ICR The Institute of Cancer Research

Your career in cancer research

Working together to defeat cancer

Who are we?

At The Institute of Cancer Research in London, we make the discoveries that will defeat cancer.

We are world leaders when it comes to identifying cancer genes, discovering cancer drugs and developing modern radiotherapy.

Our team is made up of chemists, biologists, physicists, mathematicians, geneticists, clinicians, computational biologists and more.....all working together to make the discoveries that defeat cancer.

Maybe our next discovery will be you!

Why are we scientists?

For a start, science is really interesting!

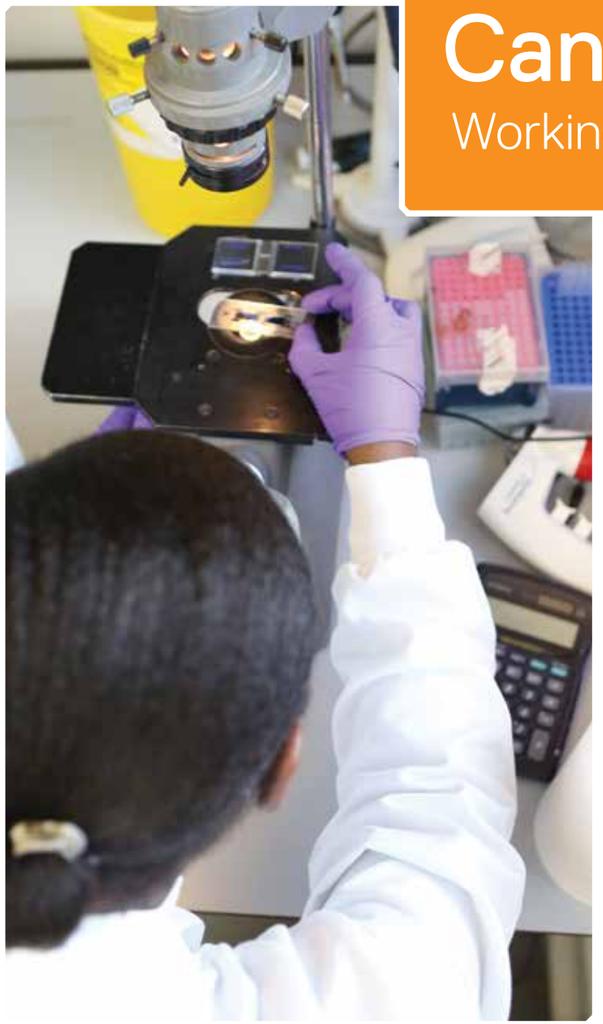
As a scientist, no day is the same. You might spend your time designing experiments, travelling to conferences, meeting collaborators or writing about your research, as well as doing experiments.

You get to work at the forefront of scientific discovery, doing work that no one has done before. And best of all, as a cancer researcher your discoveries can make a real difference for people with cancer. It's rewarding to help contribute to new treatments for patients.

Studying science can lead to many different job opportunities – and not just in a lab. You could work as a researcher in a university, hospital or private company, set up your own biotech firm, or use the transferrable skills you've gained to get a job outside science itself – everything is possible.

Knowing that we are working to defeat cancer is inspiring.

But we also want to inspire the next generation of cancer researchers – people like you.



Cancer research

Working together

In school, you might study biology, chemistry, physics, maths and IT.

But in research, these subjects can be re-mixed, merged, and used together to discover more about the world.

A huge team of people are involved in our research, and we need researchers with different skills, backgrounds and viewpoints to help to solve the biggest problems in science.

We talked to our scientists to show you the variety of work we do here at the ICR, and why they do what they do.

Biology

We study biology to find out how cancers behave because understanding how they work means that we can come up with new ways to treat them.

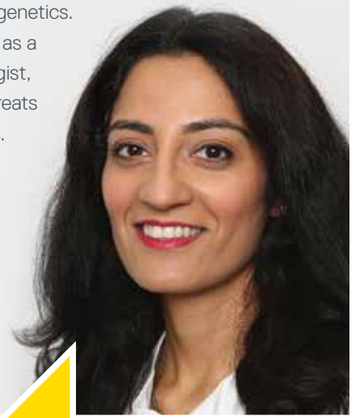
Zoe Walters is an ICR researcher who grows cells to look at individual molecules to figure out what's causing cancer.

"I am a naturally inquisitive and outgoing person and I find that a career in scientific research has suited both of those things down to the ground."

Genetics

Cancers develop when something goes wrong in the DNA of a cell. Studying the DNA of people who develop cancer, and of those who don't, can be key in identifying people with a particularly high risk. It also helps in the search for new drugs and in choosing the best treatments for patients.

Saira Khalique conducts a research project at the ICR looking at new treatments for ovarian cancer patients based on their genetics. She also works as a medical oncologist, a doctor who treats cancer patients.



"My research work in the lab, coupled with my clinical skills as a doctor, may one day provide new treatments for patients with cancer. Knowing this inspires me to keep going."

Computer Science

Computing is incredibly important to modern cancer research –research in areas like genetics or cancer imaging can generate huge amounts of data, and we need to create new programs to interpret and analyse it all.

Bissan Al-Lazikani runs the data science department at the ICR – she uses her computer science background to help discover new drugs, and has developed the world's largest cancer database, canSAR.

"I'm passionate about what I'm doing – working on machine learning to teach computers how to improve treatment plans for future cancer patients. Today, I lead a team of people from all sorts of backgrounds – and we are building artificial intelligence programs to help us tailor cancer treatments to individual patients."

Biochemistry

"The best part of my job is the freedom to pursue the scientific questions that interest me. I also enjoy motivating my team in pursuing their own research ideas, training them to do rigorous science and tackling the important questions in cancer research."

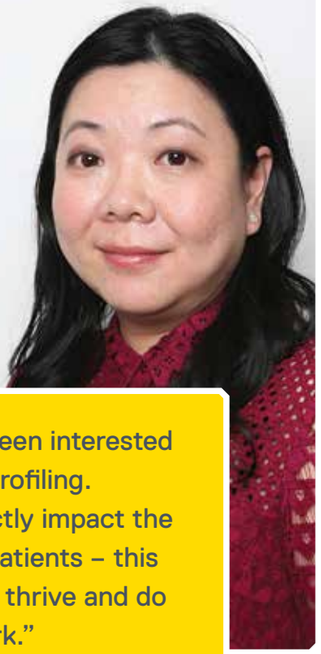
Biochemistry combines bits of biology and chemistry – we study the chemical processes that take place within our cells, looking at the changes we see in cancer and using that knowledge to think of clever new ways of treating the disease.

Paul Huang leads a team studying chemical signalling networks in cancer. He's trying to find what goes wrong in cells to make them resistant to drugs.

Maths and Statistics

When we're trying to find out if a new treatment works, we need to analyse our results and find out what they really mean. Statisticians are key to our work on clinical trials, so we can see whether a new treatment is really better than an existing one.

Maggie Cheang leads a team looking at the outcomes of clinical trials, and analyses the genomes of those who take part. Her work involves collaborating with researchers and medical staff involved in trialling a new drug.



"I have always been interested in analysis and profiling. Our results directly impact the clinical care of patients – this motivates me to thrive and do better in my work."

Chemistry

"I am an adventurer – exploring and finding new things has always been fascinating to me. Being a scientist appeals to this side of me, as I love the thrill of starting from an idea and validating (or invalidating) my hypothesis."

Chemistry is an important step in the hunt for new cancer drugs. Our chemists design and synthesise new small molecules that can act against cancer cells, and become new drugs.

Jumi Popoola works in a team that looks at the networks of signals within cells and how they are affected by drugs.

Physics

Sometimes people are surprised that physics is key to our understanding of cancer. Knowledge of physics lets us design ways to see what's going on inside the body and create images of cancers. It also allows us to design treatments that rely on physics like new forms of radiotherapy.

Emma Harris leads a team which works on techniques to look at cancers more clearly, so that we can treat them more precisely with radiation.

"I became interested in research while I was studying for my MSc – the experiments I was carrying out had never previously been done and I knew that I was breaking new ground. Every day in research is about learning, whatever stage in your career you are at."

Computational Biology

Computational biologists work to interpret and understand data, combining computer science, statistics and modelling of biological processes.

George Seed works on cancer biomarkers – biological measurements of molecules within the body which can give us important information about cancer.

I use computers to solve biological problems. I originally was interested in medicine, but found that studying biomedicine at university suited me better. It was similar to a biology degree, but focused on human disease. My team now is a mix of doctors, clinical scientists and research scientists, so it worked out well!"

Medicine

Many of our researchers also work as medical doctors, and combine their work with patients with their research. We have doctors working across the ICR on lots of different areas of research.

Udai Banerji works in the Drug Development Unit at the ICR and our partner hospital The Royal Marsden. He runs clinical trials for people with cancer, where new drugs are given to patients for the very first time. He uses his knowledge as a doctor as well as his skills as a scientist to design the best trials for patients.

"My day is very varied, but that is the exciting aspect of the job. I love working with people, which is key to working in an environment of patients, doctors and scientists; listening and trying to understand and communicate scientific and medical issues within a team is crucial as often everyone sees the same problem in a completely different light."

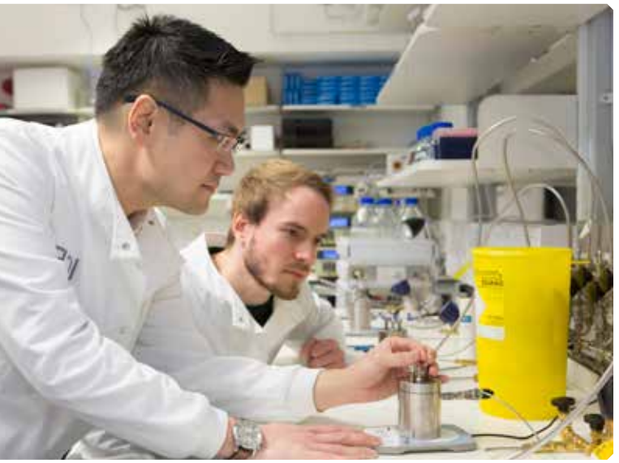
Non-research roles

A career in science can go to some interesting places. And it doesn't have to mean working in the lab.

At the ICR there are also people who:

- create business deals with partners we work with
- communicate our science to the public
- raise money to support our work
- look after the animals we use in research
- manage and coordinate our clinical trials

What are scientists like?



Modern science is a team game – you often need to work together with people with different specialist knowledge to solve the most complex problems.

Scientists are all different – and have different skills that make them good at their jobs.

Do any of these words describe you?

Curious
You love investigating and finding the answers to questions no one has thought to ask yet

Passionate
You want your work to make a difference and love working with a purpose

Creative
You enjoy creative thinking and finding new ways to make discoveries

Ambitious
You want a rewarding career which will open the door to lots of job options

Organised
You enjoy planning and keeping things on track

Persistent
You keep trying to solve a problem, even when it seems impossible

Team player
You enjoy working together to solve the most complex problems

Technical
You have great IT skills, and enjoy working with new, complex technology

Communicator
You like sharing your ideas with others to pass on your knowledge

Analytical
You like finding out the details of how things work, or getting under the skin of a problem

If you recognise some of these traits in yourself, you could consider a career in science.

How careers in science can develop

Where to start

It's great to know that your options are open.

Any branch of science can lead to a career in cancer research as we need people from many different backgrounds – including biology, chemistry, physics, maths and medicine.

There are lots of different routes you can take.

The first step is usually taking science A levels. Many universities ask you to have two science subjects at A level – or an equivalent such as a BTEC qualification – but it does depend on the course you want to study. You need a maths A level to work in several science subjects, including medical physics, for example, so think about your options early and don't ignore subjects like physics or maths just because they don't seem immediately connected to health care – you might be surprised!

You might also want to get some work experience in science at this stage to see what you enjoy and help with your university applications.

Studying at university

Typically, scientists would study a science degree at university which would normally last three or four years.

Which degree programme you choose is up to you.

They can vary a lot – some degrees are more specialist and others are broader or let you study more than one subject at once to keep your options open. Some even have a year of research or working in industry included to give you more experience, or a year studying abroad. There are also options for part-time study and distance learning to suit your circumstances.

Do some reading and talk to your school careers adviser to find out more about your options.

After a science degree, some people then stay at university to do a postgraduate qualification like a Masters, and then you can even go on to do a three-year, paid research project at a university and get a PhD.

You don't have to do these, but if you do then you'll be well on your way to a career in science.

Other options

University is not the only route into working in science – there are options for vocational qualifications and training on the job.

Higher National Certificates (HNCs) and Higher National Diplomas (HNDs) are work-related vocational courses that give you a qualification. An HNC typically takes one year to complete and is the equivalent of the first year at university, while an HND is the equivalent of two years at university.

Some positions, like animal technicians, follow a career pathway where you can gain vocational qualifications while you work.

Other ways to learn as you work include apprenticeships, which are offered by several big companies like Unilever and GlaxoSmithKline. There are different levels of apprenticeship depending on your existing qualifications.

Once you've trained in science, you'll have the skills to work in lots of different areas – both in science or working in a totally different area such as business.

Finding out more

If you want to find out more about careers in science you could:

- talk to your teachers, school careers adviser, alumni from your school at university and any friends and family you know that work in science
- organise some work experience to see what a career in science is really like, improve your CV and personal statement and gain valuable experience – try contacting local universities, companies or your nearest hospital if you want to work in a lab
- look at the websites of learned societies for information about studying and working in different fields. You could, for instance, look at the Biochemical Society, the Royal Society of Biology, the Institute of Physics and Engineering in Medicine, the Institute of Animal Technology and the Royal Society of Chemistry
- attend science fairs and careers events in your local area to speak to people who work in the field – there's lots happening across the country
- look at science careers websites like: Future Morph: **www.futuremorph.org** or Science Career Pathways: **www.sciencecareerpathways.com**

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If you want to find out more about the ICR and our research, look at:

our website:
www.icr.ac.uk

our Facebook page:
facebook.com/theinstituteofcancerresearch

our Twitter feed:
@ICR_London

BIOCHEMICAL SOCIETY

This booklet has been supported by the Biochemical Society.

You can find out more about the Biochemical Society on their website:
www.biochemistry.org