BIOCHEMICAL SOCIETY

Molecular Bioscientists in Industry

Contents

Introduction

Deciding on your next steps can seem overwhelming with the wealth of opportunities available. Some people may decide to pursue undergraduate and postgraduate degrees whilst others may move into apprenticeships or employment. There are many science-based careers where you can use your specialist skills and knowledge; some of these careers can be found in industry.

What is industry?

Industry is a broad term that refers to various companies and organisations which provide services or goods for a profit. For a biochemist or molecular bioscientist, there are a wide range of different roles available in various industries, ranging from research and development (R&D) to sales, marketing and management.

Molecular bioscientists can be found working in several areas of industry. Some of the areas which offer opportunities for molecular bioscientists are:

- **Biopharmaceuticals**
- **Consumer goods, such as cosmetics and food**
- **Service and lab equipment providers**
- **Diagnostics**
- **Forensic sciences**
- **Biomaterials**
- **Plant biotechnology**
- **Computational biology**
- **Science communication**
- **Intellectual property**
- **Climate**

Within these sectors, there are many opportunities for molecular bioscientists to be part of cutting-edge research and develop the next lifesaving medicine or superfood. R&D in industry differs from that done in academic research institutions because traditionally in academia the pursuit of knowledge drives the project rather than the desire to create a product. However, this distinction is becoming blurred as collaboration between industry and academia is more common.

If you choose to pursue a science-based career in industry, there are numerous options available. Whether it is working in large-scale companies or small and medium-sized enterprises (SMEs), they both have unique opportunities and experience to bring. Large-scale companies like large multi-national pharmaceutical companies or well-known food and cosmetics brands possess substantial resources and extensive R&D capabilities making them influential players in the market. While they dominate the industry, SMEs are increasingly emerging and making a significant impact across various sectors (pharmaceuticals, cosmetics, biotechnology, food, agriculture, sustainable energy). SMEs will, by definition, be smaller than the large companies, employ fewer people and will be more focused on a single product and/or service and have a lower market share. Lower market share refers to the smaller market portion that SMEs command compared to large-scale companies. However, SMEs often fill a niche gap and provide expertise in producing certain products or mastering particular techniques and technologies, meaning they frequently work with larger companies and industry players. If you choose to pursue a science-based career in industry, there are many options available to you.

The life sciences industry in the UK provides a large number of jobs and continues to grow year on year. For detailed statistics on the state of the UK bioscience and health technology sector, visit GOV.UK

In this booklet, we give some examples of the industries that molecular bioscientists work in, providing some case studies along the way. Explore the working in industry section to find out more about studies and jobs in this area and how to get going!

Biopharmaceuticals

In the biopharmaceutical sector, roughly half of the individuals are employed by companies directly involved in the design, development and marketing of medicines, with the other half in the service and supply chain.

The biopharmaceutical industry provides a huge number of jobs for molecular bioscientists across the world. Biopharmaceutical companies are responsible for designing and researching, developing and marketing new medicines. Biopharmaceutical R&D is composed of many disciplines, ranging from identifying possible drug targets in a disease to pharmaceutical formulation and researching in the field of personalised medicine.

The medicines developed during drug discovery and development can be separated into small molecules and biological products (e.g. antibodies,, protein therapeutics and vaccines).

Small molecule drugs

Chemicals with a medicinal effect, such as antibiotics, antivirals, and treatments for chronic diseases. Usually taken as pills but can also be injected or inhaled.

Biological products

Large protein molecules such as antibodies and hormones with medicinal effects, vaccines such as RNA/DNA, adjuvanted proteins or adenoviral vectors.

With changes to drug discovery in recent years, more companies are outsourcing certain parts of the process to service providers. Contract manufacturing organisations (CMO) can assist with optimising the formulation of a drug and scale up the production for general sale. Another option is to use contract research organisations (CRO) which conduct parts of the necessary drug discovery process from target discovery to clinical trials.

Drug Development Stage

Target discovery

Identifying a target linked with the studied disease (receptor, enzyme, signalling molecule).

High-throughput screening

Screening a library (a collection of chemical compounds) to determine which compound interacts and modulates the target.

Product characterisation

Identifying the features of the candidate compound to determine the mechanism of action.

Formulation and delivery

Choosing a formulation that will facilitate the drug delivery.

Pre-clinical development

Determining if the drug can cause harm by investigating its toxicity *in vitro* (test-tube experiments) and/or *in vivo* (animal experiments).

Phase I clinical trials

Testing the safety and tolerance of the drug in a small group of healthy people.

Phase II and Phase III clinical trials

Testing the drug in a large number of patients to determine whether it has a beneficial effect on the disease.

Pharmacogenomics

Determining the individual differences in drug effectiveness and tolerance across a population.

Case study

KEY INFORMATION

Name: **Jeffery So**
Job title: **Senior Scientist in Protein Sciences**
Organisation: **Evotec (UK) Ltd**
Education: **PhD in Molecular Biology, MSc Immunology, BSc Biochemistry**

What are your main responsibilities in your current role?

As a senior scientist in Evotec's Protein Sciences Group for drug discovery, I specialise in purifying diverse protein drug targets, including crucial membrane proteins like G protein-coupled receptors (GPCRs). I work on varied projects from a diverse clientele, requiring frequent communication, research updates, and scientific discussions with our partners. To facilitate collaboration within our teams, I make sure to share my knowledge on topics within my area of expertise and offer training on protein purification techniques. In summary, my role involves using my scientific expertise, client engagement, and collaborative teamwork.

What are the key skills you need for this role?

Four skills come to mind: the research skills I cultivated during my academic journey; being able to use a structured approach to tackle research challenges; effective communication and presentation skills; and time management, for juggling experiments, meetings, and other responsibilities!

What is the most challenging part of your role?

Definitely time management. I handle multiple projects simultaneously, each with its set of deadlines and stakeholder expectations. There are also administrative responsibilities, so balancing all these tasks really puts my time management skills to the test. Keep in mind that unlike in academia, working overtime isn't encouraged at Evotec. While this allows a healthier work-life balance, it places greater emphasis on good time management.

What is the most enjoyable part of your role?

I very much enjoy the continuous learning about drug development, staying updated on pharmaceutical challenges. Being part of a diverse company allows me to learn from colleagues across various departments. A three-week stint at Evotec's Campus Curie in Toulouse, France, enhanced my protein sciences expertise and provided insights into Evotec's capabilities. I also enjoy collaborating with different clients, as it keeps my role dynamic, enhances my communication style, and expands my professional network.

Computational biology

With increasing application of computational sciences in numerous areas of human endeavour, bioscience industries are capitalising on these advancements in multiple areas. Machine learning, artificial intelligence and data science are informing several areas of commercial efforts in the biosciences to harness (accumulate), clean (format) and analyse large biological datasets. There are various examples of how these large biological datasets could be used, such as using preclinical and clinical research into medicines to help in drug discovery and investigating plant genomes to help feed the growing human population. A lot of AI-based industries are rapidly expanding, together with the range of careers in computational biology that are available.

Discover more on this topic

Computational biology and bioinformatics

Digital Biology: Advanced computational approaches to biological design and engineering

A day in the life of a bioinformatician

Consumer goods

The manufacturing industry transforms raw materials into consumer goods on a large scale.

Manufacturing industries can be divided into many subsectors, such as the car industry, production of smart phones and clothing. The main sub-sectors of consumer goods with a biological basis are:

- Home care, such as household cleaning products
    - These employ enzymes that hydrolyse lipids

- Personal care, such as skin care (cosmetics) or oral care (toothpastes and gels)
    - Biochemical research on cosmetic lipids, proteins and polysaccharides
    - Biochemical research into oral care formulations such as surfactants, abrasives, antibacterial agents or biologics and botanicals (plant-derived phytochemicals)
- Food and drink
    - Functional foods and food formulation – vitamins, minerals, nutritional supplements, antioxidants, anthocyanins, flavonoids
    - Novel ingredients

Cosmetics

Products used to enhance the appearance of the body. They may contain biosurfactants.

Biosurfactants

Surfactants produced by microorganisms that are more environmentally friendly and help bring together water-soluble and water-insoluble substances.

Cleaning supplies

Products used to remove food or any other types of soil from a surface. They may contain biosurfactants.

Functional foods

Foods claiming to provide health benefits. Functional foods include vitamins, probiotics and antioxidants.

Due to the diverse range of products which fall under these sub-sectors, the nature of laboratory research carried out in the manufacturing industry varies. Examples include researching the mechanisms of ageing for anti-ageing cosmetic products, assessing the quality control of a cleaning spray claiming to kill 99.9% of germs and testing the effectiveness of biosurfactants.

Food formulation

Attention to consumer trends, food policies and government regulations are fundamental to the food formulation industry. Currently, low sodium, environmentally sustainable and "free from" foods, such as gluten-free bread, lactose-free yoghurt, artificial colourants, preservatives or sweeteners are all popular with consumers and this drives additional food formulation activity in these areas. It's crucial for companies to keep up to date on what type of food and drinks customers prefer and change their formulations accordingly. With the advent of consumer interest in personalised health and nutrition, research in functional foods is gaining traction in R&D platforms of consumer-packaged goods (CPG) companies. This includes foods containing perceived beneficial ingredients such as supplements or specific nutritional compounds that address nutritional deficiencies across different population cohorts, a significant aspect of public health. Some examples of processes in food formulation can be found below:

1. Upstream R&D on foundational science research (establishing scientific proof of concept in the lab or bench top), e.g. proving that an improved new ingredient acts as an equivalent of a preexisting one through lab experiments.

2. Applied research in consumer product development (validating scientific proof of concept in iterative consumer product prototypes), e.g. showing that this same new ingredient is stable in an actual food product and doesn't interact with other ingredients to alter functional performance.

Case study

KEY INFORMATION

Name: **Stella Child**
Job title: **Research and Grants Manager, Science and Technology**
Organisation: **The Good Food Institute Europe**
Education: **Postdoctoral research in enzyme chemistry and biosynthesis, PhD in Chemistry, BSc in Chemistry/Biochemistry**

What are the main responsibilities in your current role?

Supporting and encouraging the European scientific community to conduct research that improves alternative proteins such as plant-based, fermentation-made and cultivated meat, eggs and dairy, making them cheaper, better tasting and more available. In practice, this involves helping to run our grant programme in Europe, conducting analysis of research gaps for the alternative protein sector, as well as facilitating connections between research groups and relevant academic and commercial partners, and promoting the outcomes of the research projects to the European community.

What are the key skills you need for this role?

My background as a biochemist is extremely useful in understanding and being able to analyse the research that's being carried out at the moment, predicting what is needed in the future, and presenting that concisely to scientists, research institutions and policymakers. In addition, there's a lot of soft skills that are really necessary, especially communication, and good organisation.

Why did you move into this role?

I wanted to work in alternative proteins, as I believe they're a necessary part of our climate transition. I also knew I didn't want to work in a lab role anymore, but I wanted to still be using my scientific background. So the Good Food Institute was a perfect fit, as it's a non-profit, supporting scientists rather than doing the research directly.

What is the most enjoyable part of your role?

I love it when I get to sit down and read papers and really understand what the scientists we work with are doing. It's great to be able to take those and develop summaries of what great, transformative research in alternative proteins really looks like, and use them as an example of where R&D funding should be directed.

What is your advice for someone who would like to pursue a career in alternative proteins?

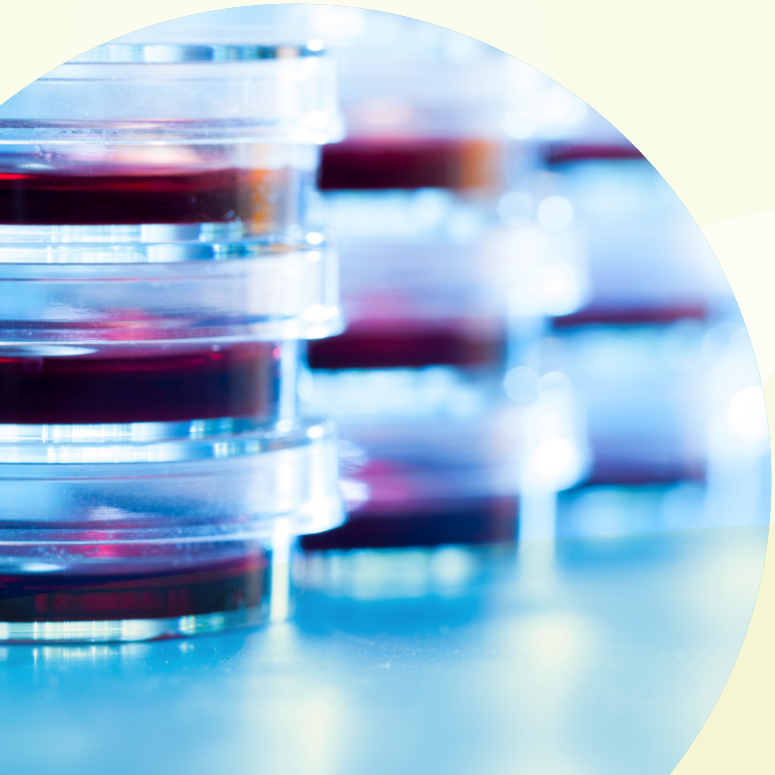
In alternative proteins – there are lots of routes into the field, depending on whether you want to work in a lab role or outside of it! We also host a jobs board where you might find the role for you. It's a growing field so if you have the technical background, and demonstrate an interest in it, there's lots of places that need you. If you're a student or early career researcher, try talking to your supervisor about whether you could scope out a side project, or reach out to companies near you about doing an internship.

Diagnostics

In health and disease

The diagnostics industry consists of many SMEs. These organisations research, develop, test and sell equipment, testing kits and devices to help assess and monitor health and diseases. Products range from medical equipment such as ultrasound machines, testing kits such as pregnancy tests, through to devices such as insulin pumps and pacemakers. The research varies depending on the product developed.

Researchers create a certain test by identifying biomarkers in the body and detecting their change in diseases.



Biomarker

A molecule used to indicate the presence or the extent of a disease state.

Examples include high blood glucose, a biomarker of diabetes.

A clinical biochemist is a laboratory-based professional responsible for performing diagnostic analysis of physiological samples. Using automated systems, clinical molecular bioscientists carry out tests on blood, urine, tissues and other biological samples to diagnose various diseases. Clinical molecular bioscientists can also perform research to identify novel biomarkers or to develop new diagnostic tests for a particular disease. Other responsibilities include keeping the protocols up to date, conducting periodic checks of equipment and assuring the quality of their investigations. In industry, clinical molecular bioscientists are generally employed by private sector diagnostic laboratories, pharmaceuticals and biotechnology companies.

In the UK, to work as a clinical biochemist, it can be necessary to complete the NHS Scientist Training Programme (STP). A good honours degree in biochemistry is required to be eligible for the STP and research experience and/or higher degrees are desirable. Alternatively, you can pursue a career as a biomedical scientist and specialise in infection, blood or cellular science. In the UK, accreditation with the Institute of Biomedical Science (IBMS) is needed to work as a biomedical scientist and it generally requires the completion of extra academic modules and of a laboratory portfolio. You will also need to register with the Health and Care Professions Council (HCPC) in order to be employed.

Find out more in the resources section.

Discover more on this topic

A day in the life of a Clinical Scientist

A day in the life of a biomedical scientist

Case study - senior clinical scientist

Environmental diagnostics

The diagnostics industry is not just involved in the health and disease sector, but throughout the life sciences. This may be in environmental diagnostics, such as detecting contaminants in our environment or detecting contaminants in food.

Service and lab equipment providers

Service providers

The service provider industry is composed of organisations offering laboratory services such as DNA extractions, sequencing and genotyping, protein purification, and assay development. These service providers play a crucial role in facilitating the work of molecular bioscientists and contribute to advancements in various fields, enabling researchers in small and medium-sized laboratories to access equipment they don't have and generate high-quality data.

Service providers can also work closely with large-scale companies as these companies recognise the value of partnering with specialised service providers for their niche expertise, flexibility, cost effectiveness, and collaborative opportunities.

Molecular bioscientists will primarily be involved in producing biological reagents in the research, development or production departments and in performing different types of molecular biology services. They could also be involved in other non-laboratory-based roles such as technical support and consulting directly with the clients, data analysis and bioinformatics, and project management.

Laboratory equipment providers

The lab provider industry is composed of various entities that supply laboratory equipment to scientific research and companies. These providers specialise in supplying high-quality laboratory equipment, ensuring that scientists, researchers, and technicians have access to the tools they need to conduct experiments and investigations. Examples of equipment are pipettes, centrifuges, chromatography systems, reagents, assays, incubators, molecular kits and sequencers. Molecular bioscientists can play various roles in the laboratory equipment provider industry and can be found at different stages such as R&D where they will develop innovative instruments, product development where they will ensure the accuracy and reliability of the product, as well as technical support, sales and marketing, and application specialists.

Case study

KEY INFORMATION

Name: **Rachele Paoletti**
Job title: **Scientist in Product Development**
Organisation: **Illumina**
Education: **MSc Molecular Biotechnology, BSc Medical and Pharmaceutical Biotechnology**

What are your main responsibilities in your current role?

I develop and characterise reagents needed for the analysis of genetic material. I use enzymatic assays and prototype instruments to define the robustness of reagents and propose solutions for improvements.

What are the key skills you need for this role?

You need good troubleshooting skills and a proactive approach, excellent communication skills and the ability to work as part of a team. A background in molecular biology and biochemistry with experience in assay development is ideal.

Why did you move into this role?

I wanted to apply my technical knowledge gained over 6 years at university to commercial product development. I chose not to do a PhD because I didn't want to be focused on only one project. I love my job because there is something new to experience and learn every day.

What is the most challenging part of your role?

Every day there is something new to troubleshoot! Working with prototypes is exciting but requires patience and resilience to resolve unexpected system errors.

What is the most enjoyable part of your role?

I never get bored; every day is unique. Participating in making and launching a new product onto the market is extremely rewarding!

What are the potential next steps from your current role?

Either excel in my role and increase my responsibilities and leadership skills or move to a new function in the business (in commercial, manufacturing etc.)

What is your advice for someone who would like to pursue a career in industry?

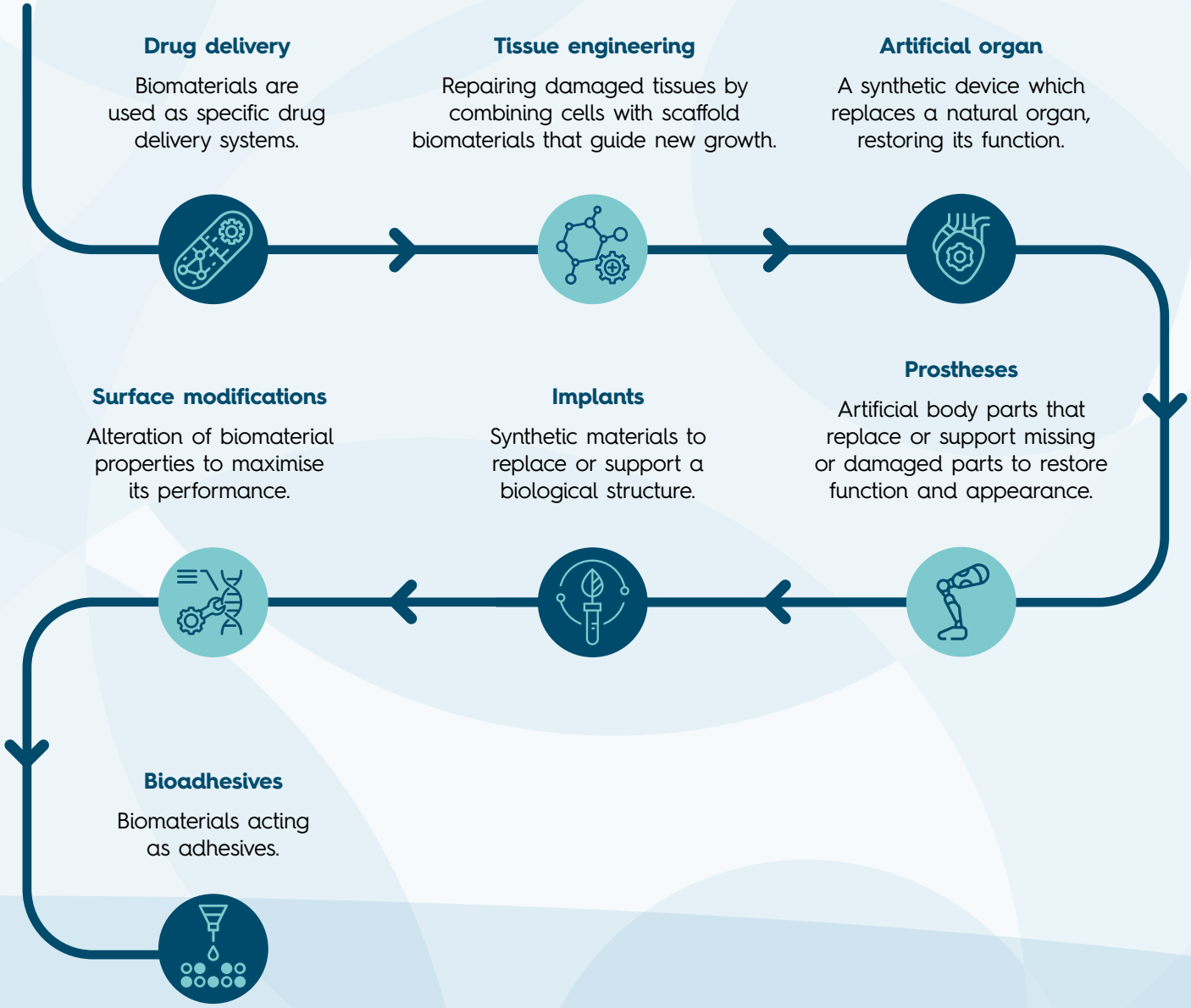
Don't be afraid to follow your passion, just be determined and committed to achieving your goals.

Biomaterials

Biomaterials are substances (other than drugs) which can be used to treat, increase or replace tissues, organs or body functions.

As healthcare and life expectancy improves, developing technologies to keep us healthy and functioning are increasingly important. Biomaterials can be used to repair, regenerate or replace parts of the body and they could revolutionise medicine. Examples include hip replacements and prosthetic limbs. There are many different areas of research depending on the product being developed (see graphic on following page).

Research in the biomaterials industry



Plant biotechnology

Biotechnology development involving plants is becoming increasingly common and necessary to tackle some of the world's biggest issues. Therefore, there are many jobs in the plant biotechnology industry.

Food

With the world's population increasing at a high rate, ensuring that there is enough food available in the future is essential. Scientists in the plant biotechnology industry work on increasing the amount of food produced, growing food in poor conditions and making food more nutritious.

Research in this area has a large basis in molecular biology as scientists try to identify key genes to assist food production, so having a good understanding of genetics and molecular science is important. Research into nutrition and health needs is also a key area.

Agrochemicals

The agrochemical industry develops and produces pesticides and fertilisers.

Pesticides

Substances that repel, control or destroy any types of pests to protect plant products.

Fertilisers

Materials that are applied to the soil to supply essential nutrients for plant growth.

With the increasing need for food, especially in the Asia-Pacific area, the agrochemical industry is steadily growing. Its products used in agriculture, floriculture and horticulture, increase food production, and help meet the demand of the growing population for grains, cereals, fruit and vegetables.

Developing agrochemicals that are environmentally friendly is a priority, so research in this area is ever expanding.

Biofuels

Finding alternative sources of fuels and materials that are sustainable, renewable and generate low carbon emissions is a priority for our future. Biofuels research focuses on finding and utilising enzymes or micro-organisms to convert plants and waste products into renewable fuels.

Forensic sciences

A degree in the molecular biosciences can also help secure a job in the forensic industry. Forensic biochemistry involves analysing biological information, like DNA, blood samples or other body fluids, to help assist criminal investigations. Analysis of biological specimens for biomolecular reports requires technologies and equipment commonly used in analytical biochemistry. These tests, alongside techniques such as DNA fingerprinting, and morphological and toxicological reports, can help identify individual members of a population with high accuracy. This industry would appeal to individuals who would like to pursue a career in law enforcement after their graduate studies in biochemistry.

A few prominent examples of industries operating in this sphere include LGC Limited, Eurofins Medigenomix Forensik GmbH, Forensic Fluids Laboratories, and NMS Labs.

This career choice would need an undergraduate entry level diploma or degree in forensic biosciences (the diploma can be obtained after your degree in basic biosciences too).

Science communication

With the increasing importance of science in society, science communication (SciComm) is gaining in popularity as a career option. The overarching aim of SciComm is to simplify scientific jargon to increase the engagement of the public with novel scientific ideas and the research that is going on around them. Learned societies and funding agencies are increasingly emphasising the importance of effective communication as a way to judge the quality of scientific research.

Science communicators need to acquire effective skills in communicating ideas across pathbreaking scientific accomplishments. This requires the science communicator to possess subject-specific expertise in addition to skills in communication. This career option may involve editorial jobs, science journalism, medical/technical writing, public engagement roles and broadcasting. Examples of a few industries involved in SciComm include publishing houses (e.g. Portland Press, Springer Nature, The Company of Biologists, Elsevier and Wiley) and public engagement and communication jobs at universities and institutes and museums/exhibitions. There are several universities and colleges that offer diploma and degree courses in science communication.

Along similar lines, a lot of aspirants of scientific careers have great inborn skills in artistic abilities and struggle with the kind of career choices that are available to them. Scientific illustration is one of the career choices that can leverage their scientific and creative aspirations. Illustrators of science use a combination of artistic and analytical skills to transform complex concepts into engaging graphics. Scientific illustrators can rely on (1) word-Blogs, essays and social media posts, (2) traditional arts, (3) graphical arts, (4) music, and (5) videography to convey the scientific ideas. Scientific illustrators are employed across the life sciences industry.

Case study

KEY INFORMATION

Name: **Rosie Curran Crawley**
Job title: **Young Scientist Centre Presenter**
Organisation: **The Royal Institution**
Education: **BSc Biochemistry**

How did your interest in science begin and change over time?

Unlike most people who choose to study biochemistry, I didn't really like science when I was growing up! I was much more interested in becoming an actor. But that all changed when my GCSE science teacher got me completely hooked. Later down the line, I found I could combine these two passions through a career in science communication.

Why did you choose to study biochemistry, and how did this experience shape your career path?

I chose to study biochemistry because I really enjoyed my chemistry and biology A-Levels and couldn't pick between the two! I was really lucky that it ended up being the perfect degree for me. I found learning about biological processes on a molecular scale fascinating. However, I was not interested in a career as a researcher.

My dissertation was part research and part outreach. I conducted a seven-week research project in a local sixth form, giving students an active role in the project. We used techniques such as PCR and gel electrophoresis to study genes associated with melanoma in zebrafish. The students got to work with equipment they had only read about in textbooks. It was an amazing experience to watch and be a part of their journey and it was this that motivated me to apply for my current role.

What do you do as a science presenter, and what impact does your work have?

As a science presenter, I deliver a range of science workshops to 7–18-year-olds focused on giving them hands-on experience in a lab. In addition to this, I get the chance to work alongside current researchers, I get trained in performing explosive demonstrations and I'm constantly developing impactful content to engage young people. It is an incredibly rewarding job, and I frequently get told by students that they want to become scientists because of a workshop I have presented. I really appreciate being in a position to be able to inspire students who previously thought science wasn't for them.

What skills are important in science communication?

It may seem obvious, but as a science communicator, I need to have flexible and creative communication skills. It's a very different experience talking about superconductors with a 7-year-old compared to an 18-year-old. It can be challenging to find this balance, but I am constantly learning and improving my presentation style.

Intellectual property

Any novel creations of the mind, such as an invention, are called intellectual property (IP). The role of a patent assessor is to help their client entities (inventors and/or companies) identify and protect their IP rights by filing applications for their inventions. This protection, if granted, is called a patent. This career entails meeting the client, learning about their scientific innovation and summarising this in a manner that is compatible with the legal vocabulary. The resultant patent application will be a detailed description of the innovation/ invention, delineating claims on its novelty and inventiveness. The work involves a thorough knowledge of the domain, carrying out an exhaustive search of existing literature to ascertain the novelty of the innovation that the client wants to protect, advising the client on the patentability of the idea/innovation depending on the outcome from the novelty search, drafting the patent in a manner that it's exhaustive and presents minimal avenues to breach the claims. This is an exciting field and requires a balanced know-how on the science and the process of litigation. Several agencies (USPTO/EPO), as well as universities/colleges, offer coursework and diplomas to get trained in the nuances of patents.

Case study

KEY INFORMATION

Name: **Victoria Suen**
Job title: **Patent Counsel**
Organisation: **GSK**
Education: **PhD Immunology, BSc Biomedical Sciences**

What are your main responsibilities in your current role?

My main responsibility is to protect GSK's inventions. I spend my time drafting and prosecuting patent applications, as well as working on contentious issues, such as oppositions and appeals before the European Patent Office (EPO). I am also involved in reviewing and advising R&D on IP clauses in contracts and agreements and educating the business on IP law, practises and strategies.

What are the key skills you need for this role?

A passion for science and medical innovation is a must. In addition, it's important to be a team player with strong communication, analytical and problem-solving skills and have attention to detail.

What is the most challenging part of your role?

Being a patent attorney is a deadline-driven job, so one of the challenges is knowing how to prioritise and juggle multiple things at the same time.

What is the most enjoyable part of your role?

As an in-house patent attorney I work closely with my clients, the scientists, and become embedded in their teams. This allows you to see the bigger picture and understand how IP fits in and contributes to the overall business. This gives the work I do so much purpose; it's what makes the job fulfilling and rewarding.

What is your advice for someone who would like to pursue a career as a patent attorney?

My advice would be to do your research to understand the process required to become a patent attorney. There are resources available online to learn more about the route to qualification, skills required to become a patent attorney, and what the day-to-day responsibilities may look like. I recommend setting up an alert to get notified of any vacancies.

The climate

There is no doubt that the number of roles in industry related to tackling the climate crisis will increase. Molecular bioscientists and biochemists will have the skills to contribute to fighting climate change and pollution in many areas of industry. Some examples of the types of areas molecular bioscientists could work in are:

- **Developing artificial meat**
- **Developing carbon fixation technologies using bacteria**
- **Genetic engineering of microbes to degrade polypropylene**
- **Developing nitrogen fixation technologies**
- **Developing biofuels**
- **Waste degradation technologies**

Larger companies may have research teams working on projects to tackle climate change, as well as small start-ups and SMEs who may be solely dedicated to one particular technology such as those listed above.

If you want to use your knowledge and skills to combat climate change, studying molecular biology can be extremely useful and opens up a wealth of opportunities in this area.

Working in industry

Each of the industry areas outlined in this guide offer many positions that are suitable for people who have studied and/or trained in the molecular biosciences. There are a variety of roles within and outside of the laboratory and roles include entry level positions, graduate schemes, graduate jobs or more specialised positions.

Apprenticeships

Apprenticeships, higher-level apprenticeships and degree apprenticeships offer the opportunity to train on the job. As an apprentice you'll work alongside experienced staff, gaining job-specific skills whilst earning a wage, and get time for study related to your role (usually one day a week).

Apprenticeships take 1–5 years to complete depending on their level, and in some cases, you can gain an undergraduate or postgraduate degree by completing an apprenticeship.

Roles such as laboratory technician, laboratory scientist, project manager, science manufacturing technician, pharmaceutical apprentice dispensary assistant, medical laboratory apprentice and many more will all involve molecular bioscience knowledge and skills.

Entry requirements will vary depending on the level of apprenticeship.

Graduate schemes

Graduate schemes are training programmes which provide a route for graduates into a certain profession. Their aim is to develop technical and transferable skills but also area-specific industry knowledge. Graduate schemes are highly competitive, and the majority of biosciences training programmes are offered by the pharmaceutical industry. Examples from the R&D and manufacturing area include:

- **Early Phase Drug Discovery - Early Talent Programme (AstraZeneca)**
- **Regulatory Affairs - R&D Graduate Programme (GSK)**
- **Drug Design & Selection**

Other areas where graduate schemes are available include:

- **Pharmaceutical Product Development and Supply**
- **Vaccines Development**
- **Vaccines Manufacturing Quality**
- **Supply Chain**
- **Regulatory Affairs**
- **Data Analysis**
- **Sales**

Graduate schemes vary in length, with a contract of generally 2–3 years, and involve rotations in different departments, to provide the trainee with a breadth of knowledge and technical skills. During the schemes there are opportunities for training, personal development, gaining additional competencies such as leadership skills and learning about the company's values and expectations. Some schemes may even comprise academic or professional qualifications.

Entry requirements may vary, but usually companies ask for a 2:1 from your degree and a strong academic track record, as well as evidence of skills you have developed. There is a yearly deadline, so make sure you start your application in plenty of time before your graduation.

Graduate jobs

Graduate jobs don't generally require any previous experience and can provide a great start point for your career. During this time, training will be provided, and your development will often be guided by experienced mentors in the team. Remember that, even if you have never had a full-time job, skills could have been acquired during a placement, holiday job or in your academic years. Practical skills developed during your degree may be an advantage.

Professional jobs

Professional jobs require previous experience in the field and/or higher qualifications, such as a Master's degree, PhD or professional registration. For laboratory-based positions, excellent practical skills are necessary, as well as a deep understanding of the field of interest.

A range of companies accept speculative applications, so contacting them with a CV and a cover letter may be a good idea.

Skill development

Studying the molecular biosciences provides you with a great skill set and knowledge base to enter many different careers. Choosing a career path is not a decision that you make once in your lifetime. As you move through different jobs, gaining and developing knowledge and skills, you may reassess which direction you wish to take. To help focus your search, it's important to evaluate both your experiences and transferable skills, remembering that you are unique in what you can offer to a company.

Work experience

Relevant work experience can help develop specialist skills and knowledge and enable you to see whether you enjoy a particular job role or field. It will also equip you with a good base of experience to reference as examples of work in answers to interview questions. Finding work experience can be challenging, but talking to your nearest careers service and looking online for internships or placements is a good place to start.

Approaching smaller companies and showing interest in work experience may be easier than with larger organisations, so research the companies near you and be proactive. However, any work experience, such as a part-time job during your holiday, still provides you with invaluable skills that you can apply to any job role.

Transferable skills

Transferable skills are those which can be used in more than one job role or setting. These skills are often listed in job descriptions, sometimes referred to as 'competencies', and certain key skills are required frequently. Therefore, it's important to understand the meaning of these skills and show an employer that you have them.

Your career path isn't fixed, and this is why an understanding of transferable skills will enable you to change and develop your own path. In biochemistry, competencies are fundamental to successfully transitioning between academia and industry or other work environments.

Alongside a degree, requirements for graduate jobs include common skills such as communication, organisational and time management skills, problem-solving and critical thinking skills. Practical skills are also desirable depending on the role. Additional essential competencies include a good attention to detail, research skills and evidence of innovation.

Discover more on this topic

Finding work experience

Exploring transferable skills

Transferable skills

Transferable skills/ Competencies	Description	Example(s)
Communication	The transfer of information, verbal or written. An important part of communication is also listening.	Customer service roles, working on a student newspaper/blog, writing reports, presenting research.
Problem solving and creativity	Ability to think outside the box and creatively approach a task to successfully complete it.	Developing new procedures to streamline a project, finding a solution to a problem in the laboratory.
Analytical and research	Ability to think critically, analyse and assess information and collect data.	Writing critical reviews and laboratory reports, final-year project in the lab.
Proactive thinking and self-motivation	Ability to anticipate difficulties and take action without instruction at every step.	Timely submission of an assignment despite unforeseen circumstances.
Leadership and management	Ability to manage and motivate a team to meet targets and deadlines.	Being the president of a university society or a sport team captain.
Teamwork	Ability to work well with others, being reliable, and supportive.	Group assignments, being a member of a sports team or a university society.
Planning, organisational and time management	Ability to plan, manage and prioritise multiple tasks to complete them by a deadline.	Meeting coursework deadlines, organising an event, combining a degree with a job.
Interpersonal	Ability to interact with a range of people in a professional manner.	Customer service job, being part of a team, outreach work within your community.
IT and technical	Confidence in using technology and specific scientific techniques.	Using Excel to manage budgets, lab experience, programming skills.

Resources

General career websites

- TARGET jobs – targetjobs.co.uk
- Prospects – prospects.ac.uk
- GradCracker – gradcracker.com/
- Milkround – milkround.com
- The Job Crowd – thejobcrowd.com
- New Scientists Jobs and careers advice – newscientist.com/nsj/
- National Career Service – nationalcareers.service.gov.uk/
- Graduate Jobs – jobs-graduate.co.uk/ or jobs.ac.uk/
- Find an Apprenticeship – apprenticeships.gov.uk/ or findapprenticeship.service.gov.uk/apprenticeshipsearch
- UCAS – ucas.com/
- Find a Master's – findamasters.com/
- Find a PhD – findaphd.com/ or jobs.ac.uk/phd
- Biochemical Society – biochemistry.org/careers-and-education/careers/
- Careers Advice – career-advice.jobs.ac.uk/

Drug discovery

- The Association of the British Pharmaceutical Industry (ABPI) – abpi.org.uk/
- British Pharmacological Society – bps.ac.uk/
- Jobs in pharmaceutical industry – abpi.org.uk/careers/ or pf-media.co.uk/ or carrotrecruitment.co.uk/

Consumer goods

- Manufacturing jobs in the life sciences – ckgroup.co.uk/search/?phrase=manufacturing

Diagnostics

- British In Vitro Diagnostics Association (BIVDA) – bivda.org.uk/

Clinical biochemistry

- NHS STP – nshcs.hee.nhs.uk/programmes/stp/
- Careers in clinical biochemistry – healthcareers.nhs.uk/explore-roles/healthcare-science/roles-healthcare-science/life-sciences/clinical-biochemistry
- Heath and Care Professions Council – hcpc-uk.org/
- Institute of Biomedical Science – ibms.org/home/

Service providers

- Association of Forensic Science Providers – afsp.org.uk/

Biomaterials and biotechnology

- European Biotechnology Network – european-biotechnology.net/
- Biotechnology Innovation Organisation – bio.org/
- UK Biotech database – ukbiotech.com/

Agrochemicals

- CropLife UK – croplife.co.uk/

Food formulation

- Food formulation jobs – jobs.foodmanufacture.co.uk/
- Tasty Careers - tastycareers.org.uk/

BIOCHEMICAL SOCIETY

Based on an original booklet written in 2014
by Skevoulla Christou and Alexa Hime.

Updated October 2025 ©Biochemical Society

Office 605, Albert House,
256-260 Old St, London EC1V 9DD
Tel: +44 (0)20 7685 2400
biochemistry.org

Follow us