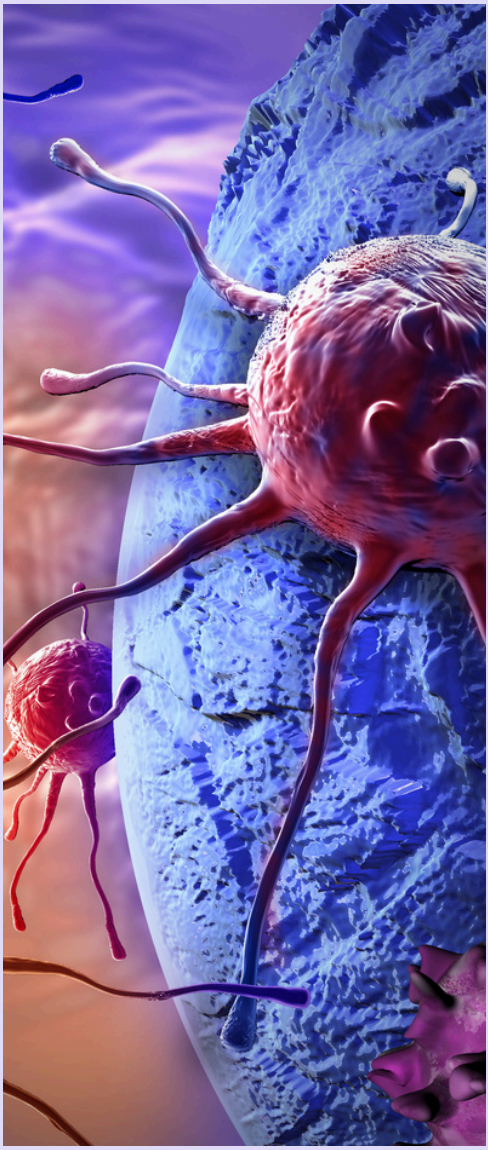
Cambridge Centre for
Innovation and Development©

PROFESSIONAL DIPLOMA



GENOMICS AND CANCER BIOLOGY RESEARCH

10-11 Months
Online (Part-Time)

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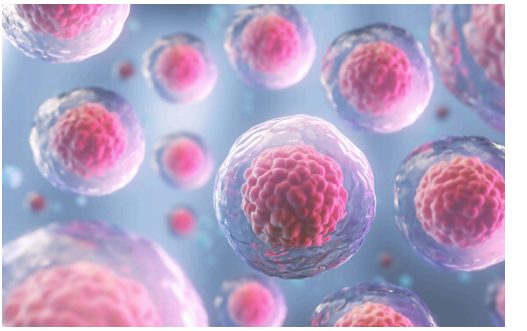
OVERVIEW



The Professional Diploma (PD) in Genomics and Cancer Biology Research is an intensive, multidisciplinary 11-month programme designed to prepare the next generation of researchers, practitioners, and innovators at the intersection of Genomics and Cancer Research.

The Diploma in Genomics and Cancer Biology Research is a rigorous 11-month interdisciplinary programme designed to equip learners with deep expertise in the molecular foundations, experimental techniques, and translational research methods used in cancer biology and genomics. As cancer continues to be a leading cause of morbidity and mortality worldwide, the need for highly trained professionals in oncological research, precision medicine, and genomic science has never been more critical.
This professional diploma blends foundational and advanced concepts in cancer biology, immunology, genomics, and molecular laboratory techniques with hands-on training and applied research experience.

Whether you are a life sciences graduate, an early-career researcher, or a medical professional seeking to specialise in oncology-related science, this programme offers a unique opportunity to advance your knowledge and career in biomedical research. Modern biomedical research relies heavily on experimental techniques.
This programme includes specialised modules in Cell Culture Techniques, Spectroscopic Analysis, Blotting Methods, and Flow Cytometry, enabling participants to gain technical proficiency in standard and advanced lab protocols used in cancer and genomics research.

THE VISION BEHIND THE PROGRAMME

The field of cancer research is evolving rapidly with the advent of high-throughput genomic technologies, immunotherapies, and precision medicine. At the same time, understanding the biological underpinnings of cancer—from genetic mutations to immune escape mechanisms—remains central to developing effective diagnostics, treatments, and preventative strategies.
This diploma programme is purposefully designed to meet the growing demand for professionals who can:

- Comprehend the complex biology of cancer and tumour progression
- Apply genomic techniques to investigate disease mechanisms
- Operate core molecular biology tools and interpret experimental data
- Engage in scientific research and paper writing
- Understand how immune responses influence cancer development and treatment
- Collaborate in interdisciplinary research environments, bridging laboratory and clinical insights

This professional diploma is purpose-built to meet these needs. This diploma provides in-depth academic grounding in Cancer Biology and Immunology, equipping students with knowledge about tumour formation, oncogenes, tumour suppressor genes, metastasis, and the immune system's dual role in both controlling and promoting tumour progression. Alongside, a dedicated course on Basic Genomics introduces students to genome architecture, next-generation sequencing, and bioinformatics tools, creating a holistic view of cancer at the molecular level.

PROGRAMME CONTENT

PART 1: CANCER BIOLOGY AND IMMUNOLOGY RESEARCH

In the first two modules of this course, you'll develop your core scientific and experimental skills across the breadth of cancer biology and immunology including an overview of the latest immunology research such as urological cancer, skin carcinomas, and immunology aspects of COVID-19. In the last two modules, you will learn about data analysis methods and data sources for cancer research including statistical analysis software, ELISA, and flow cytometry. You will also have the opportunity to use your skills and knowledge to work on a final project. This will develop your skills further in cancer biology and immunology research.

Module 1: Basics of cancer biology and immunology:

Explore the basics of cancer biology and immunology. Gain a clear understanding of the basics of cancer, including the definition, types, and prevalence. Explore the cellular and molecular mechanisms underlying cancer development.

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Understand the concept of the tumor microenvironment and its influence on cancer cell behavior. Explore the interactions between cancer cells and surrounding tissues.

Module 2: Applications of cancer biology and immunology:

Delve into the latest research strategies in cancer immunotherapy. Learn about the latest applications and developments in cancer research and immunology. For instance, urological cancer, skin carcinomas, and immunology aspects of Covid-19. Build on foundational research knowledge and explore advanced research studies in cancer biology.

Module 3: Cancer data sources and data analysis methods:

Explore cancer data sources and data analysis methods in cancer research. Explore major cancer databases and repositories. Learn how to access and utilize these resources for comprehensive cancer data mining. This module will also include statistical analysis software, ELISA, and flow cytometry analysis.

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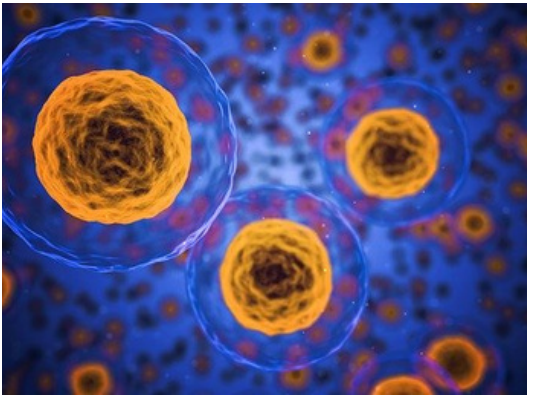
Explore how to perform basic statistical analysis and data visualization.

Module 4: Final Project Report:

Apply your knowledge of cancer biology and immunology in a final project report. Gain insights into the key components and structure of a project report, including the introduction, discussion, and conclusion. Understand the importance of contextualizing your work within the broader landscape of cancer biology and immunology. Develop skills in interpreting research results and relating them to the broader context of cancer biology and immunology. Explore effective strategies for discussing both expected and unexpected outcomes. Understand the importance of proper citation and referencing in maintaining academic integrity.



PART 2: MEDICAL GENOMICS

This part will provide you the knowledge of medical genomics and genomic technologies. It will provide you with the knowledge to participate in genomic research. You will explore the application of genomic technologies in medicine.

In the first two modules, you'll develop your core scientific understanding across the

PROGRAMME CONTENT

breadth of genomics including an overview of medical genetics and genomic technologies. In the last two modules, you will learn about the latest applications of genomic technologies such as gene discovery and genomic technologies for cancer research. You will also have the opportunity to use your skills and knowledge to work on a final project. This will provide you the opportunity to develop your skills further in genomics.

Module 1: Introduction to medical genetics and genomics:

This module provides guidance to support an in-depth understanding and knowledge of applications of medical genetics and genomics. Embark on a fascinating journey into the fundamental language of life – the DNA code. Uncover the basics of genetics, from the

structure of DNA to the intricacies of gene expression, and explore how these molecular intricacies shape our health. Explore the role of genetics in health and disease. Understand how variations in our genes can contribute to the development of diseases and conditions.

Module 2: Genomic technologies:

In this module, you will be able to

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gain knowledge and applicability of molecular principles behind next-generation sequencing (NGS) technologies. Immerse yourself in the revolutionary landscape of next-generation sequencing, where the limits of genomic exploration are continuously pushed. Explore the evolution of sequencing technologies and understand how NGS has transformed the field of genomics. You will be able to identify applications of these technologies to clinical scenarios and research.

Module 3: Applications of genomic technologies in medicine:

Explore the application of genomic technologies in gene discovery and cancer research. This module will include recent research papers and an in-depth review of the latest

developments. Explore the practical applications of genomic technologies in reshaping the landscape of medical research and patient care. Gain insights into how genomic data is transforming traditional diagnostic approaches. Explore the potential of genomic technologies in developing targeted therapies for a range of diseases. Understand how gene editing and manipulation are

PROGRAMME CONTENT

paving the way for novel treatment modalities and potential cures.

Module 4: Final Research Project:

Apply your knowledge of medical genomics in a final project report. Gain insights into the key components and structure of a project report, including the introduction, discussion, and conclusion. Understand the importance of contextualizing your work within the broader landscape of genomics. Develop skills in interpreting research results and relating them to the broader context of genomics. Explore effective strategies for discussing both expected and unexpected outcomes. Understand the importance of proper citation and referencing in maintaining academic integrity.

PART 3: CELL CULTURE TECHNIQUES

This training will provide you with essential skills and knowledge to work in a laboratory environment and cell culture techniques. It will equip you with the expertise and understanding of cell culture safety, cell culture techniques, issues in cell culture, and applying cell culture in biomedical research. To enhance your cell culture skills and get a

PROGRAMME CONTENT

research-related role, you need specific research and laboratory skills to work in an international research environment. The aim of this training is to develop these specific skills.

Module 1: Introduction to cell culture:

In this module, you will learn about laboratory health safety requirements to perform cell culture. You will also learn the basics of cell culture techniques and cell types.

Module 2: Cell culture techniques:

You will learn about different cell culture techniques and work with the primary cell culture or cell line. You will also learn different methods and cell culture protocols such as cryopreservation of mammalian cells or 3D cell culture.

Module 3: Challenges and issues in cell culture:

In this module, you will learn about the issues and challenges in cell culture. It will help you to avoid mistakes and errors while performing cell culture.

Module 4: Cell culture in biomedical research:

You will learn about the latest applications of cell culture

PROGRAMME CONTENT

techniques for research. You will also develop your research writing skills in this module.

PART 4: SPECTROSCOPIC TECHNIQUES

This training will provide you with essential skills and knowledge of spectroscopic techniques and Nuclear Magnetic Resonance (NMR) spectroscopy. It will equip you with the expertise and understanding of different types of spectroscopic techniques and spectroscopic techniques for research. To enhance your spectroscopic skills and get a research-related role, you need specific research and laboratory skills to work in an international research environment. The aim of this training is to develop these specific skills.

Module 1: Introduction to spectroscopic techniques:

In this module, you will learn about the basics of spectroscopy and the background of spectroscopic techniques. You will also learn the science of spectroscopy.

Module 2: Types of spectroscopy:

You will learn about the types of spectroscopic techniques. You

PROGRAMME CONTENT

will also learn about the methods of performing spectroscopic techniques.

Module 3: Nuclear Magnetic Resonance (NMR) Spectroscopy:

In this module, you will learn about the basics of NMR spectroscopy. It will also help you to learn about the latest NMR spectroscopic techniques for research.

Module 4: Spectroscopic techniques in research:

You will learn about the latest applications of different spectroscopic techniques for research. You will also develop your research writing skills in this module.

PART 5: BLOTTING TECHNIQUES

This training will provide you with essential skills and knowledge of the basics of blotting techniques and emerging techniques of western blotting. It will equip you with the expertise and understanding of different types of blotting techniques and blotting techniques for research. To enhance your blotting techniques skills and get a

PROGRAMME CONTENT

research-related role, you need specific research and laboratory skills to work in an international research environment. The aim of this training is to develop these specific skills.

Module 1: Overview of Blotting:

In this module, you will learn about the basics of blotting techniques and the background of blotting. You will also learn the biology of blotting techniques.

Module 2: Types of blotting techniques:

You will learn about the types of blotting techniques. You will also learn about the methods of performing blotting techniques.

Module 3: Emerging techniques of western blotting:

In this module, you will learn about the emerging techniques

of western blotting. It will also help you to learn about the latest blotting techniques.

Module 4: Blotting technique for research:

You will learn about the latest applications of blotting techniques for research. You will also develop your research writing skills in this module.

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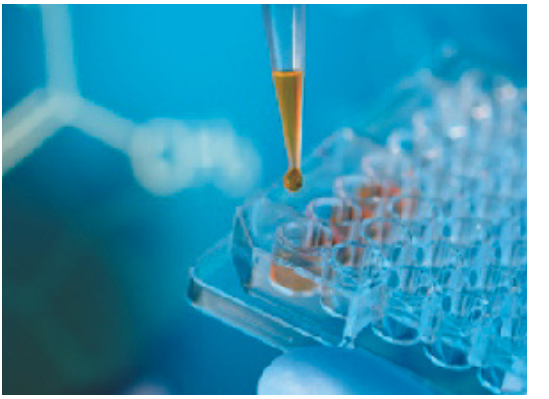
PART 6: FLOW CYTOMETRY

This training will provide you with essential skills and knowledge to work in a laboratory environment and the flow cytometry technique. It will equip you with the expertise and understanding of procedure safety, flow cytometry method, instrumentation, best practices in flow cytometry, and flow cytometry for biomedical research. To enhance your flow cytometry skills and get a research-related role, you need specific research and laboratory skills to work in an international research environment. The aim of this training is to develop these specific skills.

Module 1: Introduction to flow cytometry:



In this module, you will learn about laboratory health safety requirements to perform the flow cytometry technique. You will also learn the basics of flow cytometry techniques.

Module 2: Flow cytometry instrumentation:

You will learn about instrumentation and equipment used in the flow cytometry

PROGRAMME CONTENT

technique. You will also learn different methods and the flow cytometry protocol.

Module 3: Best practices in performing flow cytometry:

In this module, you will learn about the best practices and challenges in performing the flow cytometry technique. It will help you to avoid mistakes and errors while performing flow cytometry.

Module 4: Flow cytometry in biomedical research:

You will learn about the latest applications of flow cytometry for research. You will also develop your research writing skills in this module.

RESEARCH SCIENTIST WORK TRAINING

The 6-Month Volunteer Research Scientist work training is a unique academic and research experience offered alongside the Diploma in Genomics and Cancer Biology Research. This work training provides aspiring researchers, life science graduates, and early-career professionals the opportunity to participate in structured, guided research in the fields of cancer biology, molecular genetics, immunology, and genomic technologies.

Set within the context of a world-class online Professional Diploma (PD) programme, this volunteer role allows individuals to contribute to real-world biomedical research while developing critical competencies in scientific writing, experimental design, interdisciplinary analysis, and peer-reviewed publishing. Whether you are preparing for graduate studies, applying for research fellowships, or transitioning into industry, this role serves as a launchpad for your scientific career. This is a non-paid, voluntary, and virtual 6-month position designed for individuals who wish to gain experience in genomics and cancer research while developing critical research skills, engaging in global academic discourse, and receiving personalised mentorship.

Through structured tasks, collaborative discussions, and expert guidance, participants will emerge with a stronger foundation in both the scientific and professional practices of genomics and cancer biology.

RESEARCH SCIENTIST WORK TRAINING

PURPOSE AND VISION OF THE ROLE

The objective of this research-focused work is to bridge theoretical knowledge with experimental and analytical research practice in the life sciences. Cancer is one of the most complex and heterogeneous diseases known to medicine, and understanding its molecular underpinnings is critical to the development of novel diagnostics, therapies, and prevention strategies.

Through guided projects, reading groups, mentorship, and independent research, participants will engage with research questions in meaningful and measurable ways.

CORE COMPONENTS OF THE WORK TRAINING

1. Active Participation in Research Projects

As a Research Scientist, you will participate in research activities with focus on several research themes within the areas of genomics and cancer research. It offers a rare opportunity to build research competence, contribute to impactful scientific discussions, and develop a tangible research content under expert guidance.

You will engage in tasks such as, literature reviews, academic writing, and poster presentations. While no advanced experience is required,. Familiarity with basics of research and a foundational understanding of cancer biology will be helpful which you will gain

RESEARCH SCIENTIST WORK TRAINING

through courses during your PD programme. Training resources will be provided to support your learning.

2. Research Writing and Scientific Communication

A distinguishing feature of this role is the opportunity to develop and write a research paper during your time in the programme. Participants will be guided through the process of academic writing, including:

- Structuring a research paper
- Writing literature reviews and abstracts
- Presenting data and analysis clearly
- Referencing and citing correctly
- Revising drafts based on feedback

Each participant will receive constructive feedback, including individualised feedback to improve clarity, coherence, and academic rigor. You will work independently on research writing tasks, which can become part of your academic portfolio or future submissions to journals or conferences.

3. Global Online Research Discussions

You will participate in regular virtual discussion sessions with other volunteer researchers from across the globe. These discussions are essential to fostering a sense of academic community, encouraging dialogue, and enhancing your ability to articulate and defend your ideas.
These discussions are moderated by experienced teachers who help guide discussions and ensure every participant is heard and supported.

RESEARCH SCIENTIST WORK TRAINING

4. Mentorship from Academic and/or Industry Experts

As part of your research training, you will have the opportunity to participate in a live mentorship session led by a senior academic based in the UK and a senior researcher working in this field. This session offers a rare chance for real-time, personalised guidance from professionals with deep experience in both scientific research and mentorship.
During this session, you will be able to:

- Ask questions about research careers, postgraduate studies, and fellowships
- Receive advice on choosing research areas, applying for PhD programmes, or transitioning into industry
- Gain insights into publishing research, building academic collaborations, and securing funding
- Learn how experts overcame their own challenges and built successful careers in this field.

These are not a pre-recorded lectures—They are live, sessions, where your questions shape the conversation. These session are arranged usually after 16:00 pm UK time. All the dates and schedule will be available on our learning platform (Moodle).

LEARNING OBJECTIVES

1. Demonstrate in-depth knowledge of cancer biology, immunology, and tumour pathology.

2. Understand and apply genomic concepts in biomedical research.

3. Analyse and interpret molecular data from blotting and flow cytometry experiments.

LEARNING OBJECTIVES

4 Communicate scientific concepts effectively through writing, presentations, infographics, and digital media tailored for different stakeholders, including clinicians, patients, and regulators.

5 Conduct applied research and perform academic writing, and develop PhD and/or Master's research proposals. Design and conduct research experiments and write scientific papers.

6 Engage with academics and pursue further training or careers in academic or industry research.

CAREER AND RESEARCH OUTCOMES

Upon successful completion, participants will be prepared to pursue:

- Research assistant or lab technician roles in cancer and genomic research labs
- Entry into Master's or PhD programmes in Oncology, Genomics, or Molecular Medicine
- Roles in the diagnostic and biotechnology industries
- Internships in translational research, cancer institutes, or public health organisations

This programme is designed to aid professional development in the field of cancer biology, immunology, gene editing in cancer research, and/or cancer therapeutics research, enabling you to further your expertise within an existing career path or to change your career direction. Here are several career paths that individuals with expertise in this field may pursue:

- Cancer Research Scientist/Researcher
- Doctoral/PhD Researcher
- Immunologist
- Clinical Trial Coordinator (Oncology)
- Biotechnology or Pharmaceutical Industry Scientist
- Cancer Genetic Counselor
- Research Assistant
- Public Health Specialist in Oncology

DESIGN AND DELIVERY

This online programme is delivered on our internationally recognised virtual learning platform (Moodle). The programme is self-paced and it can be completed on your schedule within programme's duration. The programme includes recorded lectures, templates, learning material, ebooks, and research-based tasks.

This programme is designed in collaboration with our partner institute (Laboratory Skills Development Centre, London), its academic leaders from international universities, and our Research Team at the Cambridge Centre for Innovation and Development, UK.

Please see details of their collaborators on the website of the Laboratory Skills Development Centre: lsdcentre.com/collab

Please see further details about our Research Team on our website: camcid.org/groups

DUAL CERTIFICATION

1 After completing (passing) all the parts of this programme, you will be provided with an e-certificate of completion for the Professional Diploma (PD) at the **Cambridge Centre for Innovation and Development (CamCID).**

2 You will receive a separate e-certificate for your **Research Scientist** work at the Cambridge Centre for Innovation and Development (CamCID).

3 You will also receive an additional e-certificate (free of cost) for completing the Professional Diploma by our partner institute, the **Laboratory Skills Development Centre, London**

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