# Uned Ymchwil Arennol Cymru Wales Kidney Research Unit







# 2020 - 2021 Annual report

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F O R E W O R D

Dear WKRU member (or member to be!),

Welcome to this year's public report. The report highlights some of the ways that the membership have been working to combat kidney disease and all its impacts over the past year. It's been a very busy year for everyone. I think you'll get a sense of that, and I hope also inspiration, from the different projects described here. There is so much activity to talk about, the individual pieces can only really give a flavour of the work, so if there is something that particularly interests you, please do get in touch with the researchers or other WKRU members direct to talk about it. We're still in a time where these meetings have to be virtual (the dreaded Zoom!) rather than face to face. We've had some successful researcher-patient meetings like this in recent months, so if you are in a position to join an online meeting and want to do that, get in touch!

Two things come through very strongly when I read the report. The first is Covid. The past year has been dominated by that of course, and I am especially aware of the impact that Covid has had on kidney patients and their families. One positive thing I take from this report is how supportive WKRU members (be they patients, families, researchers, clinicians or commissioners) have been of each other through this time, and we will continue to foster that. So if there are other things we should be doing on this, please let me or the other team members know. Covid has also been a new research focus for us in the last 12 months –driven largely by those of you who are patient and family members of WKRU, we got the message loud and clear in our virtual meetings that this was an area you wanted to see work taking place on in Wales. In this report you'll read about some impressive work from WKRU investigators on Covid, and I hope that in next year's report we'll be reading about some of the results of those studies.

The second theme is the impact that people affected by kidney disease have on the WKRU research programme. We have a portfolio of clinical studies that could not happen without the contributions that patients make. But the involvement also includes several studies where patients and others affected by kidney disease have been pivotal in shaping the studies that take place. It's not an accident that the studies with the greatest involvement of the wider WKRU membership are the ones that funders have awarded grants to, and there are some exciting projects starting as a consequence of these grant successes.

I hope you enjoy reading the report as much as I have, and I very much look forward to the chance to meet face to face when we can do that again.

Donald Uned Ymchwil Arennol Cymru Wales Kidney Research Unit

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#### The only Biomedical Research Unit in the UK funded to focus solely on Kidney Disease

450,000 people in Wales have Chronic Kidney Disease (CKD) Stages III-V (less than 50% of kidney function remaining) and that places them at a greatly increased risk of death and cardiovascular illness.

10,000 people are under follow up in renal secondary care, including 2,000 people dependent on Renal Replacement Therapy (RRT) to keep them alive. WKRU is built on internationally recognised research in each step of the translational pathway, from fundamental disease mechanisms and better diagnosis, to improved implementation and health outcomes.

WKRU research successes are informed by and involve patients, families and carers, service providers and service commissioners, as well as researchers.

# WKRU SENIOR TEAM AND CORE STAFF



### Strategic objectives:

-Improve the infrastructure supporting kidney research in Wales.

-Involve stakeholders (patients, families and carers, service commissioners, service providers, as well as researchers) in planning and undertaking research, and dissemination of findings and subsequent improvements in practice.

problems.

-Build a portfolio of research funded by external awards at all stages of the pathway from basic research to healthcare delivery, resulting in research with impact.

-Build a portfolio of industrial partnerships in research projects leading to changes in activity.

-Engage with the public to raise awareness of kidney disease, its clinical and social effects and share the findings of our research.

and social care

# WKRU MEMBERSHIP

The membership of WKRU is based in three Centres around Wales: Bangor University, Cardiff University, Morriston Hospital/Swansea University.

#### **Administration**

Kim Abberley

#### **Bangor: Social Care**

Leah McLaughlin Barbara Neukirchinger Jane Noyes

### Swansea: Data Analysis

#### James Chess

#### Cardiff: Laboratory and Clinical Research

Elijah Ablorsu Mohammad Alhadj Ali Argiris Asderakis **Timothy Bowen** Charlie Brown Esra Cetin Rafael Chavez Kieran Donovan Matthias Eberl Siân Griffin Irina Grigorieva Shivaram Hegde Ian Humphreys **Robert Jenkins** Simon Jones Usman Khalid Mario Labéta Farah Latif Yueh-An Lu Morgane Mazzarino Soma Meran Lucy Newbury Anne-Catherine Raby James Redman Steve Riley

Shrea Roy Dan Smith Tanya Smith Kate Simpson Robert Steadman Michael Stevens Bnar Talabani Phillip Taylor Aled Williams Alexa Wonnacott Aelia Zaidi

#### Tissue Bank Governance

Timothy Bowen Rafael Chavez Katherine Craig Gareth Davies Donald Fraser David Griffiths Bob Hall Simon Jones Usman Khalid Soma Meran Pam Parkhouse Anne-Catherine Raby Stephen Riley David Hywel Thomas

### Other WKRU

#### collaborators

Jessica Baillie Jamie Hugo-Macdonald

#### **Patient Focus Group**

Lesley Cole Gareth Davies Bob Hall Jackie Holder Gloria Owens\* Margaret Parry Joanne Popham Helen Williams Janet Williams\*

\*WKRU patients' representatives





#### Why a Wales Kidney Research Unit?

Kidney disease is common and often silent. 15% of the UK population have Chronic Kidney Disease (CKD) but half will not be aware of their diagnosis and so will not be taking measures to slow progression and avoid future morbidity. Renal Replacement Therapy consumes 2% of the NHS budget, or £120 Million p.a.

in Wales. The NHS in Wales, therefore, needs to understand the service pressures and how best to meet them.

The WKRU helps meet these challenges by providing core infrastructure, enabling patients, families and carers, third sector organisations, service providers, service

#### Who benefits from the Unit's work?

#### **Patients and carers**

Advise and participate in research studies to improve outcomes for patients.

Contribute to the wider service improvements of care in Wales and beyond.

#### Get involved, get in touch

WKRU invites all patients, carers and members of the public to get involved with the design, delivery and dissemination of our research. In our quarterly *Involvement in Research Design* meetings we discuss grant ideas, each focusing on one aspect of kidney disease. The project is explained in detail in lay terms and a knowledge of science isn't necessary. We believe it is essential that patients and carers inform our research ideas. In Cardiff, we also regularly open our laboratory to the public.

#### More details at:

http://kidneyresearchunit.wales/en

You can also watch the <u>video</u> "WKRU: a day in the life" to see what we do.

More information on our activities can be found in our newsletter distributed to renal units all around Wales.

To get involved in our research please email colmontcs@cf.ac.uk or wkru@bangor.ac.uk or call 02921848469.

#### <u>Researchers</u>

Connected to other stakeholders, ensuring that the research questions will improve the health and social care of kidney patients.

#### **Health and Social Care Professionals**

Help direct research activity towards goals with impact beyond advancing knowledge.

#### **Commissioners**

Connect with other stakeholders to advance a prudent healthcare agenda.

#### Who is in the unit?

The Wales Kidney Research Unit has members from every Renal Unit in Wales.

Studies of population-scale health outcomes data have the potential to transform NHS services, and the WKRU is working with the Swansea-based world-leading SAIL (Secure Anonymised Information Linkage) Databank to develop this capacity. In addition to laboratory and clinical research taking place in Cardiff, researchers in Bangor are focusing on social care aspects and wellbeing of renal patients.

commissioners, industry partners, and researchers to explore important renal health and social care questions, and to develop state of the art services that benefit the population needs.

### Metrigau Craidd Cyfnod adrodd: 2020/2021

Uned Ymchwil Arennol Cymru

Gwobr seilwaith Ymchwil lechyd a Gofal Cymru i'r grŵp



Swyddi a grëwyd drwy gyllid uniongyrchol



### Grantiau a enillwyd yn ystod y cyfnod adrodd

Grantiau a enillwyd	Dan arweiniad y grŵp	Grŵp yn cydweithio
Nifer	9	1
Gwerth	£337,386	£665,000
Cyllid i Gymru	£337,386	£60,000
Cyllid i grŵp	£312,599	£60,000
Swyddi ychwanegol a grëwyd ar gyfer Cymru	3	1
Swyddi ychwanegol a grëwyd ar gyfer grŵp	3	1



Nifer y cyhoeddiadau



Nifer y digwyddiadau ymgysylltu â'r cyhoedd

Nifer y cyfleoedd i'r

cyhoedd gymryd rhan

### Metrigau biobancio



Caniatâd

2

Ceisiadau ymchwil



Ceisiadau ymchwil wedi'u cymeradwyo



Samplau a roddwyd i brosiectau ymchwil



Prosiectau

wnaeth

dderbyn

samplau

Cyhoeddiadau gan ddefnyddio samplau



Ymchwil lechyd a Gofal Cymru Health and Care Research Wales



### WKRU activity is organised into five work packages

#### 1. Management

WKRU management is robust, democratic, efficient and responsive to opportunities and challenges. Activity is overseen by the grants-management team at Health and Care Research Wales. WKRU reports to them on a quarterly basis with additional financial reporting mid-year, and a full annual progress report.

Input and design from public and patients

Funding from third sector organisations, service commissioners, and providers, industry partners Advice and input from three independent experts

WKRU director roles:

liaison with and reporting to the funder

day to day project management financial management

resolution of disputes arising

collecting important network information making this available to all stakeholders

Director and unit manager review all activity and operational issues weekly. Senior management team (composed of leads from Cardiff, Bangor and Swansea and unit manager): monthly teleconference to assist the director

#### 2. Research Infrastructure

Our researchers are based in Cardiff, Swansea and Bangor Universities, and the NHS.

The WKRU underpins the Wales Kidney Research Tissue Bank, which includes samples from patients recruited locally, nationally and internationally.

We work closely with Kidney Research UK (KRUK), the principle UK funder of renal research, and Dr Tim Bowen sits on the KRUK Research Grants Committee.

Siân Griffin is General Secretary of the Transplantation Society and liaises with the KRUK Research Grants Committee. The senior team meets face to face annually at the unit general meeting, together with representatives of all stakeholder groups and the funder, and with the independent external experts of the unit.

#### 2. WALES KIDNEY RESEARCH TISSUE BANK

The purpose of the Wales Kidney Research Tissue Bank (WKRTB) is to serve as a repository of samples donated by patients and healthy volunteers for use in studies advancing the prevention, understanding and care of kidney diseases.

#### What is a tissue bank?

This is an organisation that collects and stores biological samples (tissue, blood, urine etc...) and data, and makes them available to researchers to learn more about how diseases start, develop and how to treat them. The WKRTB collects such samples and supports research into kidney and related diseases by making anonymised samples available to scientists involved in such research.

### How is it regulated?

Access to tissue and any personal data that may be associated with it, is strictly controlled. A

formal request to use the WKRTB samples and the planned research must be reviewed and approved by the Tissue Bank Governance Committee. In order to do research with human tissue, researchers need to collect information from patients' medical records and record details of diagnosis tests. All personal information is kept confidential and anonymous by linking data to samples by the

team and only anonymised data is released to researchers.

### Who reviews the tissue bank?

Before any work and collection of tissue can start, the tissue bank submits documentation for review by a **Research Ethics** Committee to ensure that all rules and regulations are followed, in particular Human Tissue Authority ones. All processes are reviewed and renewed every five vears.

# What type of research is conducted?

Many different types of research rely on the use of human tissues. They can be used to develop new tests to help diagnose diseases or can be used to help develop new ways to treat or even cure diseases. Some of the research may lead to new medical products, such as diagnostic tests and drugs, or new procedures.

### What happens to the tissue?

Many people get involved to help recruit patients and collect samples, at Cardiff University and the NHS. Samples are collected during routine hospital visits and can either be processed and used immediately or stored at low temperature to be released to researchers later.











#### 3. Research Activity



Answering Research questions in four areas:

Acute Kidney Injury (AKI)

Chronic Kidney Disease (CKD)

Renal Replacement Therapy (RRT) – Dialysis and Transplantation

Social care

### **Research in the time of COVID-19**

COVID-19 first impacted on the Unit when we realized, at the beginning of March, that we would have to cancel our Outreach and Engagement events, including that for World Kidney Day on 12<sup>th</sup> March. Once lockdown was announced at the end of March 2020, all laboratory work was halted and all laboratory research ground to a halt. Although research grant and paper writing could continue at home, the Unit laboratories were closed and all experimental work was halted.

But laboratories have to be maintained and after a few weeks, two essential workers were allowed back to ensure essential equipment as well as plumbing, heating etc.. were working and safe. The Unit Manager, Dr Colmont, together with School of Medicine technicians, carried out risk assessments to allow a limited and phased return to work for when restrictions were eased. The phased return meant that senior investigators and research students were not allowed to return full-time until September 2020 and this was a very difficult time, especially for the the students. Their research had been severely interrupted and for some this meant almost six months without experimental results. Some were given extensions to their contracts by funders, but they now had to start up their research again. This was not easy as delivery of reagents was unreliable and severely delayed.

Now it's June 2021 and, while many researchers still do some work from home, all those who have laboratory research to undertake are back in the laboratories. Distancing, mask wearing and hand cleansing are all in place and it is time to try to catch up with the work.

# RESEARCHERS' QUOTES ABOUT WHAT COVID-19 DID

#### Leah McLaughlin

What COVID did: COVID-19 stopped our planned implementation events for a recently completed Wales wide research study to improve access to home dialysis.

What I did: I created a virtual seminar, a detailed lay report booklet and summary with easy-to-read point by point summaries and visuals to help explanations for the widest audience. We created video testimonies of people living well on home dialysis and submitted this to the 2020 Health and Care Research Wales Involving people in research awards and we won!

What COVID did: Stopped me from routinely engaging with patients and NHS staff as a part of all my research.

What I did: I accepted an invitation to work collaboratively with the leading kidney charities across Wales and the commissioners of renal services to help support people living with kidney disease – especially those on unit dialysis who were especially vulnerable due to being unable to shield in ways specified by Welsh Government – by providing calm, accurate and consistent messaging via an all-Wales Kidney Patient COVID-19 News bulletin. The project continues to date and is now a finalist in this year's HSJ Partnership Awards 2021, recognising the most effective collaborations with the NHS.

What COVID did: Put all of our planned studies into various aspects of kidney disease, including policy and contexts, to the back of the queue in terms of priority and set up across our NHS sites.

What I did: Reconfigured some studies to include a COVID-19 component. We are now undertaking some of the first research into experiences of pregnancy, and giving birth during the pandemic and investigations into the ways mass ITU reconfigurations may have impacted on organ donation processes and practices.

#### Soma Meran

What COVID did: Covid19 has highlighted that patients with kidney disease are at a significant health disadvantage compared to the general population in their ability to fight infections.

What I did: I increased my personal resolve to double up efforts to raise the importance of research into preventing kidney disease: prevention is easier and better than cure. It has also highlighted the importance of studying immunity and responses to infection in patients with kidney disease. I began a research study of COVID infections in dialysis patients.

#### **Tim Bowen**

What COVID did: In our continued fight against kidney disease, the COVID-19 pandemic has presented significant practical challenges to the research staff at WKRU.

What we did: Throughout the COVID-19 pandemic, the WKRU has drawn on the spirit and talents of its women and men from around the globe to continue to help people to live well with kidney disease.

#### **BnarTalibani**:

What COVID did: Prevented me going to the lab to conduct experiments. Robbed me of the ability to see my family (who live in a different city). Took away childcare while my husband continued to work as a dentist.

What I did: Learned to perform bioinformatic analysis on single cell sequencing data to understand the role of the immune system in kidney injury. Presented part of my PhD data at a national conference in UK Kidney Week. Learnt to bake to entertain my toddler!

# RESEARCHERS' QUOTES ABOUT WHAT COVID-19 DID

#### Yueh-An Lu:

What COVID did: The lab closed during the coronavirus national lockdown. I couldn't access the lab for six months and everything was uncertain, which was a stress for a three year PhD project.

What I did: I was working on my thesis and doing data analysis instead of doing nothing but waiting. This helped me to catch up on delay. I am back to the lab now. It's really nice coming back to work, with social distancing of course.

#### Siân Griffin:

What COVID did: Recruitment to most clinical trials paused during the pandemic.

What I did: We were able to continue studies with telephone contact. This approach has given more insight into the broader physical, psychological and social impact of kidney disease, beyond the details of blood pressure and blood results that are often the focus of clinic appointments. We hope to integrate these more holistic outcomes into clinical trials in the future, allowing us to discover new therapies that will significantly improve the overall health of kidney patients.

#### **Emma Woods:**

What COVID did: Covid prevented me from doing lab work.

What I did: But it allowed me time to concentrate on areas I previously had not time to concentrate on, which was mainly writing my paper.

#### Kate Simpson:

What COVID did: As a working mother of school age children, COVID-19 initially affected my research detrimentally as I was unable to come into the labs.

What I did: I had to learn to put our mental health as a priority and as a result signed up to the student support service to help young University members who were struggling with their own work during the lockdown.

#### Farah Latif:

What COVID did: COVID-19 Impact: COVID-19 has had a big impact on human research studies. To protect our patients and limit their potential exposure to COVID-19, we have had to pause recruitment to CMVIR, the study at the heart of my research.

What I did: I paused my own research work during this period to help deliver clinical support and essential treatment to shielded patients instead. Simultaneously, I have continued to analyse my research data and dedicated time to grant writing to help support future kidney research work.

# **MEET THE RESEARCHER**

### FOCUSING ON RENAL PROXIMAL TUBULAR CELLS

Young kidney specialist, Dr Yueh-An Lu started her PhD, supervised by Prof. Donald Fraser, in Cardiff in 2019. Her research focuses on the renal proximal tubular cells, which are central to normal kidney function, and to kidney regeneration versus kidney scarring following injury.

Proximal tubular cells line the inside of the proximal tubules in the kidney. These tubules are important because they are the reclamation sites of the kidney. They reabsorb important salts, water and sugars that the body needs, from the urine as it passes down towards the bladder.

She uses a developing sequencing technique called "single-cell RNA sequencing", which allows researchers to obtain the gene expression profiles from each individual cell. Using singlecell RNA sequencing, she found three new classes of proximal tubular cells that showed increased abundance in the diseased kidney compared to the naïve one (pink and red area - circled). The new proximal tubular cells exhibited gene expression signatures suggesting roles in renal injury responses and fibrosis progression.

Dr Lu said: "I really appreciate that I got this chance to set-up the kidney single-cell RNA sequencing pipeline in WKRU and use this technique in my own study. The four new classes of proximal tubular cells that we found in single-cell RNA sequencing have been validated using microscopic images. Our next step is to investigate the proximal tubular cells in growing kidney to understand the proximal tubular cellular regeneration process."



For her research interest of chronic kidney disease, Dr Yueh-An Lu started her PhD in Cardiff in 2019 after she became a nephrology specialist in Taiwan.



Compared to the healthy kidney (naïve), the scarred kidney (AAN) has an increased abundance of new proximal tubular cells: New-PT1, New-PT2, New-PT3 and proliferative cells.

# **INVOLVEMENT IN RESEARCH DESIGN**

#### **OUR PATIENT FOCUS GROUP**

For many years we have been lucky to have a dedicated and very experienced group of patients and family/carers to whom we present our latest research ideas. As well as presenting the ideas to them, we listen to their comments and criticisms and use them to improve the research plan. We currently have eight regular reviewers in the group.

Here is one research project that was presented to the group who, emphasized the importance of the work to transplant patients and contributed to the Lay Summary of the final submitted grant. This project has now been funded following the incorporation of the focus group's comments.



Dr Farah Latif has been awarded a Kidney Research UK Research Fellowship with a start date of 1/8/2021.

## Understanding how kidney transplant patients' immune systems respond to cytomegalovirus infection

Human cytomegalovirus (HCMV) is a common viral infection and up to 90% of people in the UK have been infected with it at some point in their lives. Normally, the immune system controls the virus and it generally causes few, if any, symptoms — but it remains silently present in the body after infection.

Because people with kidney transplants take drugs to suppress their immune systems and stop organ rejection, they are vulnerable to HCMV infection. Without treatment, HCMV can cause a severe illness affecting many different organs, including the lungs, liver, and bowel. HCMV is particularly dangerous in patients who haven't been exposed to the virus but receive a kidney from an infected donor. Although these patients are treated with antiviral drugs for 3–6 months after transplant, 50% still go on to have the virus in their bloodstream.

Farah is from Cardiff and studied Medicine at St Bartholomew's and the London School of Medicine before returning to Cardiff and joining the WCAT, Welsh Clinical Academic Track in 2015. With Professor Ian Humphreys and Dr Farah aims to understand how HCMV interacts with the immune system in kidney transplant recipients and how the immune system fights this infection. She will examine how molecules called cytokines — the soluble messengers of the immune system — help to control infection in those who receive a kidney transplant containing HCMV, and how the virus has adapted to manipulate cytokine responses in these patients.

Understanding HCMV infection in kidney transplant patients is the first step towards developing new antiviral drugs to protect patients from this harmful virus.

The full award is £202,836 and is jointly funded by Kidney Research UK and the Wales Clinical Academic Track.

Siân Griffin, and support from the WKRU and the Wales Kidney Research Tissue Bank, Farah began her HCMV project in 2017 and is now enrolled for a PhD.

# **RESEARCH WITH IMPACT**

### CHANGING BLOOD DONATION POLICIES

Bangor University staff and students have contributed to changing policies for Blood Donations.

Prof Jane Noyes and colleagues at the School of Health Sciences contributed to the "For the Assessment of Individualised Risk" (FAIR) project, which collated the evidence for change to the UK blood donor selection policy. FAIR carried out a review to understand the highest risk sexual behaviours for acquiring blood-borne sexually transmitted infections (STIs). They also identified methods for asking donors about their sexual behaviour in a gender-neutral way. As a result of the review, and ministerial approval, men who have sex with men in a longterm relationship will be able to donate blood in a change to be implemented across the UK from Summer 2021.

The move sees the UK become one of the first countries in the world to adopt a more individualised risk-based approach to donor selection criteria.

Health and Social Care Secretary Matt Hancock said:

"This landmark change to blood donation is safe and it will allow many more people, who have previously been excluded by donor selection criteria, to take the opportunity to help save lives."

### HOW WELL DO THE COVID-19 VACCINES PROTECT KIDNEY PATIENTS?

### Wales Kidney Research Tissue Bank-supported COVID studies

Following significant interest from kidney patients and families, WKRU and the Kidney Wales charity are supporting two research studies



that will discover how effective the Covid-19 vaccines are for dialysis and transplant patients.

Researchers from the Cardiff Transplant Unit and Cardiff University Immunology Department were already leading a project looking into the antibody response of transplant patients. This has now progressed to become the largest study of its kind in the UK looking into transplant patients.

The study will look in detail at the immune response (defence against COVID-19) amongst transplant patients (who take different immunosuppression drugs) and among haemodialysis patients. Over 800 transplant patients are already taking part and over 90 dialysis patients have provided blood samples to the tissue bank that will be accessed by the study group.

For the second study, members of the WKRU, together with Kidney Wales, Kidney Research UK and the National Kidney Federation, are joining research led by Imperial College London and the Francis Crick Institute, to investigate how people on haemodialysis respond to the vaccines. This will include additional analyses of samples from haemodialysis patients who are involved in the first research study (above), led by the Cardiff Transplant Unit.

The research teams are taking blood samples from patients before and after they received their first vaccine, and will continue taking samples following the second vaccine dose and at different time points thereafter. This will show the level of response to the vaccine over time.





### WOMEN AND KIDNEY DISEASE: PREGNANCY CHOICES RESEARCH

Chronic kidney disease affects one in ten adults. But many aspects of kidney disease have specific gender disparities. More women have kidney disease than men, yet more men are on dialysis or have a transplant. And with an estimated 195 million women affected by kidney disease worldwide, kidney disease can change many things in a women's life, including pregnancy.

Decisions about pregnancy and the challenges pregnancy can bring whilst living with kidney disease are complex and emotive. Many women are affected by society's judgments on their decisions about having children: those who haven't had children yet, those who want them and haven't been able to have them, and those who have never wanted to have children. "We are selfish if we do not want children or looked on with pity if we do not have them, we are childless. I think many women would say they are child-free, i.e. they made a decision not to have children and they are blissfully happy with that decision. Childless suggests something is missing or lacking in us as women." Researchers in Wales are part-way through a UK wide study investigating women's experiences and decision-making regarding pregnancy decisions and kidney disease. The study is looking at patients' perspectives and their information needs and is very much focused on women's personal experiences.



Dr. Sian Griffin, Consultant Nephrologist in Cardiff and Vale UHB and chief investigator in the study, explained that the data collected to date is helping to build a comprehensive picture of women's knowledge, needs and understandings.





pregnancy choices with kidney disease

Article contributed by Dr. Leah McLaughlin, Wales Kidney Research Unit





### Breaking new ground in Welsh universities

Uned Ymchwil Arennol Cymru Wales Kidney Research Unit











Bwrdd Iechyd Prifysgol Caerdydd a'r Fro Cardiff and Vale University Health Board

### New research into dialysis options and choices

An all-Wales co-productive study is exploring factors that determine treatment choices in people with advanced kidney failure.

People living with end stage kidney disease need to make a decision about their future treatment options. In Wales there are many treatments available including transplantation, dialysis at home (either haemodialysis or peritoneal dialysis), dialysis in a hospital (haemodialysis), and supportive care without dialysis (called maximum conservative management).

NHS renal teams work with kidney disease patients, family members and carers in order to support people in making the best treatment decisions for them. Currently in Wales it is known that most people choose dialysis in hospital as their preferred treatment option. This is despite hospital-based dialysis being associated with the lowest quality of life and being expensive. In this study, the team wants to learn more about

The impact

Learning from people's experiences and opinions will help the team to understand what is most important to people when making decisions about their future kidney treatment. In addition to helping patients and their families to make better decisions, this study will inform future education programmes in Wales and help make best use of NHS resources.

what people with kidney disease, their family members and carers understand of the available treatment options, what they value most when making these difficult decisions, and the support networks available to them across Wales.





# **INDUSTRIAL COLLABORATIONS**



The WKRU has close collaboration with the Nephrology and Transplant Directorate and the WKRU labs are adjacent to the Directorate. The directorate funds two thirds of a WKRU technician post to process trials samples. This allows us to recruit patients promptly to time and continue to provide samples leading to analysis and publication (such as DAPA-CKD). Dapagliflozin reduces the risk of kidney failure and death from potential complications in patients with kidney failure.



"Identifying a microRNA signature of chronic kidney disease (CKD) progression in blood and urine" in collaboration with the industrial company UCB is an ongoing project which had several milestones and work packages (WP). Milestones have been met and the project is currently in its last WP. This project is covered by an IP patent. Tim Bowen and Donald Fraser are leading the project with post-doc Dan Smith and Kate Simpson undertaking the laboratory work.

### 4. Training

# The WKRU is a hub of activity for people at all stages of their careers in research.

We are supporting the training of two Professional Training Year students from the School of Biosciences, Cardiff University.



Hannah Lunn who is designing a cell model in the laboratory to investigate new populations of kidney tubular cells that Yueh-An Lu has recently found in fibrotic kidneys.



Sarah Buckby who is investigating the regulation of cell differentiation into pro-fibrotic cell-types by examining the mechanisms by which two signalling proteins may interact inside the cell to exert an antifibrotic effect on a specific target gene.

Below are some of the PhD students we have trained in the past year



Tanya Smith is examining a model of kidney injury that mimics that seen in the donor kidney during transplantation. She's isolating single kidney cells at different times during the injury to identify which cells may be causing most damage.



Esra Cetin is investigating the mechanisms controlling damage to blood vessels that can occur in peritoneal dialysis following a bacterial infection.



Aelia Zaidi is aiming to identify new mechanisms that modify the ischaemia-driven damage that happens to donor kidneys due to a lack of oxygen when they are prepared for transplantation, leading to progressive injury.



Morgane Mazzarino is investigating small proteins called Toll-like Receptors that are part of the very early inflammatory response to a range of bacteria and other pathogens to see if they also increase the risk of getting damaged blood vessels in kidney patients.



Bnar Talibani is investigating which genes are switched on or off in a type of cell called a macrophage that is involved in inflammation. She is examining their role in early diabetic kidney disease.



Shrea Roy is investigating the potential role of a large carbohydrate chain called Hyaluronan in the mechanisms regulating the stiffening of the blood vessels (calcification) that is often a side-effect of Peritoneal Dialysis.

# Kidney patient Covid-19 update









The WKRU is working with all kidney charities across Wales (Kidney Wales, Paul Popham Fund and Kidney Care UK) and the Welsh Renal Clinical Network (commissioners of kidney services in Wales) to deliver information about COVID 19 and available support services to people living with kidney disease. Read about the project here:

http://www.kidneyresearchunit.wales/n ews.htm?id=94 view on youtube here: https://www.youtube.com/watch?v=14 clLrGlwul

The collaboration has been selected as a finalist in this year's HSJ partnership awards for the 'Regional Covid-19 Response Partnership Award'

https://partnership.hsj.co.uk/finalists-2021



# Evaluation of changes to organ donation legislation in England

In 2020/21 Scotland and England will implement soft opt-out systems of organ donation similar to Wales. The evaluation is being undertaken by WKRU members at Bangor University who completed a similar study in Wales, in collaboration with the National Institute for Health Research.





### 5. Meeting, Engaging and Involving the public

Communication is key to the WKRU delivering on its aims. Outreach and engagement between its members and other stakeholders allow us to disseminate the results of WKRU clinical, scientific and social care research. Our public engagement and outreach has obviously suffered this year with much of it being carried out online. Below is a list of our recent activities.





For Science in Health Live (March 2021), an annual event in Cardiff University School of Medicine that usually involves tours of the laboratories by year 12 & 13 school pupils. Dan filmed a virtual tour of the WKRU laboratories based in the Division of Infection and Immunity and showed how easy it is to extract DNA.

"Eyes Bones and Gory bits" A virtual presentation by Dan at Cardiff Science Festival, February 2021. The Festival hosted 90 online events over four days, working with 62 individual event partners.

Once again, Dan also entertained school pupils at Radyr Primary School, Cardiff with his presentation.



Dr Lucy Newbury presented "Regulation of Gene Expression in Kidney Injury and Repair" at the on-line launch of the new College of Biomedical and Life Sciences Research Theme "Developmental and Regenerative Biology" March 2021.









# **MEETING THE PUBLIC**

### MUSLIM DOCTORS CYMRU



Dr Bnar Talibani



Dr Mohamed Alhadj Ali

A very important piece of outreach was carried out by Drs Bnar Talibani and Mohamed Alhadj Ali.

They have promoted the need for people to get vaccinated against COVID-19, particularly people in the muslim community. Together they have been advising the public about the spread of misinformation about the vaccine by appearing on national and international TV and through the work of Muslim Doctors Cymru. Well done Drs @emaadalauddin and @ bnar on highlighting the work MDC are doing and the importance of engaging with the 'vaccine hesitant' in the BAME community. WKRU members will keep working hard to stop the misinformation and ensure our community gets protected.

### DIALYSIS OPTIONS AND CHOICES

dialysis options & choices

Funded by Health and Care Research Wales part of the Research for Patient and Public Benefit Scheme began in October 2018. This 2year pan-Wales co-productive study has been learning about the key factors influencing patients' pre-dialysis decision making.

#### The team won Health and Care Research Wales Public Involvement Achievement Award 2020.

Follow the team behind the Dialysis Options and Choices Study, in our new blog: 'Happier at home'. @ResearchWales



For further information, to follow the study progress or to share your views, and read our updated newsletter reports see our website here <u>http://kidneyresearchunit.wales/dialysis-options--</u> <u>choices</u> and

http://www.researchwalesconference2020.com/a wards



Well done Dr Leah McLaughlin

# **CONFERENCES AND AWARDS**



Dr Charlotte Brown presented "Ischaemic preconditioning drives expansion of a protective cell population in the renal stroma" at this year's British Transplant Society meeting.

Charlie is a Surgical Registrar and has now completed her PhD. She was awarded the prestigious Medawar Medal

Gofal Cym

Health and Care Research Wales for the quality and importance of her research presentation. [#MedawarMedal #BTSNHS BT2021]



## On the 6th UN International Day for Women and Girls in Science Dr Siân Griffin was celebrated by CVUHB for her involvement in research



Bwrdd lechyd Prifysgol Caerdydd a'r Fro Cardiff and Vale University Health Board



CVUHB celebrates women in research:

#### Dr Siân Griffin - Consultant Nephrologist

"I have been involved in research since I was an undergraduate medical student. I've always felt that it's important not to stand still but to increase knowledge and understanding.

Earlier in my career I was involved in laboratory-based research, but since my appointment as a Consultant I have focussed on more clinical and holistic research with greater immediate patient benefit.

I am a nephrologist with an interest in disease that involve immunity and the kidney, including transplantation. Now is a very exciting time to be involved in medical research, especially with the development of new drugs and treatment options for kidney disease."



### #WomenInScience



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Today's research: Tomorrow's care



Dr Tim Bowen gave an invited presentation: "Urinary MicroRNAs in Diabetic Kidney Disease: Biomarkers, Disease Mediators, and Therapeutic Targets" at the American Society of Nephrology virtual meeting In October 2020. Micro RNAs are very small molecules and their role in kidney pathology provides the basis to consider circulating microRNAs as biomarkers of progressive renal decline in diabetes

### WE SUPPORTED THIS STUDY, PLEASE CONTACT THE RESEARCH TEAM IF YOU ARE INTERESTED IN TAKING PART



Research study into young adults with Chronic Kidney Disease (CKD) - We need you!

### Please help us to help other young adults

PhD student **Paula Krawiec**, from Swansea University, is conducting research to understand how young adults, age 18-35, manage their kidney disease.

Funded by Kidney Wales, the study aims to produce tools to help young adults to manage their health condition.

#### Who do we want to speak to?

- Young adults (males or females between 18 to 35 years old) with CKD stage 1 to 5
- Parents and guardians (males or females over 18 years old) of young adults with CKD stage 1 to 5
- Caregivers (males or females over 18 years old) who care for young adults with CKD stage 1 to 5; and
- Healthcare professionals (males or females over 18 years old) who care for young adults with CKD stage 1 to 5

#### What do I need to do?

- Complete a questionnaire (online or hard copy)
- Have a one-to-one interview or be part of a focus group (telephone or video conference) optional

#### Who to contact:

If you would like to take part or want further information, please contact the researcher Paula Krawiec on email address:

#### 642120@swansea.ac.uk

or email one of the study gatekeepers:

Shaun Thomas, Youth Worker: shaun.thomas2@wales.nhs.uk

Laura McGuinness, Social Worker: laura.mcguinness@wales.nhs.uk



# CONCLUSION

I hope you've enjoyed reading about the great work that the WKRU members are doing to improve the outlook for people affected by kidney disease in Wales. I'll finish by thanking all contributors, and particular thanks goes to Chantal Colmont, the driving force behind this review (and so much else at the WKRU!). This report has had to be selective, in telling just a few of our stories -you can find more on our website, and also at our regular engagement activities and other events, you'll find notices about these on our website. If this inspires you to get involved, or if you have questions or would like to find out more about our programme of activities please get in touch.

We'd love to hear from you!

Professor Donald Fraser



Thank you to you our Welsh Kidney Family for Staying Home, Protecting the NHS and Saving Lives!

Diolch i chi ein Teulu Arennau Cymru am Aros Gartref, Amddiffyn y GIG ac Arbed Bywydau!



#### Kidney Community of Wales. In it Together!



"The efforts of WKRU should be commended: to improve public awareness of kidney health and social care. Since its inception, the WKRU has staged many successful events such as those on World Kidney Day, at Techniquest, the National Eisteddfod and participating in school visits, to engage with the public in raising awareness of renal health."

Although some of these events have been possible on-line during 2020-2021, hopefully we will soon be able to continue with them as face-to-face activities once more.

### **OUR CLINICAL PARTNERS**

























CARDIFF TRANSPLANT UNIT Uned Trawsblaniadau Caerdydd







## WIDER PARTNERSHIP





For more information about the Unit's activity or to get involved, please phone 02921848469 or contact one of the following members

Professor Donald Fraser Director: fraserdj@cf.ac.uk

Professor Jane Noyes Social Care Lead: jane.noyes@bangor.ac.uk

Dr James Chess CIPHER link Lead: jc@xmed.org

Dr Chantal Colmont Unit Manager: colmontcs@cf.ac.uk

Dr Robert Steadman Dissemination and Outreach Lead: steadmanr@cf.ac.uk

You can also find information and updates on our website http://kidneyresearchunit.wales/en/

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Welsh Government