**LabMed Podcast Ep 2 - Phillip Monaghan - FINAL**

MUSIC JINGLE

**VO - Welcome to *Life in the Lab*, brought to you by the Association for Laboratory Medicine. I'm Kamiljit Chatha, and I'm a Consultant Clinical Scientist at University Hospitals Coventry and Warwickshire NHS Trust. In this series, we bring you inspiring stories of clinical scientists and medics working in laboratories in the UK and around the world.**

**Today, we're diving into research and innovation with Phillip Monaghan, the Head of Service and Consultant Clinical Scientist at the Christie Pathology Partnership in Manchester. We’ll hear about his groundbreaking work in cancer research, which has life-saving potential.**

**Phillip's passion for science started at a young age, but it was during his studies - and early in his career - that he realized his work needed to make a real difference in people’s lives.**

I'd recently moved house during secondary school. And it was in my third year of this new high school that my form teacher, who was also my science teacher at the time, she was just a great teacher in terms of biology, chemistry. At the end of the year, she gave me a gift of a textbook in regards to human biology with a nice message inside saying: aim high. So, she must have seen something in me and that really spurred me on to want to study more, learn more.

I applied for biochemistry at university. I learned a lot, and it was during which time I found quite a keen interest in studying the structure and mechanisms of proteins and enzymes. And that led me on to my PhD studies looking at a set of enzymes called redox enzymes.

**Redox enzymes are proteins that help control reactions in your body by moving electrons around between molecules. This is important for things like making energy and protecting your cells. Think of them as tiny helpers keeping everything in balance!**

It was all really interesting science. Fascinating. It was rather blue sky though. So I really struggled to see the direct positive impact that that research was having.

It wasn't until I completed my PhD and commenced with my postdoctoral research studies that a colleague in the laboratory that I was working in at the time signposted me to the NHS clinical science trainees course.

And I could see straight away that it was a great fit for me. I could see immediately that the science that I was able to conduct within the laboratories and the research that I was undertaking was able to have a direct impact on patient care.

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I undertook some research into how we measure blood levels of cortisol in patients with cortisol excess which is a condition known as Cushing's syndrome.

**People with Cushing's syndrome have too much cortisol in their body. Cortisol is a hormone that affects stress response, impacting blood sugar levels and blood pressure. People with Cushing’s Syndrome often suffer from weight gain, thinning skin, and muscle weakness. The disease can also affect your mood and make your bones more fragile.**

The medical treatments used to control those cortisol levels can quite often have an impact on the assay which is used to measure cortisol. And this was causing an overestimation of the patient's blood cortisol levels.

And consequently, there was a risk that the doctors were going to overprescribe therapies, the risk of that being quite disastrous potentially. So, we saw that in the laboratory and I was considering how we might better measure cortisol for these patients moving forward.

And there was a test available to measure cortisol, on a test methodology, called mass spectrometry.

**This is a technique that breaks molecules into smaller pieces to measure their mass and identify what they’re made of.**

And we measured cortisol by mass spectrometry compared to our conventional tests to provide the doctors with the assurance that they needed to more precisely prescribe the treatments being offered to patients. We were able to implement that new practice very swiftly and It's been a pathway that we've been using at our hospital for at least the past 10 years now and it's been very effective.

**This groundbreaking work earned Phillip and his team the research medal award from the Royal College of Pathologists in 2012.**

It was very rewarding. It was bringing together a team of experts to collaborate on good research and making a positive difference and impact on patient care. And clinical pathways and ultimately patient outcomes. So, that really spurred me on to want to conduct more research and innovation within my day to day role as a clinical scientist moving forward.

MUSIC INTERLUDE

**A few years later, Phillip joined a team working with the National Cancer Research Institute and the Manchester Institute's Cancer Biomarker Centre. Biomarkers are signs or substances in the body that show if someone has a disease or how their treatment is going.**

**They wanted to explore a new blood test that could help track how well cancer treatments are working.**

There's a class of drugs known as anti angiogenic agents, which block tumour blood supply and starve them of oxygen and nutrients. And the only way currently that doctors can infer whether these therapies are working or not is through regular monitoring through scans of patients.

And this can be quite cumbersome, quite difficult for the patient sometimes. The scans give details of the size of the tumour, but they don't necessarily give any information regarding the tumour vasculature or blood supply. So, the idea was that we would set out to validate a novel blood test which measures a protein called Tie2, which would help and potentially replace routine scanning for patients moving forward.

Now, Tie2 levels, when they're reduced, this would infer that a drug is working effectively. If a Tie2 concentration returns to its previous levels, then the drug has stopped working. So, if we can validate that this test is fit for purpose in a clinical setting, moving forward it will potentially obviate the need for routine surveillance scans for patients receiving these types of therapy.

We're moving towards a world of more personalised cancer therapy. So, the novel Tie2 tests will hopefully enable doctors to rapidly react to a patient's response to treatment, stop it if it isn't working effectively, enable the patients to consider other options of therapy, potentially extending the patient's life.

It's an exciting step forward potentially, long awaited and much needed and if we can ensure and validate that it works here at the Christie, then it could have potential global impact.

**This impact has been a long time coming - two decades of lab research, even before clinical trials. And of course, it hasn’t been without its challenges along the way.**

So, a challenge for me has been funding and gaining access to funding. I think laboratory medicine previously has been quite out of sight from a hospital setting. Clinicians would request a blood test and the laboratory would be kind of like a black box, and a few hours later a set of results would pop up.

I think since the COVID pandemic it's really shone a light on the workings of the labs and how they are run and how they're governed and regulated. And it's a real opportunity to be more involved formally within clinical trials and blood test developments.

So, collaborating with teams, clinical academics, industry, patients, patient advocates has been a real turning point whereby we can gain access to funds that will then provide finance and capital to invest in the laboratories. You know, we need large minus 80 freezer storage for biobank work, etc. And overcoming those challenges has really enabled the laboratories, particularly the Christie, to become recognized as partners in the research and innovation process.

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Speaking personally in my leadership role, I recognize my responsibility is to positively role model in my day to day work life. And my own self management if you like, so, leading with integrity, having high ethical standards, I think that's really important. Certainly for registered clinical scientists. And particularly if you're working in clinical trials and research as well, having those high ethical standards is really quite important.

Um, I've certainly faced my own challenges in my leadership journey, managing the pressures that the day job brings. And I'll admit that's not been entirely successful so far. And it's something that I feel I'm still on that journey in terms of gaining a better and more healthy work-life balance. So, lots of learning points from my perspective.

It’s always a busy time. Never a dull day in the lab! (laughs)

**So far, in its first stage of trials, the test for Tie2 has been successfully carried out in ovarian, colorectal, biliary tract and endometrial cancers.**

**In a few years, once it has been fully validated for clinical use and has regulatory approval, this blood test will be available across the NHS.**

**It'll help doctors quickly see how a patient is responding to treatment, switch things up if it's not working, and ultimately save lives.**

I can see from the first stage of the clinical trial work that the data thus far shows positive results in terms of the responses to the therapies that we're seeing. The stage two trial will be really important to absolutely evidence the value of the new biomarker.

The main end point of this would be to evidence that the Tie2 test works for its intended purpose and to offer this for cancer patients as soon as possible.

MUSIC INTERLUDE

**Riding on the excitement of this progress, Phillip founded the Translational Biomarker Lab in 2020. Since then, it's supported several biomarker studies, with more currently in the works.**

We'll be looking at different applications of the Tie2 test in different types of cancer moving forward, which is very exciting. It's not just an application for one particular kind of cancer, but we're looking at other applications to improve the way we can tailor and guide these novel therapeutics.

With working at the Christie, we're very fortunate geographically to have the new Patterson Research Center just next door, which has the Manchester Institute Cancer biomarker Center, some really good colleagues, in clinical academia.

And also fostering relationships with industry for future funding applications is really important. And I've found through various trial management groups that having patient involvement and patient advocates is really useful and really important to gather patient insight and patient feedback on these trials. So, having their voice heard is really, really quite critical.

I think there's a lot of research going on every day up and down the country in laboratories. For me, it's incumbent on clinical scientists to have some protected time to conduct research and innovation.

And hand in hand with that is growing the team of clinical scientists and biomedical scientists for the future as well, which I think is massively important. So, looking at opportunities for more apprenticeships, more funding, research and innovation, and projects, really interesting projects for clinical scientists moving forward.

**As if that wasn't enough, Phillip is also the Co-Editor-in-Chief of the *Annals of Clinical Biochemistry*. Through his work with LabMed, he's passionate about inspiring the next generation of scientists to push the boundaries of innovation.**

The journal *The Annals of Clinical Biochemistry*, the editorial board, will endeavour to better support our readership and colleagues particularly those in the early stages of their career to support and contribute to the journal. And in the future, we're also looking at exploring options to potentially develop a resource on the association's online learning academy, which would be very interesting and hopefully more accessible to a broader audience.

We'll be aiming to discuss topics, including formulating research questions, generating research ideas and topics of interest and exploring perceived barriers to publication and how we can support as a journal to overcome these.

MUSIC INTERLUDE

I would say in terms of innovation and thinking outside the box. Just don't always assume that standard practice within labs and hospitals is the best way to do things. I would say I think it's thinking laterally, thinking slightly differently, keeping your eyes open to potential issues within your laboratories and how we might be able to work more effectively and work differently.

And whether it’s looking at a new blood test or measuring something slightly different, or whether it's a change in practice or a continual service improvement, there's always something out there which, as a clinical scientist, you can look into, investigate, explore, research, and improve practice.

And it might be one tiny area of your laboratory or it might be something with more of a global impact. But what I would say is it's great doing these things alone initially, but I think if you would like to have a broader impact, then I would certainly advocate for closer collaboration not just within the laboratory, but exploring more widely. So, breaking down the conventional silos working more integrated within your hospitals and indeed across your regions and nationally as well.

Stay up to speed with the scientific developments in the field and just look at opportunities to develop better ways of working within the laboratory.

Always look for how you can have a positive impact in your role as a clinical scientist, as a researcher, and just keep your eyes and ears open as to how you can look to improve the service that we provide.

My advice for any young scientist, young clinical scientist in the field, would be to stay curious, seize opportunities that come your way and collaborate because clinical science is a team sport.

**For a transcript of this episode or for more about Phillip Monaghan and his work, visit our website at** [**www.labmed.org.uk**](http://www.labmed.org.uk)**/podcasts**

**This podcast is brought to you by the Association for Laboratory Medicine. Produced and edited by Caroline Bacle, sound mixed by Daniel Fletcher. Special thanks to Avi Surskas and everyone in the LabMed team.**

**And we’ll be back next time for more stories of *Life in the Lab*.**

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