Microbiology

**Your skills and the employment market**

**Scientific knowledge and skills:**
- Microscopy skills;
- Microbial identification;
- Practical laboratory skills;
- Ability to manipulate statistics;
- Communicate scientific concepts, experimental results & analytical arguments clearly & concisely, verbally and in writing;
- Access information and use it in synthesis and problem solving activities;
- Critically analyse and evaluate information from multiple sources and perspectives;
- Understand and use the processes of scientific inquiry, scientific method and hypothesis formulation and testing.

**Transferable skills:** e.g. Communication skills, teamwork skills, leadership skills, management & organisational skills.

**Potential Career Opportunities & Industry Sectors**

Microbiologists are in demand in various sectors including:

**Research:** employed in universities, research institutes, hospitals and industry. (e.g. Mycologists (fungi), Bacteriologists (bacteria), Virologists (viruses), Immunologists (immune system). Or **Medical Research**, e.g. studying topics including how diseases develop. Or **Healthcare Research** finding ways of identifying, preventing and treating infectious diseases. Microbiologists are also helping to pioneer gene therapy techniques against genetic disorders such as cystic fibrosis and inherited cancers. Microbiologists may also work in Health Protection Agency laboratories, e.g. tracking down sources of food poisoning.

**Pharmaceuticals & Manufacturing:** The Irish pharmaceutical industry is a great commercial success, employing thousands of scientists in research facilities and manufacturing plants. This industry is dominated by multinational companies, including Wyeth, GlaxoSmithKline, Bristol Myers Squibb, Pfizer, Merck & Elan. Microbiologists play a part in the manufacture of pharmaceuticals e.g. scaling up growth of microorganisms. Microbiologists help organise clinical trials to evaluate new drugs. Others work outside the lab in registration of new products.

**Medical Devices Industry** is another large source of employment for microbiology graduates with a large portion of the world’s top 25 medical device companies and diagnostics companies based in Ireland.

**Start-ups/Spin out companies:** The number of small to medium size biotechnology companies (that employ microbiologists) has increased in recent years.

**Biochemicals:** Microbiologists are involved in producing many other useful compounds including: enzymes for a variety of uses including molecular biology kits (DNA fingerprinting), washing powders and in the food industry.

**Cosmetics & toiletries:** Microbiologists check the effectiveness of anti-microbial products such as creams against acne and anti-dandruff shampoos.

**Food & Drink:** Microbes have been used for centuries to produce foods such as bread, cheese and yoghurt and alcoholic beverages like wine and beer. Microbiologists are needed at all stages of modern food production.

**Agriculture:** Some microbiologists carry out research on the important role that microbes play in agriculture and in the soil (silage production). Others investigate crop pathogens and develop products to control them.

**The environment:** e.g. studying the ecology of microbes in different habitats e.g. the ocean, salt lakes, Antarctica. Using microbes to treat industrial waste or to solve pollution problems (bioremediation).

**Working outside the lab…**

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<tr>
<th>Industry (e.g.)</th>
<th>Business (e.g.)</th>
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<tr>
<td>Sales &amp; marketing (e.g. medical sales)</td>
<td>Technology Transfer (Biototechnology)</td>
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<td>Technical support</td>
<td>Patent Law</td>
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<td>Product registration</td>
<td>Bioscience</td>
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<td>Clinical trials Admin</td>
<td>Business development</td>
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<td>Regulatory Affairs</td>
<td>HR (Consultant)</td>
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<tr>
<th>Education (e.g.)</th>
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<td>School teacher</td>
<td>Science journalism</td>
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<tr>
<td>Lecturer</td>
<td>Medical / technical writing</td>
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<td>Science centre explainer</td>
<td>Scientific editing / publishing</td>
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<td>Specialist librarian</td>
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Further study opportunities

Some of the courses chosen by graduates in the past at NUI Galway (www.nuigalway.ie/courses) were:
- Structured PhD
- MSc Cancer Research
- Master of Biomedical Science
- Postgraduate Diploma in Applied Microbiology
- HDip Occupational Health & Safety & Hygiene
- MSc Toxicology
- MSc Biotechnology
- MSc Climate Change, Agriculture and Food Security
- MA Health Promotion
- Professional Master of Education
- MSc Regenerative Medicine

Other courses taken by graduates were:
- MSc Diagnostic Radiography, Edinburgh
- Environment Mgt & Ecological Biology, Queens
- Nutrition, Glasgow
- Food Microbiology, UCC
- Masters Business and Biotechnology, UCD
- Biomedical Science, Ulster
- Pharmaceutical/med device manufacturing, Tallaght
- Masters of Pharmacy, Ulster
- MSc Healthcare Infection Management, TCD
- PhD, Teagasc

The website www.postgradireland.com contains useful information on postgraduate courses in Ireland, www.prospects.ac.uk has opportunities in the UK and http://ec.europa.eu/ploteus/ covers the EU.

Sample Job Advertisements

Some jobs advertised recently that may suit students / graduates (these jobs are not currently available and are shown here for illustration purposes only).

Biomedical Vacation Scholarships, Wellcome Trust. Applicants must be at a university within the UK or ROI and be undergraduates in the middle year of a first degree.

Patent Examiner, European Patent Office. Combines scientific expertise with analytical research and an eye for the legal aspects of intellectual property. Full university degree in physics, chemistry, engineering or natural sciences.

QC Microbiology Analyst, Regeneron. Perform a wide variety of microbial testing to support raw material, utilities, in-process and bulk drug substance manufacture in a cGMP regulatory environment.

Pharmaceutical Microbiologist, CLS. Strong documentation and technical skills are required. Must have strong written and verbal communication skills. A strong team player is essential.


What past graduates have done

Here is a sample of the destinations of past students who studied Microbiology. These have been taken from our annual graduate survey.

- Diagnostic Technologist, Abbott Diagnostics
- Microbiology Laboratory Analyst, Abvie
- Manufacturing Technician, Allergan
- Quality Control Analyst, Allergan
- Quality Technician, Boston Scientific
- Lab Technician, Charles River Laboratories
- Microbiology Technician, CLS
- Microbiology Dept., Dairygold
- Lab Testing Officer, Norbrook (Newry)
- Biotech Production Analyst, Regeneron
- Operations Support Microbiologist, Stryker
- Laboratory Associate, Ballina Beverages(Coca Cola)
- R & D Documentation Assistant, Mylan Pharma
- Raw Materials Analyst, Pepsi, Cork
- Internship - Brewing, Eight Degrees, Cork
- QC Analyst, Reliance Genemedex, Offaly
- Internship Laboratory Technician. ICON
- Quality Technician, Hilton Foods, Galway
- Lab Technician, Elanco, Sligo

Resources in the Careers Information Room

Reference material in the Information Room includes:
- Job Sector files ‘V’ including Science in industry and Science in the public sector.
- Careers with a degree in Science –book
- New Scientist graduate special

We also have a range of titles to reference on taking psychometric tests, going for interview, writing a CV or personal statement... and much more. Pick up our free booklets ‘Your CV’ and ‘Interview Skills’.

Drop into our information room and we will be happy to assist you – there’s no need to book an appointment to browse through our resources.

Useful websites

- www.gradireland.com
- www.iscm.ie
- www.ida.ie
- www.science.ie
- www.ibec.ie/IBIA
- www.biopharmaceuticalireland.ie
- www.prospects.ac.uk/options_microbiology.htm
- http://jobs.newscientist.com
- www.sgm-microbiologycareers.org.uk/careers.html
- www.ibms.org/go/biomedical-science/
- www.nhscareers.nhs.uk/
- www.absw.org.uk
- www.csm-scm.org/english/stu_resources.asp
- www.microbiologycareers.org/
- www.simbhq.org/careers/career-information/