

Careers in the Pharmaceutical Industry

A hundred years ago there were no antibiotics, no paracetamol and no readily available relief from common illnesses like diabetes or asthma. There was no hope of remedies or cures for more serious conditions like cancer. The medicines which doctors can prescribe (and many which you can buy without a prescription) were developed and often discovered by the pharmaceutical industry. In this article, five people who work in the industry explain what they do and why they enjoy it.

Sarah Marshall, 25

Toxicology Study Director for a Contract Research Organisation

“I came into the company with a degree in Anatomical Sciences and began work as a laboratory scientist. After a year I was promoted to my current role.”

Toxicology is the study of the adverse or negative effects of chemicals on living organisms. If a new drug is potentially going to be given to people, we need to be reasonably sure that there are not going to be terrible side effects.

I work as a Toxicology Study Director. I run general toxicology studies in rodent and non-rodent models. We study pharmaceutical, agricultural and industrial compounds to find out what negative effects they may have. I manage all the procedures that contribute to a study, have responsibility for how the study is carried out and its final report. In the report we will interpret clinical data such as body weight, organ weight data, electrocardiographs (ECGs) and other observations of the animals.

In my company we carry out a wide range of pharmaceutical research for our clients. As I am the single point of control for the study, I have to liaise with the clients, design a study which meets their needs and host their visits and inspections. Although I work mainly on my own, there is a lot of teamwork involved in a successful study and it is important to have good communication skills, time management and to be able to multi-task.

Drug Industry

The industry employs more than 70 000 people in the UK in a variety of roles including drug development and scientific research, manufacturing and making the medicines, IT, statistics, testing the drugs and clinical trials, human resources and looking after the staff and sales and marketing.

Economics

- In 2006, the British pharmaceutical industry spent around £11 billion each day on pharmaceutical research and development, which is nearly £4 billion each year.
- The value of the UK pharmaceutical exports in 2006 was £13.8 billion (more than £200 000 per employee), making the industry one of the UK's largest exporters.

An ECG measures the rate and regularity of the heart beats and can be used to detect problems with and damage to the heart





Mark Bratt, 32

Process Development Chemist, Pfizer

“I have a degree and a PhD in Chemistry and decided that I wanted to work with products which were actually being manufactured or going to be manufactured as it seemed to be based more in the real world.”

I work at a laboratory in a manufacturing facility where the medicines are made. My role is to redevelop existing manufacturing processes with the aim of creating a more efficient manufacturing route. Most of the compounds we make are not made in one single step; they are multi-step processes. I might try to increase the yield for an individual step; use cheaper or less hazardous reagents or solvents; reduce the number of steps. This might involve either an alternative synthesis or ‘cleaning up’ an earlier step to reduce the amount of purification required. If I succeed we might be able to manufacture for example 8 batches in the same reactor volume and time that it would normally take to produce 6. This reduces wastage and also cuts costs.

As part of the job I need to appreciate the issues involved in making the compounds not just in the lab but on a chemical plant scale where the risks are much greater due to the scale we work on. Any changes we propose making need to be discussed with project managers and engineers so communication skills are important as well as practical skills.

Drug Development

- On average it takes at least 10 years from initially making a new compound to it becoming a prescribable drug
- For every new compound which makes it onto the market, around 10 000 will have been made which do not



Tamsin Jenkins, 28

Formulation Scientist, Pfizer

“I did Science A-levels at school but got very nervous in the exams and did not do as well as I had hoped so did not get onto my first choice of course. However, I went to university to do an HND and did so well on it that after a year I was able to swap to the degree course that I had originally intended to follow. I now have a degree in Pharmaceutical and Cosmetic Science.”

I work as a scientist within a formulation group and focus on treatments for allergy and respiratory problems. I spend about half my time in the lab and the other half at my desk. In the lab I formulate dry powder blends and test them. This involves blending the active drug with other materials (called excipients) and then filling the blend into a given format before testing it, to develop a product which can be inhaled. The formulation of the drug is what it is mixed and blended with and is very important as we are trying to target the lungs. They have a very large surface area and can only easily be reached by using an inhaler. The formulation must be able to be placed into the delivery device – but also come out and get to where it is needed in the lung.

The project that I am working on is about to go into clinical trials (where it is tested in people) which is exciting and I am looking forward to learning about the next phase of development.

As part of my degree I did a year long placement in the pharmaceutical industry. I really enjoyed it and decided to make it my career.

A PhD is an advanced degree requiring 3 or 4 years further study which can be taken after a first degree (which is usually a Bachelor’s or Master’s degree)

The simplest type of chromatography is paper chromatography which can be used to separate colours in inks or food dyes. Other more complex types of chromatography are used in industry to separate and purify compounds, but they work on the same principles



Emma Rees, 25
Drug Safety Officer for Hospira UK

“I have a degree in Pharmacy. I prefer the work-life balance which you have in my job to that which I had in my previous experience being a Pharmacist in the community or in hospital.”

Pharmacovigilance is the detection, assessment, understanding and prevention of adverse effects, particularly long term and short term effects of medicines

In the UK, the main regulatory authority is the Medicines and Healthcare Regulatory Agency who are part of the Department of Health. They monitor the safety of medicines and medical devices, in addition to the monitoring done by the pharmaceutical companies themselves

I work in the pharmacovigilance department of a large pharmaceutical company. My role is to monitor reports which come in with information about an adverse reaction which a patient has had when receiving a drug manufactured by my company. These reports come from sources such as the regulatory authorities, health professionals (doctors, nurses and pharmacists), articles in published scientific literature and during clinical trials.

We write safety update reports where we gather together all the information on adverse events (a bad reaction to the drug) that have been received over a certain time period for one particular drug. We then use this data to analyse if there are any patterns in a particular side effect. Depending on what our data shows we can act in different ways: we may not need to take any action; we can make changes to prescribing information given to doctors and in patient leaflets; or in the worst case we can issue a withdrawal notice for the drug and stop it being used. Fortunately, this hardly ever happens.

As part of my degree course I did an industrial placement and loved it. I work mainly at my desk on my PC, but work as part of a team so it is important to be able to communicate well, be organised, work with others and be willing to learn.

I enjoy my job enormously and it is very satisfying to feel that I am helping to ensure that the medicines which we make are as safe for people to take as possible.

Marie Timms, 28
Analytical Chemist, Discovery for Lilly

“I joined the company straight from school where I had completed Science A-levels. I started as a lab technician but have been promoted several times. I have now completed a Masters degree while working at the same time which took me 5 years.”

I work as part of the Discovery Chemistry group whose aim is to make and analyse new compounds. My role as an analytical chemist is to analyse and purify these compounds so that they can be passed onto the biological group for initial testing.

I begin work by checking to see which compounds have come in and need to be purified. I may then begin to develop a method so a sample can be purified or I will start purifying a sample. It is hard to plan exactly what I will do during the day as urgent samples can come in which need to be dealt with immediately. I mainly use different types of chromatography in my work, but do sometimes work on other projects using different methods of analysis. I have also been able to go to several scientific conferences including one where I presented some of my own, novel (new), work.



World Leader

The UK has an impressive track record when it comes to discovering new medicines and drugs – nearly 1 in 5 of the top 100 medicines in the world were discovered and developed here. That is higher than for any other country apart from the USA.

Vicky Wong – with thanks to Sarah Jones from the ABPI for her help in preparing this article.

Look here!

For more information about careers in the pharmaceutical industry, see www.abpi-careers.org.uk