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| **Programmes** |
|
| Bioinformatics and Systems Biology |
| Biochemistry, Biological Science, Cancer Research and Molecular Biomedicine, Cell Biology, Developmental Biology, Neuroscience |
| Biotechnology and Enterprise |
| Cancer Biology and Radiotherapy Physics |
| Cardiovascular Health & Disease |
| Clinical Biochemistry  |
| Clinical Immunology |
| Clinical Rheumatology and Musculoskeletal Medicine |
| Experimental Medicine (Cancer) |
| Genomic Medicine |
| History of Science, Technology and Medicine |
| Infection Biology |
| Medical Microbiology  |
| Medical Imaging Science |
| Medical and Molecular Virology |
| Medical Sciences |
| Molecular Pathology |
| Neuroimaging for Clinical and Cognitive Neuroscience |
| Oncology |
| Physician Associate Studies |
| Precision Medicine |
| Psychology |
| Reproduction and Pregnancy  |
| Science Communication |
| Skin Ageing and Aesthetic Medicine |
| Tissue Engineering for Regenerative Medicine (TERM) |
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**MSc Bioinformatics and Systems Biology**

MSc Bioinformatics and Systems Biology students undertake two research projects over the year, each of them for about 3 months. The first project runs from end of January to end of April; the second project runs from end of May to end of August. Bioinformatics projects can involve any application of computational techniques to biological and medical research, including development of software, web resources, databases or other tools; analysis of biological, medical or health data; construction and simulation of biological models, etc. These projects should be *in silico* only, students cannot carry out lab experiments but they are encouraged to interact closely with experimental researchers whenever possible. Students are expected to work full time on the project. Supervisors may have limited bioinformatics experience, although they are expected to be familiar with the research problem and the necessary tools. The students will have had bioinformatics and programming teaching during the first semester and should be able to work autonomously. The supervisor is expected to meet with the student regularly (generally once a week) in order to advise them on the project direction and follow their progress. The main supervisor will be expected to first mark their students' reports and to moderate an equal number of reports from independent projects.

Key dates:

Project 1: submission of outline description in November; allocation decided in December; project start end of January; report submitted end of April

Project 2: submission of outline description in February; allocation decided in March; project start end of May; report submission early September.

**Programme Directors:** Dr Jean-Marc Schwartz (jean-marc.schwartz@manchester.ac.uk). Dr David Talavera (david.talavera@manchester.ac.uk )

**MSc Biological Science, MSc Biochemistry, MSc Cancer Research and Molecular Biomedicine, MSc Cell Biology, MSc Developmental Biology, MSc Neuroscience.**

The projects for the research intensive masters programmes are usually hypothesis-driven, and address a specific research question specific to the field of the programme. The students are expected to spend the majority of their time in the labs undertaking the project. Therefore the projects should have the scope to allow that level of work. A core component of the MRes style masters programmes is the training in wet lab research skills. This means that the project should have a substantial opportunity for training the students and then consequentially carrying out the lab work by themselves. The intended learning outcome is that the students demonstrate that they are capable of undertaking research in a lab environment and that they can acquire and use new lab skills. Due to the limited timeframe alternative hypothesis testing based on their findings is not required. Normally students work alongside a PhD or Post-doc and help with the completion of an aspect of their lab project.

**Programme Director:** Dr Ingo Schiessl (i.schiessl@manchester.ac.uk)

**MSc Biotechnology and Enterprise**

These one year Biotechnology Research Projects span the life sciences. Our students have undertaken projects with supervisors located throughout the Faculty of Biology, Medicine and Health as well as other Faculties- MIB, SEAS. Topics span all areas in the Faculty. Past topics include recombinant protein expression in a variety of eukaryotic and bacterial cells (CHO, insect, bacteria, yeast, plants, algae), biofuels, collagen biology, CrispR-Cas genome editing, diet and health, environmental and medical diagnostics, green chemistry, biofuels, DNA barcoding-insects/plants, bioremediation, bioinformatics/genomics/RNAseq, cell/matrix biology, immunology, biotechnology of filamentous fungi, protein structure, matrix biology, RNA thermometers, stem cells, combatting antibiotic resistance, protein structure, natural polymers and circadian clocks, bacterial identification using 16S rRNA sequences and wound healing. The research project starts with a literature review (4000 words) in November, which is submitted in January and marked by February. The research project starts in February with the equivalent of ~3 days per week due to taught course units and is full-time in May-August. At the end of May the students talk on their projects. The final project (6000 words) is submitted in September in the format of a research article suitable for a scientific journal. This is marked by early October. Most Biotechnology and Enterprise students have prior laboratory research experience including working in industry. Supervisors would normally be expected to provide the training that is specific to the research project.

**Programme Director:** Dr Anil Day (anil.day@manchester.ac.uk)

**MSc Cancer Biology and Radiotherapy Physics**

MSc Cancer Biology and Radiotherapy Physics students will undertake a 3 month research project.  The project will run through the months of May, June and July. Projects can be based on any aspect of cancer biology and/or radiotherapy physics and can include a mix of computational and empirical work.  The supervisor is expected to meet with the student regularly (generally once a week) in order to advise them on the project direction and follow their progress.

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| **Month** | **Task** |
| February | Submission of outline description of the project  |
| March | Projects advertised to students |
| April | Final allocations |
| May | Project start |

**Programme Director:** Dr Mike Taylor (m.j.taylor@manchester.ac.uk)

**MRes Cardiovascular Health and Disease**

Cardiovascular diseases are major causes of mortality and morbidity in the developed world. The high incidence of these dictates the need for continued research into these disorders for the development of new treatments for them. The MRes in Cardiovascular Health and Disease will provide students with specialist knowledge of the cardiovascular system in heath and disease with an emphasis on translational ‘bench to bedside’ research. The course will consist of both taught (research methods, laboratory skills, tutorials, seminars, masterclasses) and research modules. We have a wide range of research projects for students to choose from, offered by basic scientists and clinicians. Training in generic skills (academic writing, communications etc.) will also be provided. Assessment will be via dissertation.

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| **Month** | **Task** |
| Autumn | Project outlines requested from allocated supervisors. |
| September | Induction week |
| Sept. – early October | Students review proposed projects and make preferred choices. |
| September - April | Taught units start late September and run until April |
| October | Students are allocated projects and schedule first meeting with supervisor to discuss. |
| October - end of January | Students prepare a literature review and research proposal supported by regular meetings during this period with Supervisor. |
| End Jan. | Students start their Research Project  |
| July | Students have an oral presentation based around the Research project |
| Mid-August | Submission of Dissertation |

**Programme Directors:**

Dr Ashraf Kitmitto (Ashraf.Kitmitto@manchester.ac.uk)

Dr Elizabeth Cartwright (Elizabeth.j.cartwright@manchester.ac.uk)

**MSc Clinical Biochemistry**

This programme provides knowledge and understanding of the pathophysiology of the major organs and endocrine systems and how biochemical parameters in the body can help the investigation, diagnosis and management of patients. Teaching is delivered by both clinical and research biochemists on campus. Our students include bioscience graduates, clinical scientists and intercalating medical students from both home and overseas.

**Taught units cover:**

* Endocrinology
* Major organs of disease (eg Liver, Kidney, Heart, Pancreas/GI)
* Pregnancy & Paediatric biochemistry
* Nutrition
* Toxicology / therapeutic drug monitoring

**Research Projects (60 Credits):**

**10 - 12 weeks** in the laboratory **May to August**

* Diverse topics offered as projects from different specialisms e.g. Biochemistry, Immunology, haematology, microbiology/virology or pharmaceutical science etc
* Wide variety of laboratory techniques acceptable e.g. Mass spectrometry, chromatography, protein analysis, ELISA, spectrophotometry, bioinformatics, genomics or PCR etc.
* Students write up their project as a 10,000-15,000 word dissertation
* Supervisors required to first mark the dissertation
* Supervision and marking counts towards your teaching load contribution
* £1000 per project given to each supervisor/laboratory

**Please Note:**

Research projects **DO NOT** necessarily have to involve clinical samples. Projects that have any disease background would be acceptable. The field of clinical biochemistry is evolving and expanding constantly therefore we would be happy to discuss any other potential projects ideas.

Intercalating medical students need to commence their projects slightly earlier as they need to return to their courses in mid-August. Please see the key dates below:

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| **Month** | **Task** |
| Autumn | Project proposals requested from allocated supervisors. |
| March | Students review proposed projects and make preferred choices. |
| April | Students are allocated projects and schedule first meeting with supervisor to discuss. |
| Early May | Intercalating students are available to start 10-12 week lab project. |
| Late May | Non-intercalating students are available to start 10 week lab project. |
| Mid-August | ***Intercalating medical students only dissertation deadline.*** |
| First week in September  | Non-intercalating students: deadline for dissertation. NB Supervisors are required to mark the dissertation within 4 weeks after the submission date. |

**Programme Contacts:**

Programme Director: Helen Jopling Helen.Jopling@manchester.ac.uk

Deputy Programme Director Dr Phil Macdonald (philip.macdonald@manchester.ac.uk)

Programme Administrator: Amanda Benson (clinicalscience@manchester.ac.uk

**MSc Clinical Immunology**

This programme is unique in that it applies advanced immunological concepts to diagnostic understanding and clinical presentation. Teaching is delivered by both clinical and research immunologists on campus and local hospital sites. Our students include bioscience graduates, clinical scientists and intercalating medical students from both home and overseas.

Taught units cover:

* Basic and Advanced Immunology, including responses to infection
* Immunotherapy, including genetic approaches
* Immune Deficiency
* Hypersensitivity and Allergy
* Haematological Malignancy
* Autoimmunity
* Research masterclass: assessed two week practical component including flow cytometry and protein analysis.

***Research Projects:***

The research component consists of a focused literature review and research proposal (Research Project 1; 30 credits) followed by a related 10 week research project and dissertation (Research Project 2; 60 credits) under the same supervisor. Project supervisors will be credited with supervision of a 90-credit dissertation to cover both components.

Research projects in any areas related to Immunology are suitable. The overall timetable is below.***NOTE:*** *intercalating medical students need to commence their projects earlier as they need to return to their courses in mid-August*. *Supervisors are given the option to offer their project to an intercalating student on the project submission form.*

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| **Month** | **Task** |
| Autumn | Project proposals requested from allocated supervisors. |
| January | Students review proposed projects and make preferred choices. |
| 1st February | Students are allocated projects and schedule first meeting with supervisor to discuss. |
| 1st – 31st March | Students prepare a research proposal with supporting tutorials from PGT staff. During this period students are allowed a *maximum* of three 1 hour meetings with their allocated supervisor. |
| April | Supervisors first mark research proposal and agree a mark with the Programme Committee. All supervisors are required to second mark another dissertation from the programme.***Intercalating medical students only start their projects.*** |
| May | Non-intercalating students are available to start 10 week lab project. |
| Mid-August | ***Intercalating medical students only dissertation deadline.*** |
| First week in September  | Non-intercalating students: deadline for dissertation |

**Programme Contacts:**

Programme Director: Dr Joanne Pennock (joanne.l.pennock@manchester.ac.uk)

Co-Director: Dr Nicholas Barnes (nicholas.barnes-2@manchester.ac.uk)

**MSc Clinical Rheumatology and Musculoskeletal Medicine**

The MSc in Clinical Rheumatology aims to provide students with the specialist knowledge, understanding and skills needed to practice rheumatology. The taught elements of the course cover topics including epidemiology, aetiology, pathogenesis, diagnosis and management of musculoskeletal disease. The research component of the course involves undertaking either a literature review or original research project, supervised by either senior Clinical Academics or NHS rheumatologists. The research element encourages direct of experience of literature searching, academic writing, critical appraisal and statistical analysis, and these elements are assessed in the marking of the dissertation. Candidates are encouraged to pursue projects that align with their own clinical interests, with a varied selection of titles available each year. Time to complete the research element of the MSc is scheduled for the latter half (March-September) of each academic year in this part-time course, with students excepted to have chosen a project and supervisor by the December after joining the programme. It is expected that students meet regularly with their supervisor throughout the research time, with at least monthly contact encouraged.

**Course Director:** Dr Hector Chinoy hector.chinoy@manchester.ac.uk

**MRes Experimental Medicine (Cancer)**

The Experimental Medicine (Cancer) programme will give nurses, doctors, health care professionals, clinical researchers and clinical trials co-ordinators the skills needed to work in early phase clinical studies. The primary purpose of the Experimental Medicine is to provide students with the opportunity to work within a premier UK Phase 1 cancer clinical trials unit and, through a mix of taught and experiential learning, master the discipline of experimental medicine related to cancer. They will be able to choose two aspects of their direct clinical trial research experience to write up for two research projects in a dissertation format. Supervisors are expected to meet with the students 1-2 weekly, and to mark the report on submission.

Key dates: students will choose their projects by the 2nd week of October. Projects need to be submitted for inclusion in the dissertation handbook by the first week of September.

**Programme director:** natalie.cook@christie.nhs.uk

**MSc Genomic Medicine**

Full time (1 year) students complete a 60 credit research project.

Part time (2 year) students complete a 30 credit literature report.

Supervision of one 60-credit research project will be considered the equivalent teaching contribution of two 30-credit literature reviews.

These are *in silico* projects and no practical work is normally allowed. Projects must be on an aspect of human genomics, frequently analysing or interrogating genomic data. Examples:

* Service evaluation e.g. molecular diagnosis from next generation sequencing data
* Correlation of phenotype and genotype
* Case review of disease, genetics, counselling etc.

Past project offers have included:

* Copy number variation and cardiovascular structure in the UK Biobank cohort
* Determining the incidence of compensated pathogenic deviations (CPDs) in mutation-negative gene panel tests
* Creation of a gene/disease report for a clinically important gene for use in the evaluation of possible disease causing variants in diagnostic sequencing, with focus on dysmorphology
* A case study to explore patient motivations for genomic testing within the 100,000 genome project

***Milestone Guide for Full-Time/Part time MSc Students (60 Credit/30 Credit)***

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| **Milestones** | *Approximate timeline* |
| Submission of Project Proposal Form for students undertaking their own project | *Mid/End March 2021* |
| Submission of Project Selection Form for students undertaking a project from the project booklet. This will be available in January.  | *Mid/End March 2021* |
| Confirmation of Project  - an email will be sent confirming the students project choice | *Early April 2021* |
| Face to Face meeting with project supervisor – Form 1 must to be completed  | *Mid/End April 2021* |
| Data Collection | *May 2021 –July 2021* |
| First half research project meeting – Form 2 must be completed | *End May 2021* |
| Intention to Submit – an email will be sent with instructions | *End July 2021* |
| Data Analysis & Writing Dissertation | *May 2021 – August 2021* |
| Prior to write up meeting - Form 3 must be completed | *Mid-June 2021* |
| First Draft to be sent to supervisor – Feedback will only be given on your draft once. Ensure your supervisor has at least one week to read a draft. | *Mid-August 2021* |
| Final Changes  | *Mid August-Early September 2021* |
| Submission for marking | *Early September 2021* |

**Programme Director:**

David Gerrard (david.gerrard@manchester.ac.uk)

**MSc History of Science, Technology and Medicine**

The MSc in History of Science, Technology and Medicine (HSTM) is a typical humanities Master’s programme running from September to September, over 1 year full-time or 2 years part-time. It consists of 120 credits of taught content, delivered on the University’s standard schedule in Semesters 1 and 2, and one 60-credit research dissertation, largely produced after the end of Semester 2 teaching. The dissertation is of 12 000 to 15 000 words, and must be based on original primary research on a topic selected by the student.

Full-time students produce their dissertations according to the following schedule:

**September onwards:** begin thinking about possible topics and sounding out potential supervisors

**December:** identify topic and provisionally confirm with supervisor

**One week before beginning of Semester 2:** deadline to agree supervision arrangements with supervisor and submit details of chosen title and supervisor

**Early Semester 2:** submission of research outline (3000 words); 5-minute oral presentation on research plans

**February onwards:** preparatory work on dissertation/portfolio alongside Semester 2 taught courses

**May onwards:** fully focused work on dissertation/portfolio, with regular supervisor meetings

**End of July:** student should share full draft with supervisor

**Early September:** final submission deadline.

Part-time students are encouraged to develop their ideas during Year 1, confirming supervision arrangements in the course of this year if possible and doing part of the research during the first summer vacation. However, the required progression milestones all take place in Year 2 and are scheduled as for the full-time schedule.

Research design and the selection of viable research material are important intended learning outcomes, and there is a strong emphasis on students developing their own topics in consultation with potential supervisors. Staff available to supervise will supply listings of their own research specialisms and ideas for possible promising topic areas, as appropriate, but are not expected to design projects.

The range of topics and disciplinary approaches that may be accepted is the same as that covered in the taught component of the programme, including, in addition to HSTM as strictly defined, historical geography of STM; anthropology of STM; sociology of STM/science and technology studies; contemporary science policy studies; science communication studies; and, subject to programme director approval, related approaches from the medical humanities. Students will need to bear in mind the range of specialist supervisory expertise available in making their decisions, and are responsible for finding an available supervisor willing to commit to the proposed study.

Students who are taking the Master’s as a research preparation year for a specified postgraduate research programme at the University of Manchester (usually through research council 1+3 funding) will need to define a research project appropriate to their training needs, and will normally be supervised by the intended PhD supervisor.

Supervisors themselves are typically trained to doctoral level in HSTM or a closely related humanities or social science field, or have equivalent experience through formal publication. Colleagues in other fields should not generally take on HSTM supervision, although co-supervision with an HSTM colleague is sometimes appropriate, and should be discussed with the programme director.

**Programme Director**

Duncan Wilson (Duncan.Wilson@manchester.ac.uk)

**MRes Infection Biology**

**Key dates:**

Offered projects required by end September

Project 1: October – January (12 weeks)

Project 2: February – August (27 weeks)

**Format**

Students will work on two linked research projects under the same supervisor, commencing with a written review of the literature and project proposal, followed by an extended period of laboratory-based experimentation. Students are expected to utilise the initial research period to learn key techniques and skills required to carry out the research.

**Educational aims of the course**

The MRes in Infection Biology is a postgraduate course providing exemplary academic and research training in the molecular basis of host-microbe interactions in health and disease. Based predominantly in the Division of Infection, Immunity and Respiratory Medicine (DIIRM) this course provides an opportunity to learn directly from internationally recognised scientists through joint research, thereby providing sustained interaction with expert mentors for the duration of the course. The course will provide research training in fundamental aspects of infectious diseases, microbial pathogenesis, host interactions, antimicrobial immunity, and antimicrobial therapy with particular attention to the scientific and professional acumen required to establish research independence in the ensuing stages of a scientific career in academia, or in the clinical or industrial setting. Students will become fully integrated FBMH members working within research teams operating at the forefront of contemporary host-pathogen research. Particular interests include how microbes sense and respond to host environments, resist and shape host immune responses, cause damage to host tissues, secrete molecules to benefit their own survival and undergo physiological adaptation to facilitate virulence. For the talented student this course provides an excellent training prior to registration for a PhD.

The MRes Infection Biology is a research intensive Masters programme for talented students pursuing a career in academia or industry. A core component of the research programme is the training in wet lab research skills and students are expected to spend the majority of their time undertaking the project. Research projects should involve hypothesis-driven experimentation addressing a specific research question. Research projects must have direct relevance to the mechanistic basis of infectious disease but may also explore the role of such knowledge in development of diagnostic or therapeutic tools and resources. Projects which focus predominantly on either of the pathogen or the host immune response to infection are equally acceptable. Normally students work alongside a PhD or Post-doc and help with the completion of an aspect of their lab project.

**Programme director**: elaine.bignell@manchester.ac.uk

**MSc Medical Microbiology**

The MSc in Medical Microbiology course has its roots in a prestigious qualification developed in the early 1920s by Professor WWC Topley. As such, it can be considered to be the oldest taught postgraduate microbiology qualification in the country, and probably in the world.

This is an intensive postgraduate taught programme, encompassing the medical and molecular aspects of virology, bacteriology and mycology, as well as immunity to infection and epidemiology. We have a large multi-national cohort comprising approximately 50:50 home/EU and international students. Our students are from a wide variety of backgrounds: from students who have just completed a 1st degree in e.g. Biomedical Science to medics, dentists, pharmacists and even veterinary medicine. Many are taking the programme to further their careers in academia, research and hospital practices.

**Research Projects**

The course delivers a practical element via a 60 credit research project/dissertation for approximately 10 weeks over the summer months, starting in June/July. A variety of projects are offered which reflects the diverse nature of the course and therefore we welcome projects from different specialisms e.g. bacteriology, virology, mycology, parasitology, biochemistry, immunology, pharmacy, medicine, dentistry, nursing or even multi-disciplinary, but all should retain an emphasis on infection or the involvement of microorganisms in disease. These may be lab-based investigations/evaluations, clinical audits, systematic reviews.

As the period for these projects is quite short, we especially suggest contained topics that are achievable in the timeframe. If projects are allocated early, the students are permitted to begin working with the supervisor to learn any new skills that we may not have covered during the taught component of the programme. We are aware that some students will not have worked in a research environment previously, so may require a little more guidance initially.

**Programme Director:** Dr Carol Yates (Carol.Yates@manchester.ac.uk)

Deputy Director Moustafa Alkhalaf (moustafa.alissaalkhalaf@manchester.ac.uk)

**MSc in Medical Imaging Science**

The MSc in Medical Imaging Science covers the basic science and technology behind the principal imaging modalities currently used in medicine and medical research, as well as advanced imaging techniques, clinical and research applications, imaging biomarkers and computational methods. By the start of the 60-credit dissertation project during the summer semester, the students have gained knowledge and understanding of ultrasound, CT, SPECT, PET and MRI, the latter two modalities in greater details, from image acquisition through reconstruction and quantitative analysis. For their elective course unit, the students have opted to develop skills in either visual interpretation of clinical images or computational methods of image analysis.

The dissertation project, conducted either alone or in pairs, is meant to give the students an opportunity to apply their knowledge and skills in medical imaging to answer a focused research question, typically based on imaging data already acquired either clinically or as part of a broader research project. Over the course of the 13-week project worth 60 credits, the students are expected to critically review and summarise the relevant scientific literature, to design and execute under supervision the data analysis contributing to the aims of the study, and to present and discuss the main findings in a 12,000-word dissertation report.

Dissertation projects can span the clinical areas of neuroscience, oncology, cardiology, musculo-skeletal, breast and paediatric imaging covered as part of the MSc. Co-supervision with academics with a background in Medical Imaging Science can be arranged upon request.

**Programme Directors:**

Dr Marie-Claude Asselin (marie-claude.asselin@manchester.ac.uk)

Dr Neil Thacker (neil.a.thacker@manchester.ac.uk)

**MSc Medical and Molecular Virology**

The virology students undertake a 90 credit research project (March-late July) which can be a laboratory based wet project or computer based bioinformatics. Projects can be based around any area of medical, clinical, diagnostic or molecular virology. They can range from basic science through to clinically applied projects.

To prepare for the project, the students will have studied four virology modules in semester one which will give them the knowledge and background to individual viruses and viral families and the diseases they cause, how the infections can be diagnosed in a patient and in the community including the use of molecular technologies such as next generation sequencing. Viral interaction with the immune system and the importance of immunity for diagnosis and disease prevention will be covered. They will also learn about epidemiology of infection, its impact on global public health and treatment, and management and prevention of viral disease. The students will also study these concepts via practical laboratory classes running through semester one, where they will learn and improve their laboratory skills.

The students will also undertake research skills training using a structured approach to develop their research proposal and begin to plan their literature review, so that when they begin their project they will be ready to begin their experimentation. Project supervisors can be academic or clinical staff members. Supervisors are expected to offer advice on the research proposal and literature review planning during the research skills training module (Feb/March) and meet with the student at least once per week when the project begins. They will comment on written work, including one draft of the dissertation. Supervisors are also expected to aid students in the preparation of their written work, and to read and comment on a single draft of the literature review, research proposal and dissertation. Students should be incorporated into the host laboratory and if possible to attend lab meetings/journal clubs etc. The project will be assessed by a written dissertation and by an oral presentation. The oral presentations will take place during a course conference day to be held in August. Assessment of the written dissertation will include project performance and will be undertaken by the supervisor and another independent staff member. Completion of the research project and presentation of it to their peers will allow students to demonstrate confidence as independent graduates of their subject.

**Programme Directors:**

Prof. Pam Vallely – Pamela.j.vallely@manchester.ac.uk

Prof. Paul Klapper – paul.klapper-2@manchester.ac.uk

**MRes Medical Sciences**

To provide a niche opportunity for medical students keen on pursuing a career in academic medicine to undertake intensive training in biomedical research, the Intercalated MRes in Medical Sciences was established in 2005. This strategic development complements the NIHR Integrated Clinical Academic Clinical Training Pathway, and enables prospective clinician-scientists to receive a strong early experience within Manchester’s research groups. Participation in this programme offers a twin approach of being embedded in a successful research group whilst receiving academic tutelage and broader careers guidance. These learning outcomes are delivered by input from senior clinical academic staff who understand (and live) the dual realities of future clinician-scientists. Our intercalating students undertake a full time research project and also participate in a series of tutorials and seminars designed to equip them with skills in critical appraisal and scientific writing.

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| **Month** | **Task** |
| Mid September | Induction Meeting with Course Director |
| 1st week in October | Deadline for Research Project selection\* |
| 2nd Week in October | Begin First Research Project (Research proposal and literature review) |
| End of January | Deadline for submitting Research Project 1 ReportSupervisors first mark and agree a final mark with a second marker. All supervisors are required to second mark another dissertation from the programme. |
| End of January | Begin Research Project 2 |
| End of July  | End Research Project 2 Lab Work |
| Mid July  | Poster presentation day |
| 2nd/3rd week of August  | Dissertation Submission Deadline |
| 1st week of October  | Final Board Meeting |
|  | \*This has to be agreed with the programme director so it is expected that a draft of your proposal will be submitted well in advance of this deadline. |

**Programme Director:** Dr. Luigi Venetucci (Luigi.Venetucci@manchester.ac.uk)

**MSc Molecular Pathology**

The MSc in Molecular Pathology can be taken part-time or full-time and includes a research project at either 30 or 60 credits for the part-time programme or 60 credits for the full-time programme. In order to facilitate vocational training research projects taken in the part-time option will be undertaken in the 3rd or 4th year of the programme and can be in any clinical laboratory or cellular pathology subject, and can be undertaken at the students place of work subject to confirmation of suitability of the project and appointment of University of Manchester supervisor. Research projects taken in the full-time option will be wet laboratory projects in any area of pathological research and will be undertaken at the University of Manchester or its associated research laboratories at CRUK-MI or MCRC in semester two by a 12 week wet laboratory research project. A literature review forming part of the project dissertation will be based on the background to the wet laboratory project.

**Programme Director:** Dr Richard Byers richard.byers@mft.nhs.uk

**MSc Neuroimaging for Clinical and Cognitive Neuroscience (NCCN)**

Students taking the MSc in Neuroimaging for Clinical and Cognitive Neuroscience will be undertaking a research project during the second half of their course. Formally, the project work starts after the completion of semester two and runs through the summer months, with submission of a poster and a report in early September. However, considerable reading, planning, piloting and setting-up can be achieved during the latter part of semester two.

Might you have a suitable project?

***All projects must involve a substantial amount of neuroimage analysis work*** and can involve fMRI, structural MRI (including VBM), EEG/ERP, PET, TMS or a combination of these. The data can already have been collected, but in these cases, it must be very clear that a substantial amount of analysis work and interpretation is required and that this work is novel for this data set.

What can you expect of our students? Our students will be highly trained in SPM, FSL and EEG analysis tools and will have a working knowledge of a number of other analysis procedures including connectivity analyses, DTI and phMRI. While students will be able to draw on the expertise of the MSc teaching team for the benefit of their research, the supervisor (or the supervisor’s research team) is expected to be able to provide ample support in methodology.

The aim of these projects is to provide our students with an experience of using analysis techniques in a research environment -- hopefully within a team setting where they will integrate with others doing imaging work. The aims of the project are not specifically to provide them with experience in Ethics, specialist participant recruitment (e.g., clinical populations) or similar areas of the research. Therefore while these may form a part of their work, these should not be the major responsibility of the student but of the supervisor.

What is the process for allocating projects?

If you have a suitable project, you must select our programme as a project preference (via the central allocation system). At the start of the academic year, we will invite allocated supervisors to complete a brief project description form. This will help ensure that the projects being offered fit with the general course requirements and that they are achievable within the timescale. At the start of semester two, we will offer the list of project descriptions to our students for them to order by preference. Their project selection will follow a period of consideration and consultation, during which they are encouraged to contact potential supervisors for discussion and clarification of projects. Once a student has been allocated to a supervisor/project a meeting between supervisor, student and their advisor (one of our team) will be set up to confirm project details and timetable.

For more details about the MSc NCCN course, please see our website (<http://www.manchester.ac.uk/bmh/neuroimaging-msc>) or contact us

Cheryl Capek, Programme Director (Cheryl.Capek@manchester.ac.uk)

Dan Cox, Deputy Director ( (daniel.cox@manchester.ac.uk)

Amanda Connaghan, Administrator ( (NCCN.admin@manchester.ac.uk)

**MRes Oncology**

This is an exciting and stimulating course and is one of only a handful of MRes Oncology courses available across the country. It is primarily aimed at 3rd and 4th year intercalating MBChB students who have an interest in both medical and clinical oncology, although it will also be relevant to basic biological scientists with an interest in oncology. Modern oncology practice requires an understanding of the scientific basis of cancer and its treatment, as well as demanding the skills needed to evaluate the potential efficacy of new treatments. The MRes in Oncology will equip students with these essential skills by using the unequalled expertise available between the Faculty of Biology, Medicine & Health, Manchester Cancer Research Centre, the CRUK Manchester Institute and the Christie NHS Foundation Trust. The course combines formal lecture-based teaching, small group tutorials with active researchers and practising clinicians, and on-line modules. This taught element cover a wide range of topics including cancer epidemiology, screening and prevention, pathology, diagnosis, radiology, delivering a cancer service, cancer biology and principles of cancer therapy. A major component of the MRes is a research project; a wide range of projects are available with some of the UK’s leading cancer researchers using state-of-the-art facilities and equipment.

**Programme Director:**

Dr Guy Makin (Guy.makin@manchester.ac.uk)

**MSc Physician Associate Studies**

Students will carry out a project and write a report/dissertation under supervision. There is considerable flexibility to match projects to the interests of students and supervisors. The majority of projects are expected to be quality and evidence or literature based (for example, systematic review), clinical audit or educational. Students will be required to identify research questions, develop the design of a research project and protocol (where applicable), collect and analyse data and then write up the project. All students will also be required to deliver an oral presentation.

**Timings:** projects take place throughout the academic year. Please note that the Programme’s academic year starts in January, not September.

**Programme Director:**

Dr Drew Tarmey (drew.tarmey@manchester.ac.uk)

**MRes Precision Medicine**

Projects are designed to offer students interdisciplinary training relevant to precision or stratified medicine. Projects can cover any area relevant to the field, including genomics, transciptomics, proteomics, metabolomics, biomarker discovery, stratified medicine, companion diagnostics, gene therapy etc. Projects can relate to any clinical area such as cancer, cardiology, rheumatology, neurology, respiratory medicine, diabetes, infectious diseases or inherited diseases. Projects range across the translational spectrum from basic science, to more clinically applied research, including both ‘wet-lab’ and computational biology approaches e.g. bioinformatics or analysis of genetic data.

Examples of previous projects can be found here:<https://www.manchester.ac.uk/study/masters/courses/list/13018/msc-precision-medicine/course-details/#course-profile>

Our students include both home and international basic science students from biomedical sciences backgrounds, and intercalating medical students (internal and external).

Students first undertake a ~10-week literature review and prepare a research proposal. They then undertake a 25-week full-time empirical research project. The 6,500-word literature review allows students to develop skills in literature searching, critical appraisal and scientific writing, while the 2,500-word research proposal provides an opportunity for students to formulate a hypothesis and design a research project. The empirical research project should offer research experience across a range of techniques and allow students to fully analyse and interpret empirical data. Students will finally prepare a 13,000-word dissertation and give a poster presentation, allowing them to enhance their skills in scientific writing, data presentation, analysis and discussion.

Supervisors are expected to maintain contact with the student through regular (e.g. weekly) meetings, and to provide an alternative day-to-day contact, where necessary. Supervisors should provide guidance about the project, oversee progress, provide feedback on drafts and assess project written work. Supervisors should also encourage the student to present their work to research group members, and externally, where appropriate. Students should be incorporated into the host laboratory and are encouraged to attend lab meetings and journal clubs.

**Programme Directors:**

Dr Janine Lamb (janine.Lamb@manchester.ac.uk)

Dr John Curtin (john.Curtin@manchester.ac.uk)

**MRes Psychology**

MRes projects can be any area of psychology and can be qualitative or quantitative in nature. Although most students will collect their own data, analysis of a provided dataset is also permissible as long as there is sufficient scope and depth for the student to demonstrate their research skills. Projects which require NHS ethics not already in place are generally discouraged due to the stress of the time demands. At the start of Semester 1, students will be provided with a list of project titles and short descriptions provided by staff. Students will be encouraged to contact the member of staff providing the project title in which they are interested to discuss the project. Students then rank their preferred projects and the projects are allocated to them by the program directors. Then, the student and supervisor will meet early in Semester 1 in order to arrive at a plan for the dissertation research proposal. It is feasible to have more than one student working on the same project area as long as the projects themselves are sufficiently different from each other. The majority of students collect their data over the second semester and summer. Thus, the supervision period will extend across the whole academic year. For ESRC 1+3 students, the dissertation will serve as a pilot study for their 3-yr PhD research. For other MRes students, it will be a stand-alone research study.

Students will have at least twelve meetings with the dissertation supervisor over the year, to discuss the aims and objectives of the study, to enable the student to arrive at a final design, and to facilitate the conducting and writing up of the research. Supervisors will give general advice and help with analysis when necessary, and will provide feedback on one draft version of the final dissertation.

**Programme Directors:**

Dr Bo Yao (bo.yao@manchester.ac.uk)

Dr Karen Lander (karen.lander@manchester.ac.uk)

**MRes in Reproduction and Pregnancy**

The MRes (Masters in Research) in Reproduction and Pregnancy is a 1year full time course providing experience and training in reproductive medicine and pregnancy-related research. It is open to intercalating medical students (after completion of 3rd or 4th year) as well as to graduates with a science-based or medical degree. This course is ideally suited to those with a future interest in Reproductive Medicine or Obstetrics and Gynaecology and/or wishing to gain experience of translational medical research. No previous research experience is required.

Students complete two related research projects on a specific area of reproduction or pregnancy. The first (Research Project 1) is a literature review that leads to the guided preparation of a research proposal, followed by a 6 month research project (Research Project 2). Both laboratory and clinical research projects are offered. The research projects are complemented by taught units providing general research skills including critical evaluation of published data, scientific writing and statistics. The programme covers broad aspects of reproduction and pregnancy, including major landmarks in pregnancy research, infertility, the major diseases of pregnancy, clinical trials, current developments, and ethical and social issues. The Masterclass in Reproduction and Pregnancy provides students with contemporary knowledge of reproductive medicine and obstetric research, and showcases our own pioneering research antenatal clinics. Students initially complete a series of practical skills workshops, to provide experience and training in a wide range of biomedical laboratory techniques as well as specialist skills in reproductive and pregnancy research.

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| **Month** | **Task** |
| June | Project proposals requested from allocated supervisors. |
| September-early October | Students review proposed projects, consult potential supervisors and make preferred choices. |
| mid October | Students are allocated projects and schedule first meeting with supervisors to discuss. |
| mid-October- December | Students prepare a literature report with support from supervisory team. |
| January | Students prepare a research proposal with support from supervisors.   |
| February | Literature reports and proposals are marked by one supervisor and an independent expert.  |
| February-July | Students undertake their research project. |
| March | Students give a short talk outlining their project design and aims.  |
| Late July | Students present their findings in a poster symposium. |
| Mid-August | Dissertation deadline. |
| August-September | Dissertations are marked***.***  |

**Programme Directors:**

Professor John Aplin (john.aplin@manchester.ac.uk)

Dr Mark Dilworth (M.R.Dilworth@manchester.ac.uk)

**MSc Science Communication**

MSc Science Communication students undertake two major projects. The first project is a **Science Communication Research Project (HSTM60022)** that is an empirically based research project on a topic in science communication that makes an original contribution to knowledge, understanding, policy or practice in science communication. For this project the students are expected to have a clear research question, utilise appropriate theoretical tools, and follow recognised research methods in science communication studies. Science communication is a relatively new academic field, and there is scope to research historic or contemporary events, objects, places, people, policies, institutions, practices, professions, signs, and rhetorics. Journals such as *Public Understanding of Science* and *Science Communication* include good examples of reports of research projects in this area.

* Academic staff generate a list of potential research topics by early-October. This list is then provided to the students. Students can also speak with members of staff about designing projects that are not on this list if they are motivated to do so. The students confirm their research project titles in mid-January.
* Students produce a research proposal (deadline mid-January) and an oral presentation (early-February) outlining their research plans.
* The final research essay (8500 words) is due in mid-May.

The second project is the **Science Communication Mentored Project (HSTM60622)**. This project is a substantial item of supervised coursework that acquaints the students with professional contexts for science communication. For the Mentored Project the student develops a piece of work that is relevant to the professional context of the mentor and should be something that will be of use to the mentor or external partner organisation. The Mentored Project is a compulsory unit that the student completes over the summer from May until September, although we encourage them to start earlier if the mentor or external partner organisation is amenable. Previous mentored projects have included: proposals for a documentary; gallery proposals; short films or videos; briefing notes for a governmental Green Paper; outreach workshops or events; designs for an interactive exhibit; podcasts; research proposals; websites; promotional material; and news articles.

* The academic advisor for the academic justification component of the mentored project is the same staff member that supervised the science communication research project.
* Students are given a list of potential mentors/mentored projects in early-February. They choose their mentor and mentored project by mid-April. Proposals for science communication projects (outreach, media, museums, etc.) that could serve as a mentored project for the student should be sent by late-January.

**Programme Director:** Elizabeth Toon (Elizabeth.Toon@manchester.ac.uk)

**MSc Skin Ageing and Aesthetic Medicine**

Skin Ageing and Aesthetic Medicine MSc students are clinically qualified (in medicine and dentistry) and are engaged on the course on a part-time distance-learning basis over a period of 3 years. They will have previously completed 8 units in years 1 and 2 which cover: fundamentals of skin ageing; skin rejuvenation; injectables in aesthetic medicine; Lasers and; invasive aesthetic medicine.

The dissertation project should be based within the research areas of skin (or hair) ageing, or aesthetic medicine (including plastic surgery). The dissertation projects count for 60 credits and, due to the nature of the course (distance learning on a part-time basis), should be a ‘dry ‘ project following either an extended literature review model or research proposal. The students have a full 11 months to complete their dissertation (October – September). The supervisors are expected to conduct monthly/six-weekly telephone tutorials with their students to provide advice and feedback on early drafts and to mark the dissertations after submission.

**Programme directors**:

Dr Helen Graham ( helen.k.graham@manchester.ac.uk)

Professor Rachel Watson (Rachel.watson@manchester.ac.uk)

**MRes Tissue Engineering for Regenerative Medicine (TERM)**

The MRes in TERM projects are designed to offer students multidisciplinary training in all aspects of tissue engineering and regenerative medicine. Projects can cover any area relevant to the field, including biomaterials design/fabrication/analysis, stem cell culture and differentiation, cell-biomaterial interactions or gene therapy.

Students undertake two linked projects in the same laboratory. In semester 1 (Oct-Jan) students undertake a 10-week literature review and prepare a research proposal. In semester 2 (Feb-July) they undertake a 25-week full-time laboratory-based project. The 6,500-word literature review allows students to develop skills in literature searching, critical appraisal and scientific writing, while the 2,500-word research proposal provides an opportunity for students to formulate a hypothesis and design a research project. The laboratory-based project will be in the same area studied in project 1, but may not be identical to the study designed by the student in their research proposal. The project should offer practical experience across a range of techniques and allow students to fully analyse and interpret experimental data. Students will finally prepare a 10,000-word dissertation and give a 10-minute oral presentation, allowing them to enhance their skills in scientific writing, data presentation, analysis and discussion.

Supervisors are expected to meet with their students regularly throughout both projects, but particularly in project 2 where they should hold progress meetings on a weekly or fortnightly basis. Supervisors are also expected to aid students in the preparation of their written work, and to read and comment on a single draft of the literature review, research proposal and dissertation. Students should be incorporated into the host laboratory and are encouraged to attend lab meetings and journal clubs. Supervisors will be required to first-mark their own students work (along with a second independent examiner) and to second-mark work from another student within the cohort.

**Programme Director:** Dr Stephen Richardson (s.richardson@Manchester.ac.uk)