clinically diagnosed adult-onset type 1 diabetes using genetic and islet autoantibodies

Autoantibodies are immune proteins that mistakenly target and react with a person's own tissues or organs. Islet antibody tests for adults and young people suspected to have type 1 diabetes are available in routine clinic practice across the UK. However, the additional benefit of measuring these antibodies when someone has strong clinical suspicion of type 1 diabetes, particularly in a dult-onset, is not known. Currently, it is performed more widely when there is diagnostic uncertainty.

Researchers aimed to explore this by assessing the genetic risk of type 1 diabetes in a large number of autoantibody-negative and -positive children and adults to reduce the risk of misdiagnosis.

Professor Paul Squires

Does reorganization of the extracellular matrix promote glucose induced fibrosis in diabetic nephropathy?

Our kidneys are made up of thousands of tiny tubes. Together, they regulate several important processes in the body. They clean our blood and control blood pressure. They also make several important hormones. In diabetes, high levels of sugar can trigger

fibrosis (scarring) of these tubes, which if left untreated can cause our kidneys to fail.

Damage occurs when the cells that make up these tubes fail to respond as they should and start behaving in way that is more characteristic of cells of another tissue type. In doing so, they lose their ability to synchronize their activity with each other. They become less able to directly stick to neighbouring cells and to the extracellular matrix, a ty pe of skeleton that surrounds and supports the cell. Loss of these interactions prevents cells from sharing healthy survival signals. We know little of how high levels of sugar disrupts both cell structure and function in the early part of these tubes.

This project used healthy and diseased kidney cells to establish how high levels of sugar altered the ability of cells of the early kidney to talk to each other and their environment. The aim of these studies was to identify a future therapeutic target for alleviating kidney scarring in people with diabetes.

Professor Susan Wong

Immune cells in type 1 Diabetes

The immune system is responsible for attacking the insulin-producing beta cells of the pancreas. Different types of immune cells work together, and our projects focus on B cells which produce antibodies which are markers of the immune activity, as well as killer T cells which carry out the damage and destruction of the beta cells.

We will discuss our research related to how the immune cells work together, and how immunotherapy could be of benefit in Type 1 diabetes.

Dr Stephanie Hanna

Identifying islet antigen specific lymphocytes by recruitment to intradermally injected autoantigens, using single cell RNA sequencing: a route to novel cell based therapies and immune monitoring.

Immunotherapies are medicines that target the immune system. In autoimmune diseases such as type 1 diabetes they aim to stop the immune system from harming the person's own cells. The first immunotherapy to delay the development of type 1 diabetes has just been licensed in the USA (teplizumab/Tzield).

T cells are a type of immune cell that play a crucial role in the development of type 1 diabetes by attacking the pancreas rather than harmful germs. Autoantigens are proteins that are particular targets of the immune system in autoimmune disease. In the case of type 1 diabetes, proinsulin and GAD are examples of autoantigens made by the insulin-producing-beta cells in the pancreas.

The pathogenic T cells that target these autoantigens and destroy insulin-producing cells in type 1 diabetes are rare in the blood and we cannot sample them directly from the pancreas in humans. My research, funded by the DRWF, focuses on how we can identify and track these cells during immunotherapies. This is a promising route to offering people the most appropriate immunotherapies and clinical trials.

Professor Claire Hills

Cx43 mediated regulation of the inflammasome, a therapeutic target in diabetic nephropathy

Cells lining the surface of the small tubes of the kidney work together to ensure that appropriate function is maintained. However, in the diabetic kidney, these cells become bathed in high levels of sugar and associated stress molecules that affect kidney cell behaviour.

We have previously demonstrated that high sugar reduces stickiness between kidney cells, an event that impairs the way in which cells talk to each other, and ultimately affects their ability to work efficiently. More importantly, our preliminary studies suggest, that in kidneys of people with diabetic nephropathy, there are altered levels of proteins responsible for transferring information between both cells and their surrounding environment.

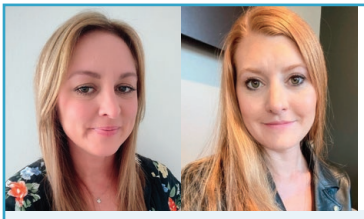
In the absence of appropriate data sharing, cells respond inappropriately to incoming danger changes and ultimately kidney function is impaired. Our proposal aims to understand the mechanisms which link inappropriate cell conversation to the damage that occurs in the diabetic kidney. Importantly, in collaboration with our clinical colleagues, we will demonstrate the ability of a new therapeutic to negate these effects.

Dr Nerys Astbury

Exploring the Long-term health Outcomes following a Pregnancy with Gestational Diabetes Mellitus (ELOPEGDM).

Gestational diabetes is a form of diabetes that affects pregnant women. It usually goes away after birth. Getting GDM increases the risk of problems during pregnancy and birth. There is also evidence that women who develop GDM are at much higher risk of developing conditions like type 2 diabetes. But the effect of getting GDM on other conditions as well as on the health of the baby has not been widely investigated.

Using one of the UK's largest databases of routine healthcare records we will measure the effect getting GDM has on health and disease risks in mothers and their babies. Insight into the full effects that GDM has on women and their babies will provide a boost to research efforts for the early detection, prevention and treatment of GDM.



Kelly Carden and Naomi Parnell

Improving patient and public involvement in research, in underrepresented groups.

With funding from the National Institute for Health and Care Research (NIHR), we looked at how to improve patient and public involvement in research, particularly in under-represented groups in our communities.

This was an important study to understand how people access information about specific pieces of work that are recruiting patients and the public; their motivations for getting involved, and how we can make it easier to participate and encourage higher numbers of people to take part in research studies.

Designing treatments, interventions, and devices, and setting research priorities in collaboration with people with lived experience, means we can be sure of meeting the needs of the people that we are here to support.

Dr Vicky Salem

Research Advisory Board member and recipient of the Type 1 Grand Challenge award.

Vicky Salem is a Consultant Diabetologist and runs a Type 1 clinic at St Mary's Hospital in London as well as helping with the pancreas transplant service at Hammersmith Hospital. She has a lab in the Department of Bioengineering at Imperial College London and her research has focused on understanding the pancreatic islet as a complex unit, including developing new ways to test and image them with advanced microscopy.

'If we understand islet biology better, we can find ways of fixing them (or successfully replacing them) when diabetes occurs. I believe we will find a cure for diabetes one day'.

I was truly honoured to be invited to join the DRWF advisory board. The board represents the best diabetes researchers from across the UK. Their skills span from very fundamental science through to clinical translation. They all share the passion and values that make DWRF a really wonderful organisation - one which has patients with diabetes at its heart and is suffused with a culture of kindness and research excellence. I hope that together we will direct support to the most impactful projects and, in particular, fund the next generation of rising stars. We will succeed by attracting and retaining the brightest research brains in the country!

Dr Shivani Misra

Sutherland-Earl Clinical Fellowship recipient 2012 and DRWF Trustee

Imperial College London

Dr Shivani Misra was a specialty registrar training in diabetes when she first applied for funding for her PhD from DRWF. She was successful and was awarded the Sutherland-Earl clinical fellowship in 2012.

Shivani went on to lead the MY DIABETES study which investigated whether genetic forms of diabetes were being missed in different ethnic groups in England. Soon after her PhD, she became a consultant in Diabetes at St Mary's Hospital in London. During which time she balanced her research and clinical activities. She was also invited to join the board of trustees for DRWF and sits on the board to this day, helping to shape the charities mission and overseeing its governance. More recently she switched to a full-time academic job and is now funded by the Wellcome Trust to investigate early onset Type II diabetes in England. Her work has led to a change in policy, which now means people under the age of 40 with type two diabetes will be receiving extra care.

Dr Misra says "from the day I was awarded my PhD funding by DRWF until now I have maintained a close relationship with the charity. It has been hugely pivotal in both my academic and personal career development. It is a pleasure to now serve on the board of trustees. "

Dr Rebecca Spiers

Optimising islet isolation for human islet transplantation islet isolation for human islet transplantation.

NUFFIELD DEPARTMENT OF SURGICAL SCIENCES
Medical Sciences Division

UNIVERSITY OF OXFORD

Islet cell transplantation involves extracting islets of Langerhans (the clusters of cells responsible for producing insulin) from the pancreas of a deceased donor and implanting them into the liver of someone with severe Type 1 diabetes. This is done as a minimally invasive procedure in the x-ray department. The transplanted islets start working and producing insulin a week or so after the procedure. Most people need two islet transplants to get the maximum benefit from the procedure. Islet transplant recipients need to take anti-rejection drugs so that their immune system does not reject the newly transplanted islet cells.

These drugs must be taken for the rest of the transplant recipients' life. Eligibility for this procedure is very strict and is only available for certain people with Type 1 diabetes who have severely impaired awareness of hypos despite optimised conventional treatment with insulin, and who have experienced two or more severe hypos within the last two years. Islet transplantation is also used to ensure optimal blood glucose control in people with Type 1 diabetes who are needing a kidney transplant or in those who already have a functioning kidney transplant who experience se vere hypos and impaired hypoglycaemia awareness or poor blood glucose control despite the best medical therapy.

The goals and possible benefits of an islet cell transplant for people with Type 1 diabetes are to:

- Prevent life-threatening hypos
- Improve awareness of hypos
- Reduce insulin requirements including insulin independence in some people
- Reduce fear of hypos and restore independent living
- Reduce the risk of developing long-term complications of diabetes Improve quality of life
- Prolong the survival of a kidney transplant

"Please join us at United Through Diabetes in 2024 - as a member of the diabetes community, as a clinician or scientist, or as an industry partner or collaborator - this is where we come together to demonstrate how we are investing in a brighter future for people with diabetes..."

Sarah Brown
Research Grants Administrator

DRWF Research: Study looks at differences between diagnosis of type 1 diabetes in adults and young people

RESEARCHERS SAID THE STUDY FOLLOWED MISDIAGNOSIS OF THE CONDITION.

A recently published DRWF-funded study looked at the genetic risk of adults and young people when diagnosed with type 1 diabetes. Previous to the study, the reason for the noted lower rate of islet autoantibody positivity in clinician-diagnosed adult-onset in comparison with childhood-onset type 1 diabetes was not known.

Researchers aimed to explore this by assessing the genetic risk of type 1 diabetes in autoantibody-negative and -positive children and adults. The results of the study were recently published in Diabetologia. Researchers measured type 1 diabetes genetic risk by genotyping (investigating the genetic constitution of, for example, an individual organism) 30 type 1 diabetes-associated variants at diagnosis in 1,814 people with clinician-diagnosed type 1 diabetes (1112 adult-onset, 702 childhood-onset).

Researchers then compared the overall type 1 diabetes genetic risk in those with adult-onset and childhood-onset diabetes. They also measured the type 1 diabetes genetic risk in 1,924 individuals with type 2 diabetes from the Wellcome Trust Case Control Consortium to represent non-autoimmune diabetes control participants.

Dr Kashyap Patel, Wellcome Trust Fellow and Consultant Physician at the University of Exeter, who lead the study, said: "We showed that misclassification is rare in childhood-onset clinically diagnosed type 1 diabetes as expected, but greatly increased in adult (6%) and late-onset clinical type 1 diabetes (20%)."

He added: "The results strongly suggest that lack of islet autoantibodies in childhood-onset clinically suspected type 1 diabetes does not change the diagnosis, but it greatly changes the diagnosis in the adult/late-onset clinically suspected type 1 diabetes. Thus, highlighting the importance of routine testing for islet autoantibodies at diagnosis in all patients suspected to have adult/late-onset type 1 diabetes. This data contradicts the current NICE guideline which suggests testing these antibodies in clinically uncertain cases only.

"Once we discovered the misclassification of type 1 diabetes in our clinically suspected type 1 diabetes study, it became clear that all the previous studies that used the clinical judgment to define type 1 diabetes at diagnosis, inadvertently included non-autoimmune diabetes. This may have resulted in masking the true phenotype of late-onset type 1 diabetes. Indeed, when we removed the misclassified type 1 diabetes, we uncovered novel biology of late-onset type 1 diabetes and heterogeneity of type 1 diabetes."

The results suggested that the intermediate type 1 diabetes genetic risk in autoantibody-negative adults was more likely to be explained by the inclusion of misclassified non-autoimmune diabetes (estimated to represent 67% of all antibody-negative adults, 95% CI 61%, 73%) than by the presence of unmeasured autoantibodies or by a discrete form of diabetes. When these estimated people with non-autoimmune diabetes were adjusted for, the prevalence of autoantibody positivity in adult-onset type 1 diabetes was similar to that in children (93% vs 91).

The study concluded: "The inclusion of non-autoimmune diabetes is the most likely explanation for the observed lower rate of autoantibody positivity in clinician-diagnosed adult-onset type 1 diabetes. Our data support the utility of islet autoantibody measurement in clinician-suspected adult-onset type 1 diabetes in routine clinical practice.

"In summary, our detailed immunogenetic study of a large group of people with clinician-diagnosed adult-onset type 1 diabetes highlights the possible causes of the apparently lower prevalence of positive autoantibodies in adults. Misclassification of type 1 diabetes is the most likely explanation for this observation. The high rate of misclassification in adults who are clinically suspected of having type 1 diabetes strongly supports the routine measurement of autoantibodies in all individuals and not just when there is diagnostic uncertainty."

Dr Patel
Wellcome Trust Fellow and Consultant Physician at the University of Exeter

"Our study results have improved our understanding of the late-onset type 1 diabetes which accounts for nearly half of all type 1 diabetes. Our results suggest that nearly 1 in 5 patients who are clinically thought to have late-onset type 1 diabetes (diabetes onset after 30 yr of age), actually have T2D and thus are mistreated as type 1 diabetes. We went on and showed that measuring islet autoantibodies, which are easily accessible in routine clinical practice, greatly minimise this misdiagnosis."

Oxford team begin pioneering human trial of stem-cell derived islet transplants for type 1 diabetes

A pioneering clinical trial at the Islet Transplant Unit in Oxford was announced in late 2023.

This is the first such trial in the UK that involves the transplantation of pancreatic islets derived from stem-cells into patients with type 1 diabetes.

Participants in the Vertex study will have experienced episodes of severe hypoglycaemia requiring third party intervention. This is when blood sugar levels become dangerously low without the patient being aware of their worsening condition and this can lead to coma and even death.

DRWF made an unprecedented £1.2 million award to the Nuffield Department of Surgery, Oxford in 2004 for the provision of a Human Islet Isolation Facility.

This centre of excellence opened at The Churchill Hospital, Oxford in 2006 and was pivotal in the decision-making process in 2008 which led to the NHS funding the clinical islet transplant programme for a small cohort of people living with type 1 diabetes and hypoglycaemia unawareness.

Since then, DRWF has funded around 30% of the Facility staff, committing almost £4 million in total to furthering the non-clinical research element of the Oxford Islet Transplant Programme.

Patients undergoing treatment as part of this new groundbreaking first trial with Vertex, will need to take immunosuppression (anti-rejection medication) as they would for any other transplant.

However, the Oxford team are planning to start another Vertex trial soon that uses encapsulated stem-cell-derived islets without the need for this medication.

Professor Paul Johnson, Director of the Oxford Islet Transplant Programme and the Oxford DRWF Islet Isolation Facility, and UK Chief Investigator for this trial said: "Islets derived from stem cells offer the potential for an unlimited source of islets that could be a game-changer and transform the future treatment of diabetes.

"We are very excited about this ground-breaking trial with Vertex, which we are conducting in collaboration with the team in Newcastle. While islet transplantation is a life-changing treatment in patients with severe hypoglycaemia who have exhausted conventional insulin and pump treatment, it relies on the extraction of insulin-producing 'islets' from donor pancreases.

"The shortage of pancreas donors, and the inefficiency of the islet extraction process, currently limits the wider availability of this important treatment. We hope that this trial will be an important step towards our ultimate goal to be able to reverse diabetes in children soon after diagnosis.

DRWF Chief Executive, Sarah Tutton said: "Whilst there is much work to be done, we are very excited about the Vertex study's potential to address these long-standing issues of a treatment which can transform the lives of people with type 1 diabetes and hypoglycaemia unawareness. If we can find a sustainable supply of insulin producing cells for transplant, and ultimately mitigate the need for life-long immunosuppression treatment, we will be able to make islet transplants more widely available to more people with diabetes."

Dr Shivani Misra on the new NHS programme for people diagnosed with type 2 diabetes aged under 40

Here, we highlight Dr Shivani Misra's career progression following on from her DRWF Clinical Fellowship achievements. The T2Day: Type 2 Diabetes in the Young programme was created to support a rising number of 18 to 40-year-olds being diagnosed with the condition. Dr Shivani Misra, Consultant in Diabetes and Metabolic Medicine and a Senior Researcher at Imperial College London, and DRWF Trustee, helped develop the new NHS programme.

Dr Misra said: "Our recent analysis has shown that there are now 140,000 adults in England between the ages of 18 and 40 living with type 2 diabetes. Concerningly, the rate of increase is much higher in under 40s. We have seen an 18% increase in people diagnosed with type 2 diabetes under 40, relative to 11% in the rest of the population. Earlier onset type 2 diabetes seems to be linked with increasing levels of obesity. Our analysis has also shown that people from certain minority ethnic groups in England are more susceptible to earlier onset of type 2 diabetes. I think it is driven probably by obesity, also the intrinsic susceptibility of some populations to earlier onset."

Type 2 diabetes is commonly linked to lifestyle, and people who are overweight are more likely to develop the condition. However, Dr Misra offered caution at the suggestion "ultra proceeded foods" could be in part responsible for this age group developing type 2 diabetes, or genetic factors.

Dr Misra said: "I think at this point, this is speculation. I have not seen any research studies that have specifically looked at the impact of ultra processed foods on younger people with type 2 diabetes. As clinicians, who look after these individuals, we recognise that the presentation is very complex and that there are multiple factors. And indeed, diet may be one of them. But I think it is important not to underestimate the other factors that may be involved. In general, when some conditions present early on there is likely to be a genetic susceptibility, but again, that might only be a small part of the whole puzzle."

Whether being diagnosed at a young age, in this case under 40, with type 2 diabetes, could present a better or a worse chance of being able to manage your condition over time, was also discussed.

Dr Misra said: "This is the concerning feature of earlier onset type 2 diabetes. It seems from the studies that the earlier you are diagnosed, the faster you progress to complications and the more likely you are to have some of the adverse outcomes that we are trying to support our affected patients with. Really, that's why we've developed the new programme called T2Day, recognising the needs of younger individuals and making sure that they get the support they need, right from the offset. Our analysis shows that younger people seem not to be accessing the care that they need to and we can track this using measurements called cares processes.

In our analysis, it looks like they are less likely to receive the care processes, and so in designing T2Day with other experts, what we are trying to do is really shine a light on this group and make sure that people know that they need to come in and get the support that they need to around these complications.

The things that we can do are for example, ensuring that they have good diabetes control, which we can measure using a blood test called HbA1c, making sure cholesterol levels are targeted, along with blood pressure. In women, who have early onset type 2 diabetes, making sure they are adequately prepared for pregnancy. Ensuring that they are on the correct treatments, things that are going to help them to control their blood sugars and getting access to weight management services. With T2Day, we are hoping to develop all of this, through a greater number of appointments, with flexibility around how these are developed for younger people living with type 2 diabetes.

"One of the reasons I have focussed my research on this group is because they are at huge risk of developing multiple long-term conditions, from an early, including all of the traditional complications that we see from type 2 diabetes. These are people of working age, sometimes with young families. We really need to get in there early and support them. That is exactly what this new programme is trying to do."

Strategic Aims & Priorities 2024 – 2026

Our funding of research for the benefit of people with diabetes is wide-ranging to enable us to be both strategic and reactive in approach. We don't want to miss an opportunity to fund the next big breakthrough!

Every research grant that we award fits into one of these key priorities which we believe maximises our resources and gives us the best chance to deliver benefits for people with diabetes as quickly as possible.

SUPPORT research that is of the highest quality and that is most likely to produce results relevant to our vision of a ***world without diabetes.***

EXPAND our cadre of DRWF-funded clinical and non-clinical fellows working closely with them to **elevate** the profile of their research.

MAXIMISE opportunity to **leverage funds** into the proof-of-concept research that our pump priming grants fund, **building capacity** by doubling our money and **accelerating ideas and innovation.**

DEVELOP collaborations with researchers and organisations where there is a synergy of mission and vision and a benefit for people with diabetes, as we work together towards our cure.

To deliver our strategy, we will:

- Grow our network of DRWF-funded researchers, identifying new funding streams and opportunities to support the very best work
- Explore opportunities to work collaboratively with like-minded funders who share our vision and values
- Increase visibility of DRWF-funded research/ers to ensure that the results of their work is published in our supporter communications and online via our website and social media campaigns
- Grow and involve our community of diabetes supporters and beneficiaries to ensure an active participation in our work, helping us to understand their research priorities and to raise the funds that will enable us together, to invest in a brighter future for people with diabetes

Katie Boots on running for diabetes

In February half term 2022, shortly after his eighth birthday, Eddie was admitted to the Royal Surrey County Hospital where he was diagnosed with Type 1 Diabetes. We'd been worried about him for a while as he'd he been unwell and lost a lot of weight. The diagnosis was a horrible shock to the whole family, and we immediately tried to work out 'why' 'what' 'when' and 'how'. The care we received that week from the paediatric diabetes team was incredible. We found ourselves on a steep learning curve attempting to process how this autoimmune disease affects the body, test blood glucose levels through finger pricks and, learning how to deal with often scary 'hypos and hypers'. We were taught how to give Eddie multiple daily insulin injections (practicing on Brian the Satsuma!). Once home from hospital we had to determine how to fit this care into Eddie's incredibly active life and we began the 24/7 juggle of managing exercise, food, stress, medication, technology, and BG levels.

Eddie has been through so much. His first question whilst in A&E was 'Mummy, how long will I have this for?' The realisation that this condition wouldn't go away like a cold or chicken pox was something hard to break to him.

DRWF was one of the first online resources we found to educate ourselves on the practicalities of T1D. Their mission of 'Staying well until a cure is found' resonates as this is how we choose to support Eddie is his day-to-day life. We are committed to making sure that T1D won't ever stop him from being involved in anything he wants to be part of. We not only support but want to be involved in future research and development that strives to find a cure and before that, the more seamless management of diabetes.

Eddie is passionate about athletics and being active. He was so keen to get back to his track sessions at the Young Athletes Club after coming out of hospital that I stood trackside with him in the dark, in the rain, throwing jelly babies in his mouth every time he ran past me. After 18 minutes of his first session back at Young Athletes Club we had to come off as he had a dangerously low 'hypo'. He cried, I cried, frustrated at how unfair 'stupid diabetes' was but he went back the following week stronger and more determined than ever not to let T1D stop him.

Megan managed brilliantly

Spotting the signs of diabetes early could save lives.

A young woman who nearly died from undiagnosed type 1 diabetes is campaigning to save the lives of others by raising awareness of the symptoms while fundraising for DRWF.

Megan Jansen overcame her fear to abseil more than 550 feet down Portsmouth's iconic Spinnaker Tower to celebrate the fact she's still alive after defying a deadly complication from undiagnosed type 1 diabetes just over five years ago.

Megan hoped her participation in this challenge would help to raise awareness of the symptoms to save the lives of other young people and children.

"Knowing the symptoms of diabetes is lifesaving and had it not been for the intensive care unit team at Torbay Hospital in Torquay I would have lost my life in 2016," warned Megan, 22.

"I think DRWF has a great understanding of how devastating a diagnosis of diabetes can be and their attitude towards wellbeing has helped me become more confident in myself."

Simon Jansen, Megan's father who has type 2 diabetes joined his daughter in the abseil for DRWF. He added: "I am so proud and grateful to have been 'roped in' to abseil the Spinnaker Tower to support my daughter's efforts to raise money for DRWF."

Megan said: "Diabetes is not just as simple as controlling your glucose levels and DRWF has helped people develop healthy relationships with their diabetes. The abseil was exhilarating and so important for me to constantly challenge myself. Even more exciting was that my dad chose to take up a place as well, especially as he is living with type 2 diabetes."

"One more thing – please remember if you're struggling with your diabetes, reach out to DRWF and make the most of the incredible support networks that they can provide. Do not let your diabetes get in the way of what you want to achieve, whether it be a big abseil, a work goal or a personal life goal. Living with diabetes does not define you."

Diabetes Wellness Family Camp

The annual DRWF Diabetes Wellness residential Family Camp is provided for families of children with type 1 diabetes in partnership with Over The Wall, the serious fun charity. For our last camp, we received 37 family applications (134 individuals) and had to close the online application process early due to demand. We had 60 individual places available and following triage, offered 62 places to 18 families. Eleven families (43 individuals) remained on the waiting list. All families were offered places on the Autumn virtual **Camp in the Cloud.**

The feedback from attendees was overwhelmingly positive and we secured essential input from our families, to steer our next residential Camp offering.

"I made lots of new friends with diabetes which is important to me because sometimes I feel like the odd one out. We relaxed into camp after a very short space of time, and we managed to reconnect as a family but genuinely chatting to other caregivers, mums and dads dealing with the same things and being able to laugh about it with people who really know what you're living through. We all feel completely refreshed and less overwhelmed and just not so alone."

"I gained time to be with my family without having to constantly think about food- carbs, quantity, gluten/non gluten."

"Finding someone else who understands what you are dealing with. Developing friendships with like-minded people. Listening to advice and support from other families."

How to support us

YOUR GENEROSITY CAN HELP OUR DREAMS BECOME A REALITY

We don't receive any government income and rely entirely on donations and fundraised income to support our work. The researchers we fund work tirelessly to improve our knowledge of diabetes; explore new treatments and management pathways, on the long road towards our ultimate goal of a CURE. Alarmingly, diabetes continues to grow in pandemic proportions around the world and with almost 5 million people living with diabetes in the UK, our work is increasingly important.

Your support enables us to fund the research that we believe will make diabetes a thing of the past. We are investing in a brighter future for people with diabetes, **WILL YOU?**

If you would like to get involved in our fundraising activities, perhaps participate in a pre-planned challenge event, or hold an event in your local community with family and friends, please contact us on 023 92 637808, email fundraising@drwf.org.uk We would love you to **JOIN US!**

ALTERNATIVELY YOU CAN –

Make a one-off donation or set up a regular giving direct debit on our website **www.drwf.org.uk/get-involved/donate**

Play our lottery, a great way to be in with a chance to win a prize and make a donation at the same time **www.drwf.org.uk/lottery**

Talk to your employer about their Corporate Social Responsibility (CSR) policy, most have one. They may be encouraged to match-fund your fundraising sponsorship. This is a great way to double the money you raise!

It is sometimes hard to understand how making a donation today, or getting involved in a fundraising event can make a difference in the future, but it is this combined effort that drives change forward.

You can visit our website for more inspiration on how you can help us find a cure and create a world without diabetes.

We are investing in a brighter future for people with diabetes, and you help us to do that!

GIVE A GIFT OF HOPE...

DONATE TODAY

£10 A MONTH FUNDS TWO DAYS

of a yearly research grant, to find better ways to manage diabetes and ultimately a cure

YOUR SUPPORT MAKES ALL THE DIFFERENCE!

BECAUSE OF YOU

THANK YOU FOR SUPPORTING DRWF

Our ultimate goal is to find a cure for diabetes. In pursuit of this, we fund some of the best and brightest diabetes researchers in the UK and around the world, whose work improves our understanding of diabetes; explores new treatments; develops self-management strategies; and seeks out potential cure pathways. The dedication and commitment of our diabetes research community is second to none.

Each year, through open competition, we issue calls for applications for our Fellowships and Pump Priming Awards. Our support of Institutional and Collaborative awards enables us to commit to higher value, longer-term funding in-line with our strategic priorities.

Through our awareness raising, information resources and educational support programmes, we enable people with all types of diabetes to learn more about their condition, providing the tools to motivate, empower and engage in a pro-active approach to good self-care.

Every day, we do our utmost to ensure that people living with diabetes are 'staying well until a cure is found…'

To find out more...

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www.drwf.org.uk

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