

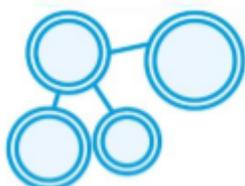


March/April 2021 Research Roundup

Our Research Support Network (RSN) connects you to Parkinson's research. From finding out more about research to getting involved, there's something for everyone. You can register to receive our research emails directly by visiting

www.parkinsons.org.uk/research/get-involved-research and clicking on "Join our Research Support Network."

Here's our **March/April Research Roundup** with the latest research news and opportunities for you.



GET CONNECTED

Creating drugs to restore mitochondria and stop Parkinson's

We catch up with Dr Heather Mortiboys from the University of Sheffield to hear all about her exciting Parkinson's Virtual Biotech project which aims to create new drugs that can rescue failing mitochondria.

[Parkinson's UK](#) is investing up to £1.2 million into a pioneering one-year project in partnership with the University of Sheffield. The project aims to take important steps towards creating a drug that can protect dopamine-producing brain cells and slow down the progression of Parkinson's.

This important project is funded through the charity's [Parkinson's Virtual Biotech](#) initiative, which exists to fast-track the development of new treatments for people with Parkinson's.

We're delighted to be joined on the Parkinson's UK blog by lead scientist Dr Heather Mortiboys to tell us more about this exciting research.

What are mitochondria and why could drugs that restore them be the key to slowing or stopping Parkinson's?

Mitochondria are like tiny batteries that are present in almost every cell in our bodies. They are responsible for producing the essential energy that our cells need to function properly and survive. Brain cells need lots of energy. And the dopamine-producing brain cells that become damaged and lost in Parkinson's are among the most energy hungry because they are so large

and complex with lots of connections to other brain cells. It has been known for some time that mitochondria seem to stop working properly in these dopamine-producing cells in Parkinson's and that mitochondrial problems seem to happen in almost all forms of the condition.

When mitochondria stop working properly the cells don't have enough energy to do their jobs properly which causes lots of problems. To make matters worse, faulty mitochondria seem to build up inside these brain cells, releasing toxic chemicals that poison the cells causing even more damage.

For these reasons, I and many other scientists believe that if we can develop drugs that can get mitochondria back to being healthy and working well we could slow or even stop the progressive damage to brain cells in Parkinson's.

How are you trying to develop these drugs?

I received a Senior Research Fellowship from Parkinson's UK in 2013 and that enabled me to set up my own research group here at the University of Sheffield's Institute of Translational Neuroscience (SITraN) and really focus my research on mitochondria in Parkinson's.

I became a scientist because I wanted to develop treatments that could really make a difference to peoples' lives. And as well as receiving funding from the charity, I've also been hugely inspired by getting to know and work with the Parkinson's community. Not only is their passion for research and their interest in our work incredibly motivating, but discussing my work with them has actually helped shape the experiments that I do to make my research more relevant to people with Parkinson's.

I've now been studying mitochondria in Parkinson's for almost 20 years. In that time we've made some really important steps towards finding drug-like molecules that can fix the problems that we see with mitochondria in Parkinson's.

Crucially we use skin cells taken from people with Parkinson's that we can grow into brain cells in the lab. Importantly, when we study these cells from people with Parkinson's we can see that they have problems with their mitochondria — just like those that happen in the cells in the brain in the condition.

We use these precious cells to test drugs already in clinical use that might have a beneficial effect on the mitochondria. This is a new way of working in drug discovery, most drug discovery work does not include testing in cells from people with Parkinson's so early in the pipeline. We tested thousands of these molecules and found a handful that seemed to have really exciting positive effects.

So what's happening with this new Virtual Biotech project?

Repurposing existing drugs is hugely important because we know these drugs are safe for people to take and therefore they can be more rapidly taken forward into clinical trials in people with Parkinson's — and ultimately if they are proven to be effective, they could be made available quickly.

However, while repurposing drugs holds great promise, because these drugs haven't been purposely designed for Parkinson's there is likely to be room for improvement. By that I mean, can we take a drug that shows promise and then use it as the inspiration for an entirely new drug molecule that could be even more effective. That's what we are attempting to do with this new Virtual Biotech project — take some of the drugs we identified in my research and improve on them to hopefully produce a drug that is the best that it can be. We found that these drugs are boosting mitochondrial function by working in a new way, but they also could cause some side effects that we wouldn't want when given to someone with Parkinson's. We started working with Richard Morphy who is a Drug Discovery Manager at Parkinson's UK and an expert in medicinal chemistry in 2018 to see whether it would be possible to create new molecules from the drugs we originally identified.

Over the past year we've successfully created new molecules that seem to be very effective at addressing mitochondrial problems in Parkinson's and they do not have the activity which would cause the unwanted side effects of the original drugs. This initial success has now led Parkinson's UK to invest a further £1.2million to take these molecules forwards and try to develop them into drugs that could be tested in people with Parkinson's in future. Over the next year, we plan to develop our molecules further to produce a molecule that can restore mitochondrial function in our cells from Parkinson's patients as well as having the ability to get from the bloodstream into the brain — which is a crucial factor in creating a drug that can be given in a pill. If we're successful, we'll then be ready to start testing in animals to understand safety and effectiveness which would be an important step towards taking it forward into clinical trials in people with Parkinson's.

It's a painstaking process and there is a lot of work and rigorous testing to be done but I'm incredibly excited about what the future holds.

Written by Claire Bale, Head of Research Communications and Engagement at Parkinson's UK

Researchers move closer to a test that can sniff out Parkinson's

Research part-funded by Parkinson's UK has shown it is possible to identify the condition by analysing the chemicals present on the surface of the skin. The findings offer hope that a pioneering new test could be developed to diagnose the degenerative condition through a simple and painless skin swab.

The test works by analysing chemical compounds found in the sebum — the oily substance that coats and protects the skin — and identifying small but important changes in people with Parkinson's.

Professor Perdita Barran, Professor of Mass Spectrometry at The University of Manchester, who led the research, said: "We believe that our results are an extremely encouraging step towards tests that could be used to help diagnose and monitor Parkinson's. Not only is the test quick,

simple and painless but it should also be extremely cost-effective because it uses existing technology that is already widely available. We are now looking to take our findings forwards to refine the test to improve accuracy even further and to take steps towards making this a test that can be used in the NHS and to develop more precise diagnostics and better treatment for this debilitating condition.”

These promising results published today could lead to a definitive test to diagnose Parkinson’s accurately, speedily and cost effectively.

Amazingly, this groundbreaking research was all inspired by Joy Milne, a former nurse with an exceptional sense of smell.

The woman who can smell Parkinson’s

Joy’s husband Les was diagnosed with Parkinson’s at the age of 45. Joy noticed a difference in his smell many years before that. But she never considered that the musky smell and the condition might be connected until the couple started meeting other people with Parkinson’s.

“It dawned on me that every person with Parkinson’s that I met had the same unique, musky odour as Les... and I realised it was the condition itself I could smell. I was surprised to find that no one had made the connection before — but when I mentioned it to a researcher from the University of Edinburgh he was intrigued. He devised a simple experiment to test whether I really could smell Parkinson’s. I had to sniff t-shirts worn by people with and without the condition and I think he was rather surprised when I got all but one correct. The only one I got ‘wrong’ I identified as having Parkinson’s when they were in the control group. But that person came back 8 months later and said he had been diagnosed, so I had actually detected the condition before he himself realised he had it. And that’s where everything started. I’m so delighted to have been able not only to highlight this phenomenon to the research community but also to work as part of the scientific team to help them develop a simple non-invasive test.”

Watch a BBC News clip featuring Joy: <https://www.youtube.com/watch?v=XB0QgwVffvk>

Towards a simple and accurate test

Clinical lead Professor Monty Silverdale at Salford Royal Foundation Trust, recruited 500 people with and without Parkinson’s who provided samples of sebum from their upper backs for analysis. Using different mass spectrometry methods, 10 chemical compounds in sebum were identified which are elevated or reduced in people with Parkinson’s. This allows scientists to distinguish people with Parkinson’s with 85 per cent accuracy.

Further analysis using high resolution mass spectrometry showed subtle but fundamental changes as the condition progresses. This means this ‘world first’ testing strategy is not only useful in diagnosing Parkinson’s but also in monitoring the development of the condition. The skin swab could provide an incredibly important new tool in clinical trials helping researchers measure whether new, experimental treatments are able to slow, stop or reverse the progression of Parkinson’s. The team is now seeking funding to further develop the test and explore the potential for using the test to ‘stratify’ patients.

Why better diagnosis matters

Parkinson's tends to develop gradually. It may be many months, even years, before the symptoms become obvious enough for someone to go to the doctor.

There is currently no definitive test for the condition. Diagnosis is made by a specialist based on symptoms. They look for things like tremor, slowness, stiffness and balance issues. However, many of the symptoms of Parkinson's can overlap with other conditions, especially in the early stages when symptoms are more subtle, so it's not a straightforward task.

This means that getting a diagnosis of Parkinson's can take time, and some people may be misdiagnosed at first. This period of uncertainty can be extremely frustrating and worrying for people, and delays their ability to access vital treatment and support.

In a recent survey of more than 2,000 people with Parkinson's carried out by the charity, more than a quarter (26%) reported they were misdiagnosed with a different condition before receiving the correct Parkinson's diagnosis.

56-year-old Daxa Kalayci lives in Leicester and was diagnosed with Parkinson's in September 2019. She was misdiagnosed several times over four years before finally finding out she had the condition.

"I was misdiagnosed with anxiety, stress-related tremors and told that my problems stemmed from going through the menopause. I embarked on a 4-month cruise across the globe not knowing I had Parkinson's. Just two weeks into the trip, my symptoms worsened and my dream holiday turned into a nightmare. Without confirmation that it was Parkinson's, which I had suspected for a long time, I was left with unpleasant side-effects caused by different medications prescribed to manage my symptoms. Despite my diagnosis eventually being confirmed by a DaTscan, a quick and simple diagnostic test for Parkinson's would have given me the chance to start my treatment earlier and enjoy life a lot more. But instead, I lost so many years not being able to pursue a career as a paramedic or go back to Nursing. This test could be a game-changer for people living with Parkinson's and searching for answers like I was. I am so happy with this news because it will mean that in future people won't have to experience the anxiety of multiple appointments, long waiting times and sleepless nights. The sooner this test is available, the better. Anything that can help people looking for a diagnosis is a bonus."

Written by Claire Bale, Head of Research Communications and Engagement at Parkinson's UK

For more research articles, please visit <https://medium.com/parkinsons-uk>

You're invited to online research events

1. Saturday 10 April, 11am: Please join the South East Research Interest Group (RIG), Medway Groups and the University of Kent, as they hold a World Parkinson's Day Lecture on research and exercise. Speakers will talk about research engagement and participation, the therapeutic effects

of exercise, and how dance can help people with Parkinson's. There will be emphasis on opportunities for people in Kent and East Sussex, but all are welcome!

You can read more and register to attend online here:

<https://www.eventbrite.co.uk/e/world-parkinsons-day-lecture-research-exercise-tickets-141810989487>

2. Wednesday 14 April, 2.30pm: Please join the [Greater Glasgow Research Interest Group](#), as they host two researchers from the University of Strathclyde, talking about their work in Parkinson's research and rehabilitation. Dr Andy Kerr will discuss 'An introduction to the Co-Creation Centre in Rehabilitation Technology at Strathclyde, and including people with Parkinson's in the technology development process (focus groups and surveys);' and Esraa Aldayil, PhD student, Biomedical Engineering, will discuss 'How people with Parkinson's differ in the way they start walking and change walking speed.'

You can read more and register to attend online here:

<https://www.eventbrite.co.uk/e/greater-glasgow-research-interest-group-meet-the-researchers-online-registration-146975657147>

3. Saturday 17 April, 10.30am: Please join the [East Midlands Research Interest Group](#) as they hold a Spring Research Event on 'improving physical and mental health for people with Parkinson's'. Keynote speakers include Dr Bhanu Ramaswamy OBE (exercise for people with Parkinson's), Dr Rob Skelly (investigating the benefits of physiotherapy at different stages of Parkinson's) and Dr Jennifer Foley (mental health and Parkinson's).

You can read more and register to attend online here:

<https://www.eventbrite.co.uk/e/improving-physical-and-mental-health-for-people-with-parkinsons-tickets-143103140345?utm-medium=discovery&utm-campaign=social&utm-content=attendeeshare&utm-source=strongmail&utm-term=listing>

4. Friday 23 April, 10.15am: Please join the [East of England Research Interest Group](#) as they host Professor Mina Ryten, explaining what genes can tell us about the causes of Parkinson's and using genetics to understand and find treatments for Parkinson's.

You can read more and register to attend online here:

<https://www.eventbrite.co.uk/e/using-genetics-to-understand-and-find-treatments-for-parkinsons-disease-tickets-145512781647>

All will be hosted on Zoom.

Catch up on recorded research events

- 'Ending Parkinson's: A prescription for action' with speakers Bas Bloem and Ray Dorsey, hosted by the Oxford Branch of Parkinson's UK. You can find the recording online here: <https://oxfordparkinsons.org.uk/events/20210203-epd/video>

- **'Parkinson's and Technology'** three-part series, with multiple topics and speakers, hosted by the [Dundee Research Interest Group](#). You can read more about the three events and watch them back online here: <https://www.drig.org.uk/events/past-events>
- **'Could cannabidiol be the answer to Parkinson's psychosis?'** Watch the Gretschen Amphlet Memorial Lecture, recorded on 24 March 2021, to hear from a range of speakers: <https://www.youtube.com/watch?v=f3zYhXgvAkc>
- **'Predict PD: The causes and determinants of Parkinson's'** with speaker Dr Alastair Noyce, hosted by the [East of England Research Interest Group](#). You can find the recording online here: <https://www.youtube.com/watch?v=-ucqwenxFAC>

You can find more research event recordings online here:
<https://www.parkinsons.org.uk/research/research-events>



TAKE PART

For people who wish to participate in studies, please visit our [Take Part Hub](#), a post code searchable database of studies actively recruiting participants. The Hub is updated weekly with new studies, so please do check it regularly:

<https://www.parkinsons.org.uk/research/take-part-research>

And for those people not online, you can call our free, confidential Helpline on **0808 800 0303** and our trained Advisors will be able to discuss what you are interested in and put you through to the Research team to find studies for you.

TOPHAT - Trial of Ondansetron as a Parkinson's Hallucination Treatment

The aim of the research is to see whether ondansetron will effectively treat visual hallucinations in people with Parkinson's. As this is an already licensed drug, if the research shows significant

outcomes, ondansetron could be available for people with Parkinson's who experience hallucinations within the next few years.

Locations around the UK: Cornwall, Central London, London Lewisham and Greenwich, Glasgow, Newport, Bangor, Tayside, Salford, Dartford, Bury, Kings Lynn, Bournemouth

Who is needed: 216 people diagnosed with Parkinson's who experience hallucinations related to your Parkinson's at least once a week. You also need to not be taking apomorphine and be on a stable dose of your Parkinson's medication for 28 days before starting the research.

What is involved: The first activity is a telephone call to discuss the research more fully, give your consent to take part and complete some questionnaires. This will be followed by a brief face to face screening visit to assess your Parkinson's, take a blood sample and monitor your heart rhythm. This visit may take place either at your house or at your local research site.

Once all the results from this visit are reviewed, you may be invited to take part and will be randomised to either receive ondansetron or placebo tablets, which will be shipped to you via a courier.

For full information about the research and to register: Please go to <https://www.parkinsons.org.uk/research/tophat-trial-ondansetron-parkinsons-hallucination-treatment>

Need to chat to someone? Our helpline and Parkinson's local advisers are here to answer any questions you have about the symptoms of Parkinson's. You can call them on **0808 800 0303**.

Thank you for supporting research!
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