SCIENCE & PHARMACEUTICAL CAREERS

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The world of Science is vast! Add in Pharmacy and the jobs are endless!

Today we wanted to give you a flavour of the sort of careers you can expect to find in these areas. We'll talk about what the job is about, how you get there and what experience you may need.

The focus will be on the 3 main Sciences of Biology, Chemistry and Physics, as well as touching on Pharmaceutical careers.

MICROBIOLOGIST

Microbiologists study microorganisms (microbes) in order to understand how they affect our lives and how we can exploit them.

By understanding microbes, Microbiologists aim to solve a range of problems affecting our health, the environment, climate and food and agriculture.

This can include the prevention, diagnosis and control of infections and disease, as well as ensuring that food is safe, understanding the role that microbes play in climate change, and developing green technologies.

As a Microbiologist, you will find yourself working in many areas that may include:

Hospitals
Agriculture
Education
Biotechnologist
The Environment

MICROBIOLOGIST

How to become a Microbiologist: Qualifications

In order to become a Microbiologist, you will need to have a honours degree in a subject that is relevant, such as:

Microbiology
Biomedical Sciences
Molecular Biology
Applied Biology
Biology (specialising in Microbiology)
Biological Sciences

Some employers look for a postgraduate qualification such as a Masters or PhD. To work as a microbiology researcher in a university, you'll need a PhD in a relevant area of microbiology.

To work as a clinical scientist in microbiology, you need to successfully complete the NHS Scientist Training Programme (STP). This leads to eligibility to apply for a Certificate of Attainment from the Academy for Healthcare Science, which allows registration as a clinical scientist with the Health & Care Professions Council (HCPC).

MICROBIOLOGIST

How to become a Microbiologist: Experience

Having experience in a laboratory is useful when applying for jobs. If your degree doesn't include a year out in industry or research, consider taking a research project over the summer.

A number of organisations provides a limited number of grants for undergraduates wanting to get hands on experience, including the Microbiology Society.

Student membership of a professional body such as the Microbiology Society or the Society for Applied Microbiology (SfAM) will show your commitment and provide valuable networking and career development opportunities.

Details of pharmaceutical companies you can contact about work experience or work shadowing opportunities are available on the Association of the British Pharmaceutical Industry (ABPI) Careers website.

You can also speak to hospital laboratories or your university careers service about getting some voluntary experience.

RESEARCH SCIENTIST (LIFE)

If you have an inquisitive mind and enjoy planning and working on experiments, you could be suited to a career as a research scientist in life sciences.

As a researcher in life sciences, you'll mostly be involved in planning and conducting experiments and analysing results. This could be to develop new products, processes or commercial applications, or to broaden scientific understanding.

You'll usually carry out your work on your own, but you'll typically be part of a larger team and will share your findings with colleagues. This is sometimes done at international conferences or through the publication of research papers.

You can find employment in commercial or government laboratories, hospitals and higher education institutions.

RESEARCH SCIENTIST (LIFE)

How to become a Research Scientist: Qualifications

You'll typically need a good honours degree, usually a 2:1 or above, in a related science subject to get into life sciences research.

Any subject based in the areas of health, medicine, agriculture, horticulture or biology should be appropriate, but the following subjects are particularly useful; **Biochemistry, Biomedical Science, Microbiology, Natural Sciences, Environmental Biology and Ecology.**

Many employers also require you to have either a research-based MSc or a PhD, or to be working towards one, particularly for higher-level roles.

It may be possible to enter with just an undergraduate honours degree and to study part time for a postgraduate qualification and then progress on to a more senior role.

RESEARCH SCIENTIST (LIFE)

How to become a Research Scientist: Experience

Practical laboratory experience and knowledge techniques used will improve your chances when applying for research jobs. This experience can be achieved through a sandwich year placement in industry or vacation work.

Try to gain experience in both academia and industry as it will help to illustrate how the two environments differ and will inform your future career choice.

You should also try to keep up with developments in the area and read peer reviews. Organisations such as the Biotechnology and Biological Sciences Research Council (BBSRC) provide news and publications relevant to the field and can be a good way to stay up to date. See BBSRC News, Events and Publications for more information.

ASTRONOMER

As an astronomer, you'll conduct research that explains the fundamental processes that govern the universe.

Astronomers are scientists who study the universe, its objects and how it works. They aim to push the boundaries of human knowledge about how the universe works by observation and theoretical modelling.

You can work in observational astronomy, using telescopes and cameras to look at the stars, galaxies and other astronomical objects, or in theoretical astronomy, where you'll use maths and computer models to explain observations and predictions.

Astronomers can specialise in studying:

Planets

Stars

Galaxies

Cosmology (Origin of the Universe)

ASTRONOMER

How to become an Astronomer:

Almost all astronomy jobs require a PhD. To apply for a PhD, you generally need a 2:1 or above in any of, but not limited to, the following subjects:

Astronomy/Astrophysics
Geology/Earth Sciences
Mathematics
Physics

If you're interested in astronomical instrumentation, either for research telescopes or space missions, then engineering degrees are often a standard requirement.

It's possible to work in astronomy research with only an undergraduate degree, but to progress you'll need a PhD.

Professors in astronomy usually have a PhD but sometimes also several years of postdoctoral positions as well before they land a permanent post.

ASTRONOMER

How to become an Astronomer:

The best way to find out if you're well-suited for a career in research astronomy is to spend time doing research. Many university departments offer summer placements for undergraduate students, and undergraduate students can sometimes be involved with research alongside their studies.

Gaining some work experience at an observatory or astronomical museum would also give you an understanding of how to use equipment and how data is collected. Customer-facing roles would also allow you to gain skills in dealing with and communicating with the public.

There are a large number of observatories in the UK, which include The Royal Observatory in Greenwich and Edinburgh, Joddrell Bank in Cheshire, and the Tolcarn Research and Educational Observatory in Cornwall. There are also many other smaller amateur clubs and stargazing organisations in locations across the UK.

METEOROLOGIST

Meteorologists are concerned with the weather and climate, and carry out scientific analysis of data to make predictions. As a meteorologist, you'll predict the weather and study the causes of particular weather conditions using information obtained from the land, sea and upper atmosphere.

You'll need to use computerised and mathematical models to make short and long-range forecasts concerning weather and climate patterns.

A variety of organisations use meteorological forecasts, including: **Aviation Industry, Farmers, Government Services, Health Services, The Media, Shipping and Sea Fishing Industries, The Armed Forces and Public Services.**

In addition to forecasting, you may also study the impact of weather on the environment and conduct research into weather patterns, climate change and models of weather prediction.

METEOROLOGIST

How to become a Meteorologist: Qualifications

To become a meteorologist you must have a degree, although it doesn't need to be in meteorology. Other accepted subjects include:

Mathematics
Ocean Science
Physical Geography
Physics & Physical Sciences
Environmental Sciences

The Met Office usually asks for a degree or equivalent in either meteorology, a physical science or a mathematical subject, plus an ability in maths and physics at AS-level or higher (or equivalent). You'll also need to demonstrate your interest in the weather. Other employers will look for similar qualifications and qualities.

A postgraduate degree is required for research posts and, although not essential for other work, may increase your chances of appointment to meteorology positions generally.

METEOROLOGIST

How to become a Meteorologist: Experience

Relevant work experience or project work will increase your chances. The Met Office runs a summer placement scheme in areas including science and forecasting, which lasts for three months. Recent graduates and current students can apply. This can help you gain invaluable experience that can help you decide if this career is for you.

The scheme also offers an industrial placement for 12 months for those studying a degree which has a significant numeracy, science or IT element. Again, this will put you at a massive advantage later down the line and can help you develop the necessary skills.

As computer modelling is a major part of a meteorologist's work, it's helpful to gain some experience of this, either through relevant work experience or by completing a degree project with computer modelling as a strong component.

CHEMICAL ENGINEER

As a chemical engineer, you'll be involved in the development of a diverse range of products. Your work will focus on changing the chemical, biochemical and physical state of a substance to turn it into something else.

You can work in a wide range of fields which include:

Energy
Oil & Gas
Plastics
Water Treatment

The need for Chemical Engineers is growing as the world looks for more efficient ways to power and operate technology in order to combat climate change.

Seeing developments in things such as Nanotechnology shows how important and rewarding the career can be.

CHEMICAL ENGINEER

How to become a Chemical Engineer: Qualifications

You'll need a degree in chemical, process or biochemical engineering to become a chemical engineer. To gain chartered engineer status as your career develops, your degree should be accredited by the Institution of Chemical Engineers (IChemE)

If your qualifications aren't accredited, you may still be able to become chartered. You'll need to supply supporting evidence to show that your technical knowledge and understanding meet the required level. The following degree subjects may be particularly relevant:

Applied Chemistry
Chemistry
Nuclear Engineering
Environmental Engineering

CHEMICAL ENGINEER

How to become a Chemical Engineer: Experience

Employers look for graduates with relevant work experience and may favour recruiting candidates from their own work placement schemes.

These are generally vacation placements, typically lasting six to twelve weeks, or extended placements, which vary in length from six months to a year. This type of placement can offer the opportunity to work on a more extensive project in industry.

Undertaking a period of work experience will give you the opportunity to put into practice what you're learning on your course, learn about different areas of operation, manage small projects, develop soft skills in areas such as communication and problem-solving, and build up a network of contacts.

TOXICOLOGIST

Toxicologists investigate any potential adverse impact that materials, chemicals, new medicines, natural substances and radiation might have on human/animal health and the environment.

During your investigation you'll take into account the potential implications of future technology such as genomics, digital tools, in silico/in vitro developments and the long-term consequences of gene-editing technologies.

As well as helping to avoid injury from chemicals and managing accidental exposure of both humans and the environment, you'll also work to understand and manage the risks chemicals pose depending on different exposure scenarios.

You'll typically work as part of a multidisciplinary team, which may include other specialists such as computational toxicologists, genetic toxicologists and histopathologists.

TOXICOLOGIST

How to become a Toxicologist: Qualifications

You need a degree to become a toxicologist. While there are very few degrees specifically in toxicology, there are a number that combine toxicology with other subjects such as biochemistry and pharmacology.

Other relevant courses include:

Toxicology
Medicine, Medical Science or Veterinary Science
Forensic, Chemical & Physical Sciences
Biological, Biomedical & Biochemical Sciences

You need to make sure that your degree gives you a sound background in chemistry and a good understanding of biological systems.

You can also study for a PhD in toxicology or a related field such as pharmacology, medicines safety, biochemistry, computational toxicology or molecular biology.

TOXICOLOGIST

How to become a Toxicologist: Experience

Employers always value relevant work experience and some degrees provide related placements as part of the course. These, along with part-time work in a research laboratory or organisation, can help you develop practical skills and build up useful contacts.

Student membership of a professional organisation such as the British Toxicology Society (BTS) is also useful for networking opportunities and keeping up to date with developments in toxicology and safety sciences.

You may also wish to try and gain experience within specific industries to help you determine which area may suit you most.

For example, you could attempt to gain work experience within the police toxicology teams where you would analyse victims to see if they had a reaction to anything, or you may assist officers in determining how far over the limit a drink driver may have been.

HOSPITAL PHARMACIST

As a hospital pharmacist, you'll be an expert in the field of medicines, understanding how they are used and what their effects are on the human body.

As well as dispensing prescriptions, you'll be involved in the purchasing and quality testing of medicines. You may also manufacture medicines, as in some cases treatments need to be tailor-made for individual patients.

You'll work closely with medical and nursing staff to make sure hospital patients receive the best treatment, advising on the selection, dose and type of administration. You'll also provide help and advice to patients in all aspects of their medicines.

Many are based within the NHS or private sector, however you may be involved in hospices, care homes & GP Surgeries.

HOSPITAL PHARMACIST

How to become aHospital Pharmacist: Qualifications

To qualify as a hospital pharmacist, you'll need to:

Successfully complete a Masters degree in pharmacy (MPharm) accredited by the General Pharmaceutical Council (GPhC)

Complete one-year's pre-registration training in a hospital pharmacy, during which time you'll demonstrate competency in a number of areas and produce a portfolio as further evidence of your learning

Pass a GPhC registration assessment

You'll then be able to apply for registration with GPhC, which is necessary to practise as a pharmacist in England, Wales and Scotland. Pharmacists in Northern Ireland must register with the Pharmaceutical Society NI.

HOSPITAL PHARMACIST

How to become a Hospital Pharmacist: Experience

Try to get experience either in a setting where you work with the public, or in a local pharmacy that will give you exposure to working with prescriptions and drugs. Any knowledge and experience of the profession will be helpful.

You should also consider becoming a student member of the Royal Pharmaceutical Society. This provides access to resources, networking opportunities and support throughout your studies.

As the majority of the employers are based within the NHS it may be worth exploring whether they have an additional opportunities that can potentially enhance the skills you pick up at your local pharmacy.

It could also give you an idea of the avenue you wish to follow.

PHARMACOLOGIST

As a pharmacologist you'll investigate how drugs interact with biological systems. You may carry out in vitro research (using cells or animal tissues) or in vivo research (using whole animals) to predict what effect certain drugs might have on humans.

The work you do will be used to:

Discover new and better medicines

Improve the safety and effectiveness of current medicines

Understand how and why people react differently to different drugs

Find out why some drugs cause addiction or unintended side effects

There's a high level of collaboration with other scientists, and it's typical to share your results with colleagues through meetings, reports and conferences.

PHARMACOLOGIST

How to become a Pharmacologist: Qualifications

To work in Pharmacology, you'll typically require a degree in Pharmacology or a related subject, such as:

Biochemistry
Biology
Biomedical Science
Chemistry
Physiology
Neuroscience

An MSc or PhD in pharmacology or a related subject is advantageous. In some cases, for example employment with major pharmaceutical companies where competition for jobs can be fierce, a postgraduate qualification is required.

It's possible to study for a PhD while working in research. This helps you develop strong technical research, laboratory and communication skills and can lead to postdoctoral research positions.

PHARMACOLOGIST

How to become a Pharmacologist: Experience

It's important to get relevant laboratory experience through a year in industry, summer internship or other work placement. This experience will help you build up a network of contacts and prove your interest and commitment to employers.

Experience can also be gained through laboratory assistant work, vacation work experience in academia or industry or through work shadowing.

Free student membership of the British Pharmacological Society is available to anyone studying a degree that has a pharmacology element.

Membership provides access to useful information, advice and opportunities, as well as a network of national and international pharmacologists at all career levels.