



## **How would you advise new bioscience students to make the most out of practical work?**

I imagine most peoples experience of practical work at school were pretty similar to mine; we would watch the teacher make a half hearted attempt at dissecting animal organs from the local butchers, or we would go count plant species in a quadrat.

So when it came to my first practical session at university I had high expectations. I was looking forward to seeing some *real* science and to making some big breakthrough discovery.

And it was everything I expected it to be. My degree in the biosciences allowed me to do a range of lab work in anatomy, physiology and chemistry. I quickly learnt that practical work is there to allow you to take what you learn from a lecture or a book, and apply it. This 'hands-on' approach made a quite daunting subject a lot easier and more fun to learn.

Something I wish I had known in my first year was that many final year exams include questions based upon the experiments done throughout the course. I would definitely make sure you take in and make notes on the techniques as well as the results obtained.

Protocols can be extensive and I would recommend reading them through before you start. If you enter the lab with an idea as to what your broad aims are, it will make it much easier in the long run.

The biosciences are a constantly developing field and practical work allows you to get a taste for this, and see it in action. It also allows you to develop skills you which you simply would not get from a lecture. Analysis of results is a big component of any scientific research and practical sessions at university will give you an introduction to this. For a lot of people, including myself, drawing the graphs and doing the statistical analysis are the most exciting parts. It is what the whole experiment comes down to – whether you can put those three 'statistically significant' stars on a graph. I also developed my written and communication skills by reading papers and writing reports in a scientific fashion. This put me in good stead for my final year dissertation project, and for my PhD.

But it isn't all about the science. Practical sessions also allow you to meet new people and socialise. Often you are put into groups with people you haven't even noticed before (or if you are lucky, the hot guy you found yourself staring at for the entire lecture). After the initial awkwardness, you will find yourself laughing at the silly labcoats and goggles you have to wear, and at everything that goes wrong. There is nothing like a bit of team building over a failed experiment! You will find that different people often have a lot of interesting and relevant ideas so make sure you talk to them as much as possible about what is going on – it can only benefit your work.

Lab work is also intended to allow you to develop your confidence in both yourself and your abilities. There is nothing like the first time you successfully isolate the thymus from a heart, or can use a microscope on your own! It's all about developing your own opinions and ideas as opposed to just being spoon fed knowledge from a textbook.

Whilst conducting your practical work, I would definitely recommend recording absolutely every single thing you do. And don't do it on a scrap piece of paper which you later use as a shopping list, or on the back of a glove which you throw away at the end of the session. Trust me; digging through a bin in search of my glove with some very important RNA concentrations on was not fun. Yes writing as you go is a pain but until the day that universities give out free Dictaphones, it has to

be done. It is vital for the writing up process which you will inevitably leave until the night before it is due in. Often things which seem unimportant at the time can actually prove to be useful at this stage. If your institution insists on you writing up a lab book, this could also be a legal requirement.

Practical sessions do have their down side though. With long protocols, you often wonder how you are going to get through it all in that one session and most of the time you don't. You can be as determined and as keen as you like, but rest assured at some point during your practical sessions, something will go wrong. This may sound harsh, but its true and it happens to everyone.

It is easy to feel disappointed but remember that science is all about learning and even negative results can be interesting. I have spent many exhausting hours repeating experiments and trying to figure out what went wrong and where. However, if nothing is improving it can be like hitting your head against a brick wall. Often the answer is right in front of you so take some time to firstly chill out, and then talk to some peers or supervisors, read around the subject a bit more, and then approach the experiment from a different angle. More often than not it will work in the end.

Practical work is a fantastic way to apply what you know to real situations and to gain skills, all of which I have continued onto my PhD. It is also about gaining confidence and creating memories – my friend will kill me for this, but I will never forget the practical where we had to measure urine production and as she was worried that she wouldn't be able to go at the crucial moment, she drank lots of water before the session and just held it in. Let's just say she was able to go, and the demonstrator had to go get her a measuring cylinder which was the size suitable for a horse. You wouldn't get that from a lecture would you?