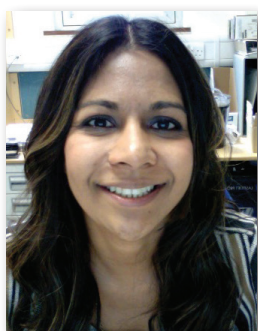


A day in the life of a Research Scientist



Melissa Salmon received a BSc in Biochemistry with first class honours at the University of East Anglia in 2006, followed by a PhD in Biochemistry, which she completed in 2010. Her first job was as a Research Scientist at the John Innes Centre, Norwich where Melissa worked for 5 years researching natural product biochemistry. She became passionate about protein engineering and enzyme biochemistry and in 2015 she returned to the University of East Anglia. Melissa is now a Senior Research Associate working on engineering enzymes for the animal feed industry. Lorenza Giannella (Training Manager, Biochemical Society) spoke to her about her work.

How did you get into science?

I've always been interested in science since I was at primary school. I am fascinated by how the body works, from entire organisms down to the enzymes in a single cell. Biology was my favourite subject at school (chemistry less so, but definitely a necessary requirement for my career path!) and I didn't have any second thoughts about doing a biochemistry degree at university.

Can you describe a typical day?

Having recently become a mum, my typical day now starts earlier! I drop my daughter off at nursery at 8:30 and start work around 9am. Each day is different, depending on what experiments I am doing. I usually plan out my day in advance. For example, if I am purifying proteins for activity assays, I make sure I have all the solutions and equipment that I need the day before. In the morning I will do my protein purification, usually with a tea break around 10:30am. After quantifying how much protein I have, it's time for lunch. In the afternoon I will set up my enzyme assays,

analyze data from the experiments, write up the work in my lab book and plan the next day's experiments. My day finishes around 5pm, then I pick up my daughter from nursery and head home.

What's the most interesting project you've worked on?

My first job following my PhD was researching natural products from plants. I worked on enzymes from the plant *Artemisia annua*, and the aim of the project was to understand how plants evolved the ability to make complex natural products. We started with an enzyme that made very simple products and were able to engineer it to produce complex products. This involved making a large library of mutants and developing a fast and efficient screening and analysis process to determine the specific amino acids that were involved. The most interesting and rewarding part of the project was the discovery that only a single mutation was required to unlock the enzyme's ability to produce complex products - a high-five moment by the gas chromatography machine!

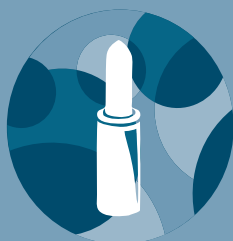
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What inspires you about your job?

What I love about my job is that the research I am doing is new and unique. No one else has performed the experiments before, and it's great to contribute to the scientific understanding of the biology community. I get a great sense of satisfaction when I design an experiment to investigate a specific question (such as the effect of active site mutations on enzyme activity), and get a successful result from my data, which I can then feed back into future experiments. Not every experiment is successful, but when something works it gives you fresh enthusiasm.

What's been the greatest challenge in your career so far?

I think the transition from a postgraduate student to a researcher was my biggest challenge. As a student my experimental path and objectives were laid out for me, whereas as a researcher I had more general objectives, so the design of day to day experiments was my responsibility. Initially I lacked the confidence to take ownership of my project, but with support from my boss, I gained belief in my abilities and embraced my freedom to follow my own research path.

What is your advice for someone who would like to pursue a career as research scientist?

In a research environment you have to be self-motivated, as there is no one to tell you what to do and when to do it. Throughout undergraduate practicals, you can be fooled into thinking that experiments always work and are easy...they don't, and often require lots of preparation and fine-tuning. Be prepared for times when it feels like nothing is working and you're up against a brick wall, but you just have to persevere and keep trying and eventually you'll have a successful result and feel proud of your achievements. ■

Job profile

A research scientist works within a research lab on a specific project, usually for a fixed period of time (2-5 years). The job can be based in a university, hospital, specialist research institute or in industry.

Qualifications and key skills

A PhD in a related discipline, usually with research experience in the subject area or experience of laboratory techniques, is a normal requirement for the role. Each position has its own specific requirements. General key skills include intellectual independence and creativity, oral presentation to scientific audiences, writing articles for publication in scientific journals, ability to work independently as well as in a team, good problem solving skills, and willingness to work unsociable hours occasionally.

Responsibilities

The main part of the role involves planning and performing experiments and analyzing and presenting data to fulfil the objectives of the projects. It's not all laboratory experiments though, other responsibilities include lab management, writing reports and journal articles; studying new techniques and current research in your field; computational research and bioinformatics; designing and ordering materials; presenting and attending talks and conferences, and supervising research project students in the lab. In a university setting, there is also opportunity for undergraduate teaching and assessment marking.

Salary

Typically £32,000 - £38,000 depending on experience.

Melissa features in our Massive Open Online Course (MOOC), 'Biochemistry: the Molecules of Life', developed with University of East Anglia. Register here for the next run, starting on 25 June 2018 www.futurelearn.com/courses/biochemistry



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