

## **Supporting the Scientists: Working as a research technician in a core service facility**

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My name is Shairbanu and I work as a research technician in PNAACL, the Protein & Nucleic Acid Chemistry Laboratory, which is one of the many core science support facilities here at Leicester. As I'll show you, most of work is in the area of proteomics.

I came to Leicester in 2001, and graduated in 2004 with a degree in Medical Biochemistry. When I was doing my third year, I didn't know whether I wanted to continue my studies or whether I wanted to go and get a job straight away. So initially I applied for both jobs and Masters courses at the same time. I didn't get any of the jobs at the time, but I did get a lot of feedback saying that I didn't have enough experience. This reinforced my decision to go onto a Masters and gain some experience that way. This is exactly what happened; I did a placement at Astra Zeneca for about eight months. I had a really great time working on this project, but I realised that going on to do a PhD wasn't for me. So I went on to work as a Biomedical Assistant in the Pathology labs at Leicester, and then in 2005 I got the research technician job here, in proteomics.

So what is PNAACL? Our work mostly involved doing DNA sequencing and proteomics for other researchers. Our first speaker today discussed DNA sequencing, I do more of the proteomics side. PNAACL is located just across the road in the Hodgkin Building and we are one of the core research facilities. You are probably not aware, but the University has quite a few different research facilities that support scientific staff in a variety of specialist ways. You've got bioinformatics support, biostatisticians, containment labs, protein expression services, genomics, and embryonic stem cell facilities. We provide DNA sequencing and proteomics services. People submit work to us and we analyse the samples and provide their data back to them.

What do I do as a research technician? I have been in this role since 2005. When I first, it was a three year contract; most technical positions are short-term, between one to three years. If there's funding available then the contract may be extended, which is what happened to me, and I am now on an open-ended

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contract. Because we are a support service, PNAACL is actually slightly different. We are self-funding, so if we don't have any work to do we don't get any money. So there's always that added pressure of generating enough work to keep things going. Working as a research technician in a core facility is also slightly different to working in a lab, because you have to depend on other people, your customers. You can't necessarily plan your day completely, because you don't know who is going to be coming that day. You could then get a phone call saying "I've got 70 samples, can I bring them over to be analysed". I don't have a specific project that I work on. The work can be quite repetitive; you sometimes have the same experiment to do over again, just with different samples. We deal with a wide variety of users - postgraduates, principal scientists, undergraduates, external users. You deal with the customers as they come, not just one supervisor you report to. You need to tailor your interactions a bit; for example, a postgraduate might have a lot more information than an undergraduate and you need to deal with them differently, in the information you give them and how you talk to them.

What do I do on a day-to-day basis? Most of my time is spent preparing samples for protein identification or accurate mass determination of whole protein. I do a lot of liaising with postgraduate users and staff, and I provide advice on training on the MALDI-ToF, which is one of our mass spectrometers. I also train people to use the facility. A lot of my job is to do lab maintenance so ordering, maintaining specialist equipment, and also doing the accounts. I also have to be up to date with health and safety issues. If you do ever apply for a support role, one of the things you might well get asked about is health and safety? For example, do you know what COSHH forms are? The specialist equipment does sometime break down, so when it does I need to contact technical support and liaise with external technicians to get the problem sorted. I also liaise with reps, which can be fun, when they give you freebies or ask you to test out their latest products. Since we do a fairly set battery of experiments, I don't usually need those products, but it helps me to increase my knowledge about what is available, in case a user comes to me and their needs match one of those newer products. So it is always useful information to have.

I have talked about proteomics. If you're not sure, this is the identification and quantification of the full protein complement expressed by the genome for an organism at a particular point in time. What we do is the identification, so what is the protein present in the proteome, and we identify using a technique called peptide mass fingerprinting and a lot of my work is to do with that, or quantification, how much of each protein is present? And also which proteins are interacting with which protein. The proteome is very

dynamic; so one protein could interact and another at a certain time and not at a different point. It's not static. With experimentation you can use mass spectrometers to answer some of these questions.

This is just an overview of what we do. It is the technique I use in peptide mass fingerprinting and this is one of the experiments workflow. Someone can come to me and say I have this protein and it is on my gel, but it is really dark and it is not interacting how I wanted it to. We take out the protein, digest it with a protease, usually trypsin, then once we've got the peptides we analyse them on the mass spec get a list of the masses. Then you search on the database to see what the protein might be. I had one customer who told me his protein wasn't working in the way they'd expected. I did the experiment and then came back to him, and it turned out to be a chicken lysozyme, not the protein he thought. So it really does help having a facility like this, because he could have spent four or five months working on chicken lysozyme, trying to figure out why none of his experiments were working. Our turnaround times are quite good. So when they talk about core facilities and working in specialist environments you get to know your technique quite well.

This image is an in-gel tryptic digestion. We excise the spot, we do a lot of washes. This experiment takes me a day. If you've done any labwork you'll know that some experiments, like Western blots for example, can take a while to do. But you might move on to something else. Support work can be repetitive, so you might be doing the same thing every day for a while. There is time to get on with other stuff whilst the experiment is incubating, but it can be a bit boring. There was a week when I was doing this experiment for about 30-40 samples and every day I was doing the same thing and by the end of it your shoulders, your arms and everything aches and you think you have repetitive strain disorder. Then after a week it is ok.

These are some of the machines that we use. We have automated liquid hand robots and they can do the digestion and all you need to do is add the trypsin and leave it to incubate overnight. That's my MALDI-ToF in that picture. It's an old machine, but it is amazing and can give me answers in two or three minutes, as long as it is working. I am happy with that.

I thought I'd give you pros and cons about being technical staff. On the 'con' side, the starting salary is about £15,000 to about £30,000 which is pushing on to management where you are starting to manage

labs, you are starting to manage students doing MSc courses. I think the thing about this career is that it is almost a bridge and if you do this job you can get some experience and then you can go on maybe to do something else with your transferable skills. There are also a lot of temporary contracts, you have the instability, every year or two years you might need to look for a new job. Some people might like that because it gives you a chance to learn something new and put that on your CV.

An advantages of this job, is that you don't get as much pressure as you do in some other roles; you don't have the demands of grant writing or always having to publish papers. In that sense, it's a bit more relaxed. You get to meet a lot of different people, different projects, we have got people who are doing malarial projects, trying to quantify what proteins are in each stage of the cycle, what proteins they have got, quantifying the proteins. We also have chemical samples and biochemical samples, so it is great you do meet a lot of people and a lot of different projects. A lot of people do acknowledge us when we do mass spec work, so I have had Lady Shairbanu in one of the papers, which was quite interesting. You get to attend conferences and keep up to date with all the different research and technology that is going on.

Career progression: I said to my friend I was going to say there was no career progression she said I couldn't tell anyone that. What I meant is that technical staff ARE needed, it's just that people like to move on. So you get experience, and then you can move on. The University does have a continuing professional development framework for technicians, so they actually give you training for management and you can do different courses again building up your CV for when you do want to take that next step and find a different job. The University is also registered with an organisation called HEaTED, for technical staff that want to develop their skills. It is free to register but then you have to pay for any courses you take. It is more like a way of finding and getting more information. As has already been said, this is about acquiring transferable skills that will help you to search for a new job, and there are so many other jobs that you could go into as a technician. If you wanted to you could apply for medical jobs, you could start applying for Clinical Scientist jobs, because you've got lab experience. My advice would be to get as much lab experience as you can. If you do want to work in a lab after graduation then try to do a lab-based project in your third year. Check on the University website because they have jobs advertised that are internal as well as external; as a student, you might be able to see something advertised internally that the external candidates don't have. Search engines, recruitment agencies, they can all point you in the right direction, also talk to people, talk to your supervisor, talk to post docs, lab technicians, and see if that is the environment you want to be in. Talk to these people and volunteer and also enjoy working with people and enjoy science.

## Question Time

***Q: How does somebody end up with chicken lysozyme as their protein?***

A: That's the great thing about our job, I always enjoy it when they come and it's supposed to be particular protein, but it's not behaving right and they just cannot work out why. They have got a band but it is really dark and they are saying but it's just not working, it is just not crystallising, what is going on? You digest it, you look at the sample and do a database search and then you say "ok, it's an *E. coli* protein instead, that's why it hasn't worked. I think it must just have been a contamination from when he was doing a pull-down assay.

***Q: In terms of the mass spec, do you run that service for people or do you teaching people how to do it, you talked about both?***

A: We usually do the mass spec itself, but in chemistry some people have been trained on it, so they are able to use it themselves. We do charge for our samples, but with chemistry they can come and use it without that fee. If we did it for them then we would charge them. So when we train them it just makes it cheaper for them.