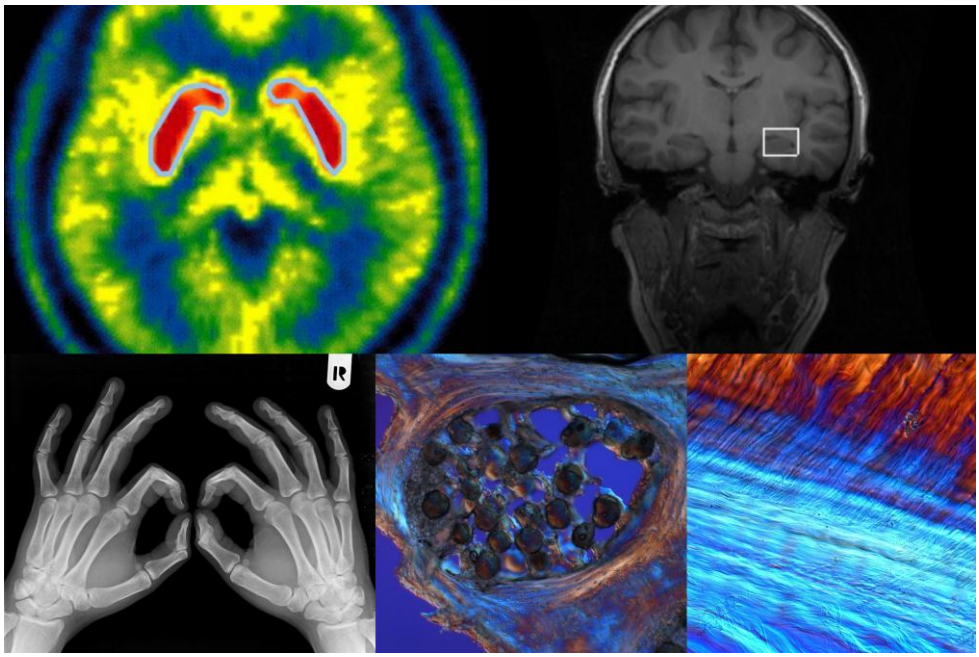

# MRes in Bioimaging Sciences

The Institute of Chemical Biology

Department of Chemistry

Imperial College London

Academic Year: 1st October 2012 – 30th September 2013

## Some Important Dates

**Monday 1 October 2012**

10.00 – 12.00 Welcome & Introduction to the Course (Postgraduate Common Room, Level 2, Chemistry)

12.00- 14.00 ICB Welcome Lunch (Postgraduate Common Room, Level 2, Chemistry)

15.00-15:45 Welcome Talk by Rector, Director of Graduate School and GSA Chair (Great Hall, Level 2, Sherfield Building)

**Tuesday 2 October 2012**

11.00-16.00 Freshers' Fair (Student Union, South Kensington campus)

**Wednesday 3 October 2012**

9.00-17.00 Sports Team Trials (Student Union, South Kensington campus)

**Thursday 4 October 2012**

10.00 – 11.00 Introductory session on Bioimaging course lectures (SALC 8, Fifth floor, Sherfield Building)

12.30 – 13.30 Safety Talks - Primary Induction (Lecture Theatre C, RCS Building) **Attendance Compulsory**

14.00 – 16.30 Safety Talks – Basic Laboratory Safety (Lecture Theatre C, RCS Building) **Attendance Compulsory**

**Friday 5 October 2012**

14.00- 15.00 Department of Chemistry Welcome Induction for all new Postgraduates (Room 2321, Level 2, Chemistry)

**Saturday 6th October 2012**

19.00-22.00 Postgraduate Mingle (Student Union, South Kensington campus)

**From Monday 8 October 2012**

Lecture Courses begin (See timetable for specific times and locations)

**Friday 12 October 2012**

11.30-12.00 Hazard Explosion Lecture (Pippard Lecture Theatre, Sherfield Building, Level 5)

**Monday 15 October 2012**

10.00-12.00 Group A: Graduate School Transferable skills course: Technical Writing (SALC 5, Fifth floor, Sherfield Building)

14.00-16.00 Group B: Graduate School Transferable skills course: Technical Writing (SALC 5, Fifth floor, Sherfield Building)

**Attendance Compulsory**

**Tuesday 16 October 2012**

10.00 – 12.30 Group A: Graduate School Transferable skills course: Tackling a Literature Review (SALC Room 5, Level 5, Sherfield Building)

14.00 – 16.30 Group B: Graduate School Transferable skills course: Tackling a Literature Review (SALC Room 5, Level 5, Sherfield Building) **Attendance Compulsory**

**Friday 2 November 2012**

Deadline 12:00 noon — Submission of 3 projects in order of preference to Dr Beeta Balali-Mood by email (b.balali@imperial.ac.uk)

**Tuesday 6 November 2012**

9.00 – 17.00 — Bioethics Transferable Skills Course – Prof Marianne Talbot (Flowers Building, Room G47A)
**Attendance Compulsory**

**Wednesday 7 November 2012**

09.00 - 1700 — Bioethics Transferable Skills Course – Prof Marianne Talbot (Flowers Building, Room G47A)
**Attendance Compulsory**

**Thursday 8 November 2012**

12:00 - 14:00 — Informal Lunch and Project Allocation (HoD room, Level 2, Chemistry)

**Wednesday 14 November 2012**

13.30 – 18.00 — ICB Colloquium (Pippard Lecture Theatre, Level 5, Sherfield Building)

**Friday 30 November 2012**

12.30- 14.00 — MRes Staff-Student Committee meeting (Conference Room B, Level 2, Chemistry)

16.00 – 17.00 — Exam Workshop (Room 47A, Flowers Building)

**Thursday 13 December 2012**

DEADLINE: 14.00 — Submit:

1) 4 bound copies of Literature Report and a signed Plagiarism form to ICB administrator (Room 249b, Level 2, Chemistry)
2) One electronic copy of Literature Report by email to Dr Beeta Balali-Mood (b.balali@imperial.ac.uk)
3) One electronic copy of your Literature Report (as word or pdf format) on ***Blackboard Virtual Learning Environment***

**Friday 14 December 2012**

ICB Christmas Party (Café, Sir Alexander Fleming Building)

**Tuesday 8 January 2013**

10.00 – 12.00 — Written Exam Paper 1 (SALC Rooms 8 & 9, Level 5, Sherfield Building)

**Friday 11 January 2013**

10.00 – 12.00 — Written Exam Paper 2 (SALC Rooms 8 & 9, Level 5, Sherfield Building))

**Monday 14 January 2013**

10.00 – 12.00 — Written Exam Paper 3 (SALC 1 & 2, Level 5, Sherfield Building)

**Mid-February 2013**

14.00 – 18.00 — ICB Colloquium (TBC)
**Attendance Compulsory**

**2 to 27 April 2013**

Mid-Term Project Progress Review
- Complete Mid-term Progress Report Form with supervisors
- Complete Student Evaluation Form

**Friday 3 May 2013**

Deadline for returning both Mid-term Progress Report and Student Evaluation Forms to ICB administrator (b.balali@imperial.ac.uk)

**29 May to 22 June 2013**

Contact supervisors and independent marker to organise MRes Viva.

**Tuesday 25 June 2013**

Deadline to confirm date/time of MRes viva with ICB administrator (b.balali@imperial.ac.uk)

**Monday 2 September 2013**

Deadline: 14.00 Submit:

1) 4 bound copies of MRes Manuscript and a signed Plagiarism form to ICB administrator (Room 249b, Level 2, Chemistry)
2) One electronic copy of MRes manuscript by email to the ICB administrator (b.balali@imperial.ac.uk)
3) One electronic copy of your (as word or pdf format) on ***Blackboard Virtual Learning Environment***

**Wednesday 11 September 2013**

All day MRes Conference – project presentations (venue to be announced)
**Attendance Compulsory**

**10 September – 14 September 2013**

*Viva* on Research Project (**date to be arranged by students**)

**16-20 September 2012**

11.00 - 12.00 External Examiner's Meeting (location to be confirmed)
**Attendance Compulsory**

**You will be notified of any changes to the above arrangements by email.**

# CONTACTS

Those responsible for the general organisation of the course


| | | | |
|---|---|---|---|
| Dr. Phil Miller | Chemistry Rm. 834 (C1) | Ext 42847 | philip.miller@imperial.ac.uk |
| Prof. Ramon Vilar | Chemistry Rm. 304 (RCS1) | Ext 41967 | r.vilar@imperial.ac.uk |
| Dr Beeta Balali-Mood | Chemistry Rm. 249b | Ext 45880 | b.balali@imperial.ac.uk |


Personal tutor
To be assigned after project allocations

**USEFUL WEBSITES**

www.chemicalbiology.ac.uk

http://www.csc.mrc.ac.uk/Research/Facilities/BiologicalImagingCentre/

## FUNDING


The Course is funded by MRC and we are very grateful to this organisation for its support.

## Why Bioimaging Sciences?

Bioimaging Science has played a vital role in improving human life. The development of a wide range of imaging techniques such as magnetic resonance imaging (MRI), positron emission tomography (PET), ultrasound and optical imaging are nowadays important tools for the early detection of disease, understanding basic molecular aspects of living organisms and the evaluation of medical treatment. This course will cover the fundamentals of modern imaging methodologies – including their techniques and application within medicine and the pharmaceutical industry, along with the chemistry behind imaging agents and biomarkers.

Imaging technologies are an increasingly important component of research and development in the pharmaceutical industry providing opportunities for pre-clinical testing of new products. It can cost £1billion to bring a new drug to market but this cost can be significantly reduced using powerful imaging techniques that speed up the process of testing new drugs. The advances in imaging technology allow researchers to gather information about the effectiveness of a drug on a specific condition or disease and observe how a drug is affecting a certain area of the body.

Molecular imaging technologies are being developed to examine the integrative functions of molecules, cells, organ systems and whole organisms. The organisms range from viruses to bacteria to higher order species, including humans, and in each case, molecular imaging is used to examine the structure and regulatory mechanisms of their organised functions.

Molecular imaging technologies use molecular probes or interactions with molecules. Many different technologies have been and continue to be developed to image the structure and function of systems, such as optical/fluorescence imaging, positron emission tomography (PET), magnetic resonance imaging (MRI), X-ray computed tomography (CT), single photon emission computed tomography, ultrasound and microwave. All have unique applications, with advantages and limitations.

The UK has a very strong record in the development and clinical application of new imaging techniques and some of the major fundamental work in magnetic resonance, computed tomography, ultrasound and positron emission tomography has been performed within Imperial College. The research strength of Imperial College in Imaging Sciences is recognised both nationally and internationally, as exemplified by the creation of the Imaging Sciences Centre (ISC) – and a recent MRC discipline bridging award. The Masters in Reseach course will further interdisciplinary development in imaging sciences and create a multidisciplinary team involving chemists, immunologists, radiologists, image scientists, physicists, biomedical scientists and computer scientists.

## Course Aims

On graduation from the course you will be in an excellent position to begin a PhD or pursue an industrial career in imaging science. You will have developed the ability to carry out research within multidisciplinary teams, and possess knowledge of basic and advanced concepts in bioimaging sciences. The transferable skills will aid you in pursuing your chosen career and in communicating your ideas to others. The course aims to produce highly trained and motivated scientists who will be ideal candidates for research (industrial and academic) positions within imaging science.

With the current world-wide lack of well-trained imaging scientists we are confident that MRes in Bioimaging Sciences graduates will have exceptional career prospects.

## Educational aims of the provision

### 1- Learning outcomes

The programme aims to:

- Produce physical sciences postgraduates equipped to pursue careers at the interface between the physical and life sciences (imaging related areas), in industry, the public sector and non-governmental organisations;
- develop the ability to undertake research in multidisciplinary teams at this interface;
- develop a knowledge of a range of basic and advanced bioimaging concepts;
- develop research and analytical skills related to bioimaging research;
- develop oral and written scientific presentation skills;
- attract the most motivated physical sciences graduates, both from within the UK and from overseas;
- develop new areas of teaching in response to the advance of scholarship and the needs of vocational training.

Considering the above aims, the main outcome of the programme is to provide opportunities for postgraduate students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

**a) Knowledge and understanding of:**

- core and specialised concepts in imaging science – positron emission tomography (PET), single photon emission tomography (SPECT), magnetic resonance imaging (MRI), optical imaging (Bioluminescence, FLIM), ultrasound, pharmacology, anatomy-physiology, image computation, the chemistry of imaging.
- research techniques, including information retrieval, experimental design and statistics, modelling, sampling, bioimaging techniques, molecular characterisation, and laboratory safety;
- detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's project;
- management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications.

**b) Intellectual (thinking) skills. To be able to:**

- analyse and evaluate bioimaging problems using a multidisciplinary integrated approach
- integrate and evaluate information
- formulate and evaluate hypothesis
- plan, conduct and write up a programme of original research

**c) Practical skills**

- plan and execute safely a series of experiments
- use laboratory–based methods to generate data
- analyse experimental results and determine their strength and validity
- prepare technical reports and give technical presentations
- use the scientific literature effectively
- use computer packages

**d) Transferable skills**

- communicate effectively through oral presentations, computer processing and presentations, written reports and scientific publications
- management skills: decision processes, objective criteria, problem definition, project design and evaluation, risk management, teamwork and coordination
- integrate and evaluate information from a variety of sources
- transfer techniques and solutions from one discipline to another
- use Information and Communications Technology
- manage resources and time
- learn effectively for the purpose of continuing professional development

## 2 - Curricula and assessment

*Course Duration*
The programme is only offered as a full-time, one-year course and leads to the Masters in Research degree. It consists of an 8-month long multidisciplinary research project, taught courses in chemical and imaging technologies, training in bioimaging research, specialist lectures in transferable skills and group discussion (journal club) sessions.

*Taught Component of Course*
Students begin their lecture programme with core courses in the first term (October-December). Coursework is examined in January. The focus will be on 'whole body imaging' and modules and lecturers are detailed below. Students will be expected to attend all the lecture modules and answer an exam question on seven module courses (module courses 2 to 8, inclusive) in the January and May examinations – however **only the best 6 marks will be counted towards this component of the degree**.

At the end of each lecture course, students will be asked to complete a feedback form which will be used to improve future courses. The students will also be asked to vote for the Best Lecturer of the Year.

*Journal Club*
Journal club meetings take place in the spring term. This is an assessed transferable skills course, which aims to develop presentation skills, whilst encouraging scientific debate, and providing the opportunity to broaden scientific knowledge. At each meeting students will work together in a group and make a presentation about a seminal high impact paper. This will be followed by a chaired discussion/debate about the paper. Students are assessed on their ability to organise the presentation in a logical manner, the use of clear power-point slides, the clarity of the presentation and its scientific content.

*Research Project*
The major component of the course is an 8 month long multidisciplinary research project. A literature report/project proposal on the research topic will be submitted in December, a research talk in early September and a final report/manuscript on the research in early September. This will be followed by an oral examination of the manuscript (mid-September).

- *Literature Report:* (***submission deadline: 2pm, Thursday 13 December 2012***)
  The literature report is to be written in the first two/three months of the course. It is expected to be an in-depth critical review of the subject matter chosen for the research project. The report should include an abstract, bibliography, literature survey and a proposal for the work to be carried out during the research project.

Reports will be marked independently by both supervisors as well as by one other external marker. The purpose of the project proposal is to test independent work. The written style, standard of presentation, completeness of literature survey and analysis of literature are assessed. The rationale for the proposed research will also be marked, to ensure an understanding of the aims and objectives of the proposed research. Guidelines for marking the MRes Literature Report can be found on page 19.

The Department and College take plagiarism very seriously. Do not plagiarise. You must read and comply with the Chemistry Department Policy on Plagiarism:
http://www3.imperial.ac.uk/chemistry/teaching/undergraduateteaching/materials/plagiarism

A copy of the Plagiarism Form should be submitted with your Literature Report.

Students are required to submit the following by the specified deadline:

1) 4 bound copies of Literature Report and a signed Plagiarism form to ICB administrator (Room 249b, Level 2, Chemistry)
2) One electronic copy of Literature Report by email to Dr Beeta Balali-Mood (b.balali@imperial.ac.uk)
3) One electronic copy of your Literature Report (as word or pdf format) on ***Blackboard Virtual Learning Environment***

**Failure to do so will result in a penalty. 5% of the awarded mark will be deducted for each day of delay.**

- *Research Manuscript (**submission deadline: 2pm, Monday 2 September 2013**)*

The research project will be written up in the form of a manuscript. It should include an abstract, introduction, updated literature review, bibliography, results, conclusions and further work (a template will be provided for this). Each manuscript will be marked by three members of staff (two supervisors and an independent marker).

The Department and College take plagiarism very seriously. Do not plagiarise. You must read and comply with the Chemistry Department Policy on Plagiarism:
http://www3.imperial.ac.uk/chemistry/teaching/undergraduateteaching/materials/plagiarism

A copy of the Plagiarism Form (page 37-38) should be submitted with your Literature Report.

Students are required to submit the following by the specified deadline:

1) 4 bound copies of research manuscript and a signed Plagiarism form to ICB administrator (Room 249b, Level 2, Chemistry)
2) One electronic copy of manuscript by email to the ICB administrator.
3) One electronic copy of your Manuscript (as word or pdf format) on ***Blackboard Virtual Learning Environment***

**Failure to do so will result in a penalty. 5% of the awarded mark will be deducted for each day of delay.**

- *Viva (10 – 14 September 2013)*

The oral examination will further test understanding of the research undertaken and more general concepts, and will be taken by the independent assessor and at least one supervisor. Guidelines for marking the MRes Oral Examination can be found on page 30-31.

**It is the student's responsibility to organise the viva date with the supervisors and independent marker, and to inform the ICB administrator (b.balali@imperial.ac.uk) the date and time of the viva.**

- *MRes Conference (Wednesday 11 September 2013)*

The MRes conference will be a meeting for all ICB students. It provides the opportunity to present the work carried out during the research project (in the form of a 15 minute presentation with 5 minutes questions), and also the opportunity to hear about research carried out by your fellow cohort. The talks will be assessed by external examiners.

The research project will be supervised by at least two collaborating scientists with differing expertise. The supervisors are most likely to be from within the College but could also involve one from industry as part of the team/pairing. The projects will form the most

important part of the MRes course and will be carried out in researchers laboratories, and along with enabling a taste of cutting edge research, these would highlight transferable skills such as report writing and oral presentations. It is expected that industrial collaborators will contribute to these research projects and students will also spend time in industrial labs and experience 'real' working environments. However, the majority of the project should be carried out within laboratories within the College. This will allow the students to remain in contact and meet regularly; maintain the communal spirit of the cohort engendered from the time of the taught modules.

*Research seminars and colloquia*
Regular research seminars given by leaders in particular fields are organised by the Chemistry department, and attendance is expected. Details will be sent via email. The ICB also organises 2 colloquia each year. These are afternoon meetings in which invited speakers give talks in a variety of research area. **Attendance is compulsory** however the lectures are not examinable.

*Transferable skills*
Students are strongly encouraged to take transferable skills courses given by the Graduate School at Imperial College London. For more information on the courses available please see:
http://www3.imperial.ac.uk/gseps/transferableskillscourses

The following three transferable skills courses have been organised for all ICB MRes students. **Attendance is compulsory** however the courses are not examinable.

1. **GSEPS Transferable Skills Course - Technical Writing**

**Credit Rating:** 1 A List Credit
**Related Courses:** *Any Writing Skills courses*
**Course Description:**
Technical writing is undergoing rapid evolution. The modern trend is towards a clearer, more direct style, packing more meaning in to fewer words. There is also a move towards producing technical documents in digital form such as HTML and pdf files. Special issues concerning digital documents are also covered.
**Topics and Highlights**

- Writing for the expert
- Writing for the layperson
- Technical writing and "plain English"
- Effective use of graphics
- Principles of good layout and document navigation

2. **ICB Bioethics Course** by Professor Marianne Talbot, Director of Studies in Philosophy, University of Oxford

This is a 1-day introductory course on 'Research Ethics'. Excellent course feedback have been received from past students.

3. **GSEPS Transferable Skills Course - Tackling a Literature Review**
4.

**Credit Rating:** 1 A List credit
**Related Courses:** *Information Retrieval; Technical Writing Two Hour Workshop; Technical Writing Lecture Series; Efficient Reading; Your PhD: The Last Lap; Your PhD: Finish Up & Move On, EndNote*

**Course Description:**
Difficulties often beset researchers when faced with the prospect of writing a literature review; these problems typically originate in a lack of understanding of what a literature review is, how it is used by others, and what exactly is expected.
Frequently the earliest task in the research process, the objective of this session is to equip delegates with the skills needed to plan, research, organise and compose a literature review.
**Selected Topics**

- Understanding what a literature review is - and what it is not
- Scoping the literature review - do I have to read everything?
- Formulating questions and a working manuscript
- Strategies for finding relevant material
- Reading and evaluating literature effectively
- You need a database!
- Organising material - anatomy of a literature review
- Citation styles and usage; avoiding plagiarism

The workshop will begin by ensuring that delegates understand the objectives and purpose of writing a literature review. With this understanding as a basis, the workshop will continue with a discussion of the features and framework of a literature review.
We will talk about the iterative cycle of scoping literature reviews and developing the manuscript and the specific questions that the literature review will address. Integral to this is the literature search, evaluation and selection process. The importance of "active reading" and appropriate note taking will be emphasised as the foundation of a successful literature review. The literature review can now begin to take shape and delegates will be shown how to develop a theme and outline that suit the working manuscript and questions that they will have been using in the research phase. We will discuss honing the draft into the finished product and examine good style, citation standards and how to avoid plagiarism. The workshop will include exercises and targeted discussion to emphasise the points made.

*Careers Day*
A day of careers talks from a range of professions to take place in spring 2012. This is a good opportunity to seek careers advice from the speakers on the day and to explore various career opportunities available. Further details of the programme will be sent via email.

*Assessment Method*

The different teaching outcomes (see the 'Educational aims of the provision' section) are assessed in the following way:

- The knowledge base is assessed through a combination of unseen written examinations (for the taught component of the course, i.e. the compulsory courses given during the first term) and assessed project work (the literature review and research project).

- The intellectual (thinking) skills are evaluated through literature report, unseen written examinations and the individual research project. This provides and overview of the intellectual abilities of the students to achieve the aims.

- Practical skills are assessed through the literature report and the research project (both the written component and the ability of the student to carry out the research, i.e. experimental work, learning specific techniques, etc.) dissertation and oral examination.

- The transferable skills are assessed in the student's research project and literature survey. Their ability to communicate in public is also assessed during the oral examination.

The assessment rules & degree classification for the programme are:

- Minimum standards (i.e. 50%) **in each element and assessed component** will be required.
- To qualify for the award of MRes, students must complete and **pass all the course requirements** and must achieve an overall pass mark (50%) in each assessed component *AND* the combined taught element (written examinations and journal club) and research element (literature report, MRes manuscript and oral viva) of the course.
- The percentage weighting of marks contributing to the degree are given in the following table:

| | **Taught Element (35 %)** | **Percentage weighting of marks contributing to degree** | **Research Element (65%)** | **Percentage weighting of marks contributing to degree** |
|---|---|---|---|---|
| **Assessed Components** | Written Examinations | 30 % | Literature Report | 10 % |
| | Journal Club | 5 % | MRes Manuscript | 40 % |
| | | | Oral Viva | 10 % |
| | | | MRes Conference | 5% |

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

| GRADE | MARKS | INTERPRETATION |
|---|---|---|
| Distinction | 70% - 100% | Marks represent a distinction performance |
| Merit | 60% - 69.9% | Marks represent a merit performance |
| Pass | 50% - 59.9% | Marks represent a pass |
| Fail | 0% - 49.9% | Marks represent a fail performance at MRes level |

- **Distinction**: to be awarded where a candidate has achieved an aggregate mark of 70 per cent or greater across the programme as a whole, comprising a mark of 70 per cent or greater in each element;
- **Merit**: to be awarded where a candidate has achieved an aggregate mark of 60 per cent or greater across a programme as a whole, comprising a mark of 60 per cent or greater in each element;
- **Pass**: to be awarded where a candidate has achieved an aggregate mark of 50 per cent or greater across a programme as a whole, comprising a mark of 50 per cent or greater in each element.
- **Fail**: to be awarded where a candidate has achieved an aggregate mark of 49.9 per cent or less across a programme as a whole, comprising a mark of 49.9 per cent or less in each element.

At the end of the course an external examiner will assess the examination process. This meeting will be on **Friday 20 September 2013** and all students will have to be present for

this day. Students that are either at boundaries between marks (i.e. pass/failure or pass/distinction) or have failed one or more components of the course are likely to get an additional oral examination (viva).

**Reading Material**

The course lecturers will distribute relevant reading material but general textbooks that are worth consulting are:

*Molecular Imaging*, Markus Rudin, Imperial College Press, 2005.

*An Introduction to the Principles of Medical Imaging*, Guy, C, Ffytche, D, Imperial College Press, 2005.

*The Chemistry of Contrast Agents in Medical Magnetic Resonance Imaging*, Merbach, A. E., Toth, E., Eds.; Chichester, John Wiley & Sons; LTD, 2001

*Molecular Imaging: Principles and Practice*. Weissleder, R, Ross, B, McGraw Hill, 2010

## Student responsibilities

The MRes course is a postgraduate assignment and as such is not following undergraduate timing. There is no term free time in this course. Students should be aware that their bursary is for a full-time employment up to the end of September 2013. **Any holidays or sick-leave should be taken at the discretion of the supervisors, but should under no circumstances be taken in the examination periods of January 2013 and September 2013.**

It is mandatory to attend all scheduled lectures, seminars and courses. Missing an exam without any support by a doctor's notice for the day of the exam will count as failure. It is the responsibility of the student to ensure that sufficient time is allocated for the exam and write-up preparation.

The MRes course directors, Prof. Ramon Vilar and Dr Phillip Miller and the program coordinator of the course, Dr Beeta Balali-Mood will be the point of contact for all administrative or logistic issues. The course directors can be consulted in all matters concerning problems with the supervision of the projects or other pastoral difficulties.

Students are expected to organise, conduct and present their research project in an independent fashion. The supervisory role is to guide and advise the student intellectually as well as technically, but it is not the supervisor's responsibility to do the thinking or the work for the student. All projects will have at least two supervisors, with differing research expertise. Both supervisors should be approached for guidance. It is the students' responsibility to make an effort and seek contact with their supervisors on a regular basis.

Students are expected to maintain an up to date webpage, summarising their research and listing attendance at scientific meetings at the ICB website
More information will be sent out by the ICB administrator.

In order to pass the course successfully students have to pass all assessed components of the course. This includes the written exams, the literature/proposal report, the final report and the viva. Failing in one of the components will normally lead to a failure of the whole course.

At the end of the course an external examiner will assess the examination process. All students have to be present for this day. Students that are either at boundaries between marks (i.e. pass/failure or pass/merit, merit/distinction) or have failed one or more component of the course are likely to get an additional oral examination (viva) that will determine their final mark.

Students should seek guidance with respect to their project write-up and literature report from their corresponding supervisors, since they will be involved in the marking. After the literature report they should seek feedback from their corresponding supervisors to foster the improvement of their final report.

Students are required to submit an electronic version of the final report to their supervisors. Additionally, they must hand over all notes, lab-books, results, computer programmes etc to their supervisors.

Final Manuscript/Literature Report
These must be submitted as four bound and typewritten copies by the specified deadlines. Failure to do so will result in a penalty. 5% of the awarded mark will be deducted for each day of delay.

Viva

Students are responsible for contacting their supervisors and independent marker to arrange a *viva* date. The ICB administrator will send further details nearer the time.

# Course Synopsis

## *Module 1 - Introduction to Cell Biology and Biochemistry*
**[This module is non-examinable but attendance is compulsory]**

- **Introduction to Cell Biology**:
  **Dr Rudiger Woscholski** (r.woscholski@imperial.ac.uk)
  Lectures: (5 hrs + 1 hr Q&A session)

This 5-hour lecture course provides a brief overview of the basic concepts and facts of cell biology, with particular emphasis on the morphology and compartmentalisation of the cell; the difference between prokaryotic and eukaryotic cells, key metabolic pathways and their control by 2nd messengers. Cellular signalling and hormonal control towards cellular destiny, shape and fate will be introduced.

- **Practicalities of Cell Culture, Handling and Visualisation**
  **Dr Jane Saffell** (j.saffell@imperial.ac.uk)
  Lectures: (4 hours)

This session outlines some practicalities of mammalian cell culture, presents examples of cellular experimentation approaches, and describes the use of fluorescence light microscopy to visualise cells and/or their components.

From engaging with this session you will be able to:

- Describe the basic conditions required for cells and tissues to thrive outside the body, including key equipment and solutions.
- Describe different assays for measuring cell survival and proliferation
- Describe how antibodies and fluorescent labels can be used to visualise specific cells or sub-cellular components using fluorescence microscopy.

## *Module 2 – Anatomy and physiology for imaging*

**Dr Azeem Saleem** (Azeem.Saleem@Imanova.co.uk)**, Dr Lisa Wells** (Lisa.Wells@Imanova.co.uk), **Eugenii A Rabiner** (e.rabiner@imperial.ac.uk) Lectures (2 hrs)

An overview of anatomy for imaging with focus on the brain and pre-clinical animal models.

## *Module 3 - Magnetic Resonance Imaging*

- **Dr Graeme Stasiuk** (g.stasiuk@imperial.ac.uk) Lectures (2 hrs)

  Overview of MRI - Basics of MRI physics: Introduction to Neuroimaging and applications.

- **Prof. Ramon Vilar** (r.vilar@imperial.ac.uk)
  Lectures (3 hrs)

This lecture course will cover the principles of MRI contrast agents. In the first lecture, the general features a successful contrast agent should have will be presented. This will be followed up my specific examples of MRI contrast agents, including Gd complexes and iron oxide nanoparticles. The lectures will then focus on targeted, responsive and multimodal MRI contrast agents.

- **Functional MRI**
  **Dr Robert Leech** (r.leech@imperial.ac.uk)
  Lectures: (2 hrs)

  The basics of Functional Magnetic Resonance Imaging (fMRI) as a techniques and how it can be applied to study the brain activity will be covered.

- **Applications of MRI**
  **Prof Jimmy Bell** (jimmy.bell@imperial.ac.uk)
  Lectures: (2 hrs)

  The application of MRI in clinical and pre-clinical studies will be discussed. MRI is a powerful diagnostic tool that has been used in medical imaging for decades. More recently, it has been applied in molecular imaging. Prof. Jimmy Bell's research focuses on elucidating the mechanisms underpinning the development of obesity and insulin resistance.

As part of this module, a visit to the MRI facilities of the Biological Imaging Centre at Hammersmith Hospital will be organized (date to be confirmed).

### *Module 4 – Ultrasound*

- **Dr Mengxing Tang** (mengxing.tang@imperial.ac.uk) Lectures: (2 hrs)

The Physics and Engineering of Ultrasound imaging

- **Professor John Seddon** (j.seddon@imperial.ac.uk)

Membranes and Surface Chemistry of Microbubbles. Microbubble Engineering.

- **Professor Edward Leen** (edward.leen@imperial.ac.uk) Lectures: (2 hrs)

The Clinical Application of US and microbubbles.

### *Module 5 - PET (Positron Emission Tomography) and SPECT (Single Photon Emission)*

- **Professor Tony Gee (**antony.gee@kcl.ac.uk)
  Lectures: (4 hrs)

Overview of PET imaging - technique and application, chemistry and modeling.

- **Dr. Phil Miller**
  Lectures (3hrs + 1 hr problem class)

  The lectures will cover the Chemistry behind Positron Emission Tomography (PET), particularly focussing on probe design involving Carbon-11 and Fluorine-18, and their application in drug discovery and medicine and (ii) The Chemistry behind Single Photon Emission Computed Tomography (SPECT), particularly focussing on Technetium-99m and Iodine-123.

As part of this module, a visit to the PET facilities at Imanova (Hammersmith Hospital) has been organized (date to be confirmed).

- **Dr Kuldip Nijran (**kuldip.nijran@imperial.nhs.uk) Lectures: (2 hrs)

Single Photon Emission techniques and clinical applications.

### *Module 6 - Pharmacology of Imaging*

- **Professor Alan Boobis** (a.boobis@imperial.ac.uk)
  Lectures (6 hrs)

Disposition of Tracers Used in Imaging **(**metabolic interconversion and active transport into and out of cells), Basic kinetics and Genetic factors **(**influence data interpretation e.g. polymorphisms in metabolism of tracer), Basic principles of drug action via interaction with molecular targets (receptors, enzymes, ion channels, etc) and quantitative relationship between concentration and response.

- **Professor Eric Aboagye** (eric.aboagye@imperial.ac.uk)
  Lectures (2 hrs)

Imaging Applications - basic concepts in the laboratory use of radioactivity (long-lived isotopes): Radiopharmacology – ligand-receptor interactions, mechanisms of radiotracer retention

### *Module 7 - Image Computation, Modelling and Imaging Statistics*

- **Dr Daniel Elson** (ds.elson@imperial.ac.uk)
  Lectures (4 hrs)

Image Computation, Modelling and Imaging Statistics.
Computerised Image Analysis – focusing on cardiovascular aspects

- **Dr Gianpaolo Tomassi** (g.tomasi@imperial.ac.uk)
  Lectures (2 hrs) + Practical (1 hr)

These lectures will focus on the quantification of PET studies, covering
1) Introduction (PET imaging, study design, input functions and what makes a good tracer)
2) Modelling of PET Data (compartmental and data led methods), kinetic equations, physiological parameters estimation
3) Clinical applications

Learning outcomes
The student will learn
1) How study design and different acquisitions protocols impact on PET data analysis.
2) Principles of modelling and the pro and cons of different methods (compartmental models, graphical plots, spectral analysis)
3) How to quantify PET scans in order to calculate metabolic rates, receptor density, and drug pharmacokinetics.

## *Module 8 - Optical Imaging – Biomedical Optics*

- **Dr James McGinty** (james.mcginty@imperial.ac.uk)
  Lectures (12 hrs)

Biomedical Optics (fluorescence imaging, laser interaction with tissues, optical biopsy)

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Sciences**

**Criteria for Assessment of Exam answers**

The assessment will take into consideration the teaching of the subject and the type of problems and tasks set. Allowance is made for what is reasonably achievable under examination conditions.

| Percentage Grade | Criteria |
|---|---|
| 85-100 | **Exceptional.** Originality, critical/analytical ability ** and evidence of outside reading is expected. The presentation of the subject combines conciseness and exemplary understanding of all relevant concepts and facts. |
| 70-84 | **Excellent.** As for Exceptional, but not fully achieving one of them. |
| 60-69 | **Very Good**. Provides a clear and accurate account of the relevant knowledge, concepts and facts. Evidence of some outside reading and critical/analytical ability **. |
| 55-59 | **Good**. Provides a mainly accurate account of the basic concepts covering at least half of the relevant taught material, but is marred by significant errors. |
| 50-54 | **Adequate**. Provides only a minimal account of the basic concepts covering at least a third of the relevant taught material, but is marred by major errors. **PASS MARK is 50%** |
| 35-49 | **Unsatisfactory**. Provides only a vague account covering less than a third of the relevant taught material and indicates a confused understanding of the subject. |
| 20-34 | Provides only a vague understanding of some concepts and facts covering about a quarter of the expected material. Presentation is dominated by inaccurate or irrelevant material. |
| 10-19 | A maximum of three relevant facts (sentences) are presented. |
| 1-9 | Answer includes at most one relevant fact (sentence) |
| 0 | Answer contains nothing correct that is relevant to question. Mark to be given where the work is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism. |

** *Analytical* = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. *Critical* = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.

# Guidelines for marking MRes project proposal/literature review

**The following should be submitted on or before 14.00 Thursday 13 December 2012**:

1) 4 bound copies of Literature Report and a signed Plagiarism Form to ICB administrator (Dr Beeta Balali-Mood, Room 249b, Level 2, Chemistry)
2) One electronic copy of Literature Report by email to the ICB administrator (b.balali@imperial.ac.uk)
3) One electronic copy of your Literature Report (as word or pdf format) on ***Blackboard Virtual Learning Environment***

Reports will be marked independently by both supervisors and one other member of staff. The report will then be moderated.

The purpose of the project proposal is largely to test the student's ability to work independently. The topic should be at a postgraduate level. Reports should normally not exceed 20,000 words excluding figures and references ***or*** 40 word processed pages including figures and references (equivalent to Arial, 11 pt, 1.5 lines spaced). The report should include an abstract and a bibliography. The word count of the report should be given on the title page.

When marking, the following criteria should be borne in mind.

## Written style/Presentation

- Is the project well written and presented, and clearly explained?
- The report should be concise and complete (thorough and informative)
- Are the references listed actually referred to or discussed in the text? Is the abstract an accurate description of the contents?
- Is the project the candidate's own work, written in their own words?
- Is the format up to publication standards?

## Literature survey

- Is the literature survey thorough and complete?
- Are important references missing?
- Are all relevant subjects (biological context and physical/technical aspects) sufficiently covered?
- A mechanical copy of existing material is not acceptable.

## Analysis of literature

- The student should show ability to compare and contrast the relevant literature in all subject areas.
- The student should present a coherent "story" throughout the report.
- Has the student made a good selection of material where choices exist or where the sources are voluminous?
- For a first class proposal, original input is expected

## Rationale of proposal

- Is the proposed work's relationship to other work in the literature clear?
- Aims and objectives should be clearly justified.
- Is the choice of methodology clear and is it justified?

The Department and College take plagiarism very seriously. Do not plagiarise. You must read and comply with the Chemistry Department Policy on Plagiarism:
http://www3.imperial.ac.uk/chemistry/teaching/undergraduateteaching/materials/plagiarism

A copy of the Plagiarism Form should be submitted with your Literature Report.

**Any evidence of plagiarism will have serious consequences according to College rules.**

# Literature review/Project Proposal Assessment Form

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Sciences 2012/13**

**Student:**

**Supervisors:**

**Title:**

**Marker:**

| | | Supervisor (one) | Supervisor (two) | Independent |
|---|---|---|---|---|
| **Written style/Presentation** | **/25** | | | |
| **Literature survey** | **/25** | | | |
| **Analysis of literature** | **/25** | | | |
| **Rationale of proposal** | **/25** | | | |
| **Total** | **/100** | | | |

**Comments on project report (justify your mark taking into account the attached marking criteria):**

**Imperial College London – Chemistry Department**

**MRes in Bioimaging Sciences**

***Criteria for Assessment of Literature Review/Research Proposal***

Account is taken of the nature of the work proposed, critical analysis of the relevant literature, the proposed work and what is reasonably achievable in the timescale of the course.

| Percentage Grade | Criteria |
|---|---|
| 85-100 | **Exceptional.** Outstanding analysis of the relevant literature showing publishing standard in quality and quantity. Evidence of originality, high critical/analytical ability.** Competent assessment of the limitations of the proposed research and the significance of research (putting the work in context). |
| 70-84 | **Excellent.** As for Exceptional, but not fully achieving one of them. |
| 60-69 | **Very Good.** Complete and accurate presentation of the literature and research proposal showing a clear understanding of the background by. Demonstrates critical/analytical ability** including an assessment of the limitations of the proposed work and the significance of the research. |
| 55-59 | **Good.** Accurate account of most of the background and proposed work. Demonstrates critical/analytical ability** including an assessment of the potential limitations of the proposed work and the significance of the research, but has significant errors of interpretation. |
| 50-54 | **Adequate.** Basic account of the background and proposed research. Demonstrates some critical/analytical ability** including an assessment of the significance of the research, but has major errors or omissions. **PASS MARK is 50%** |
| 35-49 | **Unsatisfactory.** Confused and incomplete account of the background, limited understanding of the proposed work. Presence of errors of interpretation or factual mistakes. |
| 20-34 | Vague and seriously inadequate account of the proposed work with substantial omissions and errors. Very poor review of literature. |
| 10-19 | Mainly incorrect and incompetent literature survey and research proposal demonstrating only few relevant thoughts. |
| 1-9 | Incorrect and incompetent literature survey and research proposal containing nothing of relevance. |
| 0 | Work not handed in. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism. |

**Imperial College London – The Institute of Chemical Biology**
Research Student Assessment: MRes Mid-Project Progress Report Form
**MRes in Bioimaging Sciences 2012/13**

Student name:
Project Title:
Supervisors:
Date:

---

**Evaluation to be completed by the Supervisor** *(please circle as appropriate, if starred response please give details/agreed action in space provided*)

| | |
|---|---|
| Attendance: | Excellent / good / satisfactory / unsatisfactory* |
| Commitment: | Excellent / good / satisfactory / unsatisfactory* |
| Awareness of Literature: | Excellent / good / satisfactory / unsatisfactory* |
| Presentation skills (written and oral): | Excellent / good / satisfactory / unsatisfactory* |
| Overall Progress: | Excellent / good / satisfactory / unsatisfactory* |

**Supervisor's comments on project progress to date. Please highlight any successes and problems and comment on the agreed targets for the second half of the project** (please continue overleaf if required).

**Student's General Comments, including identification of any issues which need to be addressed** (please continue overleaf if required).

Student's signature …….. Date ……..

Supervisor's signature ……. Date …….

***Please return completed form to Dr Beeta Balali-Mood, Rm 249b, Chemistry, South Kensington campus, Imperial College London***

**Imperial College London – The Institute of Chemical Biology**
**MRes Mid-Project Progress Report Form - Student Evaluation**
**MRes in Bioimaging Sciences 2012/13**

Name:
Project Title:
Supervisors:
Date:

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**Evaluation to be completed by the Student** *(please circle as appropriate,* ***if starred response please give details/agreed action in space provided***)

| | |
|---|---|
| Quality of Supervision: | Excellent / good / satisfactory / unsatisfactory* |
| Overall Project Progress to date: | Excellent / good / satisfactory / unsatisfactory* |

**Please highlight successes/problems encountered during the project to date, and detail any changes made to the research plan in light of these. Use this opportunity to identify any issues which need to be addressed in the coming weeks/months.**

Student's signature …….. Date ……..

***Please return completed form to Dr Beeta Balali-Mood, Rm 249b, Chemistry, South Kensington campus, Imperial College London***

# Research Manuscript Assessment Form

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Sciences 2012-13**

| |
|---|
| **Student:**<br><br>**Supervisors:**<br><br>**Independent Marker:**<br><br>**Title:** |

| |
|---|
| **Marker:**<br><br>**Mark (% only) for project report:** |

| |
|---|
| **Comments on project report (justify your mark taking into account the attached marking criteria):** |

# Research Manuscript Assessment Form (cont)

**Break down of Marks:**

| | **Supervisor (one)** | **Supervisor (two)** | **Independent** |
|---|---|---|---|
| **Scientific Rigor**<br>Experiments support claims<br>Methods are appropriate<br>Methods well explained | /30 | /30 | /30 |
| **Scientific Understanding**<br>Command of literature<br>Critical discussion | /30 | /30 | /30 |
| **Originality** | /15 | /15 | /15 |
| **Written Style**<br>Presentation<br>Conciseness<br>Clarity | Not required | Not required | /25 |
| **Endeavour** | /25 | /25 | Not required |
| **Total** | /100 | /100 | /100 |

Signed: Date:

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Schences**

**Criteria for Assessment of Research Manuscript**

Account is taken of the nature of the work, endeavour in the laboratory, the instructions provided and what is reasonably achievable.

| Percentage Grade | Criteria |
|---|---|
| 85-100 | **Exceptional.** Outstanding presentation of results showing publishing standard in quality and quantity. Evidence of originality, high critical/analytical ability ** and substantial outside reading. Competent assessment of the limitations of the experimental procedures and the significance of results. |
| 70-84 | **Excellent.** As for Exceptional, but not fully achieving one of them. |
| 60-69 | **Very Good.** Accurate account and presentation of results and experimental procedures showing a clear understanding of the background by providing evidence of sufficient outside reading. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results. |
| 55-59 | **Good.** Accurate account and presentation of most of the background, experimental procedures and results. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results, but has significant errors of interpretation. |
| 50-54 | **Adequate.** Basic account and presentation of the background, experimental procedures and results. Demonstrates some critical/analytical ability** including an assessment of the significance of results, but has major errors or omissions. |
| 35-49 | **Unsatisfactory.** Confused and incomplete account of the background, experimental procedures and results marred by substantial errors or omissions. |
| 20-34 | Vague and seriously inadequate account of the experiments with substantial omissions and errors. |
| 10-19 | Mainly incorrect and incompetent account and presentation of experimental work demonstrating only few relevant thoughts. |
| 1-9 | Incorrect and incompetent account of experimental work containing nothing of relevance |
| 0 | Experiment not attempted or work not handed in. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism. |

** *Analytical* = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. *Critical* = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.

## Imperial College London – The Institute of Chemical Biology

# GUIDANCE FOR THE ASSESSMENT OF RESEARCH MANUSCRIPT

These criteria should be combined with the marks classification given in the accompanying document in making an assessment of the report.

| No. | Criterion | Factors | Supervisor | Maximum Marks % | Independent Assessor | Maximum Marks % |
|---|---|---|---|---|---|---|
| 1 | content | coverage and scientific achievement | ✓ | 30 | ✓ | 30 |
| 2 | scientific understanding | description, explanation | ✓ | 30 | ✓ | 30 |
| 3 | originality | interpretation, ideas | ✓ | 15 | ✓ | 15 |
| 4 | presentation | written style, quality of English | — | — | ✓ | 25 |
| 5 | endeavour | effort, enthusiasm | ✓ | 25 | — | — |
| | | **Total:** | **Supervisor** | **100** | **Independent Assessor** | **100** |

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Sciences**

**Criteria for Assessment of Research Manuscript**

Account is taken of the nature of the work, endeavour in the laboratory, the instructions provided and what is reasonably achievable. Projects are typically 80 pages long.

| Percentage Grade | Criteria |
|---|---|
| 85-100 | **Exceptional.** Outstanding presentation of results showing publishing standard in quality and quantity. Evidence of originality, high critical/analytical ability ** and substantial outside reading. Competent assessment of the limitations of the experimental procedures and the significance of results. |
| 70-84 | **Excellent.** As for Exceptional, but not fully achieving one of them. |
| 60-69 | **Very Good.** Complete and accurate presentation of results and experimental procedures showing a clear understanding of the background by providing evidence of sufficient outside reading. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results. |
| 55-59 | **Good.** Accurate account of most of the background, experimental procedures and results. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results, but has significant errors of interpretation. |
| 50-54 | **Adequate.** Basic account of the background, experimental procedures and results. Demonstrates some critical/analytical ability** including an assessment of the significance of results, but has major errors or omissions. **PASS MARK is 50%** |
| 35-49 | **Unsatisfactory.** Confused and incomplete account of the background, experimental procedures and results marred by substantial errors or omissions. |
| 20-34 | Vague and seriously inadequate account of the experiments with substantial omissions and errors. Mainly incorrect and incompetent account of experimental work demonstrating only few relevant thoughts. |
| 10-19 | |
| 1-9 | Incorrect and incompetent account of experimental work containing nothing of relevance |
| 0 | Experiment not attempted or work not handed in. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism. |

# Project Oral Examination Assessment Form

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Sciences 2012/13**

**Student:**

**Supervisors:**

**Independent marker:**

**Title:**

**Examiners present at viva:**

**Supervisors:** _____

**Print name** **signature**

_____

**Print name** **signature**

**Independent marker:** _____

**Print name** **signature**

**Agreed Mark**

**Comments on viva performance (justify your mark taking into account the attached marking criteria):**

**Imperial College London – The Institute of Chemical Biology**

**MRes in Bioimaging Sciences**

*Criteria for Assessment of oral examination performance*

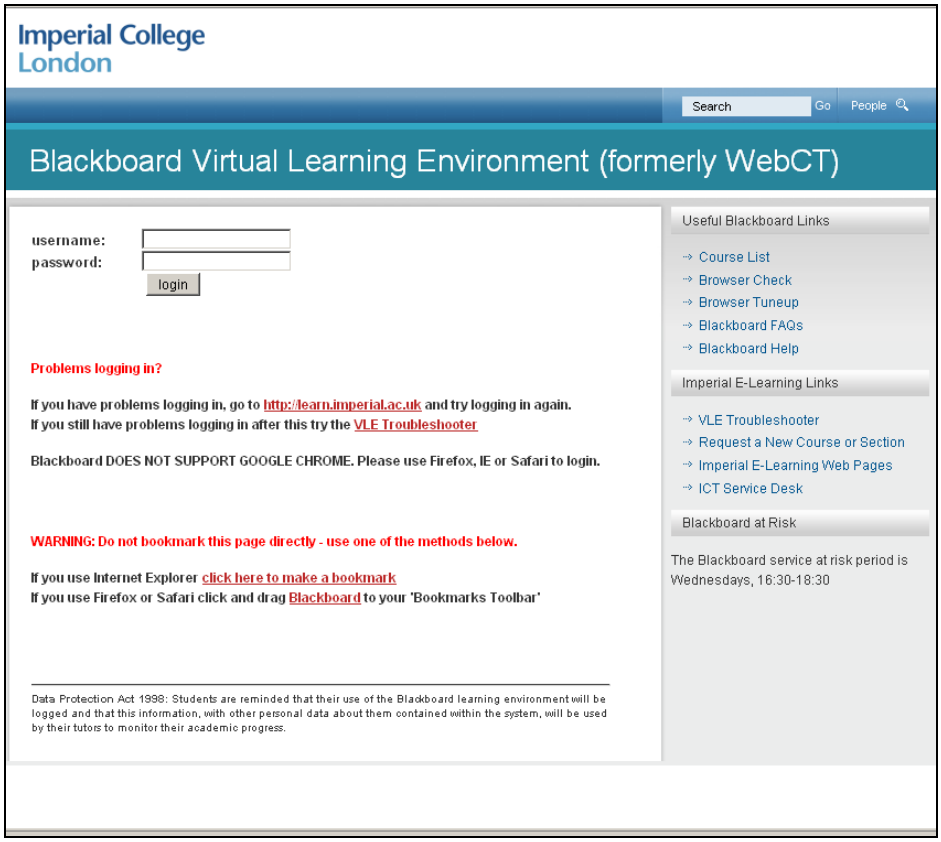
Account is taken of the nature of the work, endeavour in the laboratory, the instructions provided and what is reasonably achievable.
**The independent marker should take the lead in the oral examination.**

| Percentage Grade | Criteria |
|---|---|
| 85-100 | **Exceptional.** Outstanding presentation of results showing publishing standard in quality and quantity. Evidence of originality, high critical/analytical ability ** and substantial outside reading. Competent assessment of the limitations of the experimental procedures and the significance of results. |
| 70-84 | **Excellent.** As for Exceptional, but not fully achieving one of them. |
| 60-69 | **Very Good.** Complete and accurate presentation of results and experimental procedures showing a clear understanding of the background by providing evidence of sufficient outside reading. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results. |
| 55-59 | **Good.** Accurate account of most of the background, experimental procedures and results. Demonstrates critical/analytical ability** including an assessment of the limitations of the experimental procedures and the significance of results, but has significant errors of interpretation. |
| 50-54 | **Adequate.** Basic account of the background, experimental procedures and results. Demonstrates some critical/analytical ability** including an assessment of the significance of results, but has major errors or omissions. |
| 35-49 | **Unsatisfactory.** Confused and incomplete account of the background, experimental procedures and results marred by substantial errors or omissions. |
| 20-34 | Vague and seriously inadequate account of the experiments with substantial omissions and errors. |
| 10-19 | Mainly incorrect and incompetent account of experimental work demonstrating only few relevant thoughts. |
| 1-9 | Incorrect and incompetent account of experimental work containing nothing of relevance |
| 0 | Experiment not attempted or work not handed in. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism. |

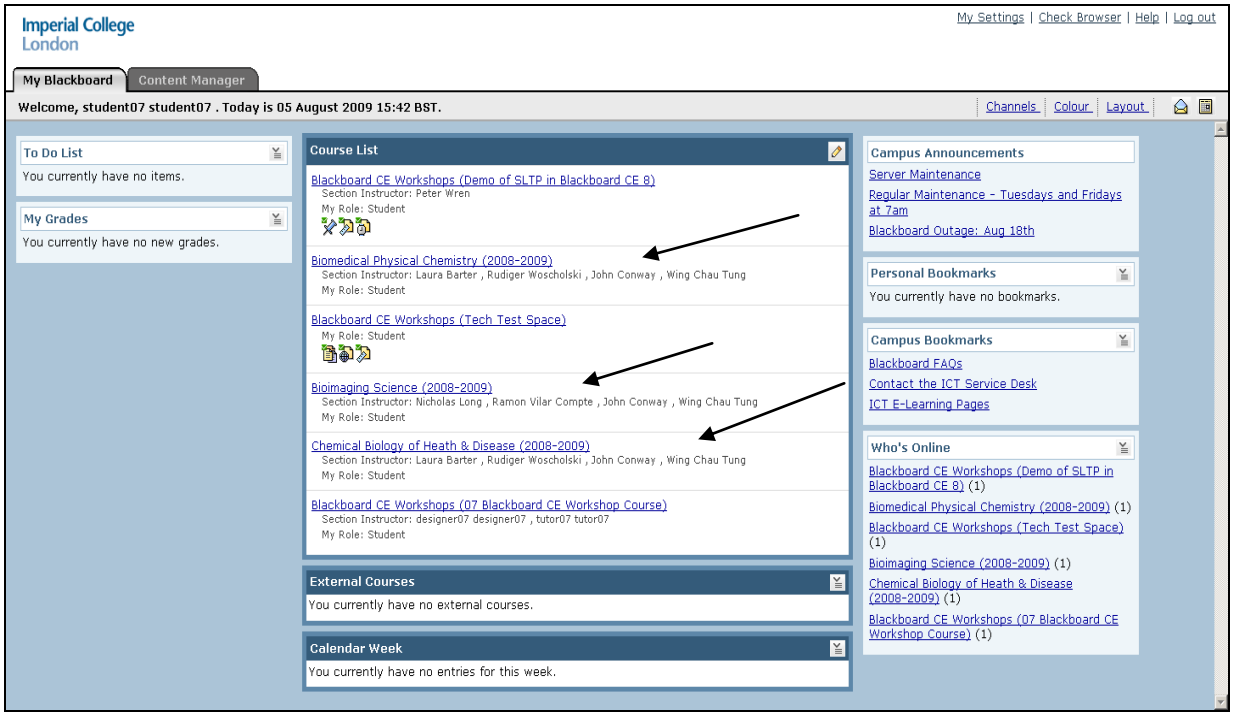
** *Analytical* = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. *Critical* = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.

# Instructions on submitting your Literature Report or MRes Manuscript on Blackboard

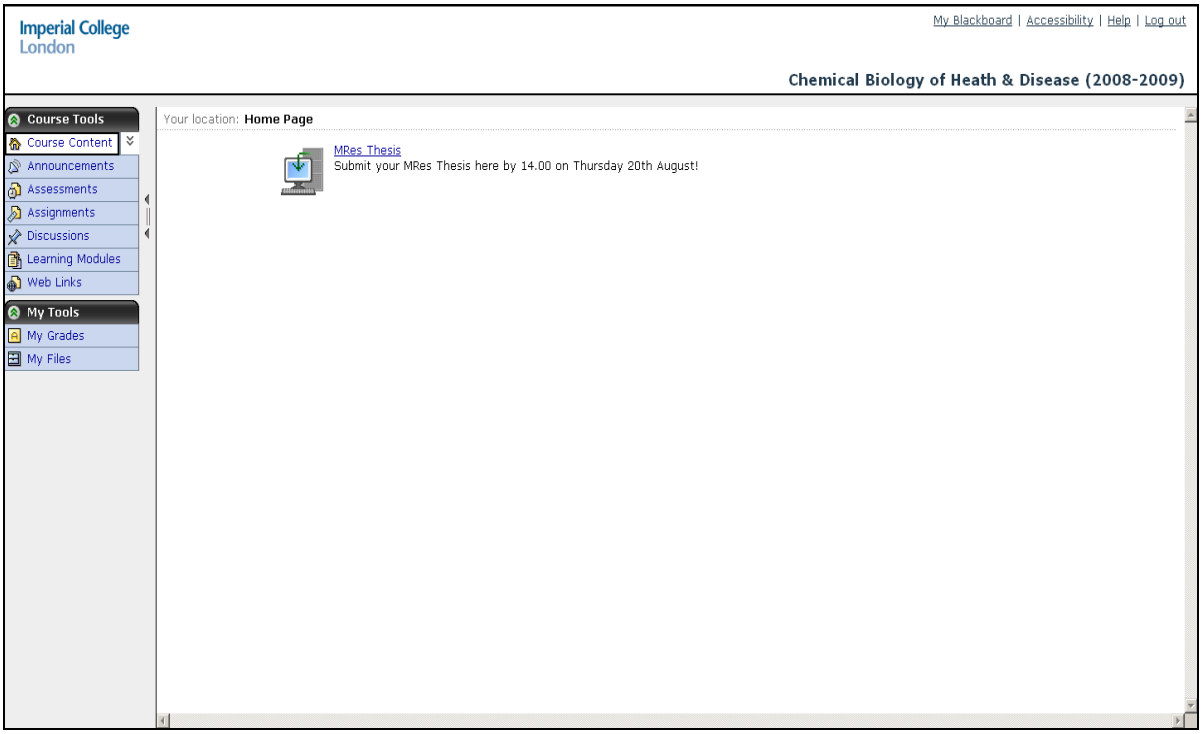
1. Go to Blackboard Virtual Learning Environment homepage https://webct.imperial.ac.uk/webct/logonDisplay.dowebct and log in using your College username/password



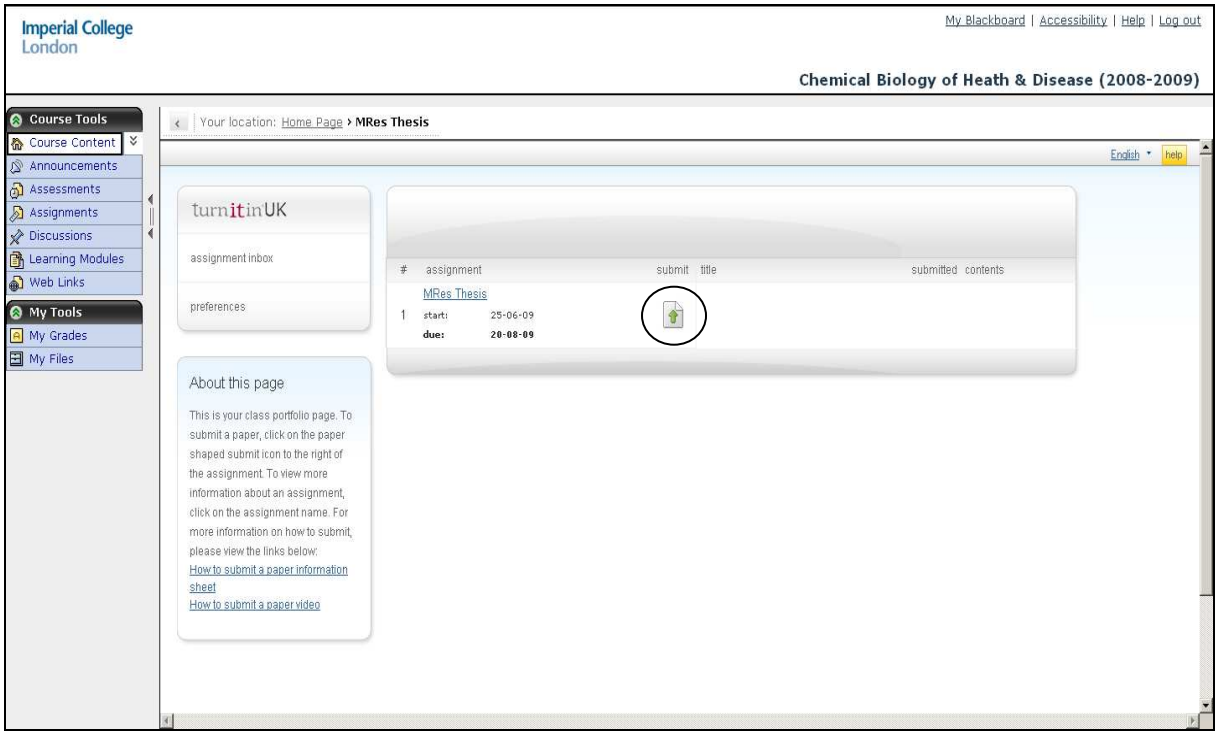

2. Select your MRes course, i.e. **Bioimaging Science** from the Course List shown.



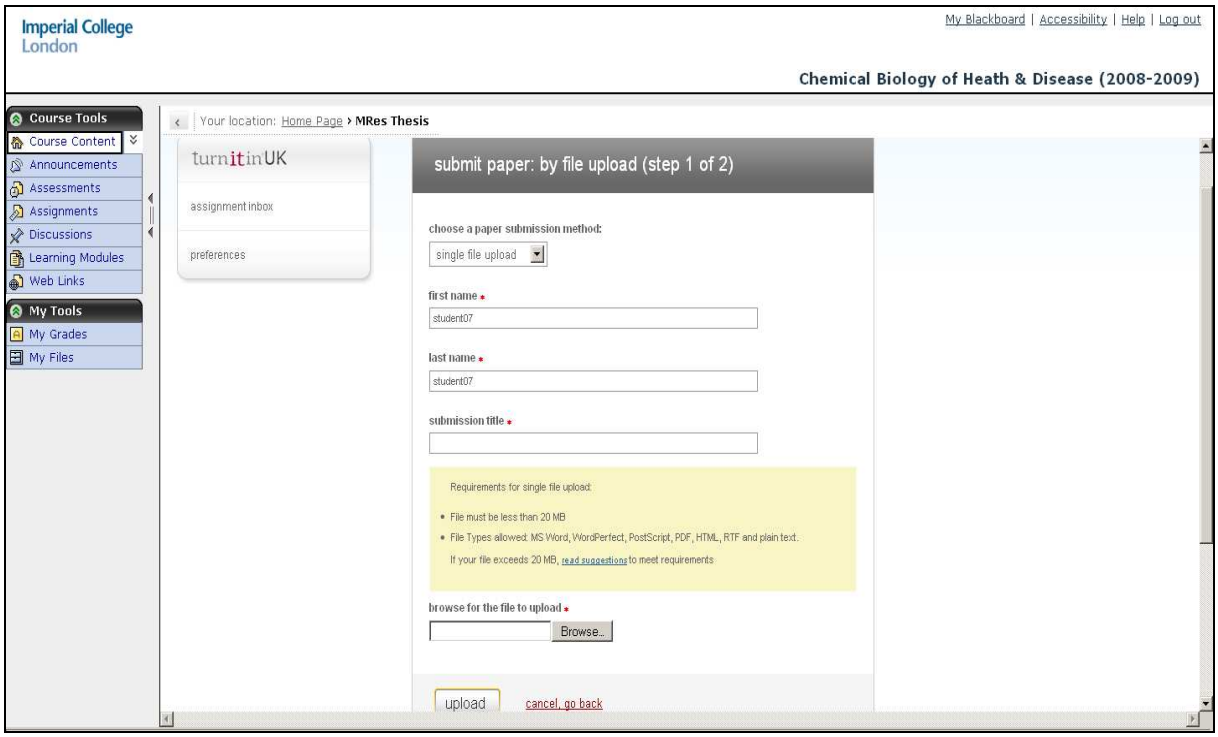
3. Select **Literature Report** or **MRes Manuscript** on the Home Page of the MRes Course. This will take you to 'Turnitin UK'.



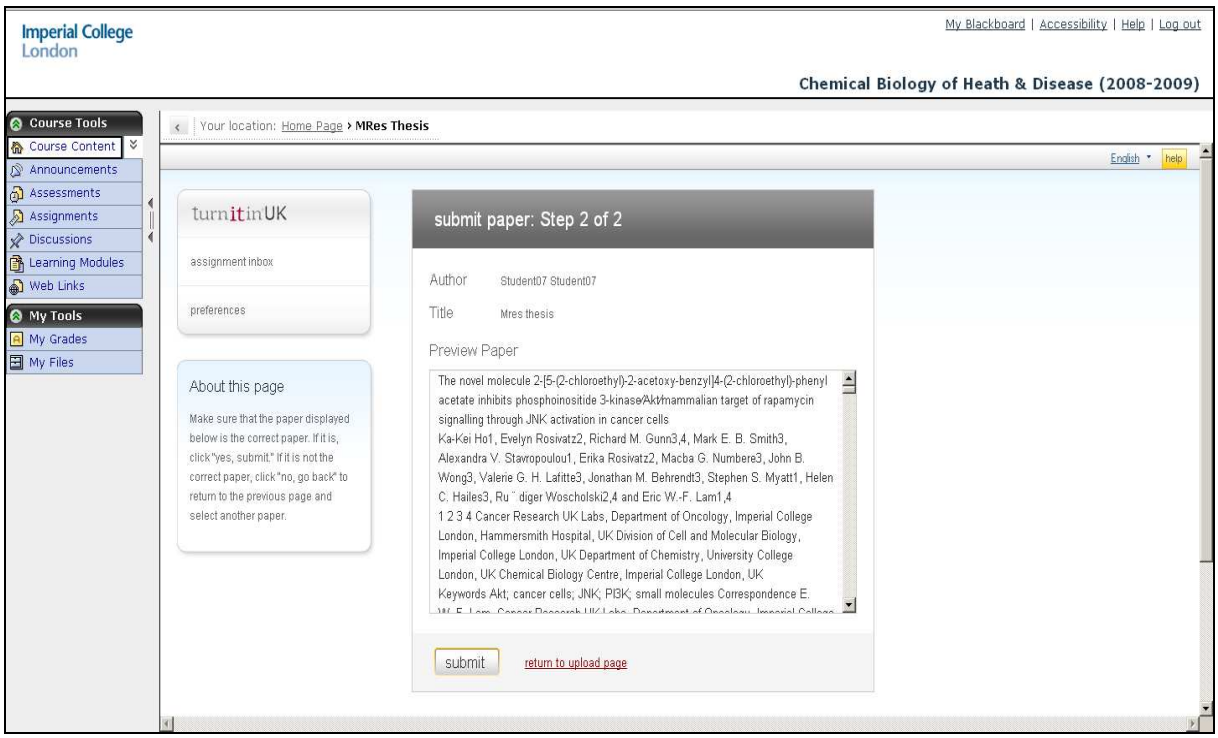

4. Left click the **submit button (circled)** as shown below



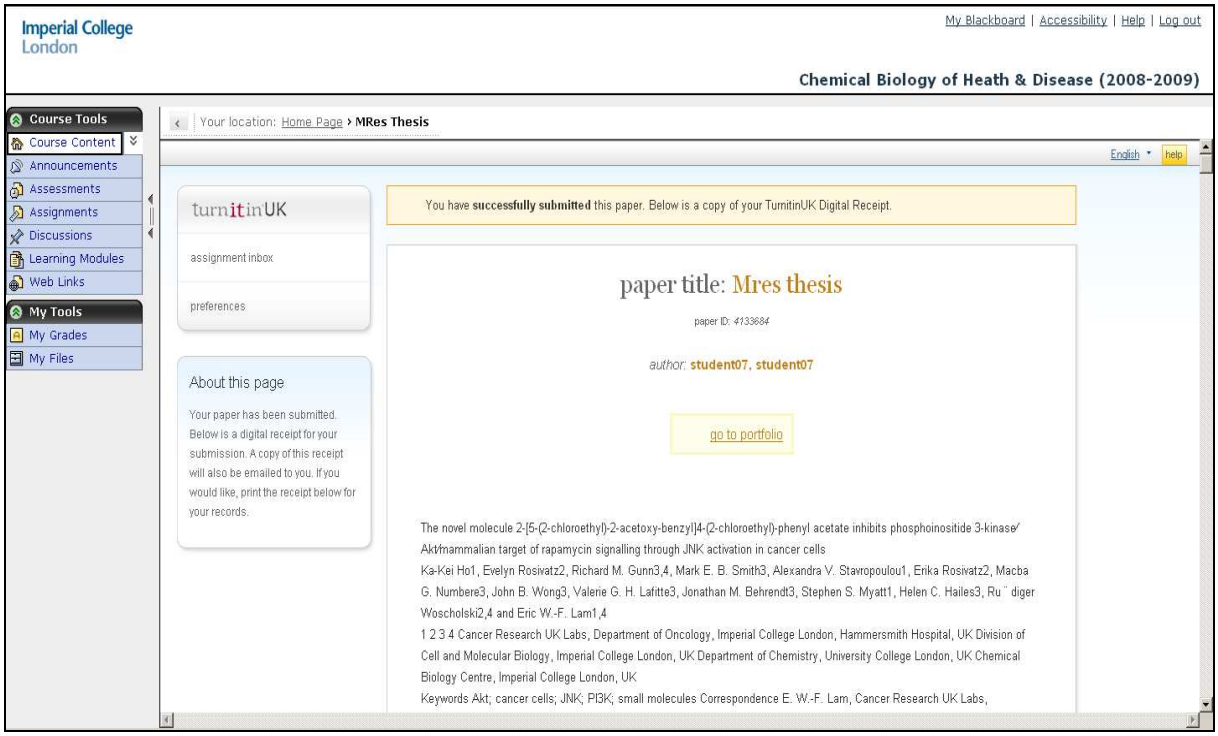
5. Ensure '**single file upload**' is selected under "Choose a paper submission method".
Enter your '**first and last name'**
Enter the '**submission title'** – this is your literature report or manuscript Title
Select '**Browse'** and locate your  and select it
Press '**Upload'**



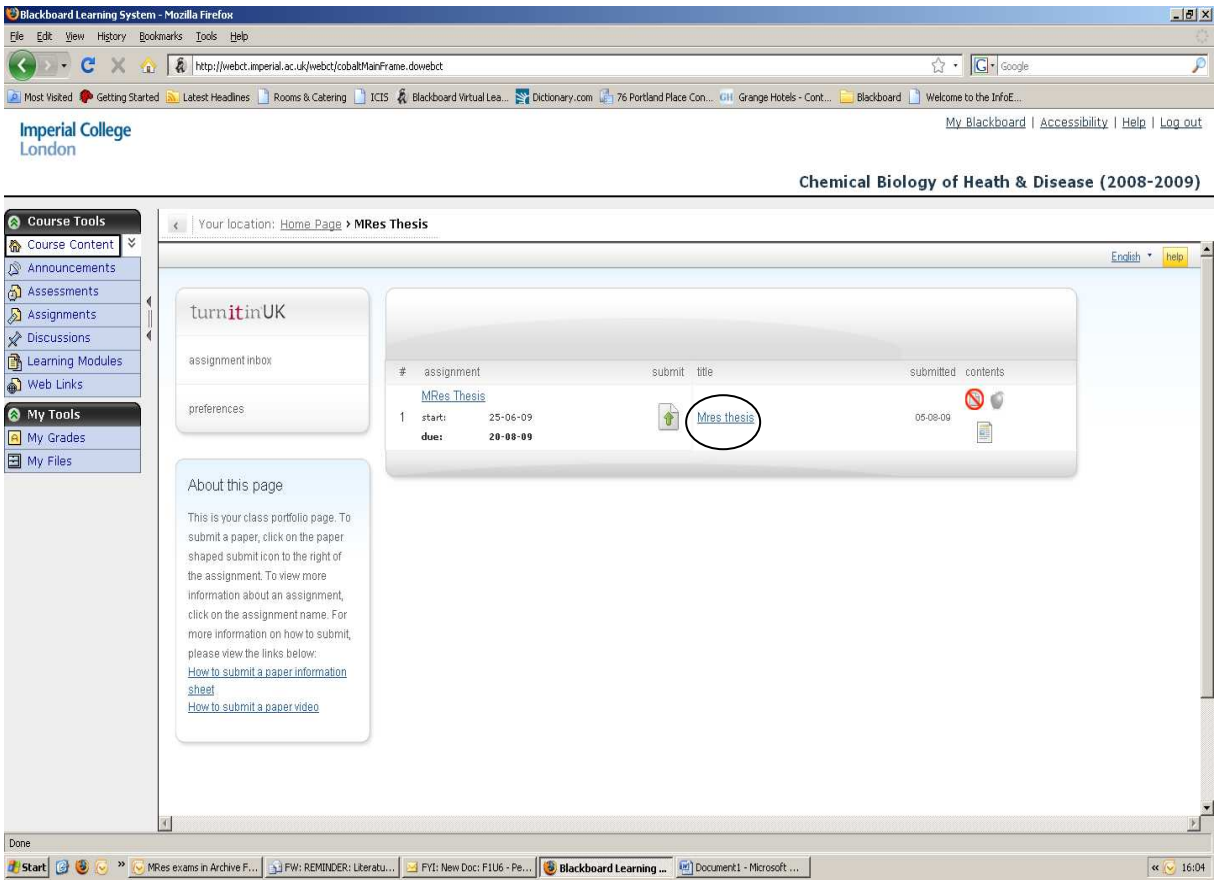

6. Press '**submit**' once your report has been uploaded onto the system.



7. You will receive a notification if it's been successfully submitted.




8. If you return to the 'Turnitin UK' homepage, you will see that your document has been added (circled).




You can now log out of Blackboard.

***Please read this carefully. You will be required to submit a signed copy of this form along with your Literature report and Manuscript***

## The Institute of Chemical Biology, Department of Chemistry, Imperial College College – Plagiarism Policy

The Institute of Chemical Biology, Department of Chemistry, and College take plagiarism very seriously. All work submitted as part of the requirements for any examination (including coursework) of Imperial College London must be expressed in your own words and incorporate your own ideas and judgments.

Plagiarism is the presentation of another person's thoughts, words or graphics/art work as though they were your own. This includes *e.g.* copying text, figures, schemes and graphs from another source such as a book, an academic article/paper or the internet without acknowledging it explicitly. Plagiarism must be avoided, with particular care in coursework, essays and reports written in your own time. Note that you are encouraged to read and criticise the work of others as much as possible. You are expected to incorporate this in your thinking and in your coursework and assessments. But you must acknowledge and label/cite your sources.

Direct quotations (*i.e.* anything that is "copy-pasted") from the published or unpublished work of others, from the internet, or from any other source must always be clearly identified as such. A full reference to their source must be provided in the proper form and quotation marks used This means you must provide the reference directly after information is given and, in the case of figures/schemes/graphs indicate explicitly in the caption that this has been taken from the literature: *e.g.* "Figure taken from ref. X" or "Scheme adapted from ref. Y". Remember that a series of short quotations from several different sources, if not clearly identified as such, constitutes plagiarism just as much as a single unacknowledged long quotation from a single source. Equally, if you summarise another person's ideas or judgments, figures, diagrams or software, you must refer to that person in your text (and in the case of figures/schemes/graphs in the caption of the corresponding graphic), and include the work referred to in your bibliography/reference list. Please see 'addendum 3' (below, '*How to correctly reference material*') for examples of how to correctly reference material. If in doubt, ask for advice from academic staff in the Department about the appropriate use and correct acknowledgement of other sources in your own work.

The direct and unacknowledged repetition of your own work which has already been submitted for assessment can constitute self-plagiarism (see also 'addendum 1': '*Plagiarism in the context of MSci Research Reports*', below). Where group work is submitted, this should be presented in an approved manner. You should therefore consult the supervisor of the group assignment, your tutor or another member of academic staff if you are in any doubt about what is permissible. You should be aware that you have a collective responsibility for the integrity of group work submitted for assessment.

The use of the work of another student, past or present, constitutes plagiarism. Where work is used without the consent of that student, this will normally be regarded as a major offence of plagiarism.

Plagiarism will not be tolerated in the Department and if it is detected in a student's work presented for assessment, it will be reported, together with the evidence, to the course supervisor, Head of Teaching Section and the Director of Undergraduate Studies who will take appropriate action which may result in an allegation of plagiarism/cheating. Cases of suspected plagiarism/cheating will be dealt with by the College Registry under the College's Examination Offences Policy. The penalty for proven cases can vary from loss of marks to expulsion from the College.

*NB.* This policy is adapted from the Imperial College Student Handbook: http://www3.imperial.ac.uk/studenthandbook/advice/plagiarism/ (accessed 15.07.2010).

**ADDENDUM 1:** ***Plagiarism in the Context of MSci Research Reports:***
We recognise that your *Introduction* and *Aims and Objectives* sections may have substantial overlap in terms of content with your Research Proposal. Consequently, for these sections, a reasonably lenient threshold for self-plagiarism (which will be picked up by the electronic plagiarism scans that we perform on both documents, see later) will be allowed (*e.g.* some identical sentences and paragraph constructions). However, wholesale verbatim transcription of multiple paragraphs should be avoided. If you think this is necessary then place the relevant text in inverted commas and insert a reference to your Research Proposal. In general, it is expected that your understanding of the project will have matured substantially during the course of the year and that such verbatim transcription will not be appropriate.

**ADDENDUM 2:** ***How to Correctly Reference Material***
In a research publication or reference work you will almost always find a bibliography/reference section included. The aim of this is three fold, to act as a source of background information for the interested reader, to provide original sources for specific pieces of information vital to your scientific case, and to acknowledge the efforts of others on whom you have drawn for ideas and inspiration. The most usual way of referencing a paper, book, figure or quotation in the text is to use a superscript number,1 or number in parenthesis [1], or an author name in parenthesis (Spivey, 2001), clearly associated with the item you want to reference. The first mentioned convention (*i.e.* using superscripted numbers) is employed in most chemistry journals and is illustrated below, but this is varies with academic discipline. If you select 'RSC style' within the reference manager Endnote then the superscripted number style of referencing will be implemented automatically. In the bibliography/reference section you must then give the full source. The source should be completely specified such that it can be located without ambiguity by the reader. Therefore, the bibliography should generally contain static references such as journal papers and books; citing dynamic reference sources such as websites is discouraged as they may disappear.

If you need to cite material from a website and you cannot trace the primary source, then you should quote text directly from the website, using quotation marks around the text in question. The text must then be referenced, in the manner indicated above, to the full website URL with the date on which you viewed it indicated in parenthesis. Similarly, if you copy figures from the web, you must clearly state so in the figure caption and this should also be referenced, in the manner indicated above, to the full website URL with the date on which you viewed it indicated in parenthesis.

Examples of correct citation practice are presented on the following page – always ensure that you make it clear where your work stops, and copied material starts, and that you give a sufficiently detailed reference to allow the source to be identified clearly and uniquely.

Useful additional College sources of information re-Plagiarism see:

Department of Physics:
http://www3.imperial.ac.uk/physics/students/ug/info/guidance/

**I have read and understood the above and am willing for the Course Directors to submit any piece of my work to the TurnitinUK Plagiarism Detection Service.**

Signed……..Date……..

Print Name……..