Programme Specification

A statement of the knowledge, understanding and skills that underpin a taught programme of study leading to an award from The University of Sheffield

1	**Programme Title**	Cancer Biology and Therapeutics
2	**Programme Code**	OCPT01, OCPT02, OCPT05
3	**JACS Code**	B130
4	**Level of Study**	Postgraduate
5a	**Final Qualification**	Master of Science (MSc)
5b	**QAA FHEQ Level**	7
6a	**Intermediate Qualification(s)**	Postgraduate certificate, postgraduate diploma
6b	**QAA FHEQ Level**	7
7	**Teaching Institution** (if not Sheffield)	Not applicable
8	**Faculty**	Medicine, Dentistry and Health
9	**Department**	Oncology and Metabolism
10	**Other Departments involved in teaching the programme**	Biomedical Science, ScHARR, Dental School
11	**Mode(s) of Attendance**	Full-time or Part-time
12	**Duration of the Programme**	12 months or 24 months
13	**Accrediting Professional or Statutory Body**	None
14	**Date of production/revision**	July 2022

15. Background to the subject area and main features of the programme

Global cancer incidences are rising rapidly each year and are a huge economic burden to society and cause of much suffering to patients and carers alike. Cancer Biology and Therapeutics embraces an ever-widening range of disciplines and unravelling the basis of cancer in addition to development of new therapies is of utmost importance and incorporates a range of employment possibilities. Our MSc programme will give both scientists and clinicians an in-depth understanding of the scientific and clinical challenges pertinent to the management of tissue-specific cancers and offers theoretical and practical training in fundamental aspects of contemporary oncology encompassing the cellular and molecular basis of cancer, tumour microenvironment, cancer epidemiology, diagnosis and treatment, cancer technologies and clinical research.

The course will be run by the Department of Oncology and Metabolism in the Faculty of Medicine, Dentistry & Health which comprises 8 collaborative academic units forming a dedicated network of cancer specialists who are engaged at the cutting edge of translational oncology research. Indeed, our research environment, which encompasses the entire scope from basic research into molecular mechanisms, target identification and validation, and their implementation in new therapies with a strong emphasis on translation to the clinic, enables us to offer excellent research and teaching facilities in multiple areas of contemporary oncology. Students on our MSc programme study a range of modules that provide detailed theory and specific practical skills in Cancer Biology and Therapeutics. Additionally, students have the opportunity to undertake an individual research project in one of our laboratories to provide further practical experience and training in research methods in this area. The research project and literature review, seminar programmes, tutorials and taught modules provide a range of subject specific and transferable skills pertinent to a career in academia or in industry.

16. Programme aims

1. To provide an advanced course of study in the theoretical and practical aspects of the causes and treatment of cancer.

2. To enable students to develop independence of thought, intellectual curiosity and a critical approach to evidence, theories and concepts.

3. To train scientists and clinicians to be able to design, perform, interpret and critically analyse experiments that will help elucidate patho-biological mechanisms of cancer and translation of these into clinical trials/practice.

4. To develop the skills required to critically evaluate new advances in cancer research and be familiar with the analytical methods used in its study.

5. To provide stimulating and enjoyable teaching that is informed and invigorated by the research and scholarship of the staff.

6. To foster a commitment to continuing professional development and lifelong learning.

7. To prepare students for further postgraduate work and/or a professional career in translational oncology or other areas of biomedical research through transferable skills.

17. Programme learning outcomes

Knowledge and understanding: Candidates completing the programme will have:	
Candidates for MSc and PG Certificate and PG Diploma will be able to:	
K1	Demonstrate an in-depth and critical understanding of the factors involved in the normal regulation of cell function, growth and differentiation, how these are altered in cancer, and how such alterations affect the cells directly, modify interactions with the host and drive precision medicine development.
K2	Demonstrate an in-depth and critical understanding of the importance of the modified tumour microenvironment and to relate this to understanding mechanisms of tumour growth, metastasis and drug development.
K3	Demonstrate a critical understanding of cancer epidemiology (incidence, cause and detection), and of statistical principles underlying the design and analysis of clinical trials, studies of aetiology and prognosis.
K4	Describe and critique different approaches to the diagnosis of common cancers including screening, and describe and appraise how the molecular and physiological characteristics of tumours impact subsequent patient treatment and prognosis.
K5	Describe, interpret and appraise the applicability of various therapeutic strategies, including surgery, radiation energy and chemotherapeutic agents used in conventional and novel medical oncology procedures.
In addition, candidates for MSc and PG Diploma will be able to:	
K6	Demonstrate a theoretical critical understanding of the majority of techniques used in current cellular and molecular biology and their applicability in cancer research and clinical diagnosis.
K7	Demonstrate a detailed critical knowledge in the retrieval, interpretation, referencing and presentation of scientific information.
In addition, candidates for MSc will be able to:	
K8	Demonstrate a critical understanding of hypothesis-driven research including experimental design, execution of experiments and analysis of outcomes.

Skills and other attributes: Students completing the programme will be able to:	
Candidates for MSc, PG Diploma and PG Certificate will be able to:	
S1	Retrieve, critically analyse, synthesize and summarise research findings and published literature.
S2	Demonstrate analytical and interpretational skills.
S3	Demonstrate independent thought and judgement in relation to critical analysis of scientific literature and experimental data.
S4	Present information orally and in writing to peers in the scientific world and to the general public.

S5	Analyse and interpret scientific data in a critical, objective manner, and demonstrate the ability to formulate scientific hypotheses.
S6	Make informed critical judgements about the merits of evidence and arguments generating original effective solutions or making reasoned choices about presented solutions as appropriate.
In addition, candidates for MSc will be able to:	
S7	Work in a safe, risk-free way, with consideration for others, taking due account of statutory requirements.
S8	Demonstrate the ability to plan and execute scientific experiments using laboratory equipment and techniques commonly used in translational oncology.

18. Teaching, learning and assessment

Development of the learning outcomes is promoted through the following teaching and learning methods:

The department of Oncology and Metabolism fosters an environment that provides many opportunities for individual and group learning. However, the primary responsibility for learning lies with the student, who must be organised and self-motivated to make the most of the programme. The course integrates a range of teaching styles to provide theoretical information, including lectures, seminars, class discussions/workshops, practical demonstration classes and interactive tutorials. The transferable skills are embedded within all aspects of the conduct and content of the programme, such as the self-learning requirement, preparation for different types of assignments and assessments, tutor feedback, participation in tutorials and opportunities for personal reflection. Indeed, students are expected to undertake a significant amount of independent study using library and web-based resources. Each core module is assessed by a 'seen' written exam which takes the form of a series of essay style questions which the students have 2 days to answer and hand in (they receive it electronically at 9am on day 1 and have to submit electronically by 5pm the following day), and will assess the students' ability to synthesise and use information, not just regurgitate it. In addition students give poster and oral presentations, and written individual assignments. Each student independently produces one critical literature review essay on an original title having done all background work necessary to write a comprehensive review. The student also makes a presentation describing their research project which is prepared with guidance from the supervisor. Practical skills are obtained through a research project which is carried out in a research laboratory under the supervision of an experienced member of staff. The student will write a thesis on the research project with guidance from the supervisor. Tutorials, seminars and individual meetings with staff provide opportunities for discussion and feedback.

The linkage between the main teaching, learning and assessment methods adopted for each outcome are tabulated below.

Learning outcome	Teaching						Assessment				
	Lectures/seminars	Discussion groups/workshops	Problem Based Learning/Practical classes	Research Project	Tutorials	Mock MDT	Oral /poster presentation	Written seen exam	Open book coursework	Literature review/essay	Research dissertation
K1	x	x	x	x	x		x	x	x		x
K2	x	x	x	x	x		x	x	x		x
K3	x	x	x	x	x		x	x	x		x
K4	x	x	x	x	x	x	x	x	x		x
K5	x	x	x	x	x	x	x	x	x		x
K6	x	x	x	x					x		x
K7	x		x	x	x				x	x	x
K8	x	x		x			x				x
S1	x			x	x	x	x	x	x	x	x
S2	x	x	x	x	x	x	x	x	x	x	x
S3				x	x	x	x		x	x	x
S4			x	x	x	x	x	x	x	x	x

S5	x	x	x	x	x		x	x	x	x	x
S6	x	x	x	x	x	x	x	x	x	x	x
S7		x		x	x				x		x
S8		x		x							x

Opportunities to demonstrate achievement of the learning outcomes are provided through the following assessment methods:

The first taught 15 credit module (K1, K5) will be assessed using a seen examination (100%), the three other main taught 15 credit modules (K1-K5, K7) will be assessed using a seen examination (60%) and one further assessment, including essays, oral and poster presentations (40%). The seen examination papers are a choice of 2 questions of 1000 or 1200 words, which are completed independently over two days. This will assess the students' ability to synthesise and use information, not just regurgitate it (S1-S6). The use of appropriate and critical references will also be evaluated, which will reinforce key objectives of the MSc programme (S1-S6). The Cancer Technologies and Clinical research module (15 credits; K6, K7)) will be assessed by an oral presentation of material presented in the module (40%) (S1-S6). Each student will be given a different paper to critique. The assessment seeks demonstration of an understanding of key concepts as well as the ability of students to transfer their knowledge to critically evaluate the approaches used, discuss limitations and suggest alternative strategies (K6, K7). The remainder of the assessment for this module (60%) will depend on the students' choice of the Home office Licence course (formal examination and practical) or Cancer Bioinformatics/modelling (practical mini-project) (S1-S6). The students will be given plagiarism tutorials in the first few weeks of the course to inform them of the University's attitude to plagiarism, and all assignments are screened with plagiarism software. The literature review module (15 credits) is assessed through the submission of a review paper formatted according to author guidelines for a chosen review journal (K7, S1-S6), and the research project (90 credits; K8) is assessed in the form of a written thesis (60%), oral presentation (15%), conduct award (10%; given by the supervisor) and a Viva voce (15%) (S1-S8). Candidates undertaking the PG Diploma will take a library project (30 credits; K7) in place of the research project, which will be assessed in the form of a written essay (80%) and an oral presentation (20%) (S1-S6). In all cases the learning outcomes from each module will be carefully matched to the method of assessment, and all assessments will be double marked.

19. Reference points

The learning outcomes have been developed to reflect the following points of reference:

Subject Benchmark Statements
https://www.qaa.ac.uk/quality-code/subject-benchmark-statements

Framework for Higher Education Qualifications (2014)
https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf

University Vision
https://www.sheffield.ac.uk/vision

Learning and Teaching Strategy (2016-21)
https://www.sheffield.ac.uk/polopoly_fs/1.661828!/file/FinalStrategy.pdf

The QAA 'Master's degree characteristics'

Oxford Brookes University 'writing learning outcomes'

Feedback from lecturers, students and external examiners on other MSc courses, including the MSc in Molecular Medicine and MSc in Human Nutrition.

20. Programme structure and regulations

All students complete four foundation taught modules during the first two semesters that serve to introduce both scientific and clinical aspects of translational cancer research and treatment. Students wishing to undertake the post graduate certificate only need to pass these four modules.

- Cellular and molecular basis of cancer (15 credits)
- Cancer Epidemiology (15 credits)
- Tumour Microenvironment (15 credits)

- Cancer Diagnosis and Treatment (15 credits)

All PG Diploma and MSc students will then complete the 'Cancer Technologies and Clinical Research' module (15 credits) which consists of a common core with a written assessment and then a choice between:

- Home Office Licence Induction Course
- Cancer Bioinformatics/modelling Course

All PG Diploma and MSc students will also undertake a student selected literature review from a title provided by academics (15 credits).

Finally PG Diploma students will undertake a Library project (30 credits), whereas MSc students will undertake the 25 week translational research project (90 credits).

Detailed information about the structure of programmes, regulations concerning assessment and progression and descriptions of individual modules are published in the University Calendar available on-line at http://www.shef.ac.uk/calendar/regs

21. Student development over the course of study

The programme is designed so that students progressively achieve more advanced levels of learning and practice. In semester 1-2, students take four modules designed to ensure that all students, irrespective of their background, have a thorough knowledge of the fundamentals of cancer, cancer research, and basic research skills such as literature retrieval and analysis. In semester 2 the students take an advanced module exploring the interface between basic and clinical research in more depth, as well as undertaking a literature review, before progressing to the project. The research project lasts for 25 weeks and is supported by one-on-one supervision. All students have a personal tutor and are encouraged to reflect on their work throughout the course. Detailed feedback will be given to the students in a one-on-one session with the module lead after each assessment and students will be encouraged to show how their thinking has developed during the course, by reflecting upon their own work.

22. Criteria for admission to the programme

Detailed information regarding admission to programmes is available from the University's On-Line Prospectus at http://www.shef.ac.uk/courses/.

The course is suitable for graduates in Life sciences, Biomedical sciences, and allied subjects as well as clinicians specialising in Medical Oncology, Clinical Oncology or other disciplines related to cancer care and treatment, and MBChB students wishing to intercalate. Candidates will normally have a 2:1 degree or equivalent in a relevant science related subject, those with a good 2:2 will be considered in exceptional circumstances. Candidates will also have an IELTS mean of 7.0 (with a minimum of 7.0 in listening and 6.0 in other components) or equivalent.

23. Additional information

Sheffield combines the advantages of a top quality University, an outstanding Student's Union, a large city and a pleasant location adjacent to the Peak District National Park.

Information on the wealth and breadth of Oncology research at the University of Sheffield can be found by browsing the following website: http://www.shef.ac.uk/oncology

This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at http://www.shef.ac.uk/ssid.