

Programme Specification (PG)

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| Awarding body / institution: | Queen Mary University of London |
| Teaching institution: | Queen Mary University of London |
| Name of final award and title: | MSc Regenerative Medicine PgDip Regenerative Medicine |
| Name of interim award(s): | PGCert |
| Duration of study / period of registration: | PGDip 18 months part-time; MSc 24 months part-time |
| Queen Mary programme code(s): | PMSF - PSGRM - A3WD / PDPP -PSGRM -A4WD |
| QAA Benchmark Group: | |
| FHEQ Level of Award: | Level 7 |
| Programme accredited by: | |
| Date Programme Specification approved: | 18 Jan 2023 |
| Responsible School / Institute: | Blizard Institute |

Schools / Institutes which will also be involved in teaching part of the programme:

School of Engineering & Materials Science

Collaborative institution(s) / organisation(s) involved in delivering the programme:

Programme outline

This part-time pathway of the MSc/PgDip Regenerative Medicine is to promote inclusion and equity, widening access for students who have caring responsibilities or need to work alongside their studies for financial reasons.

Regenerative medicine is an interdisciplinary field, which aims to repair diseased or damaged tissues using biological or cell based technologies. It is a rapidly growing area of biomedical research that encompasses stem cell biology, tissue engineering, drug delivery, and nanotechnology. This MSc/PgDip course aims to provide the next generation of scientists and medical professionals with the skills and knowledge required for successful careers in regenerative medicine. The multi-disciplinary programme is based within the Blizard Institute and delivered jointly with the School of Engineering and Materials Science. The programme is delivered via a blended learning programme, combining onsite and online delivery to offer an optimal educational experience.

Taught modules will develop a strong scientific foundation in the biology of stem cells and regeneration and the fundamental principles of biomaterials, tissue engineering and cellular reprogramming. The course then will explore how these concepts can be applied in academic and industrial settings, towards the development of novel regenerative technologies and the treatment of disease. Students will also receive practical training in research methods, translation and commercialisation, and ethics.

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The MSc course will culminate with an intensive research project where students will work full time investigating a specific topic in Regenerative Medicine. In addition to technical knowledge, the research project will include training in experimental design, effective collaboration, data analysis, and presentation skills.

Students will receive the highest quality instruction from leading scientists and clinicians in their fields and participate in cutting-edge research in regenerative medicine. Students will benefit from:

- The expertise of internationally renowned scientists in stem cell biology, cellular regeneration, biomaterials, and tissue engineering.
- Interactive lectures, with tutorials to enhance the individual learning experience.
- Close links to St Bartholomew's and the Royal London Hospitals and interaction with clinicians involved in translational research. These top teaching hospitals treat a large and diverse patient population and are well known for cardio-vascular, cancer, immunology, dermatology and trauma research.
- A strong emphasis on multi-disciplinary training through collaboration with the School of Engineering and Materials Science.
- Access to outstanding online and/or onsite research facilities in both the School of Medicine and Dentistry and School of Engineering and Materials Science.
- Industrial contacts, networking opportunities, and support from academic advisors and the student office.

Ultimately, the MSc/PGDip in Regenerative Medicine will provide students with a sound understanding of the biological basis of tissue regeneration and experience in the application of these principles in research and technology development. Students will be well positioned to continue their research training as PhD students or for professional careers in industry, healthcare, scientific communication or science policy.

Aims of the programme

The programme aims to:

- Synthesise and evaluate knowledge in modern concepts of stem cell biology and regenerative medicine, including fundamental principles of developmental biology, biomaterials, tissue engineering and cellular reprogramming.
- Develop the ability to critically appraise scientific literature relevant to regenerative medicine.
- Analyse scientific data in a rigorous manner and interpret the significance of experimental results in the context of previous work in regenerative medicine.
- Display skill in summarising and disseminating results using oral and written communication.
- Develop knowledge and technical ability in biomedical research.

What will you be expected to achieve?

Upon completion of the MSc/PGDip in Regenerative Medicine, students will be well placed for professional careers in academia, as well as the biotechnology and pharmaceutical industries. Throughout the MSc/PGDip essential transferable skills are emphasised that will be beneficial for any future career path. As a multi-disciplinary course, the MSc/PGDip is appropriate for a wide range of students. Graduates with degrees in biological sciences or medicine will gain an in-depth understanding of the cellular and molecular aspects of regenerative medicine as well as an introduction to the interdisciplinary fields of biomaterials and tissue engineering. Similarly, students with a physical sciences background will have the opportunity to broaden their experiences and acquire new skills in the biological sciences. Students who complete the MSc will additionally benefit from an intense 12 week research project, that will prepare them well for possible progression to PhD studies. The research project provides training in research techniques, data analysis, oral presentation skills, and critical appraisal of the scientific literature.

Academic Content:

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| A 1 | Apply fundamental principles in biomaterials and tissue engineering to problems in regenerative medicine. |
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| A2 | Develop in depth knowledge of the molecular and cellular basis of development, stem cell biology, and tissue regeneration. |
| A3 | Describe and select appropriate research methods for investigating pluripotent and adult stem cells. |
| A4 | Critically analyse and evaluate cell-based therapies in regenerative medicine. |
| A5 | Assess the ethical and regulatory issues associated with stem cell and regenerative research. |

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| Disciplinary Skills - able to: | |
| B1 | Display skill in summarising and disseminating results in oral and written communication. |
| B2 | Design appropriate experiments to test a hypothesis. |
| B3 | Integrate information from a variety of sources to construct a coherent analysis on a scientific topic. |
| B4 | Collect and analyse experimental data from which to draw appropriate conclusions. |

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| Attributes: | |
| C1 | Develop the ability to engage and communicate effectively with diverse audiences using oral and written methods. |
| C2 | Critically evaluate one's own work in a reflective manner and that of others in a respectful and constructive fashion. |
| C3 | Work independently when appropriate and negotiate effective working relationships in a collaborative environment. |
| C4 | Conduct work in a professional manner mindful of the necessity of intellectual integrity and ethical responsibility. |

How will you learn?

- Each topic will be taught using a range of blended learning methods, varying according to the subject and learning objectives of the module. Modules may include lectures, small group tutorials, presentations, asynchronous online content, group discussion, practical classes and independent study. Most modules will follow a format of structured preparatory work (reading, preparation, and reflection exercises), with weekly interactive lectures/tutorials.
- As regenerative medicine is a multi-disciplinary field, collaborative group projects will be a significant component, and students will have the opportunity to work with and learn from their peers.
- The final research project will also be an essential part of the learning process. By working on a significant independent research project, students will gain new technical knowledge relevant to their thesis topic. In addition, students will develop research and transferable skills, such as literature review, data analysis, presentation skills, and scientific writing.
- Visiting speakers will describe current research in different fields relevant to regenerative medicine.
- As self-directed learning is a major component of each module, students will be encouraged to be proactive in identifying their own learning needs as the modules progress. Where required, support will be provided by module leads and academic advisors.
- Each 15 credit taught module involves approximately 30 hours of contact time plus 120 hours of independent study. Individual study time could be spent preparing for, or following up on formal study sessions; reading; producing written work; completing projects; and revising for examinations. The direction of the individual study will be guided by the formal study sessions, along with the reading lists and assignments

How will you be assessed?

Modules will be assessed through a variety of ways including in-course written assignments, oral presentations, group projects, research proposals and examinations. Assessments may be delivered online or on campus.

How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

The PGDip comprises taught compulsory & elective modules (to the total value of 120 credits).

The MSc programme consists of the PGDip requirements plus plus the core research project (equivalent to 60 credits).

Year 1, Semester One (two 15 credit compulsory modules)

- Stem cell and developmental biology (FMD, ICM7142)
- Research skills and methodology (FMD, ICMM132)

Year 1, Semester Two (two 15 credit elective modules)

- Tissue specific stem cells (FMD; ICM7144)

OR

- Induced pluripotent stem cells and genome engineering (FMD, ICM7145)

OR

- Neurodegenerative Diseases (FMD, ICMM929)

OR

- Medical ethics and regulatory affairs (SEMS, DENM702)

Year 2, Semester One (two 15 credit modules)

- Cellular and molecular basis of regeneration (FMD, ICM7141)
- Tissue engineering and regenerative medicine (SEMS, EMS617P)* OR Clinical sensors and measurements (EMS706P)**

Year 2, Semester Two (two 15 credit elective modules that have not have been taken previously)

- Biomaterials in regenerative medicine (FMD, ICM7143)

OR

- Tissue specific stem cells (FMD; ICM7144)

OR

- Induced pluripotent stem cells and genome engineering (FMD, ICM7145)

OR

- Neurodegenerative Diseases (FMD, ICMM929)

OR

- Medical ethics and regulatory affairs (SEMS, DENM702)

Year 2, Semester Three (60 credit core module)***

- Research project in regenerative medicine (FMD, ICM7146)

Students will select research projects from a wide range of topics in regenerative medicine. Examples include research on the cellular and molecular aspects of tissue regeneration, disease pathogenesis, development of stem cell therapies, design of novel nano-biotechnologies, or engineering biomaterials and tissue scaffolds.

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* Level 6 module

** Elective modules - most students will be encouraged to take Tissue Engineering and Regenerative Medicine unless they have taken this module during their undergraduate studies at Queen Mary or a virtually identical module at another University

***Students on the intended PGDip will only complete the 120 taught credits (not ICM7146).

Academic Year of Study PT - Year 1

| Module Title | Module Code | Credits | Level | Module Selection Status | Academic Year of Study | Semester |
|---|-------------|---------|-------|-------------------------|------------------------|------------|
| Stem cell and developmental biology | ICM7142 | 15 | 7 | Compulsory | 1 | Semester 1 |
| Research skills and methodology | ICMM132 | 15 | 7 | Compulsory | 1 | Semester 1 |
| Tissue-specific stem cells | ICM7144 | 15 | 7 | Elective | 1 | Semester 2 |
| Induced pluripotent stem cells and genome engineering | ICM7145 | 15 | 7 | Elective | 1 | Semester 2 |
| Medical ethics and regulatory affairs | DENM702 | 15 | 7 | Elective | 1 | Semester 2 |
| Neurodegenerative diseases | ICMM929 | 15 | 7 | Elective | 1 | Semester 2 |

Academic Year of Study PT - Year 2

| Module Title | Module Code | Credits | Level | Module Selection Status | Academic Year of Study | Semester |
|---|-------------|---------|-------|-------------------------|------------------------|------------|
| Cellular and molecular basis of regeneration | ICM7141 | 15 | 7 | Compulsory | 2 | Semester 1 |
| Tissue Engineering and Regenerative Medicine | EMS617P | 15 | 6 | Elective | 2 | Semester 1 |
| Clinical sensors and measurements | EMS706P | 15 | 7 | Elective | 2 | Semester 1 |
| Biomaterials in regenerative medicine | ICM7143 | 15 | 7 | Elective | 2 | Semester 2 |
| Tissue-specific stem cells | ICM7144 | 15 | 7 | Elective | 2 | Semester 2 |
| Induced pluripotent stem cells and genome engineering | ICM7145 | 15 | 7 | Elective | 2 | Semester 2 |

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| Module Title | Module Code | Credits | Level | Module Selection Status | Academic Year of Study | Semester |
|---|-------------|---------|-------|-------------------------|------------------------|-----------------|
| Medical ethics and regulatory affairs | DENM702 | 15 | 7 | Elective | 2 | Semester 2 |
| Neurodegenerative diseases | ICMM929 | 15 | 7 | Elective | 2 | Semester 2 |
| Research project in regenerative medicine | ICM7146 | 60 | 7 | Core | 2 | Semesters 2 & 3 |

What are the entry requirements?

A 2:1 or above at undergraduate level in a relevant subject such as the biological sciences, physical sciences, medicine or Dentistry. Applicants with a 2:2 degree will be considered on an individual basis.

International applicants: qualification at degree level in an appropriate subject from a university or equivalent institution acceptable to QMUL.

If English is not a student's first language, they will be required to meet the following standards in the IELTS or another acceptable English language examination.

IELTS

Overall: 6.5

Writing & Speaking: 6.0

Reading & Listening: 5.5

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The Staff-Student Liaison Committee provides a formal means of communication and discussion between the Institute and its students. The committee consists of student representatives from each year in the institute together with appropriate representation from staff within the institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments.

Staff-Student Liaison Committees meet regularly throughout the year. Each Institute operates a Learning and Teaching Committee, or equivalent, which advises the Institute Director of Education on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant Queen Mary policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in the committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All Institutes operate an Annual Programme Review (APR) of their taught undergraduate and postgraduate provision. APR is a continuous process of reflection and action planning which is owned by those responsible for programme delivery. Students' views are considered in this process through analysis of the PTES results and module evaluations.

What academic support is available?

- Programme induction for orientation and introducing study skills.

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- Research Skills and Methodology Module in Term 1 includes: practical laboratory techniques, seminars focused on writing, development of critical appraisal skills, training in statistical analysis, and workshops teaching oral presentation skills.
- Course handbook with timetable, other course information and contact details.
- Dedicated intranet website with access to lecture material, assignments and other course information.
- Library facilities with electronic access from distant sites.
- Academic Advisor System: each student will be assigned to an advisor who will act as a mentor to provide support and advice during the course, as well as guidance for career development and further training opportunities.
- Students will be allocated a dissertation supervisor relevant to their topic.
- Students will be encouraged to attend seminar programmes organised regularly in the Blizard Institute, the School of Medicine and Dentistry, and the School of Engineering and Materials Science.
- The course uses the virtual learning environment provided by the College (QM+), as well as other online platforms. This enables lecture notes, recorded content, captioned lectures, and handout material to be available electronically,

Programme-specific rules and facts

How inclusive is the programme for all students, including those with disabilities?

The Blizard institute & MSc Regenerative Medicine are committed to supporting inclusion and accessibility for all students, including those with disabilities. The institute close links with QM DDS and student support services. Academic advisors and course tutors are encouraged to closely monitor the experience of all students, and provide all necessary support and referrals as needed. The programme aims to identify and assist any undiagnosed students who may have specific learning differences within the first semester. All efforts will be made to support these students in collaboration with the services offered by Queen Mary. All students are given the opportunity for a disability and dyslexia assessment, and the programme will work to implement all recommendations made by Queen Mary for diagnosed students.

Through the Queen Mary Disability and Dyslexia Service students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)
- Mentoring support for students with mental health issues and conditions on the autistic spectrum.

To ensure access and inclusiveness, the programme ensures that reading material is available from Library Services and is reviewed annually. Slides are released in advance of lectures. Lectures and tutorials are recorded, captioned, and made accessible to students as soon as possible after delivery via QMPlus. Recordings remain available on QMplus for the full academic year and are archived for students who resit out of attendance in subsequent years.

All written assignments are to be submitted electronically by the student for entry into plagiarism detection software (Turnitin). Students deliver a formative, non-assessed essay and formative oral presentation early in the first term of the programme and receive substantial individual & group feedback. As part of this training, students will be shown their Turnitin score, including how it was calculated.

Lecturers use a broad range of pedagogical and assessment strategies to engage and support students with different learning styles. Learning outcomes for the programme and each module are clear and published on QMPlus and/or the programme

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handbook. QMplus content for all Blizzard programmes is reviewed for accessibility standards using Blackboard Ally.

Links with employers, placement opportunities and transferable skills

There are no formal employer links for this programme. However, the programme will offer an opportunity for graduates to further their career prospects within their own professional specialty, through the acquisition of:

1. A broad knowledge of stem cell and developmental biology.
2. An understanding of the research and clinical applications of stem cells in regenerative medicine, including aspects of tissue and genome engineering.
3. Skills for designing, evaluating and conducting experiments within their area of interest in stem cell biology and regenerative medicine.
4. Development of transferable skills, including:
 - communicating effectively to diverse audiences via oral presentations and written reports
 - working collaboratively within a team
 - conducting work in a professional manner, mindful of intellectual and ethical integrity

Programme Specification Approval

Person completing Programme Specification:

Prof. Kristin Braun

Person responsible for management of programme:

Prof. John Connelly & Kristin Braun

Date Programme Specification produced / amended by School / Institute Education Committee:

24 Nov 2022

Date Programme Specification approved by Taught Programmes Board:

18 Jan 2023