pkd charity
Polycystic Kidney Disease

newsletter

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Organoids: the human kidney structures grown in the lab

"Regenerating kidney tissue to treat patients with kidney disease will happen within our lifetimes, I am relatively convinced"

Professor Freedman

Researchers at the University of Washington, USA, have developed techniques to grow kidney structures in the lab. They can even make kidney tubules with polycystic disease. We caught up with Professor Benjamin Freedman, who runs the lab, to hear about his groundbreaking research.

What first drew you to research the kidneys?

I was motivated by personal experience: I have family members with cystic kidney disease. Having completed my PhD, I was looking for a way to use my knowledge to help people and so put two and two together.

What is an organoid?

An organoid is made of human cells in a lab dish and resembles a body organ. Kidney organoids are not complete kidneys in miniature, but have some similar structural patterns. The first time we succeeded in making an organoid, I could see before testing it that we were on to something, as it had developed tubules like a kidney's.

How is a kidney organoid made?

We start with a stem cell. These are the first cells from which we form in the womb. They can morph into many cell types and divide to form structures. Given the right cues, they generate kidney organoids. Incredibly, we can take cells from an adult's hair or urine sample and 'turn back the clock' to make the powerful stem cells from which organoids can be generated.

What have you learned by studying organoids?

An amazing discovery is that we can make organoids that mimic human disease. Most impressively, we can develop organoids with PKD, by giving them the same gene faults that cause PKD in people. These organoids swell up, just like the kidneys of people with PKD.

What's next for organoid research?

By studying PKD organoids in the lab, we are learning how the disease works. We are also generating organoids on a mass scale, so we can test out many different drugs simultaneously.

Could this technology be used to grow a new kidney for patients needing a transplant?

We can already grow bucket loads of kidney structures. Getting these to organise in the precise structure of a functional kidney – that's the big challenge. These things will happen within our lifetimes, I am relatively convinced.

Professor Freedman would like to acknowledge the support of the University of Washington's Division of Nephrology, the Kidney Research Institute, the Northwest Kidney Centers and the Institute for Stem Cell and Regenerative Medicine.

Update on tolvaptan (Jinarc®)

Over 1,000 adults with ADPKD in the UK are now taking tolvaptan. If your kidney doctor has not discussed tolvaptan with you and you are interested to know more, please ask for information at your next clinic appointment. If you currently see a GP, ask for a referral to your nearest renal unit.

In England and Wales, tolvaptan can be prescribed to adults with ADPKD, chronic kidney disease (CKD) stage 2 or 3, and evidence of rapid disease progression. In Scotland, tolvaptan can be prescribed at CKD stage 1, 2 or 3, with evidence of rapid progression.

pkdcharity.org.uk/about-adpkd/living-with-adpkd/treatments-for-adpkd

NICE publishes Renal Replacement Therapy Guidance

Helping you choose the right option when kidneys fail

After months of evidence review and extensive consultation, NICE (the National Institute for Health and Care Excellence) has published the first Renal Replacement Therapy (RRT) and Conservative Management Guidance.

About 60,000 people in the UK have kidney failure. We think about 5,000 of them will have polycystic kidney disease and will need RRT, either by dialysis or from a transplant. Some people choose not to have RRT, preferring supportive or palliative treatment – termed conservative management.

NICE wants to make sure that children, young people and adults with kidney failure get the best possible care and are able to choose the RRT option that's right for them. The Guidance has a number of important recommendations:

- About a year before your kidneys fail completely, you should be having discussions with your kidney care team about possible treatment options, including supportive treatment – giving you and your family time to make the decision that's right for you and to plan and prepare.
- Your care team should explain the risks and benefits of a kidney transplant and whether it could be a suitable option for you.
- Your care team should help you understand the pros and cons of different types of dialysis and what they involve.
- If you choose supportive treatment, your care team should explain the consequences of your decision and what to expect.

How to decide the best option for you

Your needs, preferences and wishes should be central to your decision about RRT. It's known that when patients are involved in their own health care decisions, they experience better care. Your kidney care team should give you clear information and provide sufficient time to discuss options and listen to you carefully.

To help you decide, NICE suggest that you think about:

- What matters most to you – what do you want to get out of your treatment and care?
- How will each treatment option affect your day-to-day life?
- What do you need to know about the treatments and their effects?
- What happens if you don't want to have renal replacement therapy?

Visit the NICE website to read the full guidance: www.nice.org.uk/guidance/ng107

You can discuss RRT with other PKD patients and families by visiting the PKD Charity UK Facebook Group: www.facebook.com/groups/pkdcharityUK

If you don't use Facebook, we offer peer support by telephone. Find out more about our support services here: pkdcharity.org.uk/support

The DRINK trial

Hope grows for a clinical trial of water as a therapy for ADPKD

Results from the DRINK study show that it will be possible to run a large trial testing the effect of high water intake on ADPKD progression.

The study was part funded by the PKD Charity and took place at the Addenbrooke's Hospital.

DRINK (Determining feasibility of Randomisation to high versus ad libitum water Intake in Polycystic Kidney Disease) was designed to test whether patients would be willing to take part in a water trial over 8 weeks and keep to a daily 'prescription' of water.

Dr Ragada El-Damanawi, one of the research team, explains more: "We know that cyst growth in ADPKD is stimulated by an antidiuretic hormone called vasopressin. Drinking enough water can stop the brain making vasopressin and may work just as well as medications such as tolvaptan. We needed to know if people would voluntarily drink more water than normal and achieve a target urine dilution, which we knew would suppress vasopressin. "

Forty-two adults with ADPKD took part in the study. They were randomly divided into 2 groups: one group agreed to continue drinking as normal; the other group were asked to drink a lot more water. Participants were given dipsticks to record their urine specific gravity at home and record it on a smartphone app. This test shows how dilute or concentrated urine is. If it was too concentrated, participants were told to drink more water and if too dilute, to drink less.

At the end of 8 weeks, the results showed that most people achieved the target specific gravity and were able to adhere to a fluid prescription. There were no harmful effects on kidney function during the study.

The research team is now looking at how to run a larger, longer trial. Despite water being potentially a low-cost therapy for treating ADPKD, finding the money for a major clinical trial is proving a challenge.

PKD Charity funds vital PKD databases

A foundation for future research in children and adults

The PKD Charity has awarded £20,000 to UCL Centre for Nephrology Royal Free Hospital to fund a specialist research nurse to help develop the ADPKD and ARPKD RaDaR paediatric patient databases.

RaDaR – the National Registry of Rare Kidney Diseases – is gathering information on children and adults across the UK with a range of rare and uncommon kidney diseases, including ADPKD and ARPKD. These databases are a vital tool for researchers because they contain comprehensive information about both forms of PKD. Currently, over 5,400 ADPKD patients and 180 ARPKD patients are registered. However, the majority of those registered are adults and we know that many paediatric nephrology centres struggle to find time and staff to register children with PKD.

This grant will enable the specialist nurse to visit each centre and help with data entry. Important data to be added will include how many are affected and crucial patient, genetic, and disease characteristics.

Professor Pat Wilson, PKD Charity Research Advisory Board chair, said: "The goals are to expand and enrich the RaDaR childhood PKD database in the short and long term. Many more children with PKD will be identified and their individual conditions will be better understood. This initiative will also provide some tailored assistance to overstretched paediatric nephrology referral centres."

Find out more about RaDaR via the links below. If you haven't registered yourself or your child, please read/download the information leaflets and consent forms, or ask your doctor.

pkdcharity.org.uk/about-adpkd/adpkd-patient-registry

pkdcharity.org.uk/about-arpkd/arpkd-patient-registry

When to tell children about ADPKD?

Are you unsure when to start talking to your child about ADPKD?

Professor Alison Metcalfe – a specialist in risk communication and family psychology – advises that most children cope better when their family communicates openly:

"Talking to children helps them feel valued and respected. It helps them cope better than when they are left feeling confused and unsure how or what to ask."

While children value honesty from parents, they might hold back on asking questions.

So, be ready to invite these when the time feels right.

Children are likely to begin understanding the basics of inheritance by age 8–11, but you can begin simple discussions even from age 2 – by showing where the kidneys are on a teddy, for example.

'Drip feed' information, using words your child understands. Informal chats while driving, cooking or gardening can make things easier.

Alison advises not to gloss over emotions: it's okay to explain why you're anxious or upset.

For more advice and tips, see our factsheet on talking to children and young people about ADPKD: pkdcharity.org.uk/about-adpkd/living-with-adpkd/talking-to-children-and-young-people-about-adpkd

Pioneering ARPKD research

Studying the genetics of this rare disease

Photo published with the permission of Arran Browns' family

The PKD Charity, Arran Brown Rainbow Foundation and University of Wolverhampton are jointly funding a pioneering 3-year ARPKD research project at Wolverhampton and UCL London.

What is ARPKD?

ARPKD (autosomal recessive polycystic kidney disease) is a rare disease that affects the kidneys and liver. It is usually diagnosed in babies and young children and occurs in roughly one in every 20,000 live births. ARPKD causes cysts to develop in the small tubes of the kidneys. ARPKD also causes problems with the liver, including the formation of scar tissue (called fibrosis), and a swollen bile duct.

Although ARPKD affects the kidneys and liver, the immediate risk to about a third of babies born with the disease is lung underdevelopment. This can make it difficult for the baby to breathe and they may need emergency breathing support from a machine (ventilation). Sadly, some babies don't survive pregnancy or birth.

Over time, ARPKD causes damage to the kidneys, stopping them working properly, and eventually leading to kidney failure, often during childhood or young adulthood. It can also cause complications in the liver and bile duct, such as infections.

ARPKD symptoms, severity of disease and the age that problems occur vary between different people. For example, some babies have serious lung and kidney problems, but others do not; and some children and adults have mainly kidney symptoms, while others have mainly liver problems.

There are no drugs to treat or slow down ARPKD. Children with kidney failure will need either dialysis or a kidney transplant. Some children may also need a liver transplant.

Genetic influence on ARPKD progression

ARPKD is caused by a change in the DNA of one of the building blocks of the cell that controls how signals are communicated in the cell. This change in DNA and cell miscommunication causes cysts to form in the kidneys and expand in size and number with age.

The rate at which cysts form and expand might depend on the interactions of the various genes and building blocks of the cell with each other. One of these genes is called *ATMIN*. Previous research funded by the PKD Charity has shown that *ATMIN* modifies how signals are communicated in kidney cells, affecting kidney formation.

Novel research project

During this 3-year project, researchers will investigate *ATMIN*'s interactions with the main gene that causes ARPKD (called *PKHD1*), because they believe that *ATMIN* might be a useful target for novel therapies to treat ARPKD. Normal and diseased cells will be studied to see how defects in these genetic interactions relate to disease progression and severity. At the end, they will have greater understanding of the variation in disease severity and impact on diagnosis and prognosis.

The research will be undertaken at Wolverhampton University and UCL Centre for Nephrology London by Taylor Richards, a PhD student. He will be supervised by Dr Evi Goggolidou and Professor Pat Wilson.

About Arran Brown

Arran Brown was born with ARPKD and died just after his first birthday. He spent most of his life in hospital and although he returned often to his family home in Cumbernauld, his longest uninterrupted period at home was just six weeks. Any slight cold had a severe impact on him and he was ventilated on five occasions. He also suffered at least three cardiac arrests brought on by breathing issues.

Despite all the trials that Arran faced in his life, he remained a very happy child with an amazingly infectious smile. Whether laughing and waving, playing peek-a-boo, or constantly repeating the word 'Hiya' he would brighten up any room and the mood of those around him. He would wave out of the window from his hospital bed at all who passed. Even the most stubborn of doctors would check for his wave and smile broadly back.

Arran passed away on 20th May 2011, peacefully in the arms of his mother and holding his dad's hand, surrounded by close family and friends. He remains an inspiration to so many.

The Arran Brown Rainbow Foundation is a registered Scottish Charity (SCO42510) set up in 2011 in memory of Arran Brown.

Alasdair Brown, Arran's father, explains why the Arran Brown Rainbow Foundation is funding this research with the PKD Charity: "The rate of growth of the cysts within Arran's kidneys applied a constant pressure and strain on his other organs preventing them from developing. Research that can help to progress the understanding of cyst formation and expansion is perfectly aligned with the aims of our charity, and it may ultimately lead to helping those impacted by the disease."

Registered Charity: SC042510

ARRAN BROWN RAINBOW FOUNDATION

Taylor Richards

ARPKD PhD student

"I am excited to have been awarded a PhD studentship, co-funded by the PKD charity and I can't wait to start working on this 3-year project on the 'Molecular Mechanisms of the Fibrocystin-*ATMIN* interactions in Autosomal Recessive Polycystic Kidney Disease (ARPKD)'.

During the course of my undergraduate BSc degree in Biomedical Science at the University of Wolverhampton, I became interested in the ways that the building blocks of the cell interact and drive its activity and in how changes in DNA are the drivers of many inherited diseases.

During my studies, I learnt about the disease known as ARPKD and it fascinated me, not only as an example of such an inherited genetic disease, but also, due to its rare nature, there is less research being carried out, leaving an aura of mystery on the exact mechanisms underlying this disease.

During the summer after my second year I sought out the opportunity to undertake a summer internship and I managed to secure a placement looking into the ways that a novel gene, *ATMIN*, modulates ARPKD.

Having first-hand experience of how research is carried out and being able to put the ideas and techniques that I had learnt during my time at university into practice was an exciting experience. During this internship I got to understand the need for this research, which led me to volunteer to try and raise awareness for the disease at my university during Rare Disease Day 2018. After finishing my degree, I had become interested in pursuing a career in medical research.

Upon seeing an advert for a PhD studentship on exploring genetic interactions in ARPKD, I was eager to apply, enabling me to further develop my abilities and gain the knowledge necessary to move into a career in research and hopefully deepen our collective knowledge of the role of some of these major players in this disease.

In my spare time, I enjoy building and repairing computers, as well as regular workouts at the gym. "

A spotlight on events

Are you up for a challenge?

There are many ways you can get active in support of the PKD Charity!

We have secured sought-after places in many of the UK's most popular challenge events in 2019, and we'd love you to be part of #teamPKD.

Nightrider

Get your wheels in motion and join the PKD Charity team at the 2019 Nightrider Series – we're excited to announce we're an official Tour Partner for 2019!

Come and join us for a fun-filled challenge like no other:

- a fully supported, night-time cycling event
- a great way to get fit, have fun and raise funds for the PKD Charity
- see a city in a different light
- choose from 50 or 100 km routes
- #notyourusualnightout

London: 8/9 June 2019
40 places

Glasgow: 22/23 June 2019
20 places

Bristol: 6/7 July 2019
20 places

Liverpool: 13/14 July 2019
20 places

Sign up before 31 December 2018 and benefit from a discounted registration fee of £29.

Suggested sponsorship target: £175

Why not take on an Ultra Challenge and sign up for two or more events in the Nightrider Series?!

To find out more visit pkdcharity.org.uk/nightrider or email kelly.oakes@pkdcharity.org.uk or call 07715 664687

PKD Charity Abseil 2019!

It's been 10 years since the first PKD Charity abseil... watch out for news of the 2019 abseil challenge, launching soon! If you're interested in taking part, please get in touch with us.

The Great Run Events

Great Bristol 10k
5 May 2019

A run with a view, the course takes you past the iconic Avon Gorge and Clifton Suspension Bridge.

5 places available
Suggested fundraising target: £150

Great Manchester Run: ½ marathon
19 May 2019

Experience a running event like no other on the streets of Manchester and remember, no matter how you get to the start-line, the North West runs together.

5 places available
Suggested fundraising target: £200

Great Birmingham 10k
26 May 2019

Soak up the atmosphere and support from the community, while you run through the heart of Birmingham.

5 places available
Suggested fundraising target: £150

Vitality London 10,000
27 May 2019 – Bank Holiday Monday

Entry is now open for the 2019 Vitality London 10,000, which will take place on Bank Holiday Monday 27 May. Join #teamPKD for this friendly 10k which takes you through the streets of the capital city.

8 places available
Suggested fundraising target: £150

Fancy something a little different?

Sarah Knapman

Earlier this year, Sarah Knapman got in touch, looking to take on a personal challenge, inspired by her Dad. Here Sarah tells us a little bit about her challenge:

"I am trekking through the foothills of the Indian Himalayas to raise awareness for Polycystic Kidney Disease. My Dad has it, and has been through dialysis, transplant and is now battling lymphoma as a result of his immunosuppressant drugs.

It has profoundly affected my family, as my Grandmother and Uncle both had/have the disease.

So, to raise awareness, and to do something out of my own comfort zone, I am partaking in this amazing opportunity whilst raising money for the PKD Charity. I am so excited to do this for my family and for the charity – I would love to meet people in the PKD community along the way".

You can sponsor Sarah on her challenge here: www.gofundme.com/sarah039s-trek-for-pkdf

If there is a challenge, UK or international, that you've always wanted to do, whether it's to climb Kilimanjaro, cycle London-Paris, or even sled The Lapland Husky Trail, get in touch. We can source places in all sorts of incredible challenges.

Contact Kelly Oakes, Fundraising Manager at the PKD Charity: kelly.oakes@pkdcharity.org.uk or call 07715 664687

Once you've registered, we can help you with fundraising advice, information on how your support makes a difference and lots more.

Support our work

Fundraising ideas

The PKD Charity is almost entirely funded by donations from people and families affected by PKD, and we are very grateful to everyone who has raised funds or given their time.

There are many ways to help us continue our work.

Donations

Single or regular donations can be made online via our website. If you are a UK taxpayer, we can also reclaim Gift Aid on your donations: pkdcharity.org.uk/fundraising/donate-to-pkd

Payroll or Workplace Giving is a simple and cost-effective way to donate. We are registered with CAF, the UK's biggest scheme: www.cafonline.org/my-personal-giving/plan-your-giving/caf-give-as-you-earn

Leaving a gift in your will to the PKD Charity can help us continue our long-term research activity - such as funding the PKD bio-bank used by many researchers in the quest for new therapies.

You can donate in memory of a loved one online or set up a tribute fundraising page on one of the third party platforms we use: pkdcharity.org.uk/fundraising/justgiving-virginmoney-btmydonate

If you are arranging a funeral collection, we can send you printed envelopes to make the collection easier. Just email kelly.oakes@pkdcharity.org.uk letting us know how many you need.

Facebook Fundraisers

Facebook has made it super easy to raise money – to celebrate your birthday or a special anniversary. Visit the PKD Charity Facebook Page www.facebook.com/pg/pkdcharity/fundraisers to start a fundraiser and share the link with family and friends.

Take part in an event

You can read all about the places we have in challenge events on the previous page, or visit pkdcharity.org.uk/fundraising/pkd-fundraising-events

'Your fundraising, your way' is a great way to involve your family, friends or work colleagues in raising money for our cause. Baking, knitting, making crafts are all popular with our supporters. Email kelly.oakes@pkdcharity.org.uk for an ideas pack.

When you're doing a fundraising event, ask your employer if they have a Matched Giving Scheme where they will match the amount you fundraise up to a certain level.

Online shopping

The PKD e-shop offers you a variety of Christmas Cards with new designs for 2018. Buy your cards today at pkdcharity.org.uk/fundraising/christmas-cards

An easy – and free – way to raise money by shopping is to use the Easy Fundraising portals. Every time you shop online at over 4,200 stores, they receive commission which is donated directly to the PKD Charity. Sign up at www.easyfundraising.org.uk/causes/pkd/?u=96OIY1

Amazon has a new charity shopping scheme called Smile. Visit smile.amazon.co.uk

Need help with fundraising? Email kelly.oakes@pkdcharity.org.uk or call her on 07715 664687

Donate your car

Do you have a car to dispose of? Giveacar is a UK based fundraising organisation that organises car donation for good causes in the UK.

giveacar.co.uk/charities/polycystic-kidney-disease

Registered with FUNDRAISING REGULATOR

The PKD Charity is registered with the Fundraising Regulator.

This means that we commit to carry out fundraising in accordance with the Code of Fundraising Practice and will ensure that our fundraising is legal, open, honest and respectful at all times.

We make the following promise to all our supporters:

- We will comply with the law as it applies to charities and fundraising.
- We will do what we say we are going to do with donations we receive.
- We will give a clear explanation of how you can make a gift and change a regular donation.
- We will explain our fundraising costs and show how they are in the best interests of our cause.
- We will not put undue pressure on you to make a gift. If you do not want to give or wish to cease giving, we will respect your decision.
- We will manage our resources responsibly and consider the impact of our fundraising on our donors, supporters and the wider public.

Find out more: www.fundraisingregulator.org.uk

Make a difference with your gift

- **£5 pays for refreshments for a patient or family member attending one of our regular Information & Support Days**
- **£10 will help us send 100 PKD health information leaflets to a renal unit for doctors and nurses to hand to patients**
- **£20 enables us to offer 60 minutes of telephone support to an anxious person who rings our helpline**

Our support services

Helping you cope with PKD

In person/face-to-face support

Meet ups

We help organise regular social meetings for adults living with PKD, their family members or friends. An informal way to share experiences, offer friendship and signposting to other sources of support and information. Check our website for details.
pkdcharity.org.uk/support/pkd-meetups

ADPKD information and support days

Hosted by leading PKD renal consultants in venues around the UK. Providing an opportunity to find out more about ADPKD, treatments, ask questions, meet with others and share experiences. Check our website for the next event.
pkdcharity.org.uk/support/pkd-information-support-days/adpkd-info-support-days

ARPKD family day

Annual event for children with ARPKD and their families. Whilst the adults attend information sessions and meet other parents, children are provided with supervised entertainment.

Telephone support

0300 111 1234 Helpline

Confidential personal support from an experienced PKD volunteer. Available from 9:30am to 5:00pm Monday to Friday.

Telephone peer support service

Our trained volunteers are people living with PKD. They have a range of experiences, so whether you are wondering about dialysis or transplant, or worrying about what to say to your children, our volunteers can help. Call 07739 632836 to find out more and be matched with someone who understands what you are going through.

Topic based teleconference

Monthly conference call on a specific topic for up to 10 people. Hosted by a professional and a volunteer with experience of PKD. An opportunity to dial in, ask questions and listen to others' experience, from the comfort of your home.

Online support

Facebook groups

We moderate a dedicated PKD Charity UK-only closed group. A safe place to ask questions, share experiences and offer mutual support to those diagnosed with PKD, their families, and loved ones.
www.facebook.com/groups/pkdcharityUK

HealthUnlocked Communities (linked with NHS Choices)

We moderate two HealthUnlocked communities, one for ADPKD:
healthunlocked.com/pkdcharity-autosomaldominant

The other for ARPKD:
healthunlocked.com/pkdcharity-autosomalrecessive

Topic based webinars

For people who can't attend Information and Support Days. Webinars are led by a medical expert, are easy to access from a PC or smartphone or can be viewed later.

The topics will include PKD in children, tolvaptan, genetics, pain, diet and lifestyle.

Visit our **Events page** for details of upcoming webinars, information days, meetups and support group calls:
pkdcharity.org.uk/news-events/events

PKD Charity Health Information

Health & care information you can trust
The Information Standard Certified Member

The PKD Charity's health information is accredited by the NHS Information Standard.

All factsheets are written by medical experts and checked by our lay reading panel of people affected by PKD.

Key factsheets include:

Just Diagnosed with ADPKD
pkdcharity.org.uk/about-adpkd/just-diagnosed

Symptoms of ADPKD
pkdcharity.org.uk/about-adpkd/symptoms-of-adpkd

Living with ADPKD
pkdcharity.org.uk/about-adpkd/living-with-adpkd

About ARPKD
pkdcharity.org.uk/about-arpkd

If you do not use the internet, ring our Support Line 0300 111 1234 and ask for printed copies.

Links to Other Sources of Help

Links to other sources of help:

Kidney Care UK - individual grants
www.kidneycareuk.org

Turn2us – broad range of advice on welfare benefits and grants
www.turn2us.org.uk

Family Fund – grants for seriously ill or disabled children
www.familyfund.org.uk

UK Government Benefits Info
www.gov.uk/browse/benefits

Children's Liver Disease Foundation
childliverdisease.org