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Science 2010

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opportunities in Ireland, north and south • useful contacts • graduate profiles • what employers want

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Introducing your science career

Science as a career choice

Science is not something just for the chosen few – each one of us, regardless of our background, has to understand science to some degree in order to progress through life. Science is the axis on which all our decisions are based, the best method for acquiring information about everything around us. Employment opportunities exist for science graduates in a wide range of areas – and you don't even have to work in a laboratory. Science is a key sector for graduates, opening doors to the pharmaceutical, biotechnology and medical devices industries. Research and development (R&D) is also an area which is very significant and many alternative job roles are available once you have acquired the appropriate qualifications and skills.

See pages 8–12 for some of the main areas of work in science.

Science in the Republic of Ireland

The pharmaceutical industry in the Republic is dominated by multinational companies, many of them household names. Nine of the top ten global pharmaceutical companies are based in Ireland, with seven of the top ten blockbuster drugs produced here. Encouraged by investment from IDA Ireland and Enterprise Ireland, many multinationals continue to invest in both research and development and manufacturing. Ireland's low corporation tax, one of the lowest in the world, continues to attract foreign investment by multinational companies. Most of the major US medical technology players are represented in Ireland, with manufacturing facilities in many locations, and the biotechnology industry is also strong. Over 25,000

people are employed in science related occupations in Ireland, which represents almost one per cent of the total workforce.

Investment in postgraduate research continues to be a government strategy, leading to continuing opportunities in research and development. Innovation in research will be key to ensuring that major multinational employers in these sectors remain here and continue to invest heavily in their Irish operations. The 2009 Government Strategy *Powering the Smart Economy* highlights Ireland's commitment to establishing a critical mass of internationally competitive research in the areas of science and engineering.

Employers want science graduates

The real concern for the science sector is in attracting the skilled graduates it needs to continue its long-term development. The 2009 FÁS National Skills Bulletin highlights that employment opportunities in science in Ireland are concentrated in the areas of manufacturing, chemical and chemical products, food products and beverages, and healthcare. 60 per cent of those working in science are at technician level, with 40 per cent working at professional levels. Between 2003 and 2008, 3200 positions were created, with two thirds of these at professional levels. 90 per cent of those working at professional levels are third-level graduates. Recent employment forecasts from FÁS and the Economic and Social Research Institute (ESRI) highlight a strong demand for science graduates, so you will be sought after. Because of this demand, science jobs pay well: according to the gradireland *Graduate Salary and Graduate Recruitment Trends Survey 2009*, the average starting salary for graduates in science roles was over €25,000. The majority of employers surveyed reported that they pay more for students with a postgraduate degree.

Science in Northern Ireland

The public sector remains a considerable employer of graduates in general and recruits a substantial number of scientists. In the private sector, there are openings for graduates in the pharmaceutical and medical devices industries. The life sciences industries employ over 4,000 people in Northern Ireland. Invest Northern Ireland continues to promote investment in small companies to boost capability through research and development.

Northern Ireland is seen as a prime location for biotechnology and medical healthcare technology companies. Research centres have been established in the University of Ulster and Queen's University Belfast in areas such as pharmaceutical, biomedical, cancer and medical polymer research. Research and development remains a growing area, with major investment in research facilities continuing by Invest Northern Ireland.

What if I don't want to work in a lab?

Many students labour under the misconception that science limits you to teaching, research and laboratory work. They believe that they are married to science for the rest of their lives. This is so far removed from reality. The wonderful point about science is that it armours you with skills for life. Having a degree will give you logical thinking and problem solving abilities which will open the door to a wide array of opportunities. Journalism, sales and marketing, human resources, patents and medical writing are but a few examples of the choices open to you.

See page 13 for more on alternative careers for science graduates.

What can I do with my degree?

Specific scientific disciplines may open many different career paths.

There are different branches of science, and the job opportunities open to you will depend to some extent on the specific scientific discipline that you have chosen to major in.

Biochemistry

Biochemists work in various environments where living cells and tissues play a role, examining the effects that drugs have on plants and animals. Biochemists also work in hospital laboratories analysing tissue and blood samples, while others find employment in the brewing and food industries.

Biomedical engineering

Biomedical engineers fuse engineering principles with clinical medicine to design and manufacture a wide variety of medical devices which can diagnose, cure or prevent disease, combining engineering design and problem solving skills with medical and biological sciences. You could work in private industry, government, hospitals, consultancy or research centres. There are numerous opportunities from researching, designing and

'I work for a medical device manufacturer and my job is very varied. I could be on the manufacturing floor conducting trials, at my desk report writing or travelling across the USA.'

Aine Ruddy, Associate Manufacturing Engineer

developing medical products to designing and modifying medical equipment for managing the use of clinical equipment in a clinical setting. You could be involved in developing and producing biocompatible prostheses, or designing clinical equipment and medical devices such as implants or medical imaging devices. Biomedical engineers are also involved in tissue, genetic and pharmaceutical engineering.

Biomedical science

Biomedical scientists are involved in testing tissue and body fluid samples to diagnose disease and monitor the treatment of patients. Biomedical scientists have strong knowledge of biomedical and biological sciences including biochemistry, cell biology, cellular pathology, clinical chemistry, haematology, medical genetics, medical microbiology, molecular biology, physiology, path physiology and transfusion science. The majority of graduates are employed in the public sector in hospitals and the Irish Blood Transfusion Service. Many graduates are also employed by universities, schools and colleges, biopharmaceutical and biotechnology industries, and specialist research institutes. To work as a medical scientist in hospital laboratories, your degree must be recognised by the Academy of Medical Laboratory Science (www.aml.ie).

Botany

Graduates in botany go on to become university lecturers, wildlife officers, environmental consultants and molecular biologists.





Chemistry

You could find work in the pharmaceutical and chemical manufacturing industries as a professional chemist and in other areas such as environmental analysis; microelectronics; environmental protection; horticulture; healthcare; food; biotechnology; agriculture; cosmetics; and textiles sectors.

Environmental science

There is always a demand for environmental science graduates, often securing positions in environmental management, nature conservation, pollution control, environmental consultancy, state agencies, industry and education at secondary and tertiary level. See page 11 for more information.

Food science

You could work in food production, food processing, quality assurance or food analysis. There are also opportunities in instrumental analysis. You could also be involved in producing, processing, evaluating, packaging or distributing food. Opportunities are vast: investigating food safety and disease, developing flavours, working in food quality assurance, developing new foods, or developing processes to manufacture safe and nutritious products.

Maths

Maths is the foundation on which so many careers are built. Computer scientists, physicists, economists, statisticians and actuaries all use maths extensively. There are many career

opportunities for numerate graduates especially in the IT and financial services sectors.

Microbiology

Employment opportunities include laboratory work in a hospital environment where you aid in the process of identifying the cause of disease in patients. The food industry is also an area where the role of the microbiologist is paramount in the investigation of spoilage and decay, checking and monitoring samples for bacteria and meeting the required standards of quality (quality control).

Physics

A degree in physics gives you boundless opportunities such as developing medical equipment, optical devices, electronic devices and new energy sources. There are opportunities for employment in the computer and electronic industry as well as optics and telecommunications and in the chemical and engineering industries. The medical industry is a popular area for graduates in recent years allowing opportunities in medical physics, optics, biophysics and radiology. Other jobs are available in a range of careers including astronomy, financial risk analysis, computer games and weather forecasting.

Zoology

Zoology graduates find employment in fisheries, marine biology, agriculture, forensic science and environmental research.

Getting a job

How to find vacancies in the science sector and what to expect from the recruitment process.



Careers in the science sector in Ireland offer rewarding and interesting work, and there are a wealth of opportunities to explore.

A broad industry

Many people think of the pharmaceutical and chemical sector when they think of careers in science in Ireland. PharmaChemical Ireland represents a growing sector responsible for exports totalling €44.1 billion in 2008 and accounts for 51 per cent of the GDP. According to Dr Gillen, PharmaChemical Ireland: 'It is encouraging that Irish manufacturing plants are now looking to enhance their R&D operations. This will embed the companies in our economy and secure the long-term future of this vibrant sector.'

The pharmaceutical sector in Ireland is a large employer and appears to be in a good position to see out the recession; people will always need medical care, ensuring a continued demand for research, development and

production of new drugs. The Irish pharmaceutical industry directly employs almost 25,000 people, over half of whom hold a third-level qualification. The PharmaChemical Ireland report *Why Ireland should be your location of choice* stated that Ireland is 9 per cent above the European average in producing third-level science graduates. By 2015, it is predicted that 50 per cent of all drugs produced globally will be through biotechnology, and Ireland needs to continue to attract investment from such companies.

However, the science sector in Ireland is also made up of a wide variety of other industries including agrochemicals, petrochemicals, toiletries, plastics, paints, polymers, food and drink, environmental management, medical research/diagnostic companies, utilities, energy, health and local authorities, research associations, laboratories, agencies and organisations.

There are therefore a huge range of occupations available, including product and process development; research and development; manufacturing; compliance and validation; teaching; writing and editing; management and administration; consultancy; data management; IT support; HR; marketing; and logistics and sales.

Science graduates are also found in other industries, including IT, engineering and technology companies, financial organisations and management consultancies. Many graduates from non-science backgrounds are found working in the science sector too.

Employment trends

Despite an overall decline in employment in 2009, some science areas such as pharmaceutical, medical devices, diagnostics and biotechnology have been performing well. According to the FÁS National Skills Bulletin 2009: 'At the professional level, shortages continue to exist for qualified and experienced professionals in fourth-level research, development, clinical trials and in regulatory compliance. At entry level, shortages continue for lab technicians, junior chemists, and prototyping/development technicians. Energy, in particular renewable energy, is forecasted to become one of the key growth areas of the economy.'

Entry routes vary depending on the career you wish to pursue. The minimum requirement is a degree in science, but many science graduates will pursue postgraduate study before entering employment. A masters degree is almost the standard for working in a large proportion of scientific jobs.

Relevant work experience will increase your chances of a job offer. Many third-level institutions have links with industry to arrange in-service training and often students will be offered full-time employment on the basis of a successful period of work experience.

Finding a job

Typically job vacancies will be advertised in the national press, local press and scientific journals or through specialist recruitment agencies or websites. However, many positions are not advertised; as a result, good networking skills are essential to target prospective employers with speculative applications. While some companies will have specific closing dates for graduate programmes, many recruiters in the science sector fill their vacancies through ongoing recruitment.

The recruitment process

Recruitment processes vary according to the type and size of employer you are interested in. Larger organisations tend to hold a first round interview followed by a second round interview if successful in the first round. Smaller organisations often have only one interview.

A first round interview is an initial meeting and questions will be general, with the focus on your CV or application form. A panel generally consists of two people: one representative from HR and one from the department that you are applying to. More often than not, it could be your future supervisor (eg a lab supervisor).

Second round interviews are also likely to be a panel of two: a representative from HR and again somebody from the area that you applied to, but of a more senior level than the first interview, eg a laboratory manager. The questions at this stage will be of a more technical nature focusing on your knowledge of the area and your work experience. Assessment centres are also used by some of the larger recruiters. These generally consist of an interview, a group observation exercise and an aptitude test.

What employers want

Because of the technical nature of most jobs in the science sector, employers will specify the qualifications, skills and personal qualities that they require. Technical skills are important and are obviously a minimum requirement

when applying for a technical role. Less obviously, what are known as 'soft skills' are equally important. Most industries require those working in scientific areas to possess good organisational and planning skills; communication and team working skills; IT skills; flexibility and adaptability; the ability to work quickly, accurately, and independently; and logical and critical thinking. This is true both when applying for jobs and in your future career development. Of course, you will need to be a wizard in your specialist area but you also need to grow as a person. This allows you to take advantage of opportunities and challenges that you meet along the path of your career.

find out more

Job search

- Graduate jobs and advice – gradireland.com, targetjobs.co.uk
- PharmaChemical Ireland – industry federation within IBEC www.pharmachemicalireland.ie
- National Recruitment Federation (Ireland) – search for recruitment consultants by sector and location www.nrf.ie
- Science Recruitment Ireland www.sri.ie
- Public Appointments Service www.publicjobs.ie
- EURAXESS Ireland – research network www.euraxess.ie
- The Recruitment & Employment Federation (UK) www.rec.uk.com
- Pharmajobs www.pharmajobs.co.uk
- Jobs in Science www.jobsinscience.com
- SRG (recruitment consultants) www.srg.co.uk
- Careerscene (biomedical jobs) www.careerscene.com
- IDA Ireland (Industrial Development Agency) – database of European and international companies operating in Ireland www.idaireland.com
- www.science.ie Careers information
- www.science-ireland.ie Science Ireland

Newspapers

Ireland

- *Irish Independent* (Thursday & Sunday)
- *The Irish Times* (Friday)

UK

- *The Guardian* (Tuesday)
- *New Scientist* (Thursday)
- *Nature* (Thursday)
- *The Times Educational Supplement* (Friday)

Work experience

- IAESTE – The International Association for the Exchange of Students for Technical Experience www.iaeste.ie

Areas of work

Whichever sector you choose to work in, a variety of different roles are available to you.

Research & development

The focus of research and development (R&D) is mainly on creating products, processes or commercial applications using innovative, multidisciplinary approaches. Current R&D activity in private industry in Ireland is focused on clean and green technologies, life sciences and pharmaceuticals, according to Dr Martin Lyes, Research & Innovation Manager, Enterprise Ireland.

Manufacturing

Ireland continues to be a favoured manufacturing base for leading biotechnology, medical device, pharmaceutical and chemical companies. Scientists working in manufacturing and production turn raw materials into finished products. This involves the design, development and implementation of systems and procedures and the planning and control of scientific equipment to ensure that products are of specified quality. You could also be involved in process development, which entails improving existing manufacturing processes.

Quality assurance and control

Quality assurance (QA) or quality control (QC) involves ensuring that products are manufactured to a high quality in accordance with the recommended standards, and involves analysing raw materials, intermediates and the finished product. Quality is important at all stages of production, from the initial stages when raw materials are received to ensuring that standards are met during the production phase, and testing and monitoring the product at the completion stage to ensure that it meets the required standard. You could be involved in monitoring environmental factors like water and air quality, as well as checking and testing raw materials and products in the lab.

Regulatory affairs

Opportunities for regulatory affairs officers, managers and consultants are found in the pharmaceutical, chemical, clinical research, medical device and biotechnology industries.

There will always be opportunities in this area, as companies must comply with legal standards. The US Food and Drug Administration (FDA) continues to rate Irish manufacturers in the pharmaceutical sector positively in terms of regulatory compliance. You could be involved in ensuring regulatory compliance is adhered to for the appropriate Irish and

European guidance documents. You could also be involved in mainstreaming quality systems, such as risk assessments, complaints, rejects, disposal, self-inspection, or batch reviews as required. You may assist the QA team in developing strategies for the overall quality function of the company, too.

Clinical trials

There are many opportunities in the clinical trials industry in Ireland. All medicines must undergo clinical trials before they are granted licences. Scientists are involved in setting up trials to ensure that new pharmaceutical and chemical products are safe for use. You could be involved in lab-based research, or using statistical methods to analyse and interpret results, or managing and monitoring trials.

Other job roles

Other jobs roles you may consider include:

Chemical development engineer

A chemical development engineer creates and develops industrial processes and plants to make products such as chemicals, pharmaceuticals and fuels.

Production engineer

A production engineer designs, implements, monitors and maintains manufacturing processes to achieve the most efficient, cost-effective and high-quality production possible.

Process development engineer

Process development engineers aim to optimise the performance of manufacturing systems by improving the quality of the product, increasing production capacity and reducing costs.

Microbiologist

Microbiologists study microbes, including bacteria, viruses, fungi, algae and protozoa. Areas of specialism include: basic research; medicine; healthcare; food; industry, such as pharmaceuticals, toiletries and biotechnology, agriculture and the environment.

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Pharmaceutical industry

This is a large sector offering numerous career opportunities.

Opportunities in the pharmaceutical, biotechnology and medical device industries are diverse and many, offering a range of excellent career options.

Pharmaceutical

Drug discovery is the starting point for a new medicine. Because many diseases cannot yet be cured, or because existing treatment may cause unwanted side effects, new medicines that work in different ways are constantly being sought. Chemists, biologists, pharmacologists, IT specialists and colleagues from a variety of other science disciplines work in teams to try to identify chemical compounds that might eventually become a medicine.

Drug development is the next phase. Once a chemical compound has been found that could possibly work to treat the target disease, a variety of tests must be carried out to ensure that the compound can be made on a viable scale, formulated into a medicine and given to patients without causing them harm. Clinical trials are important to ensure

the medicine works safely and effectively. It is first tested on animals before moving on to 'Phase One' trials on human beings.

Manufacturing the medicine involves making the chemical compound and then mixing it with other substances to make a tablet, cream or aerosol that enables patients to take it. Safety and quality assurance is paramount, demanding constant vigilance and careful control at every step. Ireland continues to have an excellent reputation for quality. Scientists, engineers, IT specialists and many others are involved at both stages. There will always be opportunities for professionals in the areas of health and safety, validation, regulatory affairs and compliance.

Biotechnology

Biotechnology graduates are employed in many industries including pharmaceutical, medical technologies, research organisations (academic or industrial), food processing, drinks manufacturers and more. Within the medical technologies sector there are specialties such as cardiovascular, diagnostics and ophthalmic, along with businesses manufacturing medical equipment and hospital products.

Roles for biotechnology graduates include quality assurance and quality control technicians, biochemists, analytical chemists, microbiologists and process engineers. Graduates with degrees in biotechnology, microbiology, chemistry or biochemistry are always in demand in this sector.

Medical devices

Medical devices are vast in number, and include everything from wheelchairs and beds, to cardiac stents and MRI scanners. Sectors in the industry include cardiovascular, orthopaedics, diagnostics and ophthalmics, while other key sub-sectors include contract manufacturing, medical equipment, filtration, and hospital products.

Job roles in the medical device industry are wide ranging. They include product design engineering, production and manufacturing, sales and marketing, quality assurance and quality control, regulatory and legal affairs, and R&D.

The medical device industry is a sizeable employer with diverse career opportunities. Medical device manufacturing and support companies are predominantly located in the Midlands, west and north-west areas.



Food industry

The food industry is a dynamic and fast-paced sector with good promotional prospects.

There is a diverse range of jobs open to you in the food industry, from the scientific and technological to the creative. A lot more work goes into the manufacturing of food than meets the eye: we are all familiar with the end product but we may not be as familiar with the processes which take place before the final product is produced. The main areas of opportunity include product development, food technology, quality assurance and R&D.

Food technology and product development

Food technologists plan the manufacture of food and drink products. Working on ingredients and technologies that lead to the development of new recipes is a key part of the role. Conducting experiments, designing processes and machinery are also central.

A food related degree is advantageous but degrees in microbiology, biochemistry, nutrition, and applied chemistry are also extremely beneficial. Applied science, mathematical science and physical sciences are also recognised to gain entry to this area.

Quality assurance

Food safety is of paramount importance. Those involved in quality assurance ensure that the product meets the highest standards. This involves checking and double checking from

the start of the process right through to finish. It is essential that candidates have a methodical approach to their work and a good eye for detail.

Research and product development

This involves producing new products to a high standard of quality that can be kept fresh and safe until they reach the consumer. It is also important to maintain competitiveness within the industry. Food scientists are involved in research at various levels both in private companies and in public research facilities (including universities). Opportunities also exist in food companies and food research institutes. Graduates with a primary degree or a masters mostly work in positions as research technologists while those with a PhD typically work as project leaders, research project coordinators, research directors or university professors.

Opportunities are available in organisations such as beverage companies, canning plants, dairy companies, confectionery companies, cereal and grain companies, meat producing firms, food manufacturing firms, flavour and fragrance companies, food equipment companies and frozen foods companies.

There are also opportunities in the public sector, for example in government departments, the Food Safety Authority of Ireland and Teagasc.



Environmental science

There is a wide range of career opportunities for scientists with an interest in the environment.

Management of the environment is assuming increasing importance, as indicated by government initiatives in pollution control, conservation and environmental impact assessment at both national and EU level. Career opportunities exist for graduates with a degree in environmental science and related disciplines such as chemical, biomedical and pharmaceutical sciences.

Earth and life scientists are involved in a wide variety of environmentally based careers which draw upon the skills of field work, observational methods, laboratory techniques and computer based studies. For example, scientists in the laboratory may analyse water pollution caused by industry and agriculture, testing water samples to find the type, concentration and source of the pollution.

The main areas of environmental science include climate change, the environment and health, the protection of nature and biodiversity, resource management and waste management. The majority of opportunities lie in the areas of environmental management and conservation and environmental protection and control.

There is a growing demand in industry, business and state agencies for graduates in the environmental sciences. Career opportunities are available with a range of employers, including public sector employers, industry and manufacturing, energy production companies, environmental protection industries, transport companies and university-linked research departments/institutes.

Local authorities

Job roles in local authorities are in the areas of environmental management and control, waste management and operations, drainage and water. Producing and adhering to a strategic environmental assessment statement is also a key activity.

Environmental consultancies

Working for an environmental consultancy involves environmental auditing, working on environmental impact assessments and statements, and developing environmentally sustainable solutions. This could cover areas such as renewable energies; environmental training and safety; ecological surveys of terrestrial, aquatic, air, flora, fauna and noise; and consultative advice on integrating environmental policies in all sectors. You could be working



with clients in industry, business, agriculture, construction or engineering (in both the public and private sectors).

State organisations with environmental responsibilities

In the ROI, these include organisations such as:

- the Heritage Council
- Teagasc
- the Health & Safety Authority
- the Environmental Protection Agency
- the Department of the Environment, Heritage and Local Government
- the Marine Institute
- Coillte Teoranta.

In Northern Ireland, these include:

- the Department of the Environment
- the Department of Agriculture and Rural Development
- the Northern Ireland Environment Agency
- the Health & Safety Executive in Northern Ireland.

These employers require graduates with a scientific understanding of environmental problems along with the technical skills to deal with these problems and an understanding of the managerial aspects of environmental control. See page 12 for more information about working in the public sector.

Public sector

Working in the public sector offers a wide choice of careers.

There is a wide range of careers to choose from in the public sector, which is made up of local government (local authorities) and the civil service. Public sector employers include public analyst laboratories, forensic science laboratories, state laboratories, local authorities and environmental and health agencies.

In the Republic of Ireland, you should apply for civil service jobs through the Public Appointments Service (www.publicjobs.ie) and in Northern Ireland through www.nicsrecruitment.gov.uk.

Specialist scientific posts are available within the Northern Ireland Civil Service. Examples are Scientific Officer – Biometrics and Higher Scientific Officer – Marine Biology. These posts will require a specific degree, sometimes at postgraduate level. Most of the laboratories are situated within the Greater Belfast area. Jobs are also available with the Department of Agriculture and Rural Development (www.dardni.gov.uk), in the NI Environment Agency (www.ni-environment.gov.uk) and in the Health and Safety Executive for Northern Ireland (www.hseni.gov.uk).

Forensic science

The Forensic Science Laboratory is part of the Republic of Ireland's Department of Justice, Equality and Law Reform and provides a scientific analytical service in criminal

investigation. Work by the laboratory is carried out mainly for the Gardai and through them for the courts. The laboratory is divided into four sections: Biology (crimes against the person, eg sexual assault and murder), Chemistry (mainly crime against property), DNA (eg genetic fingerprinting) and Drugs/Toxicology (analysis of substances thought to contravene the Misuse of Drugs Act). All staff employed are civil servants. Vacancies are advertised in the national papers and recruitment is by competitive interview. The equivalent in Northern Ireland is Forensic Science Northern Ireland (www.fsni.gov.uk), although job opportunities are rare.

Laboratory work

The State Laboratory provides a comprehensive analytical and advisory service to ROI government departments and offices, enabling them to implement and formulate the technical aspects of national and EU legislation. The State Laboratory is divided into 12 sections: Agriculture, Animal Feedstuffs, Molecular Biology/Microbiology, Corporate Services, Environmental Heritage and Consumer Protection, Customs, Human Toxicology, Revenue-Excise, Quality Assurance, Veterinary Toxicology and Information Technology.

Health service roles

The Health Service Executive (HSE) is responsible for providing Health and Personal Social Services for everyone living in the Republic of Ireland. Career opportunities exist in the Science Laboratory for analytical chemists, biochemists, medical scientists, pathology technicians and physicists. All positions are advertised on www.careersinhealthcare.ie and www.hospitaljobs.ie, as well as in the national and local press each week. In Northern Ireland, lab work can be available for biomedical scientists in hospitals.

Local authorities

A career in local government offers opportunities with excellent benefits and career progression. Each authority has its own personnel department which looks after all local recruitment and selection processes. Applications can be made by contacting each local authority directly. See the Department of Environment, Heritage and Local Government website (www.envirom.ie) for contact details of local authorities.



Alternative careers

Not every science graduate wants to work in a lab. The good news is there are plenty of alternatives.

Alternative job roles

Working in a laboratory is not for everybody. The attractiveness of having a science degree is that there is an array of diverse and exciting opportunities out there that do not involve working in the lab.

Regulatory affairs

It is crucial that all pharmaceutical, medical device, veterinary and cosmetic products are registered before they can be marketed for sale. Working in regulatory affairs involves the preparation of scientific and technical information to support approval globally, and keeping abreast of changes in legislation and informing colleagues accordingly. Job roles include:

- regulatory affairs specialist/manager
- quality and regulatory affairs engineer
- research scientist
- process development chemist

Sales and marketing

This involves informing physicians and patients about new medicines that come onto the market. It includes visiting hospitals and GPs' surgeries, informing them of new drugs coming onto the market and ultimately selling the products. Jobs in the area include:

- marketing manager
- medical sales representative
- hospital sales representative

Patents

Patent examiners assess applications for patents, which are granted to inventors, giving them the right to stop others using, selling or making their inventions.

A good honours degree in science is essential along with relevant industrial experience which need not necessarily relate to patents and documentation. While opportunities in Ireland are limited, the UK patent office and the European patent office should be explored. For the latter, fluency in two languages is required: English and either German or French (a working knowledge of a third is preferred).

Medical writing

Medical writers are mainly employed by pharmaceutical and biotechnology firms. The work involves writing reports, which include drug registration, promotional literature,



training manuals and clinical studies. A good knowledge of physiology and anatomy is essential along with good writing and word-processing skills, and attention to detail.

Scientific publishing

If you have a flair for writing and a strong scientific background, then scientific publishing could be the career for you. There are several job roles involved in this area ranging from editorial assistant to marketing executive.

Teaching

If you enjoy science and would like to communicate your knowledge to the next generation, then a career in teaching may be for you. Excellent organisational and administrative skills are also very important.

Banking and finance

Considerable numbers of science graduates pursue careers in the banking and finance area, particularly those who graduate from the more numerate disciplines such as physics, chemistry and mathematics. Accountancy is also an area where science graduates pursue very successful careers. See [gradireland Finance](#) for further information on this career choice.

My science career

Science offers a huge range of career opportunities. Two graduates share their experiences.

'Testing new products'

Name Ciaran Dawdry

Job Quality Control Analyst

Employer Takeda Ireland Ltd

Education BSc Physical and Life Sciences, Dublin Institute of Technology (2007)



I work for a pharmaceutical company in the finished goods department, dealing with drugs for life-altering conditions like insomnia, diabetes and hypertension. I have been working here since February 2008.

My role

My job is to carry out various chemical tests on finished products, such as identifying different active pharmaceutical ingredients and checking for contamination. These involve using different tests and instrumentation including UV, dissolutions testers and disintegrators. Over a six-week period I do six main tests. One week I might work on related substances, analysing contaminants in samples using high-performance liquid chromatography (HPLC). The next week I could be looking after content uniformity of the samples using the UV.

I'll also receive ongoing training for new products and schemes within the company, such as our Lean Lab initiative, which is all about eliminating inefficiencies and non value-added activities in the lab. In the future, I might look into further study and I'd also like to get into environmental analysing, but at the moment I'm enjoying getting a good grounding in pharmaceutical work.

Advice for graduates

It can take a while to get that first job – it took me about six months – but it's important to stick it out and not get disheartened. After college I worked for an active pharmaceutical ingredient (API) plant in Cork, which was useful experience in communicating with people from a pharmaceutical background. Get any relevant work experience you can.

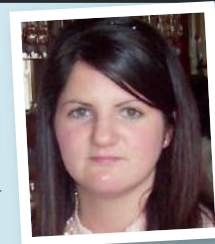
'A varied technical role'

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I enjoyed maths and science at school and became interested in the practical applications of these subjects, so I went on to study engineering at university. I always wanted a hands-on engineering role, and when I attended a careers event at university I was impressed by my current employer's graduate development programme. After joining the scheme I completed job rotations in the Manufacturing and Research & Development departments.

Solving problems on the line

I work for a medical device manufacturer where I enjoy a very technical role. On a day-to-day basis I deal with material problems on the polymer processing lines. I work from 8.00 am to 5.30 pm Monday to Thursday and finish at 1.00 pm on a Friday, which is great. My work is very varied; I could be on the manufacturing floor conducting trials, or at my desk doing root cause analysis or report writing. I also travel frequently to various sites in the USA. Recently I worked on a problem where I ran investigations in Galway and then flew to Boston to continue trials and analysis before finding the solution.

Top tips

I studied for my PhD before starting work, but if you are torn between postgraduate study and an exciting job offer, speak to your prospective employer as they may support you through further education. Bear in mind that a first job isn't for ever so don't be afraid to relocate or take a role in a different engineering discipline – you may be pleasantly surprised. Also ensure you get involved to make the most of your early career: I chair a society that organises technical and social events for the Galway site.

Training and career development

Further study and professional qualifications can improve your long-term career prospects.

Obtaining an undergraduate degree is a fantastic achievement. However, on its own an undergraduate degree may not suffice for career advancement. Reaching a glass ceiling is often common for degree holders, but with further study and professional qualifications, this can be overcome. The recent Forfás Business Expenditure on R&D report stated that ‘in 2007, 61 per cent of enterprises with PhD researchers employed indicated that they were very likely or quite likely to increase the number of PhD researchers employed over the period 2008 to 2013’.

Postgraduate study

The more qualifications you have, the higher your ceiling of opportunity will be. However, having qualifications without work experience can make it very difficult to enter the job market so it is important to get the balance right.

Postgraduate study is an opportunity for you to explore topics in greater depth. Taught programmes are useful to gain a specialised knowledge of your chosen area of study plus many transferable skills. Employers often seek graduates with specialist knowledge of an area. Taught programmes should not be underestimated, as they are completed in a much shorter time than a research programme. For a taught masters, there is also an element

of research involved (leading to your thesis), again furnishing you with additional skills.

There are two routes to a research degree in the sciences: an MSc or a PhD (masters students can in most cases upgrade to PhD level). You will need to develop a research proposal and identify a suitable supervisor.

A PhD is valued by many employers but is particularly relevant if you aspire to a career in academic research and teaching. During this time you will learn how to publish components of your research and will make contacts with academics in your discipline. You will also have the chance to gain some teaching experience, which is essential when it comes to applying for an academic post.

However, there are many other careers for which a research degree is desirable or essential, for example, working as a scientific researcher for a pharmaceutical company, or commissioning editor for a specialist academic journal. In some very high-tech areas, such as medical research, a postgraduate research qualification is often considered mandatory. You will also find that the skills you acquire during your research will equip you well for many other fields of work and could give you a valuable edge in the employment market.

See postgradireland.com/science for more information about postgraduate study.



University-linked institutes

There has been significant investment in third-level institutions to promote and develop high quality research capabilities. University-linked research institutes provide support for researchers and teams within educational institutions. Co-operation between researchers and teams within institutes is encouraged, as is inter-institutional co-operation: the

majority work in collaboration with other institutes. Many opportunities exist within these institutes across a wide range of disciplines.

Various university-linked institutes exist within the areas of environmental and natural resources (eg the Environmental Change Institute and the Marine Science Research Programme – Martin Ryan

Institute, both at NUI Galway, and the Urban Institute at UCD), bioscience and biomedical (eg the Biosciences Institute at UCC and the Institute of Immunology at NUI Maynooth), and physical sciences and technology (eg the Materials and Surface Science Institute at the University of Limerick and the National Centre for Sensor Research at DCU).

Professional bodies

Once you are in employment, joining a professional body will enhance your career prospects by providing the opportunity for Continuing Professional Development (CPD). Joining such a body will give you access to courses and professional qualifications that are delivered by experts trained to a very high standard. Courses are delivered through part-time and distance learning modes, which allow you to remain in employment and accelerate up the career ladder at the same time. Another advantage of joining a professional body is access to vast resources of information through monthly magazines, publications and libraries.

When starting out on your career, the ability to build up a network of contacts is of utmost importance and this is one of the huge advantages of joining a professional body. Becoming a member of a professional body will give you the stamp of approval to show that you possess the relevant level of academic achievement, skills and experience to operate effectively in your chosen career area.

Moving into management

It is not uncommon for graduates having gained many years' experience in their specialist area of science to enhance their career further by moving into management positions. It is advisable to get several years' work experience before contemplating a qualification in management. At this point you will have discovered the positive and negative points of working in your chosen field, as well as career choices open to you. You may be lucky to get some exposure to the business and entrepreneurial aspects of little projects that spark an interest in business and management.

Opportunities for science graduates with some work experience include management consultancy, venture capital, investment banking and business development. The Masters in Business Administration (MBA) will benefit those

who wish to be effective at strategic level, and will provide an invaluable opportunity to develop your career. The MBA is an excellent qualification which will improve your chances of success, whether you decide to start up your own business or to be employed by somebody else.

find out more

Professional bodies

- Institute of Physics in Ireland www.iopireland.org
- The Institute of Chemistry of Ireland www.chemistryireland.org
- Institute of Biomedical Science (IBMS) www.ibms.org
- The Academy of Medical Laboratory Science www.aml.ie
- Society of Biology www.societyofbiology.org
- Royal Society of Chemistry www.rsc.org
- Society for General Microbiology www.sgm.ac.uk
- Society for Applied Microbiology www.sfam.org.uk
- The Royal Pharmaceutical Society www.rpsgb.org.uk
- IDA Ireland (Industrial Development Agency) – database of European and international companies operating in Ireland www.idaireland.com
- www.science.ie Careers information

Research funding

- Irish Research Council for Science, Engineering and Technology www.ircset.ie
- Health Research Board www.hrb.ie
- Marine Institute www.marine.ie
- Environmental Protection Agency www.epa.ie
- Teagasc www.teagasc.ie
- Engineering and Physical Sciences Research Council www.epsrc.ac.uk
- Science Foundation Ireland www.sfi.ie