

Programme Specification for the MSc in Translational Medicine

PLEASE NOTE. This specification provides a **concise** summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. This specification provides a source of information for students and prospective students seeking an understanding of the nature of the programme and may be used by the College for review purposes and sent to external examiners. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the course handbook or on-line at [http://www /iccs.org.uk](http://www.iccs.org.uk). The accuracy of the information contained in this document is reviewed by the College and may be checked by the Quality Assurance Agency.

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| 1. Awarding Institution: | Imperial College London |
| 2. Teaching Institution: | Imperial College London |
| 3. External Accreditation by Professional / Statutory Body: | Not applicable |
| 4. Name of Final Award (BEng / BSc / MEng etc): | MRes |
| 5. Programme Title: | Translational medicine |
| 6. Name of Department / Division: | Investigative Science |
| 7. Name of Faculty: | Medicine |
| 8. UCAS Code (or other coding system if relevant): | Not applicable |
| 9. Relevant QAA Subject Benchmarking Group(s) and/or other external/internal reference points: | Medicine |

10. Level(s) of programme within the Framework for Higher Education Qualifications (FHEQ):

Master's (MSc, MRes)	Level 7
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- 11. Mode of Study:** Full time; Part time
- 12. Language of Study:** English
- 13. Date of production / revision of this programme specification** (month/year): January 2008

14. Educational aims/objectives of the programme

The programme aims to:

- Provide students with an understanding of principles and practice in topical issues in translational medicine, drug discovery, biomarker research in basic science and clinical investigation through both theoretical and practical exposure.
- Provide a solid foundation for those who intend to go on to study for a PhD;
- Give students the opportunity to complete a novel and high-level scientific project, accumulated experimental findings and have exercised critical scientific thought in the interpretation of those findings.

- Allow students to acquire the theoretical and practical skills and experience essential for undertaking further postgraduate scientific training.
- Give students the opportunity to obtain excellent scientific communication skills in written and oral presentation skills.
- Provide students an appropriate environment to obtain mature and efficient scientific communication and teaching skills through exposure to wide range of collaborators with different backgrounds
- Give a thorough training in laboratory and research skills;
- Provide a supportive learning environment;
- Attract highly motivated students, both from within the UK and from overseas.

15. Programme Learning Outcomes

1. Knowledge and Understanding

Knowledge and understanding of:

1. fundamental principles of translational medicine, drug discovery, biomarker research in basic science and clinical investigation through both theoretical and practical exposure
2. principles of modern technologies of in drug and biomarker discovery;
3. principles of Omics (genomics, proteomics, metabolomics) in biomarker discovery
4. Pharmacoinaging in drug/biomarker discovery
5. Focus in Cardiovascular/Neuroimaging biomarkers
6. Gene profiling
7. Molecular monitoring of disease
8. core knowledge on research techniques, including essential molecular biology methodologies; Southern blotting, library screening, isolation of recombinant DNA, PCR and DNA sequencing technologies;
9. detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's theme of subsequent research;
10. management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications.

2. Skills and other Attributes

Intellectual (thinking) skills

1. understand the principles of drug and biomarker discovery
2. integrate and evaluate information from a variety of sources
3. formulate and test hypotheses
4. be creative in the solution of problems and in the development of hypotheses
5. plan, conduct and write-up a programme of original research.

Practical skills

1. plan and execute safely a series of experiments;
2. use laboratory equipment to generate data;
3. analyse experimental results and determine their strength and validity;
4. prepare technical reports;
5. give technical presentations;
6. use the scientific literature effectively;
7. use computational tools and packages.

Transferable skills

1. communicate effectively through oral presentations, computer processing and presentations, written reports and scientific publications;
2. apply statistical and modelling skills;
3. management skills: decision processes, objective criteria, problem definition, project design and evaluation, risk management, teamwork and coordination, extension needs;
4. integrate and evaluate information from a variety of sources;
5. transfer techniques and solutions from one discipline to another;
6. use Information and Communications Technology;
7. manage resources and time;
8. learn independently with open-mindedness and critical enquiry;
9. learn effectively for the purpose of continuing professional development.

- **16. The following reference points were used in creating this programme specification**

Student Handbook (for Course approved by Senate of Imperial College)

17. Programme structure and features, curriculum units (modules), ECTS assignment and award requirements:

The programme is offered as a full-time, one year course, or part-time, two to three year course. The course leads to the MRes degree. The course is comprised of two parts, a taught component, which is given over the first term, and a research component that will be given over the second and third terms. The taught component will include lectures, tutorials and student presentations. A full time laboratory/clinically based research project will be carried out within the departments of the Division of Investigative Sciences, Imperial College and associated partner groups, from the beginning of January until the end of August (4 months per project). Titles of research projects, offered by prospective supervisors, will be made available towards the end of term 1. On completion of the two projects a written report will be produced and submitted for an examination followed by a viva in September with an internal and external examiner. The overall pass mark is 50%. The written examination and the research projects with the viva voce will contribute 30% and 70% towards the final mark, respectively.

Full time : Term 1

All students attend a core induction week, followed by a module of core basics of molecular and cellular biology, together with molecular biology technologies, including molecular genetics, DNA sequence analysis and polymerase chain reaction (PCR). This is followed by specific programmes centred on drug and biomarker discovery, Omics (genomics, proteomics, metabolomics) in biomarker discovery, Pharmacoinaging in drug/biomarker discovery, Focus in Cardiovascular/Neuroimaging biomarkers, Gene profiling and Molecular monitoring of disease. At the end of this term students will be assessed through formal written exam (3 essay questions and 4 short answer questions), lasting 3 hours (40 minutes per essay questions, 1 hour for SAQs), contributing 30% of the final mark.

Full time: Term 2 & 3

The individual, full-time research project begins with the start of the second term (full-time) or from term 1 (part-time variant B). Each student will complete 2 assignments, incorporating 2 individual intercalated research projects lasting 4 months each, designed to give practical experience of laboratory and clinical research. The experience gained will help in developing and focussing research skills in modern biomedical and clinical investigations research laboratories. It will include a literature survey on assigned research area, preparation of a written report and presentation of proposed experimental work on RIP seminars, and independent conduct of experimental work. Students will be expected to present and discuss their work at group meetings in the laboratories where they undertake their projects and have regular documented weekly meetings with their supervisors.

Part time: autumn of year one for the 2-year PT course; autumn of year one or two for the 3-year PT course

All students attend a core induction week, followed by a module of core basics of molecular and cellular biology, together with molecular biology technologies, including molecular genetics, DNA sequence analysis and polymerase chain reaction (PCR). This is followed by specific programmes centred on drug and biomarker discovery, Omics (genomics, proteomics, metabolomics) in biomarker

discovery, Pharmacoinaging in drug/biomarker discovery, Focus in Cardiovascular/Neuroimaging biomarkers, Gene profiling and Molecular monitoring of disease. At the end of this term students will be assessed through formal written exam (3 essay questions and 4 short answer questions), lasting 3 hours (40 minutes per essay questions, 1 hour for SAQs), contributing 30% of the final mark.

Part time

Remaining 21 months of the 2-year PT course; remaining 33 months of the 3-year PT course

The individual, research projects last 4 months each. Each student will complete 2 assignments, incorporating 2 individual intercalated research projects lasting 4 months each, designed to give practical experience of laboratory and clinical research. The experience gained will help in developing and focussing research skills in modern biomedical and clinical investigations research laboratories. It will include a literature survey on assigned research area, preparation of a written report and presentation of proposed experimental work on RIP seminars, and independent conduct of experimental work. Students will be expected to present and discuss their work at group meetings in the laboratories where they undertake their projects and have regular documented weekly meetings with their supervisors.

18. Support provided to students to assist learning (including collaborative students, where appropriate).

- One week induction programme for orientation, introduction to library and computer facilities
- MRes Student Handbook, which includes lecture timetable and practical protocols
- A large community of postgraduate research students and postdoctoral research workers who work on molecular and cellular biology of disease at Hammersmith.
- A comprehensive external speaker seminar programme at the Hammersmith Campus.
- Library and other learning resources and facilities at Hammersmith, and also at the South Kensington Campus.
- Dedicated computing facilities at Hammersmith.
- Safety lecture given in first week core programme.
- An MRes staff - student committee, which meets three times per year.
- In addition to the Course administrator and tutor, who has overall responsibility for student welfare and guidance, all students are allocated personal tutors whose role is to assist them with personal problems and to advise on pastoral and academic issues.
- Students conducting their research projects at an external site are assigned a member of Imperial College academic staff to oversee progress and advise on the project dissertation. Where practical, students will be visited by College staff during their project.
- Student email and open personal access to tutorial staff including the Course Director.
- Access to student counsellors on the South Kensington site.
- Access to Teaching and Learning Support Services, which provide assistance and guidance, e.g. on careers.
- Opportunities for students to conduct their research projects at a wide range of internal laboratories at Imperial College, and possibly at external institutions and companies.
- Employer needs and opinions feed into the programme through frequent guest lecturers from industry and possible student placements in relevant industries and industry-based research projects.

19. Criteria for admission:

Applications are welcomed from candidates, expected to hold a graduate medical degree from a UK/EEA university or an equivalent qualification recognized by GMC UK. In line with Imperial College policy, non UK/EEA students for whom English is not their first language and who did not undertake their undergraduate degree in English will be expected to pass the British Council IELTS test at grade 6.0 or above, with a score of 5 or above in each component. A TOEFL qualification with a score >600 with a minimum score of 4.5 in the writing element, would be an acceptable alternative. In view of necessity for proficiency in command of English, high scores obtained in IELTS/TOEFL will be regarded as advantageous.

20. Processes used to select students:

As far as possible, UK applicants (and where possible overseas applicants) are invited to Hammersmith Campus for interview and a site tour. Those who cannot attend are interviewed by telephone. Places are offered on the basis of written applications as well as the interview.

21. Methods for evaluating and improving the quality and standards of teaching and learning

a) Methods for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards:

- Module reviews, based on feedback questionnaires and convenor reports.
- Annual course review prepared by the Course Director and considered by the Course Committee and the Imperial College, Departmental Teaching Committee.
- Biennial review of the course by an Imperial College academic staff member from outside the department with a report and grading to the Graduate School of Life Sciences and Medicine Postgraduate Quality Committee.
- MRes Staff – Student Committee, held each term, with report to Departmental Teaching Committee.
- Biennial staff appraisal.
- Peer teaching observations.
- External Examiner reports.

b) Committees with responsibility for monitoring and evaluating quality and standards:

- MRes Staff – Student Committee.
- Course Committee.
- Board of Examiners – meets in September to consider awards.
- Departmental Tutors' Committee.
- Departmental Teaching Committee.
- Graduate School of Life Sciences and Medicine, Postgraduate Quality Committee.
- Imperial College, Quality and Academic Review Committee.
- Imperial College, Senate

c) Mechanisms for providing prompt feedback to students on their performance in course work and examinations and processes for monitoring that these named processes are effective:

- Written feedback sheets returned promptly to students with assessed coursework;
- meetings with personal tutees to discuss progress;
- course questionnaires and Staff-Student Liaison committee;
- External examiners and course committee

d) Mechanisms for gaining student feedback on the quality of teaching and their learning experience and how students are provided with feedback as to actions taken as a result of their comments:

- MRes Staff – Student Committee;
- meetings with personal tutees;
- course questionnaire evaluation of taught components;
- meeting of individual students with course organisers to discuss exams, research project and career aims;
- viva with External Examiner.

e) Mechanisms for monitoring the effectiveness of the personal tutoring system:

- MSc Staff – Student Committee;
- meetings with personal tutors;
- course questionnaire evaluation of modules;

f) Mechanisms for recognising and rewarding excellence in teaching and in pastoral care:

Staff are encouraged to reflect on their teaching, in order to introduce enhancements and develop innovative teaching methods. Each year College awards are presented to academic staff for outstanding contributions to teaching, pastoral care or research supervision.

g) Staff development priorities for this programme include:

- active research programme in molecular and cellular biology as applied to medical research;
- staff appraisal scheme and institutional staff development courses;
- college Teaching Development Grant Scheme to fund the development of new teaching and appraisal methods;
- updating professional and IT/computing developments.

22. Regulation of Assessment

a) Assessment Rules and Degree Classification:

Assessment rules & degree classification

- Minimum pass mark is 50% for each module.
- Assessment details are provided in the MRes Student Handbook.
- To qualify for the award of MRes students must complete all the course requirements and must achieve an overall pass mark in the combined examinations, in the coursework and in the research project.

The weighting of marks contributing to the degree for the examinations, coursework and research project is: 45:10:45

b) Marking Schemes for postgraduate taught programmes:

Summary of grades, marks and their interpretation for MRes degree classification

<u>GRADE</u>	<u>MARKS</u>	<u>INTERPRETATION</u>
A	70% - 100%	Marks represent a distinction performance
B	60% - 69%	Marks represent a merit performance
C	50% - 59%	Marks represent a pass
D	40% - 49%	Marks represent a fail performance at MRes level
E	0% - 39%	Marks represent a fail performance (with major shortcomings)

c) Processes for dealing with mitigating circumstances:

For postgraduate taught programmes: A candidate for an MRes degree who is prevented owing to illness or the death of a near relative or other cause judged sufficient by the Graduate Schools from completing at the normal time the examination or Part of the examination for which he/she has entered may, at the discretion of the Examiners,

(a) Enter the examination in those elements in which he/she was not able to be examined on the next occasion when the examination is held in order to complete the examination,

or

(b) be set a special examination in those elements of the examination missed as soon as possible and/or be permitted to submit any work prescribed (e.g. report) at a date specified by the Board of Examiners concerned. The special examination shall be in the same format as specified in the course regulations for the element(s) missed.

Applications, which must be accompanied by a medical certificate or other statement of the grounds on which the application is made, shall be submitted to the Academic Registrar who will submit them to the Board of Examiners.

d) Processes for determining degree classification for borderline candidates:

For **postgraduate taught programmes**: Candidates should only be considered for promotion to pass, merit or distinction if their aggregate mark is within 2.5% of the relevant borderline. Nevertheless, candidates whom the Board deems to have exceptional circumstances may be considered for promotion even if their aggregate mark is more than 2.5% from the borderline. In such cases the necessary extra marks should be credited to bring the candidate's aggregate mark into the higher range.

e) Role of external examiners:

The visiting examiners (from other universities and research institutes in the UK) are nominated by the MRes Academic Board and approved by the Graduate School of Life Sciences and Medicine Postgraduate Quality Committee. Visiting examiners review the course modules. Visiting examiners normally serve for 4 years. The role of visiting examiner is that of moderator. In order to do this they:

- approve examination papers;
- review coursework;
- see all examination scripts and research project dissertations;
- viva students;
- attend the Board of Examiners;
- complete a report to the College.

23. Indicators of Quality and Standards:

- Favourable comments and feedback from students.
- First destination data for MSc graduates, showing a high proportion find employment or further postgraduate research training in the subject area.
- Independent review of the quality of the educational provision of the Biology Department by the Quality Assurance Agency subject review process in 1998 achieving an excellent grading of 22 out of a maximum 24 points.

Curriculum Design Content and Organisation	= 4
Teaching Learning and Assessment	= 3
Student Support and Guidance	= 4
Student Progression and Achievement	= 4
Learning Resources	= 4
Quality Management and Enhancement	= 3

24. Key sources of information about the programme can be found in:

- Postgraduate Prospectus, Imperial College of Science, Technology & Medicine (available on-line www.ic.ac.uk)
- Postgraduate Courses run by the Division of Investigative Science http://www1.imperial.ac.uk/medicine/about/divisions/is/teaching/msc_2/
- Course webpages:

- http://www1.imperial.ac.uk/medicine/about/divisions/is/teaching/msc_2/transmed/
QAA Subject Review Report Imperial College of Science, Technology & Medicine
(www.qaa.ac.uk).