Pioneering renal research in Wales
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Wales Kidney Research Unit helps people and groups who are interested in improving care for people with kidney disease to work together. It provides central support for Welsh teams studying kidney disease, helping them to make successful bids for research funding and helping them afterwards to do studies that increase understanding of kidney diseases and how they affect people, and to develop and test new ways of diagnosing and treating these conditions. In its first year, WKRU has made 12 successful grant applications worth £3.4 million, leading to the appointment of 12 new staff. In addition, four extra staff have been appointed through successful business cases to Welsh Higher Education Institutions and NHS organisations. New projects being coordinated by the unit cover a broad range of research areas at a molecular level, and also include studies on family attitudes following the implementation of the new Human Transplantation Act (Wales) and predicting cardiovascular risk in peritoneal dialysis.

Pictured on front cover:
Dr Rob Jenkins
Kidney disease is common. About one in ten people in Wales have longstanding kidney disease, and about one in five people admitted to hospital have a serious problem with their kidneys as part of their illness.

Kidney Research UK has a strong history in Wales, having invested more than £2m in renal research carried out in the area since 1985. The charity is a major partner of the Wales Kidney Research Unit (WKRU), the UK’s first biomedical research unit focussing on kidney disease, and funded by Health and Care Research Wales from 2015. This relationship evolved from the organisation’s funding legacy in Wales and its extensive links between WKRU investigators and researchers. Additionally, Welsh expertise is present on Kidney Research UK’s research grants committee. Many of the senior leaders of the WKRU are Kidney Research UK Alumni, where the charity was instrumental in their early career and whom are now helping train the next cadre of experts with Kidney Research UK’s support. Hence a direct channel of communication on a number of levels exists between Kidney Research UK and WKRU.

Ground breaking research is taking place in Wales today, examples of which are outlined within this publication. In addition to this, the involvement of Welsh scientists and health care professionals in two major UK-wide clinical trials is key to their success.

"The faith and investment that Kidney Research UK has put into Wales has been instrumental in the early success of the Wales Kidney Research Unit."

Professor Donald Fraser, Director of the Wales Kidney Research Unit
Local fundraising champion Jenny Griffiths from Caldicot in Gwent and her committee of friends have dedicated 10 years to raising funds for Kidney Research UK since her son David had a transplant in 2006.

David was 18 when tests revealed he had kidney problems after he was hospitalised with an unconnected severe bout of glandular fever. For the next ten years he had regular tests but the kidney disease had little impact on his life. It came as a great shock therefore, when, aged 28, he was told he would need a kidney transplant. “We hadn’t anticipated it deteriorating to that extent,” says his mum, Jenny. “At this point we learned that David had a rare form of kidney disease, called Membranoproliferative Glomerulonephritis (MPGN), also known as Dense Deposit Disease. His immune system had destroyed his kidneys.”

David’s mum, dad and two brothers all proved to be a good match to donate and at Jenny’s insistence, David received her kidney and the transplant was successful. “The surgeon had explained very carefully that the kidney would probably only last up to ten years, because of how virulent David’s immune system was. So we went ahead knowing that that would happen.”

After seven years, David was dealt a series of serious health setbacks in the course of a few months, including bacterial pneumonia. This meant he had to stop taking the immunosuppressant medication he took to help quash the MPGN. The end result was that he lost the kidney.

David now juggles haemodialysis (which he does in hospital three times a week for 4.5 hours a day), working as a parts advisor for a car dealership, and life with his wife Ginny and young son Joel. Being unable to dialyse at home due to health complications is restrictive and has a significant impact on his earning potential. Meanwhile, the family are also dealing with Ginny having been diagnosed with multiple sclerosis.

Sadly, David’s family’s kidneys are no longer suitable for him to receive due to the type of antibodies now in his system. A glimmer of hope instead lies in either the transplant list which David has been on for three years now, or the paired kidney programme. With the paired programme, if one of David’s family is a good match for another recipient and their family member or friend is a good match for David, simultaneous transplants could take place. “We’ve been warned the chances of finding a match are slim, but at least they’re in the programme,” says Jenny.

David says: “Life is not easy. I feel that research is important to find ways to control my disease so that I could live a more normal life and work and provide for my family.”

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David Griffiths
Tackling Acute Kidney Injury (AKI)

Acute Kidney Injury (AKI) is sudden damage to the kidneys that causes them to stop working properly. It is usually a side effect of body-wide illnesses, including infection. One in five people admitted to hospital have Acute Kidney Injury¹.

Two research studies at Cardiff University funded by Kidney Research UK are designed to increase our understanding of AKI and its consequences, with the aim of leading to better control of AKI and chronic kidney disease (CKD).

Recent research suggests that an episode of AKI increases the likelihood of subsequent development of CKD and end-stage renal failure, although at present the mechanisms controlling this progression are not well understood.

Dr Chia-Te Liao is working to increase our understanding of disease progression after AKI by studying macrophages, an important immune cell. Amongst their functions, these cells are known to be important in both maintaining tissue health, and causing tissue damage, depending on the type of macrophage they develop into.

This research will analyse microRNAs, small molecules which helps the body fine-tune a wide range of cellular functions and activities, to study how macrophages behave when different signalling pathways are blocked or activated. This work will investigate which pathways are important in causing the progressive kidney damage seen in CKD, and aims to identify potential targets for future drug development in order to delay or halt the development of CKD.

Meanwhile, Dr Timothy Bowen is investigating the use of urinary microRNAs as AKI biomarkers, factors that can be measured to monitor disease status. Work in Dr Bowen’s laboratory has developed a sensitive and robust method to detect microRNAs in urine. By measuring target urinary microRNAs in AKI patients during recovery, or failure to recover, this project aims to develop a systematic approach to identifying new biomarkers to predict AKI progression.
Faster diagnosis and treatment for infection in dialysis
Kidney patients on dialysis are particularly vulnerable to infection around the entry point for their dialysis. The disruption to treatment, and impact on quality of life can be considerable. Correct identification of infection with standard techniques is slow and inaccurate, leading to extended discomfort and outcomes for patients, the over-prescription of broad-spectrum antibiotics and the spread of multidrug-resistant superbugs. Research being led by Dr Matthias Eberl at Cardiff University is working to better understand how bacteria are detected by specialised types of immune cells at the site of inflammation, and how this contributes to infection clearance but also to collateral tissue damage. The researchers aim to develop novel diagnostic tests that can be used at the point of care to rapidly and accurately identify the cause of the infection, and ultimately to improve treatment.

UK-wide projects in Wales
The representation of Welsh scientists, clinicians and kidney patients has been vital to two of Kidney Research UK’s biggest ever trials.

The charity’s investment in research nurse posts at Morriston Hospital in Swansea and the University Hospital of Wales in Cardiff have ensured Welsh patients participation in the world-leading trial into iron deficiency and anaemia in kidney patients on dialysis, known as the PIVOTAL trial. The four-year trial will determine the optimum levels of iron for patients on dialysis and has the potential to impact iron management in dialysis patients around the world. Likewise, renal units in Wales are joining the ASSIST CKD project which uses software to map data from routine blood tests, creating graphs of kidney function over time. When deteriorating kidney function is detected, the participating laboratories send a report to the GP with a prompt that specialist advice may be needed. As the system identifies people with CKD who are at most risk of disease progression, GPs then have the opportunity to prevent patients having an unplanned entry into renal replacement therapy, for which the outcomes are worse.

...people in Wales are being treated for kidney failure

Funding from
Kidney Research UK
£199,218

1 in 5 Admitted to hospital have Acute Kidney Injury

3,000

...people in Wales are being treated for kidney failure
**Researching family experiences of transplantation**

The project explores family attitudes, actions, decisions and experiences of the new ways of consenting to organ donation in Wales since the introduction of deemed consent in organ transplantation through the Human Transplantation Act 2013. Findings will help us to understand the impact of the changes and how people have responded to the media campaign.

The team at Bangor University are working in partnership with NHS Blood and Transplant Specialist Nurses in Organ Donation (SNODs). This partnership has provided unique opportunities to explore, for the first time, the full range of perspectives, views and attitudes families experience when approached about organ donation following a recent bereavement.

Families’ vitally important stories are documented through questionnaires and interviews. Families’ personal experiences are helping to construct a critical understanding of the changes in legislation and its impact on people in Wales.

The project is funded by Health and Care Research Wales and is partnered with Cardiff University, NHS Blood and Transplant, Cardiff and Vale University Health Board, Welsh Government and part of the Wales Kidney Research Unit.

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1. UK Renal Research Strategy: Pioneering Past Report
3. Kidney Research UK
5. UK Renal Registry Eighteenth Annual Report 2015
6. The Welsh Government
7. UK Renal Registry Eighteenth Annual Report 2015

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