

I LIKE MEDICINE BUT I'M NOT SURE ABOUT BECOMING A DOCTOR



WHAT DOES A PHARMACOLOGIST ACTUALLY DO?

CAREERS IN PHARMACOLOGY

LIKE BIOLOGY? LIKE CHEMISTRY? STUDY PHARMACOLOGY!

LIFE CHANGING <-> CHANGING LIFE



WHAT IS PHARMACOLOGY?

Pharmacology is the science of drugs and their effect on living systems.

Pharmacology is everywhere. Every bathroom cabinet. Every dentist's chair. If you're put under, using an inhaler, having a drink or taking an aspirin, pharmacology is the science of what is happening to that drug and to your body.

Every time we take a pill our body's chemistry changes. Pharmacology's job is to understand why. And to use this knowledge to build better drugs.

Pharmacology can make you better (antibiotics, chemotherapy, beta blockers). Even make a better you (cognitive enhancing drugs, coffee, vitamins)...?

Pharmacology inspired the Beatles, killed Michael Jackson and made Alice in Wonderland grow.

PHARMACOLOGY?



Not to be mistaken with pharmacies, pharmacists, or farmers.

Ours is a broad science with limitless applications - from politician to clinician to lab technician. As a pharmacologist your workplace might be a lecture theatre, a pharmaceutical company lab, or a Sri Lankan field hospital. And your contribution could range from saving lives on a poisons unit to leaving a legacy in the cancer field.

Who are we? The British Pharmacological Society (BPS) is a charity whose aim is to educate and expand the frontiers of pharmacology and support those who are training and working in the field.



RESEARCH PHARMACOLOGY

Pharmacology in the lab is where discoveries are made. Every day. With very. Tiny. Steps.

It's a career of experiments and surprises, setbacks and breakthroughs, conferences, travel and collaborations.

Experiments are varied, challenging and pharmacologists rarely work a 9-5 day. But it is this uncertainty that will keep you hooked...

...And the possibility that one day you just might change the world.

If you think you want to be a research pharmacologist, don't just talk to your careers advisor. Go meet people with diseases - people who will tell you how necessary but rudimentary their current medication is - how their Parkinson's meds have grim side effects. How they treat the symptoms of the disease, but cannot cure the disease itself. Then get yourself to the lab and fashion that little piece of the jigsaw that could change their life.

The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny...'
Isaac Asimov



200,000,000

lives saved by penicillin since its discovery in 1928

CLINICAL PHARMACOLOGY

Clinical pharmacology bridges medical practice and lab science.

Clinical pharmacologists are problem solvers who work at the interface between the drug and the person. Most gain a degree in medicine and go on to work with patients in hospital settings, having had specialist training in clinical pharmacology. They are then able to apply the science of medicines to very real, sometimes urgent, human scenarios.

But it's also possible to have an active interest in this area through the teaching of future health professionals, or research at a university or in the pharmaceutical industry.

Clinical pharmacologists give advice to patients, scientists, government committees, lawyers and even TV producers - to help avoid dodgy pharmacological or toxicological plotlines.

KILLER CARAVANS?

The phone rings. It's 3am and as a clinical pharmacist you are on call. There has been a fire at a caravan park. A man and a boy are suffering burns to their respiratory tracts but the paramedics want to rule out toxic poisoning.

You immediately think carbon monoxide, a colourless gas sometimes present when things burn, and also wonder about possible cyanide and phosgene poisoning. You are able to advise them how to treat the suspected carbon monoxide poisoning immediately, and how to manage the patient in case they have inhaled gases which damage the lungs or get absorbed and poison the patient. The paramedics treat the pair, who make a full recovery.

WHAT JOBS DO PHARMACOLOGISTS DO?

Used to be, as a pharmacology student, your future was confined to a lab. Not any more.

As a pharmacologist you can apply your skills to anything from the civil service to the legal system, to media consultancy and beyond. A grounding in pharmacology gives you hardworking, transferable skills - attractive to a whole host of employers.

And your degree - three years of challenging assumptions and understanding concepts on your own terms - prepares you for a climate in which creativity and innovation are prized.

Leave your preconceptions at the door. All the best scientists do.

MARKETING

EXPERT WITNESS

INDUSTRY MANUFACTURER

SCIENCE CONSULTANT

SCIENCE JOURNALIST

TEACHER

ACADEMIC

SARAH TEATHER, MP

'I think that I'm living proof that a qualification in pharmacology needn't just lead to a career in the lab.'

Minister of State for Children and Families 2011

ENTREPRENEUR

MEDICAL TV & FILMS ADVISOR

DRUG PATENT ATTORNEY

WHERE CAN PHARMACOLOGY TAKE ME?

To the stars*. Around the globe. Into academia, industry or consultancy. Pharmacology can be a studied as a single subject but can also be something you choose after the first year of a biomedical science degree.

The way to distinguish yourself as a pharmacologist is to join BPS. We offer free undergraduate membership to anyone who takes pharmacology as part of their degree. At university, pharmacology is a bedfellow with other biomedical sciences. Opportunities for years in industry vie with opportunities for years abroad, and letters after your name span from BA to BSc, MSci to MPharmacol.

*NASA employs pharmacologists to advise on medications, as microgravity affects the behaviour of drugs. Expert pharmacologists consult on medical dramas like House - if Hugh Laurie's more your kind of star.

WHAT NEXT?

Want to find out more?

To find out about your future in pharmacology search 'pharmacological' on Facebook. Or email the BPS a question: education@bps.ac.uk

Visit www.bps.ac.uk

To find out more about how the Society can help

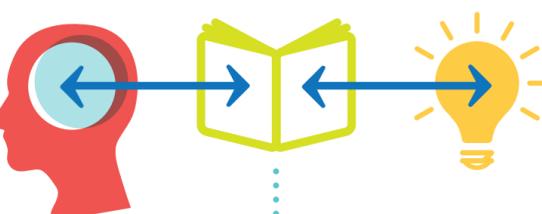
@britpharmsoc



PHARMACOLOGISTS ARE INTERESTED IN PROBLEMS.

AND IN LIFE-CHANGING SOLUTIONS.

LIKE BIOLOGY?
LIKE CHEMISTRY?
STUDY
PHARMACOLOGY!

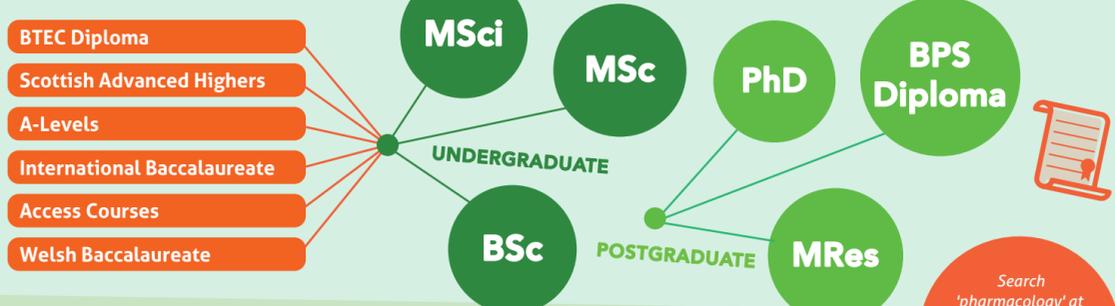


Pharmacology sits at the juncture of many sciences and many different departments. It needn't mean a straight degree in pharmacology (in fact, these days, it rarely does). Instead it can be paired with or built on any of the biomedical disciplines such as genetics or neuroscience. Pharmacology is an adaptable science creating adaptable scientific minds. Just what's required in fast-changing times.

QUALIFICATIONS: WHAT DO I NEED?

Pharmacologists need a natural aptitude for science.

A university degree course will usually require chemistry at A-Level (or equivalent) as well as some constellation of biology, maths or physics.



WHAT WILL I LEARN? You will learn about drugs and the body (physiology) and about what happens when the two collide: Pharmacology. Around pharmacology sit several other biomedical disciplines and you will study anatomy, biochemistry, immunology, genetics and neuroscience.
CONVINCE ME: Some university courses include international study opportunities and offer industrial placements where you can contribute to real research. Organizations like BPS provide bursaries so you can travel and take these placements.

BE PREPARED FOR: The first year of a Pharmacology BSc will be biology fundamentals.
AND THEN?: Many students continue into further education by studying for a PhD or an MRes but the lateral, scientific skills you've learnt within a pharmacology degree make graduates attractive to a wide range of employers.

Search 'pharmacology' at www.ucas.com to see where you can study, and what grades you need to get.

BUILD YOUR OWN DRUG IN 6 (NOT SO) EASY STEPS

It can take, on average, 9-12 years to take a drug from bench to bedside through the drug discovery pipeline.

And it's expensive too, costing an average of \$1.3bn*. No wonder people who discover and develop drugs are on the look out for adaptable thinkers who can help deliver better and safer new drugs to the patients who need them most.

The future is bright for young pharmacologists who can adapt rapidly to change, and embrace new technologies and cultures.
Tom Blackburn, Founder, CEO TPBioVentures LLC

*Tufts Center for the Study of Drug Development 2011



DR EMMA ROBINSON

Senior Lecturer, Bristol University

BSc + PhD (7 years)
5 year Research Council fellowship
Teaching post in academia

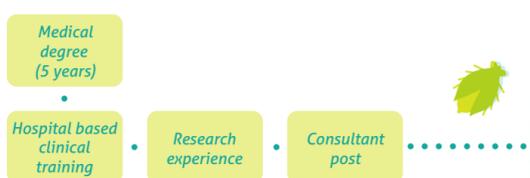
I was a reject vet. Right until my final year of Pharmacology I was still planning to do veterinary medicine but then I did some research – I got a whole animal project which was investigating alcohol withdrawal syndrome in mice – and I was completely blown away by it. By a) the fact that mice could become alcoholic and b) when you took the alcohol away they showed so many of the symptoms of human alcohol withdrawal syndrome and that c) we could use this to understand human addictions

and develop new compounds for treatment. Four weeks into the research I realized, I'm not going to be a vet – this is much too exciting.

We work with rats that are trained to do very sophisticated behavioural tests – like a nose poke, or pressing a lever. We can use these tests to study ADHD, depression and addiction. By working with our rats we can profoundly change how we understand an illness and that's my inspiration...



'...doing something tiny in the lab, like pipetting, but knowing that it might, at some point in the future, treat addiction or cure people of depression. It's amazing.'



DR JOHN THOMPSON

THINKING OUTSIDE THE BOX

Clinical pharmacologists in developing countries are seeing huge numbers of pesticide poisonings. In Sri Lanka, pesticide deaths accounted for 2/3 of suicides. By stripping out the toxic components of pesticides without compromising on agricultural output or price, clinical pharmacologist Michael Eadleston was able to create 'safe' pesticides and prevent suicides in South East Asia.

Senior Lecturer in Clinical Pharmacology
Wales College of Medicine Cardiff University

My week is split between treating patients in hospital, running clinical toxicology clinics, doing some national advisory work, lecturing and education. It's a full week. With patients I'm ensuring the safe and effective use of medicines or dealing with adverse reactions to drugs. In the Welsh National Poisons Unit we see around 1,700 patients a year – over five a day – who have self harmed or been poisoned. Through the National Poisons Information Service I advise other hospitals how to manage poisoned patients.

Often it's about children under the age of five who have got into medicine bottles accidentally, teenagers who may have deliberately, elderaged, elderly patients with therapeutic (prescribing) errors or accidental poisonings – things like carbon monoxide when somebody's decided to have the BBQ inside (not a good idea). I also advise on whether particular medicines should be made available so that our patients aren't deprived of the benefits of new drugs to market.

'I would advise people to go into clinical pharmacology because it's intellectually satisfying and great to be able to solve problems for the benefit of patients'



DR MARK CHRISTIE

Pharmacology Drug and Discovery Consultant

'For me, good, discovery-driven science is about people having core skills in one discipline and the creativity, elasticity and energy to work at the boundary of other disciplines.'



At the time I was leaving university you had a choice; you could either go into the pharmaceutical industry which was seen as a job for life or you could stay in academia which was seen as a job for life - just one that didn't pay as well. I started off as a research pharmacist and stayed on in the industry for 13 years and to the level of Department Head. Then in 2008 I was made redundant and started working for myself.

Suddenly I found myself surrounded by opportunity. Today I run my own consultancy business, focusing on

pharmacology and drug discovery. People can come to me and say, "We've got a drug that might be interesting in the treatment of spasticity and MS, what do you think?" I get to stick my nose into lots of interesting areas, to work with lots of organizations, to travel the world and they get 13 years of drug discovery expertise on a pay-for-use basis. I would recommend that everybody be made redundant once in their career; it takes away from you this idea that you must have a job and a pension and you must do the things you had always done on a 9-5.