



## Six terrific careers in science



## Shakila Bik, Senior Scientific Advisor, L'Oréal UK&Ireland

“At school, I had a natural curiosity about how the world worked but I never felt I was particularly good at Science, nor had confidence in my ability.”

Shakila did A Levels in chemistry, biology and maths, and then went to university to study Accountancy and Economics.

“I was only 18 when I went to university and didn't know what I wanted to do. I was unhappy and went to talk to my tutor who asked me what I really enjoyed. I said chemistry and she asked why I didn't change courses. I was afraid chemistry wouldn't get me a job! I switched to chemistry and it is the best decision I ever made. A science degree gives you lots of transferrable skills like problem solving, data analysis and clear communication, organisation and creativity.”

While at university, Shakila completed a summer internship with Proctor & Gamble in their product development laboratories. After university she joined their Graduate Scheme and developed business skills.

She joined L'Oréal UK&Ireland 12 years ago. “Nowadays, my job isn't in the lab. It involves marketing, communication, law and of course, science. I make sure the science behind L'Oréal's products is properly communicated to the public, to journalists and to the science community. I ensure all claims we make about our products can be backed up by science. To do this, I have to understand the products, the chemistry of the body, and how it reacts when a product is applied to the skin or hair.”

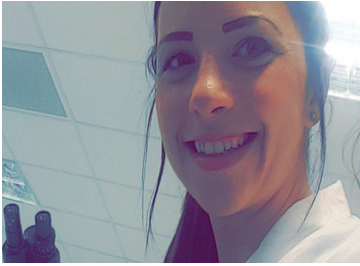
On any day, Shakila can find herself briefing journalists; on an advertising shoot checking the marketing team has understood the science behind a product and is communicating it correctly; she might be checking customer product literature to ensure it communicates clearly and correctly the benefits associated with a product; or she could be checking L'Oréal's regulatory compliance is in order with regard to which ingredients and what concentration of them is being used in their products.

“Beauty care is a fascinating area. Take a lipstick: the way it's been developed and manufactured is all science – from how the texture is formulated, how the colour is achieved and fixed, how it's applied to the skin, and what makes it stay on the skin.”

Shakila also works with L'Oréal's partner charity Inspiring the Future, which helps children to find out about careers in different sectors and raise their aspirations.

“Some people are put off science at school because it can seem remote and theoretical. But when you apply it to everyday situations, like why your shower gel doesn't drip all over place when you open the tube, it can seem less terrifying. It's important to encourage the next generation of scientists to help us further develop and improve our products.”

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### Danielle Hibbert, Technical Compliance Auditor, Natures Way Foods

At school, Danielle wasn't interested in science.

"I didn't want to be a doctor or a vet so I thought science was irrelevant to me." After school, while working casually at McDonald's, Danielle completed training in food safety.

"I didn't realise at the time that much of what I was learning at McDonalds was science – but food safety and hygiene is all about the prevention of the spread of bacteria and contamination, so of course it's science!"

Then one day, Danielle spotted an opening with Natures Way Foods, suppliers of prepared, chilled fresh food, based in Chichester. When she went for the job interview, Danielle says she immediately felt at home: the people were friendly and there seemed to be good opportunities to develop and progress.

Danielle was offered a temporary job supporting the Technical Compliance team. In the food industry, Technical Compliance means making sure that food production and how it's handled and processed comply with European Union food hygiene regulations, and that HACCP (Hazard Analysis and Critical Control Point) is implemented.

Every company is required to carry out audits to assess and minimise risks of contamination at every point in its production process and in its supply chain. The risks include bacterial contamination such as yeasts and mould; bacteria like salmonella and listeria and viruses like hepatitis A and norovirus; and also chemical contamination from fertilisers, pesticides, and cleaning products.

As Danielle got involved with the Technical Compliance team, she found she was really interested in the work and received good support and training. "The processes were logical and applied to everyday life and I could see why they were important, so I found the science easy to learn and absorb." Eventually, a job as Technical Compliance Auditor came up in the company and Danielle applied.

"Usually these jobs go to science graduates but they said I could have a go. I made a presentation on supply chain risks and I had to answer loads of technical questions like: 'What size of filter is needed to prevent the spread of cryptosporidium?!'"

Danielle's passion and enthusiasm paid off and she got the job!

Natures Way Foods is now sponsoring Danielle to study for a BSc in Food Science and Technology through the government's apprenticeship scheme. "I never dreamt that I could have a career like this. I love being part of the food industry: everyone eats but when they buy something like a sandwich, they don't know where it's come from or how it got there. I get a real kick out of knowing that!"

The Chilled Food Association says chilled food production is one of the fastest-growing food sectors in the UK but there is a shortage of people with the right skills. They believe that the sector offers great career opportunities for people with a knowledge of food science.

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## Ovando Carter, Nanotechnology Engineer and Entrepreneur

Ovando grew up in Deptford, South East London. He was always passionate about how the world worked, and from a young age was interested in science. and had encouragement from teachers and other people in his community who wanted to see him succeed.

“As a child, I was inspired by superheroes and science fiction and I had lots of ideas of things I wanted to invent. I was also inspired by the Renaissance when great inventions and discoveries were made.”

After A Levels, Ovando began a Physics degree at Queen Mary University of London, but six months into the course he felt something wasn't right and took a year out to think about what he wanted to do.

“Where I come from, most people see education as a way to make something of yourself, to learn a skill that will contribute to your community. The type of Physics I was learning at university seemed very abstract to me at the time, and I couldn't see a practical application for everyday life.”

Over the next year, Ovando completed work placements and had time to consider what he wanted to do. He was still unsure, but decided to continue with Physics degree at Queen Mary but this time he took more engineering modules.

“The engineering modules really sparked my interest and showed me how Physics could be of use in a practical way. When I was at school there wasn't a course called engineering, so I never really knew what it was.”

Ovando graduated with a Master's degree in Physics and Engineering. He completed a number of internships, including one with a bio-medical research laboratory in Spain, and decided to study for a PhD in nano-materials engineering. Nanotechnology looks at how altering the atomic or molecular structure of materials can be altered to make them more useful for humans.

“Engineering materials at the nano-scale is really changing the way the world works. My research focussed on a material that affects how cells in the body interact with surgical implants like artificial joints after they're implanted in the body to improve acceptance.”

Separate from his PhD, Ovando began to develop his own technology company, SHICARTERIMEDICAL, which came in the top 5 of a China-UK Technology Innovation competition. Ovando's company has been offered Chinese investment and he's currently considering those offers.

“Creating a technology company is great fun. I get to collaborate with some of the top people in the world and combine scientific expertise with market knowledge, creating opportunities and competitive advantages by using science and technology. Life is an unpredictable journey and it's much more fun when you're in the driving seat.”

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### Dr Jo Watson, Colour Scientist, Boots

“I loved science at school! I loved doing experiments – mixing liquids together and watching them transform into something completely different. Some people think science is difficult but it’s very logical and, once something clicks with you, you’ve got it for life.”

Jo studied for a degree in Applied and Analytical Chemistry at Staffordshire University. She had no idea what career she wanted, but in the summer holidays she got a job at a paint manufacturer where she started working with colour for the first time.

After her degree, Jo joined Clariant global speciality chemicals company, in their Pigment and Additives division. Once again, she was creating pigment dispersions that could be added to a variety of different paints for industrial use.

Jo realised she was more and more interested in colour and wanted to go further in her career. Clariant sponsored her to study part-time for a Master’s degree in Colour Application Technology at the University of Leeds.

After her Master’s degree, Jo looked for more academic opportunities and applied to Proctor and Gamble, who were offering funding for doctoral research into solving a specific colour issue with their cosmetic products.

“There are lots of similarities between cosmetics and industrial paint when it comes to using pigments, measuring colour and working out how make the pigment perform its best once fixed to a surface, so of course I jumped at the chance!”

Jo’s research involved measuring different skin tones and matching them with different pigment combinations in cosmetic products.

Just as she was finishing her PhD a Colour Technician’s role came up with Boots’ in their cosmetics development.

“I started working on eye shadows: matching colours for future fashion trends, looking at what pearlescent finishes worked best, and how you create a product that feels good on the skin and fixes well to the eyelid. There’s a lot of Science involved in that but also a lot of visual and sensory assessment.”

Jo’s next project was No7’s Match Made Foundation Service. Based on customer research, No 7 had discovered their foundations were not ‘skin true’. They wanted to improve their products and help women find the right shade of foundation. Jo was appointed Technical Lead.

“I’m a really proud of that project. We took skin tone data from over two thousand women. Everyone wants to look their best. I feel proud when I see those products in store.”

“I’ve had a great career in colour technology. Colour isn’t something that people think about and they don’t appreciate the effort that goes into creating colour. The future of colour in the digital age is also interesting: how it looks on screen affects the choices we make on-line.”

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## Holly Winton, Polar Atmosphere Ice Chemist, British Antarctic Survey

“At school I loved physical geography and finding out how the Earth worked but it wasn’t until university that I really got interested in Science.”

Holly grew up in New Zealand and studied Geography at the University of Canterbury on South Island, where they have one of the world’s leading centres for Antarctic Studies, Gateway Antarctica. She took some modules related to Antarctica which sparked her interest in glaciology. She got a place on the University’s Post Graduate Certificate in Antarctic Studies and spent two weeks in Antarctica.

“The Post Graduate Certificate in Antarctic Studies offered a multidisciplinary approach, so I was investigating the weather, the ocean, the wildlife, the ice (glaciology), the Antarctic Treaty and even tourism. I loved the whole experience and by the end of it I was completely hooked.”

Holly studied for a Master of Science degree at the Antarctic Research Centre at the Victoria University of Wellington and then went to Curtin University in Perth, Australia, for a PhD.

Her research focussed on Antarctic ice cores. The ice sheet that’s built up over the bedrock which Antarctica sits on, has developed over centuries. Analysing the ice at different depths through the ice sheet can tell you a lot about the climate and environment in the past.

Next, Holly applied to the British Antarctic Survey (BAS) and is now 18 months into a three-year project as part of a team investigating changes in the ozone layer – a protective layer of gases that acts like a barrier between harmful Sun rays and Earth – over Antarctica over the past 1000 years. BAS has been monitoring the ozone layer over Antarctica since the 1950s and discovered changes caused by manmade emissions. “However,” explains Holly, “we have little information about the ozone layer before the 1950s. We want to know if the ozone layer changed in the past due to natural causes like volcanic eruptions and, if so, how it recovered. This is important to help us learn how to manage the ozone layer today with respect to natural impacts.”

In 2017, Holly made her fifth expedition to Antarctica. This time she was going 400km inland to a height of 2,800 metres above sea level.

“It took us ten days to sail from the Falkland Islands to Halley VI Research Station, and from there it was a three hour flight inland to our field site. We had two and a half tons of equipment, not to mention our specialist polar clothing, because even in summer it’s -20°C.”

They drilled 120m down into the ice to a point at which they estimated they would get a 1000-year old ice core record. The ice was extracted in one metre length, stored in sealed icicle boxes and transported back to BAS’s laboratories in Cambridge for analysis.

Holly hopes to continue her career in Antarctic research.

“Five expeditions to Antarctica is a huge privilege, but I don’t take it for granted. I’ve tried to absorb every moment of those trips and treat each one like it’s the last.”



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## Steven Swan, Senior Acoustic Designer with Arup

“I played the trumpet as a kid but realised I wasn’t quite good enough to make it as a professional musician. A lot of acousticians are frustrated musicians!”

At 16, Steven went to Salford College of Technology to study for a National Diploma in Professional Audio Systems where he learnt about sound recording and became interested in acoustic design. He did well on the course and applied to the University of Salford to study for a BEng in Electroacoustics.

“Most people who apply to do Electroacoustics have A levels, but they must have seen my enthusiasm because I succeeded in getting a place.”

Acoustics is a broad engineering discipline and can include the acoustic design of buildings, the prediction of noise and vibration from large infrastructure projects like HS2 or Crossrail, or the assessment of industrial noise and noise at work to protect workers’ hearing.

Early in his career, Steve decided to specialise in the acoustic design of buildings for the performing arts. To date, he has worked on many prestigious projects including the Stoller Hall at Chetham’s School of Music in Manchester, the Lowry Centre in Salford, and the redevelopment of the BBC’s TV Centre in Shepherds Bush.

“On a project like the Stoller Hall, acousticians work with architects and musicians. Architects will often have a fixed idea of what the building should look like, and musicians of what it should sound like!

“To achieve an excellent sound, every last detail of a space needs to be considered: its physical size and the geometry of its surfaces; the design of its ventilation and heating systems; its finishes and interior fittings; what panels should be installed to create the right sound reflections; right down to the construction of its seating. And then the sound will be different when the hall is empty and when it’s filled with people. All these factors absorb or diffuse sound.

It’s the acoustician’s job to work with the architects and the musicians to create the best sound possible. Sometimes the skills to liaise effectively between the two are as important as engineering skills!”

In the initial stages of a project, acoustic design is done by computer modelling. 3D computer models of the space are created, factoring in all elements that will impact on the sound. These factors are adjusted to get the best possible sound before the physical space is created.

“No two days are the same: one day you can be in your office constructing a 3D acoustic computer model of a space; the next you can be on your hands and knees on a muddy building site inspecting the isolation bearings that a hall like the Stoller is built on.”

“For me acoustics has been more of a hobby than a job! I’ve met some amazing people, visited fantastic places and have found my skills to be in demand, even during the last recession. Most importantly I find it rewarding knowing that I’ve influenced the design of spaces like the Stoller Hall which people will enjoy for years to come.”