

GREAT EXPECTATIONS

Our series continues in which Australian scientists describe their journeys of personal and professional development. Adele Holloway describes her travels around Australian research laboratories, culminating in her return home to the University of Tasmania.

RESEARCH ON THE APPLE ISLE

Research beginnings at Hobart

My introduction to research life came as an Honours student in the Biochemistry Department at the University of Tasmania in Hobart. I worked with Dr Adrian West, who was at that time *the* Molecular Biologist at the University of Tasmania. In that first year I was introduced to a diverse range of research, working in the Molecular Biology Unit, which Adrian had established. At that time the lab had researchers from several University departments working on projects as diverse as analysis of human metallothionein genes, phylogenetic analysis of eucalypts and sequencing of antarctic bacteria. By the end of the year I had decided that molecular biology was the thing for me and so went on to do a PhD in the lab working on metallothionein genes.

Towards the end of my PhD I started to think about what I would do next. My PhD project had involved investigating the expression and regulation of metallothionein isoforms during brain development and had sparked my interest in



Adele Holloway.

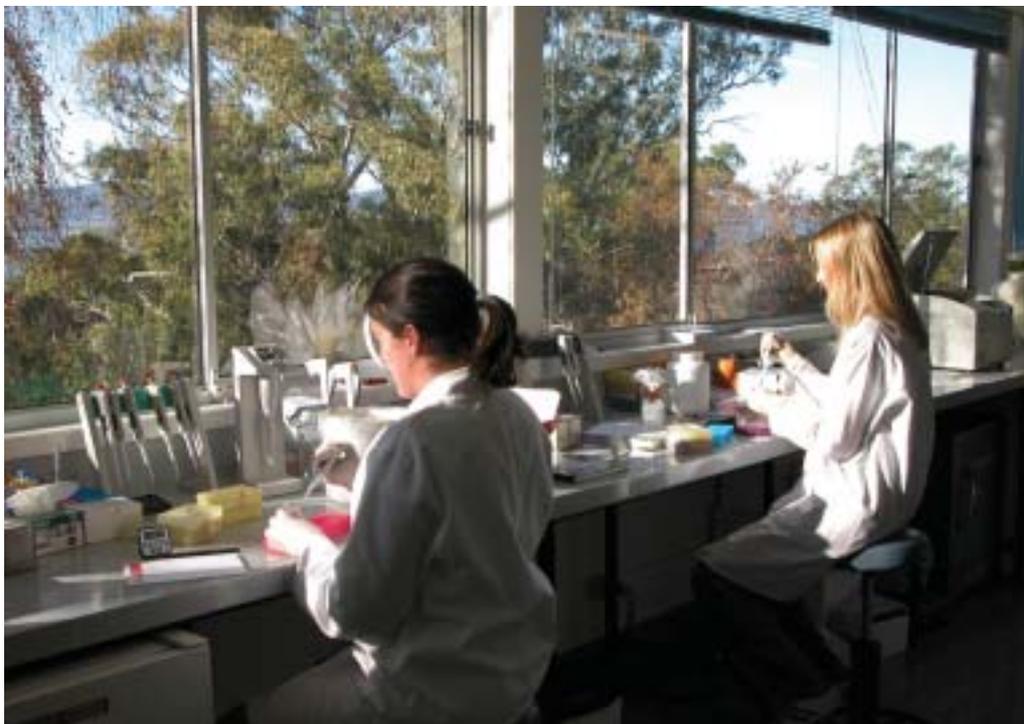
how genes are switched on and off at the appropriate time. So when deciding where I might continue research as a postdoc, I kept coming back to work that I had first heard about early in my PhD. In the first year of my PhD at a ComBio conference in Adelaide, I had heard Dr Frances Shannon talking about her studies on the regulation of cytokine gene expression in the immune system. I wrote to Frances hopeful that she might have a postdoc position available. The next thing I knew I was packing my bags for Adelaide and had taken up a postdoc position at the Hanson Centre for Cancer Research.

Postdoctoral studies in Adelaide and Canberra

There were several things that struck me about Adelaide that first summer – the heat and the scientific environment – not necessarily in that order. The research environment at the Hanson Centre was a very different experience than I was used to, with the research driven by postdocs rather than students, as is usual in a university department. It was also a great collaborative environment with



The biochemistry labs at UTas have a five star view across the Derwent River.



Students at work in the Molecular Biology Unit at UTas.

interactions between scientists from many diverse research backgrounds. The Shannon lab at that time had 5 postdocs with many years of research experience, which was another reason for choosing to do a postdoc in this lab. I started work on a project investigating the regulation of the HIV promoter in T cells and learnt a lot in this first year about gene regulation and also research in general.

However, all good things must come to an end and a little over a year after I moved to Adelaide, Frances moved her lab to the John Curtin School of Medical Research at ANU in Canberra. While not entirely enthusiastic about the prospect, I packed my bags again and moved to Canberra. Just as summer was a shock in Adelaide, winter was a shock in Canberra. Let me set the record straight once and for all – winter in Canberra is much colder than winter in Hobart! My first week in Canberra was interesting to say the least. We had a big empty lab: no fridges, no freezers, no reagents, no equipment but a very nice bright red floor. However within a couple of months we had set up a new fully equipped and functioning lab. The research environment at JCSMR was very different to the Hanson Centre not least because most members of the Shannon lab had stayed behind in Adelaide. While the research environment at the Hanson Centre was very open, the very nature of the 50 year old JCSMR building meant that it took a while to work out what was going on in the little research labs down the endless corridors.



The sequencing lab at UTas – about the only lab without a view.

Whether by good luck or good management the new Shannon lab was perfectly positioned right next door to Dr David Tremethick's lab. From a scientific point of view the move to Canberra was also perfect timing. David had been working in the chromatin field for years and our arrival in Canberra coincided with the realisation within the transcription world that chromatin plays an active role in gene

regulation. For the next few years I continued working with Frances, investigating the regulation of gene expression in T cells and was also able to take advantage of David's wealth of expertise in all things to do with chromatin. This was (and still is) an exciting time in the field of gene regulation because advances in technologies and also our understanding of gene regulation meant that we were able to start to look in fine detail at the chromatin environment of genes and how this contributes to their expression.

The big decision

In 2001 after almost 5 years working in the Shannon lab, a lecturing position was advertised in the Discipline of Biochemistry at the University of Tasmania. As often happens in the postdoc world, I was waiting on grants to find out if I would be able to continue working with Frances next year, which made applying for the position an attractive option. This, and the fact that I was determined to continue the research I was doing, were major factors in me applying for the position.

I was offered the position several days before I flew to the US to attend a Cold Spring Harbor transcription meeting. That meeting convinced me even more of what an exciting time it is to be working in the field of gene regulation, but I faced a difficult decision because I was really enjoying the research environment at the JCSMR. Really the decision I had to make was whether it would be possible to do high quality research in the Biochemistry Department at the University of Tasmania and continue the research I was doing. The answer to this was relatively straightforward. I only had to look at the Department to see that very good research could be done in Tasmania. The Biochemistry Department has been headed for the last 19 years by Professor Michael Clark, who has an excellent international reputation in carbohydrate metabolism and diabetes research, and who will be known to many through his extensive involvement in the NHMRC. Under his leadership, research has always been the main priority of the Biochemistry Department and he has done everything possible to foster an active research environment. The

second question was whether I thought I could balance teaching and research. The answer to this is a little less straightforward and is a dilemma that I now realise most researchers working in University departments battle daily. On talking to staff from the department however, it was clear that every effort was made to ensure that researchers had time away from teaching to focus on their research interests.

Back in Hobart

So in January 2002, I packed my bags again and moved (back) to the University of Tasmania to set up my own research lab. I was offered lab space in the Molecular Biology Unit. This helped tremendously in the first few months because it meant that I didn't have to go through the process of setting up and fitting out a whole new lab because I could virtually walk in the door and start experiments. It is still a very well set up lab but has changed dramatically since I was first here. The lab now houses researchers almost exclusively from the Faculty of Health Sciences including members of Adrian West's NeuroRepair group, some researchers from the Menzies Centre for Population Health and now members of my new Gene Regulation group. Getting my research underway was also helped by the fact that in the first 6 months I was protected as much as possible from teaching responsibilities so could concentrate on getting my research and my first Honours student going. Also, having moved to Canberra with Frances Shannon and gone through the process of setting up a research lab from scratch with her meant that second time round I knew what to expect. Finally, Frances was very supportive of my move to Hobart enabling me to collaborate with her lab and continue with the projects I had been working on.

Biochemistry at UTas

So 18 months down the track, what is it like working in the Biochemistry Department at the University of Tasmania, and has it lived up to expectations? The Discipline of Biochemistry (as it is now called) is relatively small, with 5 academic teaching staff, but has diverse research interests. There are 2 major research groups in the department – the Muscle Research Group



headed by Professor Mike Clark and the NeuroRepair group headed by Dr Adrian West. Mike's Muscle Research Group, which he co-leads with the 2 Dr Steves (Rattigan and Richards), has established itself internationally for its work measuring recruitment of capillary blood flow in muscle, and its impairment in diabetes. Presently numbering 14 members, former PhD students from the group are now widely distributed around the globe and include recipients of Wellcome, Howard Florey Centenary and CJ Martin Fellowships. Several have moved to the University of Virginia in Charlottesville. Indeed, the Muscle Research Group shares a large NIH grant with the University of Virginia and a gathering around the computer to discuss papers, grants and progress via Yahoo Messenger is a weekly occurrence.

The NeuroRepair group is a collaboration, which includes researchers from the Disciplines of Anatomy and Physiology (Dr Inn Chuah) and Pathology (Professor James Vickers) and aims at a multidisciplinary approach to CNS injury and degenerative disease. At present it is one of the largest research groups in the School of Medicine with around 15 members and is evidence that a productive collaboration can generate leading edge results even in a 'small town' environment. The Department also includes Dr David Woodward, whose research in human nutrition over 3 decades has resulted in papers on topics as diverse as selenium in human milk to development of a low salt soup that tastes good. The Department now also includes a rapidly growing Gene Regulation group with 3 students presently busy in the lab exploring various aspects of gene regulation in immune cells.

My perception is that the Department is a more collaborative environment than in the past. Our regular Molecular Biology research meetings currently involve researchers with a wide range of interests, from the Developmental Neuroscience lab run by Dr Lisa Foa to members of the Cancer Research Group in the Discipline of Medicine. Coincident with my return to UTas, Lisa arrived to take up a lecturing position in Anatomy and Physiology. She is a developmental

neurobiologist with a research focus in cell signalling. Lisa did her postdoctoral work at Cold Spring Harbor and chose to come to Hobart, both for the lifestyle (she is a keen sailor) and for the collaborative research environment of the NeuroRepair and Gene Regulation groups.

Small is beautiful

So what are the advantages of working in the Biochemistry Department at the University of Tasmania? Our research labs must have one of the best views of any Biochemistry Department in Australia, but more importantly, the Department is blessed with a constant stream of top students who are eager to get involved in our research groups. One consequence of the smaller class sizes in the later stages of the undergraduate Biochemistry Degree is that teaching becomes very individualised. For example, for half of their final year, each student is attached to a research group and spends 12 weeks working in the lab on their own research project: you can be sure that a graduate from our program will have advanced practical skills. Obviously, a disadvantage of doing research in a relatively small scientific environment, such as at the University of Tasmania, is that the local research community is quite small. Also, expert advice sometimes must be sought from the other end of the phone line rather than from the lab at the other end of the corridor. But the major disadvantage I perceive in doing research here is more to do with some people's perception. They erroneously infer that you couldn't possibly do serious research somewhere which is a short drive from the beach, the mountains and World Heritage Wilderness.

At the moment I think the research environment within and surrounding the Discipline of Biochemistry at the University of Tasmania is very exciting. There is a balance of young enthusiastic researchers with high expectations of what they can achieve here and experienced researchers who are a constant reminder that you can produce leading edge research in a small research community.

