

## GOLDEN JUBILEE

When Tenovus Scotland was formed fifty years ago, the founder members had no guarantee of success, either in attracting researchers with viable ideas and with the skill, ability and devotion to pursue them to successful conclusions, or in attracting funds to cover their research costs.

Fifty years on, they would have every reason to be proud of what has been achieved. The many research projects we have supported, and the skill and application of the outstanding researchers we have helped, can leave no doubt as to our success in attracting researchers of ability in many diverse fields of medical science, and there is every reason to suppose this will continue.

Many men and women with no prior interest in medical science have helped on our Regional and National Committees and fundraising ventures. Almost £14 million has been raised and invested in medical research projects throughout Scotland, with last year breaking income records when in excess of £1.2 million was raised.

2017 saw us celebrate our Golden Jubilee. We were privileged that the



**Smiles all round as Calum McMullen receives his Princess Royal Scholarship award at our Gala Concert reception**

Royal Scottish National Orchestra generously agreed that the opening concerts of their winter season in Dundee, Edinburgh and Glasgow would be used to promote our charity. In addition, we were fortunate that Nicola Benedetti, the soloist at these concerts, accepted our invitation to become an Honorary Vice President of Tenovus Scotland. Receptions were held for local supporters at the three concerts and Nicola attended these after her magnificent performances of the Elgar Violin Concerto.

During the interval at the Glasgow event, Nicola presented a Princess Royal Tenovus Scotland Medical Research Scholarship to Calum McMullen and spoke quite delightfully about her enthusiasm for the work of our charity noting that our focus on supporting young medical researchers harmonised with her own desire to encourage young musicians. All in all, the events of 5th, 6th and 7th October 2017 will be long remembered as a fitting celebration of the first fifty years of Tenovus Scotland.

## Nicola Benedetti MBE: Our new Honorary Vice President

*"I am honoured to have been invited to become Honorary Vice-President of Tenovus Scotland, especially as they celebrate their Golden Jubilee - an achievement for any organisation but particularly for a charity of this kind. Tenovus Scotland supports the young and the creative. It focusses on pilot studies of novel projects, allowing new research ideas to get off the ground, alongside support for early-career researchers. This work resonates thoroughly with my ongoing work with young musicians. Encouraging courageousness and creativity is a vital part of support for young people, and I greatly look forward to working with Tenovus Scotland into the future."*

Nicola's encouraging words and enthusiasm will surely inspire many young and creative medical researchers.



**Nicola Benedetti**

Photo Robert Piwko

# 50 Years of Funding Medical Research in Scotland

**Under the initiative of Sir Charles Illingworth, the first meeting of Tenovus Scotland took place on the 27th October 1967 in the University of Glasgow.**

The original ten, few of whom were even acquainted with Sir Charles or with any of the others, were an accountant, a Church of Scotland Minister, the wife of the Chief Rabbi, a shipbuilder, a bank manager, a former Lord Provost of Glasgow, the Roman Catholic Archbishop of Glasgow, the Editor of the Daily Express, a former Deacon Convener of the Trades House and Sir Charles himself. It is unlikely that one small room has ever contained quite such a representative assortment of the citizens of Glasgow, either before or since!

Two articles from 1987 reveal interesting insights into the early projects where the emphasis was directed towards providing equipment in addition to research grants.

## The Mobile Intensive-Care Ambulance Unit

For critically ill patients, the facilities of an Intensive-Care Unit may be life-saving. But such a department needs expensive equipment, a highly-trained staff of doctors, nurses and technicians, and ready access at all times to a full range of biochemical services.

Clearly, such facilities cannot be provided at every hospital in the country but hitherto the risk of transporting a critically ill patient for a long distance to a major hospital would have been thought too daunting.

In 1974, Iain Ledingham (Titular Professor of Clinical Physiology in the University of Glasgow and Surgeon in charge of the Intensive-Care Unit at the Western Infirmary) decided to put the matter to the test. With a grant of £30,000 from Tenovus Scotland, he constructed a Mobile Intensive-Care Unit using a modified ambulance wagon accommodating a trolley bed fitted with intensive care equipment. In 1984, with a further grant of £4,000, a new ambulance was installed with equipment for the care of critically-ill children, including a ventilator for babies with respiratory failure.



The Mobile Unit is housed at the Western Infirmary. In response to a call, two doctors from the Shock Team drive the ambulance to the referring hospital (or to the roadside) and the patient is brought back to the Western.

Since 1974, nearly 2,000 patients have been treated in this way, without a single death en route. The service is now accepted as an essential component of the emergency service in the West of Scotland.

## Cell Separator

The separator was purchased in 1972 at the cost of £20,000 and presented to the Royal Hospital for Sick Children in



**Sir Charles Illingworth presenting the Cell Separator at the Royal Hospital for Sick Children, Glasgow**

Glasgow for use in leukaemia. It was the first such equipment to be used in the United Kingdom.

It is a high-speed centrifuge, which enables blood from the patient with leukaemia to be spun with sufficient velocity for the red blood cells and the various white cells to be separated and drawn off, while the blood plasma is returned to the circulation, thus maintaining the total blood volume and avoiding danger to the child.

Originally, the aim was to separate and destroy the malignant white cells. However, within a few years it was found possible to treat leukaemia

successfully by drugs; but a new use was found for the separator, for the drugs in use at that time had their own secondary effects, including anaemia and damage to the healthy white cells, thus laying the child open to opportunist infections. So now the separator came into use to withdraw granulocytes (white cells) and plasma from healthy donors to counter these harmful effects. It was also found to be of use in some cases of "rhesus disease" in which the cells of the foetus or young baby were liable to be destroyed by antibodies in the mother's blood. In such cases, the aim of the cell separator was to remove the damaged cells to prevent haemolytic damage to the liver.

Originally concentrating its efforts on Glasgow, Tenovus Scotland quickly grew to be a truly national organisation with regional committees in Edinburgh, Grampian, Strathclyde and Tayside and an overarching National Committee.

Its core focus has been providing vital funds for early stage medical research in Scotland by supporting pilot projects and new research talent across the full range of medicine and healthcare. This allows the opportunity to develop ideas and evidence that can attract longer-term support from major external funders.

Such early stage research, and the emerging generation of researchers with the potential to bring the key medical and healthcare breakthroughs of the future, is alive and well today in Scotland with 50% of all pilot projects receiving further funding of, on average, ten times the original Tenovus Scotland grants. Some recent projects are:



## Targeting Streptococci, cause of Strep Throat Infections

**Dr Helge Dorfmueller**  
The University of Dundee

Most people know the bacterium *S. pyogenes* from the mild 'strep throat' infection, which normally can be treated with antibiotics. However, it is important to note that such a mild infection can develop into life threatening disease. Worldwide, on average, every minute one patient dies from *S. pyogenes* infections. It is imperative that we increase our understanding of how this pathogen can cause these severe infections, and that we develop better clinical treatments to prevent a shortfall of antibiotics in the future.

Dr Dorfmueller commented "I am thankful to Tenovus Scotland which, in 2015, funded my first step towards establishing myself in a research niche at one of the leading research Universities in the UK to better understand and target *S. pyogenes*. The pilot results of this funding have also been critical towards establishing my own research lab, which is funded by the Wellcome Trust and the Royal Society. This has given me the opportunity to develop from a single researcher into a laboratory with a fully funded Postdoc, PhD student and MSci student. My team studies this bacterium and, therefore, continues my quest to develop better clinical treatments."



## Swim Like a Fish

**Professor Catherina G Becker**  
The University of Edinburgh

Unlike humans, the zebrafish, a common aquarium fish, has the amazing ability to repair its nervous system, brain and spinal cord, after an injury. Dr Becker's laboratory at the

University of Edinburgh's Centre for Discovery Brain Sciences is investigating the mechanisms by which this repair is achieved. For this research, Tenovus Scotland in 2008 funded a dedicated video/computer/software set-up that allows them to record fish while they swim in a small tank and to automatically measure their swimming behaviour. The data generated with their computer set-up has helped to develop new methods to investigate how individual areas in the brain direct behaviour and has contributed to unravel part of the molecular machinery controlling spinal cord repair.

Professor Becker said "We have published this work in five scientific papers and trained over 10 postgraduate students in the latest techniques in spinal cord regeneration research in the course of these studies. Moreover, this data has allowed us to win around £1.3 million in BBSRC funding to further support our science. Tenovus Scotland has therefore significantly improved our group's research and training infrastructure and brought us closer to understanding why zebrafish repair their brains and humans do not."



## Improving ways to kill and treat Cancer

**Dr Stephen Tait**  
The University of Glasgow

The main way in which cancer

therapies work is by killing cancer cells. On the flip side, cancer cell resistance to death prevents treatment from working. We are interested in understanding these mechanisms of resistance, so as to better treat cancer.

To investigate this, Dr Stephen Tait and Gabriel Ichim of the University of Glasgow obtained a pilot project grant in 2015. It helped them develop a new way to screen for anti-cancer drugs that kill and use this technique to investigate mechanisms of resistance. This laid the groundwork for a successful project grant application to Breast Cancer Now.

More recently, they have used this technique to define a new way to kill cancer cells that activates anti-cancer immunity. Excitingly, they have shown in the lab that this can completely eradicate tumours. Going forward, they are pursuing the application of this type of cell death to treat cancer in the clinic.



## Broken Heart Syndrome

**Dr Dana Dawson**  
The University of Aberdeen

Dr Dana Dawson and colleagues in Aberdeen are

research leaders in Acute Stress Induced Cardiomyopathy (Takotsubo Cardiomyopathy), known as "Broken Heart Syndrome", a temporary, but sometimes fatal, heart dysfunction associated with intense emotional or physical stress. Understanding molecular mechanisms should advance diagnostic and therapeutic options.

Dr Dawson's preliminary researches were made possible by a pilot grant in 2013, permitting studies into the functional state of the heart in a cohort of 26 affected patients.

Extensive media publication of the disease, and Dr Dawson's findings in professional journals, newspapers, radio and television had a major impact on both the medical community and general public.

Various collaborations have informed the public of further research, including that carried out with the British Heart Foundation and Chest Heart and Stroke, and a factsheet has been distributed to all Scottish Hospitals. Since the work that Dr Dawson initiated with the original Tenovus Scotland grant, several additional grants and studentships, including clinical PhD fellows, with a combined value of about £645k have been awarded for further research; funding from the Chief Scientist Office to create a Scottish Takotsubo Registry will elaborate the epidemiology of Broken Heart Syndrome.

# Face to Face

with Professor Alan Foulis



## What is your background?

I grew up in a medical household, my father being a GP and my mother a nurse, so opting to train in medicine at Glasgow was an easy decision. What to do with a

medical degree I found a more challenging problem. I had been inspired by a number of teachers and role models - John Anderson and Roddy MacSween in pathology, and Clem Imrie in surgery - and initially embarked on a surgical career in Aberdeen. However, a bad back forced me to give up surgery, and I was grateful to be given a chance to train in pathology at the Western Infirmary in Glasgow.

## Why did you decide to get into medical research?

During my medical degree I did 6 months' research in Pathology as part of an Honours BSc. I simply loved it. I had beginner's luck with a most interesting research question in an excellent lab and I was hooked.

## You received a grant from Tenovus Scotland in 1984. Can you provide some details?

During my time in surgery I had developed an interest in the pancreas. When working at the Sick Children's Hospital, I found an archive of post mortems of 12 children who had died of childhood diabetes (type 1 diabetes). Microscopy of their pancreases showed that the cells making insulin, the so-called beta cells, were being destroyed by an inflammatory reaction. There was a theory that this could be caused by a viral infection - could I prove it? Having collected death certificates of children dying of diabetes in the UK, I wrote to over 200 pathology laboratories and

collected pancreatic tissue from over 100 childhood diabetic deaths. Tenovus Scotland then funded a research assistant, Maura Farquharson, to allow me to look for evidence of viral infection. We showed that the beta cells in these pancreases were secreting a substance, alpha interferon, which is characteristic of cells infected by a virus. However attempts to show evidence of any specific viruses drew a blank.

## How did this grant impact your career?

Following the year funded by Tenovus Scotland, I received further grants from the British Diabetic Association and showed numerous immunological abnormalities present in the diabetic pancreases. Twenty years later, following the development of new techniques to identify viruses in tissues, I was able to re-enter this field of research in collaboration with scientists in Plymouth, and show that the beta cells in diabetic children, (but not non-diabetic children) were chronically infected by specific viruses called enteroviruses. These viruses usually only cause a mild gastro-enteritis or flu-like illness. This discovery provided crucial evidence to help a consortium of European scientists (including those from Plymouth) raise a six million Euro grant from the European Union, which has provided further evidence that enteroviruses are involved in causing type 1 diabetes.

## Any long-term health benefits from this research?

The European consortium is now trying to develop a vaccine to prevent the viral infection. The dream is that such a vaccine could be given routinely to infants in the future to prevent them ever becoming diabetic.

## Why have you recently joined the Strathclyde Regional Committee?

I want to ensure that the next generation of medical researchers has the same opportunities at the beginning of their career as I did.

## EDINBURGH CHAIR

After serving as Chair of the Edinburgh Regional Committee for the past seven years, Mr James Watson has passed the baton to Professor Derek Bell. Derek, who received an OBE in the New Year's Honours, is currently President of the Royal College of Physicians of Edinburgh and works as a consultant physician in London. We are therefore very grateful that he has taken on this role in addition to his hugely demanding work schedule. Far from having well-deserved respite from chairing Tenovus Scotland in Edinburgh, James Watson has agreed to be Honorary Treasurer and his continuing support of the Committee is greatly appreciated.

## CHAIR OF NATIONAL SCIENTIFIC ADVISORY COMMITTEE

Professor Allan Struthers has contributed hugely to our work for six years as a member of the Tayside Scientific Advisory Committee and, subsequently, for the past twelve years as Chair of the National



Dr Marie Freel

Scientific Advisory Committee. The importance of this Committee cannot be overstated, ensuring as it does that the funds disbursed are directed to research projects which have been peer reviewed to the highest standards. The success of Tenovus funded medical research is a clear testament to that, and Professor Struthers deserves huge gratitude for guiding this work so meticulously. We are delighted that Dr Marie Freel, who has been a member of the Committee for the last eight years, has agreed to take over as Chair. Marie is Consultant Endocrinologist, Honorary Associate Clinical Professor and Training Programme Director (CMT) at the Queen Elizabeth University Hospital, Glasgow.

## Ted Read

*Ted sadly passed away last year aged 87. On retirement from J&P Coats in 1985, where he had a very long and successful career, he became General Secretary of Tenovus Scotland, a position he held for 23 years. He was an outstanding General Secretary, very committed, always positive, ready to listen and help, extremely sociable and always able to laugh at life.*

### SUPPORT MEDICAL RESEARCH

Please donate online at [www.justgiving.com/tenovusscotland](http://www.justgiving.com/tenovusscotland) or send a cheque to:

#### Tenovus Scotland

at Royal College of Physicians and Surgeons of Glasgow  
232-244 St Vincent Street, Glasgow G2 5RJ

Your donation will be used for medical research in your local region - Edinburgh, Grampian, Strathclyde and Tayside