KING'S College LONDON

CARDIOVASCULAR RESEARCH MSc

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Hosted by the
CARDIOVASCULAR DIVISION

KING'S College LONDON

The Cardiovascular Division is one of the largest Research Divisions within the Faculty of Life Sciences and Medicine and comprises ca. 160 research workers (including 35 Principal Investigators and >60 PhD/MD students) whose work is focused on the mechanisms and treatment of cardiovascular disease. We have excellent infrastructure and facilities and strong collaborations with groupings focussed on imaging, structural biology and genetics.

MSc Programme Director – Dr. Paul Fraser

You will be taught the following topic areas in detail:

Endothelial control of vasculature;
Flow and shear in vascular function;
Capillary permeability;
Leukocyte Transmigration;
Platelet signalling & Thrombogenesis;
Angiogenesis & Vascular Development;
Control of Heart Rate & Rhythm;
Control of cardiac contraction;
Myocardial signalling and hypertrophy;
Hypertension;
Atherogenesis;
Cardio-protection & Redox Signalling;
Acute coronary syndromes/MI;
Heart Failure & Cardiac Remodelling;
Cardiac Regeneration – Stem Cells;
Diabetes and Cardiovascular Disease
Stroke and Aortic Aneurysms.

You will have workshops on a wide range of advanced techniques currently used in research. These are updated annually to keep up with changes, and the following are some examples:

Cell Culture
Confocal Microscopy
Electrophysiology
Human Vascular Function
Imaging Ultrasound
Immunohistochemistry
Intravital Microscopy
Proteomics
Quantitative Gene Analysis
Small Animal Telemetry
Small Vessel Myography
Vascular Permeability
Western Blotting.

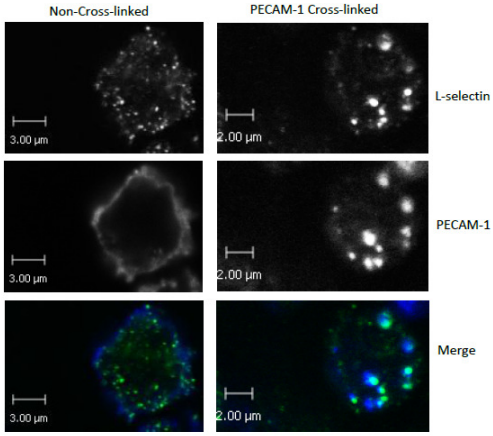
You will be taught by many of the following members of the Division:

Professor Metin Avkiran
Professor Susan Brain
Dr Alison Brewer
Professor Phil Chowienczyk
Dr James Clark
Dr Michael Curtis
Dr Philip Eaton
Dr Elisabeth Ehler
Professor Albert Ferro
Dr Paul Fraser
Professor Mathias Gautel
Dr Richard Heads
Professor Luigi Gnudi
Dr Aleksandar Ivetic
Professor Jon Kentish
Professor Giovanni Mann
Professor Michael Marber
Dr Manuel Mayr
Dr Ashish Patel
Dr Simon Redwood
Dr Adam Rodaway
Professor Ajay Shah
Prof Catherine Shanahan
Professor Michael Shattock
Dr Richard Siow
Professor Alberto Smith
Professor Qingbo Xu
Dr Lingfang Zeng

You will undertake an extended research project, which counts for 50% of your degree assessment, in a well-founded laboratory and partake in a current research programme. Here are some examples taken from recent MSc students' projects.

Signalling in monocytes during inflammation

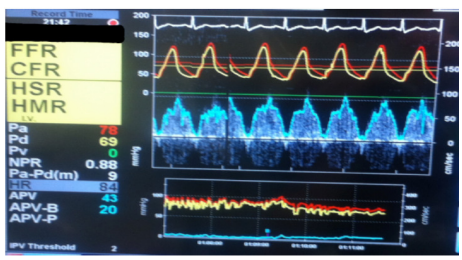
Monocytes were placed in an inflammatory medium to see whether surface proteins PECAM-1 and L-selectin would cross link. This promotes changes in the cell to enable it to cross an endothelial monolayer



Izajur Rahman MSc 13/14. Now PhD at KCL, Cardiovascular Division, started Sept 2014 in the same laboratory.

Acute effects of exercise on the physiology of coronary blood flow in aortic valve stenosis.

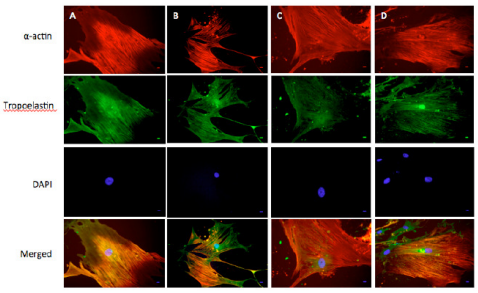
Aortic stenosis is a severe condition that has a high mortality if not detected early. Exercise stress tests are used to confirm preliminary diagnose of cardiac conditions. The aim of this project was to see if analysing the coronary arterial wave energies would be of benefit in this condition. It was found that control subjects responded by increased waveform energies, while those with aortic stenosis did not.



Maria Dwornik MSc 12/13. Dr Dwornik is now on a cardiology rotation at Royal Brompton and Harefield Hospitals.

The effect of lymphocyte subtypes on vascular smooth muscle cell phenotype and function in aortic aneurysm re-modeling

Aortic aneurysms contain a number of inflammatory cell subtypes that are thought to be directly or indirectly responsible for extracellular matrix (ECM) degradation, aortic wall dilatation and eventually rupture. The specific effect lymphocyte subtypes have upon vascular smooth cells (vSMCs) within the aortic wall are, however not yet clearly understood.



Tropoelastin and alpha actin expression in mouse vSMCs after co-culture with normal aortic lymphocytes.
(A) vSMCs co-cultured with CD3+ T lymphocytes
(B) vSMCs co-cultured with CD19+ B lymphocytes
(C) vSMCs co-cultured with T and B lymphocytes
(D) vSMCs alone.

Charlotte Lee MSc 12/13 is now a PhD student at KCL in the Academic Department of Rheumatology

Faculty of Life Sciences & Medicine
Cardiovascular Division

MSc in Cardiovascular Research
TMSC1MTCVR
Handbook for 2016/17

Programme organiser
Dr Paul Fraser
paul.fraser@kcl.ac.uk

Deputy organiser
Professor Giovanni Mann
giovanni.mann@kcl.ac.uk

1. Introduction

Welcome to the MSc in Cardiovascular Research! The coming year will be challenging at times and occasionally you will find it difficult, but we trust that you will also find you will get a lot from it, that you will find it interesting, fun, and even inspirational. You will be allocated a personal Tutor, who will be able to advise you and guide you throughout the year.

Disclaimer

This handbook was published in September 2016, and reflects the information available at that time. We have endeavoured to make this information as accurate as possible and any changes will be communicated on the Cardiovascular Research MSc site in KEATS. If there is any conflict between information on the web page and this handbook, then the web page should be taken as the authoritative source. If you should find any information that you consider to be out of date, inaccurate or misleading then please contact Dr Fraser (paul.fraser@kcl.ac.uk) with your reasons for considering the information to be inaccurate.

If you cannot find the information you require here it is likely to be in one of the other student handbooks.

Faculty Handbook. Additional useful information relating to your programme and to student welfare can be found in the Faculty Handbook: https://virtualcampus.kcl.ac.uk/vc/graduates/Default.aspx

King's Student Handbook

The university has an online student handbook, covering useful College level information about services for students: http://www.kcl.ac.uk/aboutkings/quality/academic/myhandbook/index.aspx

2. Plagiarism

The university takes plagiarism (i.e. passing off other people's ideas or writing as one's own) very seriously and has subscribed to the electronic plagiarism detection service "TurnitinUK". TurnitinUK is a highly developed online service that enables the university to carry out electronic comparison of students' work against billions of sources, including journals, web sites and work submitted to King's and other Universities. In short, TurnitinUK is a very effective tool for detecting plagiarism and it is hoped that it will also act as a deterrent for those students tempted to plagiarise. Please read the "Advice on Plagiarism" in the Appendix.

Anyone found to have plagiarised is automatically given a zero mark. Significant cases of plagiarism are referred to the Disciplinary Procedures. The Division also has to alert the relevant Examination Board. Further steps up to and including the culprit's expulsion from the University may also be taken.

All work must be handed in electronically by email to paul.fraser@kcl.ac.uk, compact disc or data stick to Dr Fraser directly in Room FWB 3.14. On occasion a hard copy will be required in addition.

3. Holiday, Absence

This is a 12 month, full time, MSc with no spring or summer holiday periods. Semester A finishes on 14/12/2016 and Semester B starts on 09/01/2017 (with no teaching activity in between those dates).

If you are ill or other circumstances prevented you from attending lectures, seminars or workshops it is imperative to inform the programme organiser. You will need to complete a mitigating circumstances form (which can be obtained from the academic centre). If you are unable to attend for an extended period of time it may be possible to interrupt your studies, if this occurs please discuss this further with the programme organiser.

<u>NOTE WELL</u> If you turn up to an exam you are deemed sufficiently fit to participate.

Communication and Contacts

- ➔ All communication about changes to the programme timetable and/or content will be sent to you via your King's email account and will also be notified on the programme's KEATS entry.
- ➔ To aid communication between members of the class a WhatsApp group will be set up early in the programme.
- ➔ There is now a Facebook group that you are invited to join and communicate your comments.
- ➔ Two students will be elected to serve on the Staff Student Liaison Committee that meets once in each semester. The minutes of those meetings will be available on KEATS.

4. Programme Objectives

At the end of the programme students will be able to:

- ➔ Evaluate and assimilate the scientific literature in a given subject area and to think critically about the results and methods.
- ➔ Devise a hypothesis that can be tested experimentally.
- ➔ Analyse data, appreciate the value of reproducibility of data and draw valid conclusions.
- ➔ Collect data and apply appropriate methods to test a hypothesis.
- ➔ Develop an ability to comprehend and synthesise complex information.
- ➔ Organize a work-schedule, stick to deadlines, and prioritize activities.
- ➔ Communicate clearly and effectively, both orally and through writing.

5. Structure of the Cardiovascular Research MSc Programme

An MSc year needs to have 180 course credits cf. a BSc year of 120. This is made up of a research project of 90 cc (5-6 months), a Skills module of 30 cc, a Fundamental Cardiovascular Research Topics module of 30 cc and an Applied Cardiovascular Research Topics module of 30 cc.

Module name:		**Module format:**	**cc**
Cardiovascular Skills:	**7MRV0012**	Workshops & 2h Exam	30
Fundamental Cardiovascular Research Topics:	**7MRV0013**	9 Lectures & 9 Seminars 1 Essay + 3h Exam	30
Applied Cardiovascular Research Topics:	**7MRV0011**	8 Lectures & 8 Seminars 1 Essay + 3h Exam	30
Cardiovascular Research Project:	**7MRV0015** **7MRV0016**	Laboratory project Dissertation Project performance	 60 30
		Total:	**180**

The MSc Pass mark is 50%. A Merit is awarded for ≥ 60% and a Distinction for ≥70%. Each module has to be passed.

Personalised exam provision

You are advised to email the module organisers no later than one week before the test to inform them of any special examination needs. This includes extra time and the need for a lap top. If you do not do this it will be too late to arrange personalised provisions for you.

Provisional marks

It is important to note that all marks awarded for assessment are provisional, and may be subject to change, until ratified by the Assessment Board at the end of the academic year.

https://virtualcampus.kcl.ac.uk/vc/emol/results/examresults.aspx

THE MODULES

CARDIOVASCULAR SKILLS (7MRV0012: 30 CC)

This module will consist of 2 elements: workshops for essential skills and advanced techniques. There are also sessions on the use of statistics and scientific interpretation that will be followed by an examination in May. A basic knowledge of statistics is required for this component, and a self-directed teaching aid is available on KEATS for those who feel unsure of this.

Lectures & **Workshops** A workshop will consist of talks, with (where suitable) some interactive components such as demonstration, worked examples & hands-on experience. Currently the following topics are available: - tissue culture - Western blotting - Use of Animals – Experimental design and analysis - Scientific Interpretation - Leukocytes - Capillary Permeability - Flow cytometry – Skin – Histology - Heart failure - Artery stiffness – Animal Models of Heart Failure and Stroke – Angiogenesis – miRNA - Confocal Microscopy.

Assessment -Scientific Interpretation exam (55%: mandatory qualifying mark 40%) + 6 of the workshops (45%) assessed on a rolling basis. These 6 assessments will often consist of 4 to 6 short paragraphs in answer to questions that centre on the theoretical and practical aspects of the workshop. At least 5 of these must be passed at 50% with the 6th must be at least 40%.

LITERATURE BASED MODULES

FUNDAMENTAL CARDIOVASCULAR RESEARCH (7MRV0013: 30CC)

AND

APPLIED CARDIOVASCULAR RESEARCH (7MRV0011: 30CC)

These modules will address a number of topics that are the focus of current interest in the field of cardiovascular biology. The topics consist of introductory lectures to support student-led seminar sessions that consist of PowerPoint presentations of original research papers, with an internal expert present for guidance, followed by formalized question and answer sessions. The student questioners are instructed to prepare their questions in collaboration with the presenter to generate a good discussion of the science. Both the presenter and questioner will be awarded marks depending on the quality of the discussion they lead. The seminar reading lists and running order of presentations will be sent to the students by email and will be available on the programme's KEATS site.

Fundamental Cardiovascular Research	**Staff**
Endothelial control of vasculature;	R Siow; P Fraser
Endothelial Derived Hyperpolarization;	P Fraser;
Capillary permeability;	P Fraser;
Leukocyte Transmigration;	A Ivetic; P Fraser

Platelet signalling & Thrombogenesis;	G Passacquale; P Fraser
Angiogenesis & Vascular Development;	A Smith; P Fraser
Control of Heart Rate & Rhythm;	M Shattock; P Fraser
Control of cardiac contraction;	I Smyrnias; P Fraser
Redox Signalling;	A Brewer; P Fraser

Assessment (30cc): Presentation and discussions (30%; mandatory qualifying mark 50%), 1h timed essay (15%; mandatory qualifying mark 40%) and a 3 question, 3 hour examination (55%; mandatory qualifying mark 40%) taken in May.

Applied Cardiovascular Research	**Staff**
Myocardial signalling and hypertrophy;	R Heads; P Fraser
Hypertension;	A Ferro; P Fraser
Atherogenesis;	C Shanahan; P Fraser
Acute coronary syndromes/MI;	D Perera; P Fraser
Heart Failure & Cardiac Remodelling;	I Smyrnias; P Fraser
Cardiac Regeneration – Stem Cells;	L Zeng; P Fraser
Diabetes and Cardiovascular Disease;	L Gnudi; P Fraser
Stroke;	P Fraser;
Aneurysms;	A Smith; P Fraser

Assessment (30cc): Presentation and discussions (30% core; mandatory qualifying mark 50%), 1 x 3,000 word essay after the Christmas vacation (15%; mandatory qualifying mark 40%) and on a 3 question, 3 hour examination (55%; mandatory qualifying mark 40%) taken in May.

NOTES ON SEMINAR PRESENTATION

The seminars are aimed to help you learn the subject matter by having a good discussion on and around the topic outlined by the reading list. It is important that certain ground rules are observed so that your presentations are understood and enjoyed by your audience.

Each paper should be presented in terms of:-

AIMS The authors will have had to justify the reasons for carrying out their experiments, you should mention these and place the work into some context.

METHODS The main methods should be **very** briefly outlined so that the audience can easily understand what really went on in the experiments. A simple diagram of the apparatus and/or the experimental procedures might be helpful, and is sometimes essential. **Do not be over elaborate**. **The methods for individual experiments are often best presented with the results.**

FINDINGS The crux of the presentation. You should present carefully **selected** graphs, and possibly tables, to emphasise the points you (or the authors) wish to make. Any scientist publishing a paper realizes that the best way to get a message across is in terms of a graph, and often considerable care

will have been taken in deciding how best to present the data. There is no need to present the full content of the paper, just those elements that you think are really important.

DISCUSSION Have the authors achieved their declared objectives? Are there possible alternative interpretations of their results? What is the net contribution to the subject of this piece of work? You will appreciate that you have to know the papers to a considerable depth to be able to present them well. It is not the intention that you read your notes. It is far, far better that you talk fluently to the class, and refresh your memory from time to time by glancing at a crib sheet. In that way whatever you say will be part of a conversation, and allow your personality to come across. A reading will be dry and stilted, far removed from ordinary human expression.

DESIGNATED QUESTIONERS

You must of course read the paper first! Your questions should be based on whether you think that the authors have really shown what they have claimed, could there be other alternative (and perhaps better!) explanations for their results, and even suggest a better experiment. **You are encouraged to collaborate with the presenter** and the others with an aim to generate as good a discussion as possible.

SEMINAR ASSESSMENT

Your performance in the seminars will be assessed equally on the quality of the presentation and on the quality of the discussion generated by intelligent and thoughtful questions. The presenter and the questioners are encouraged to work as a team to produce a good performance and will share the (marks) benefits of a good session. Free questions (those that are outside a designated presentation) are very much encouraged and will attract bonuses!

CARDIOVASCULAR RESEARCH PROJECT (7MRV0015: 60 CC & 7MRV0016: 30 CC)

The project forms half of the programme and should be the equivalent of **6 months full-time work**. This means that you should spend around 4-5 months in the lab and the remaining time should be spent on reading the literature, data analysis and writing the dissertation.

At the end of the project students should be able to:

- Design and carry out appropriate experiments to test a hypothesis.
- Interpret results and summarise main findings (conclusions).
- Carry out statistical analysis on data.
- Keep professional records of work done.
- Manage time effectively.
- Develop problem solving and trouble shooting skills.
- Have the ability to work easily and competently in a laboratory environment.
- Analyse data critically and effectively.
- Write up a research dissertation.

At the end of the project and assessment phases students should have developed research skills to a postgraduate standard.

Project Supervision

The project supervisor should spend time at the start of the project discussing the suggested topic, background reading, practical considerations, and timetabling. The supervisor will also take the necessary steps over Animal Licence, Ethical Committee permission, and safety regulations where relevant. You should ensure that you understand the details of each of these, as they have important legal and safety implications. Remember that **you are ultimately responsible for everything you do associated with the project, from your own safety, to proper attention to legal requirements over experimentation, and care of animals and human subjects.** The Home Office specifies that students must receive training in animal experimentation before applying for a Personal Licence for animal work. This training is organised by King's if necessary.

The project supervisors are asked to help in the following ways:

- encourage the student to plan the protocol and draw up the design of experiments.
- give assistance with learning how to calibrate, check and use equipment. You should understand the theory behind any apparatus used for your project work, not just its method of operation.
- give practical help initially during experiments, but thereafter encourage the student to work independently as much as possible.
- provide overall supervision of the student's work, with particular attention to regulations and safety.
- provide some key references, and suggest where to find recent information.
- give guidance on analysis and presentation of data and on the most appropriate statistical tests for the data generated.
- read and give constructive criticism of one, **and no more than two**, draft versions of the dissertation. The dissertation has to be the student's own work.
- give relevant information about the conduct of the project to the Examiners, e.g. any problems encountered, unavoidable delays, equipment faults, availability of subjects/animals, extent to which student worked alone or as part of team, extent of assistance required. Supervisors will be asked to complete report forms after reading the dissertation, and these will be forwarded to the Examiners.

Project

The starting date for the project depends on your other coursework commitments and timetable, but should be as early as possible.

Timetable:

Early October: Project Titles distributed. Discuss options with programme co-ordinator

Mid-October: e-mail project preference (4 projects) to the programme co-ordinator (paul.fraser@kcl.ac.uk)

Early November: Announcement of preliminary allocation. Contact prospective supervisor and/or (if needed) discuss options with programme co-ordinator. Please provide a 1 page CV and short (no more than ½ page) statement to the programme co-ordinator and prospective supervisor describing why you wish to do this project.

Mid November: Confirm project choice & **s**tart literature search

January-July 2016: Experimental work on project. You should write up sections as you go along (Introduction, Methods, Results, Reference list), leaving only the Discussion and Abstract to complete after the end of experiments.

End July 2016: Draft dissertation to project supervisor for comment and correction. Your supervisor is only obliged to comment on one draft and will be instructed not to comment on more than 2 draft versions.

August 2016: Deadline for submission of revised dissertation (**3 copies + CD copy**) – date to be confirmed.

Early September 2016: Oral presentation – date to be confirmed

Module structure

1) Written dissertation

The total length of the dissertation, calculated as a word count using the "Tools/word count" option of the word-processing package **should be no more than 12,000 words** (including figures, tables and references within text but not the reference list). We will check the electronic version of your dissertation to ensure that the word count listed on the front cover sheet truly reflects the dissertation length: examiners will be asked not to read beyond the 12,000 word limit and submit their marks based on this upper limit. If your dissertation is overlong you will not gain credit for a thoughtful discussion that an examiner does not read.

A numbering system for Sections/Chapters helps. Pages should be numbered in sequence, and each Section should start on a fresh page. Figures and Tables look best if they are incorporated within the text, but they can be grouped together at the end of the appropriate Section if necessary. Each Figure or Table should have a number, a title, and a legend that describes its main features, so that it can be understood without reference to the text. In figures, show error bars (specify mean ± SD or SEM), and *P* values, where relevant, using the convention * <0.05, ** <0.01, *** <0.001. **Examiners pay particular**

attention to whether appropriate statistical analyses have been performed on the data – your statistics workshop should assist with this, but if in doubt ask your supervisor for advice. In legends, give the 'n' number (specifying how many determinations of the parameter in how many treatment groups, animals or subjects). In Tables, give mean ± SD or SEM and 'n', and *P* values where relevant.

The **dissertation should consist of**:

- **Front cover sheet** - with details of number of words
- **Title page** - with name of student and supervisor
- **Abstract** - similar to a scientific paper (no more than one page) and divided into headed sections:
- Introduction & Aims; Methods; Results; Conclusion.
- **Acknowledgements**
- **Abbreviations**
- **Table of contents**
- **List of tables and figures**
- **Introduction –** including a good review of the literature (appropriately referenced), showing brief historical development and recent work, and the chief questions to be addressed. Make sure that you give a balanced coverage, not just mentioning work from your host laboratory. If figures or tables are reproduced from published material, the source must be stated in the Figure legend and cited in the reference list.
- **Aims** – it must be clear to the examiners what you are attempting to do in your project. It may be useful to give the aims as a series of bullet points with a brief outline of the approaches taken to address each aim.
- **Methods –** given more fully than in a scientific paper, so that the examiners have a clear idea of what you did. It is useful to describe, in brief, the underlying principles of methods used. If you are involved in any *in vivo* experimental work on animals (even if you are not performing the procedures yourself) you **MUST** state the Home Office scheduled procedures that have been used. Similarly, dissertations that include work performed using human subjects **MUST** provide details of the ethical approval that was granted for the study.
- **Results** – as in a paper, but you may include more examples of raw data. You should provide numerical data wherever possible, so if you obtain results in a non-quantifiable format (e.g. experimental traces, autoradiographs, etc.), you should attempt to quantify them (e.g. measurements of area under the curve, densitometric analyses, etc.). Wherever possible you should perform appropriate statistical analyses on the data obtained – **you should seek advice from your supervisor about the most appropriate statistical tests to apply to your data if necessary**. The results text should describe the results presented, highlighting the main observations, and commenting on the statistical analyses.
- **Discussion** – commenting intelligently and critically on the results obtained, and showing how they fit in with the body of knowledge. Do not be afraid to criticise your own work, if you feel some parts are weak, and try to offer an explanation if your results are different from those of previous studies.
- **Conclusion** – key points from the work, and suggestions for further study.

- **Appendix –** the appendix contains information that you may not want to include in the main text such as large tables of raw data summarised in the Results section, checks on methods, DNA sequencing data, mathematical or theoretical considerations. You do not need to include an appendix if you do not have any additional information that has not been included in the Results section.
- **References –** full details (title, year, journal, page numbers) of each reference cited in the text, **in alphabetical order**. If several different techniques are used, or different sub-projects done within the whole, it may be better to keep the sub-topics separate (e.g. by presenting Methods and Results of sub-project 1 together, then same for sub-project 2 etc.).

You will be expected to submit **two** copies of your dissertation to the Academic Centre in mid-August: the deadline will be confirmed by email in 2017. The examiners will both receive a copy that they will mark. The project supervisor who will be asked to complete an assessment form. Please note that the MSc examiners have requested that all dissertations must be submitted in a format that allows confirmation of word count and that can be scrutinised by plagiarism software if necessary. For this reason, you must submit an electronic copy of your dissertation (as well as the two paper copies). Please make sure that your electronic submission is labelled with your name, and hand it in at the same time as the paper copies of your dissertation.

60 cc will come from your written dissertation; mandatory qualifying mark 50%

2) Lab Performance: ***15 cc will come from the supervisors assessment of your performance in the laboratory;*** mandatory qualifying mark 50%. This will be based on your attendance, thoroughness in keeping records, ability to solve technical issues that come up and participation in laboratory and Divisional events.

4) Oral Presentation

You will be expected to present a 10 minute PowerPoint presentation to provide an overview of your project followed by questions from internal and external examiners. Detailed instructions will be provided at a later stage. The Dissertation Abstract must be forwarded to the programme coordinator one week before the date of the presentation.

15 cc will come from your oral presentation; mandatory qualifying mark 40%

Appendix
Advice on Plagiarism

You should already be aware of King's regulations on plagiarism and collusion and the penalties that may be imposed should you fall foul of them. If you need reminding please see
http://www.kcl.ac.uk/college/policyzone/assets/files/assessment/Academic_Honesty_Integrity.pdf

In order to help you learn about plagiarism and how to avoid it, King's provides you with a learning resource on KEATS (the King's E-learning and Teaching Service) that gives advice on writing in the correct style and citing references. The resource also allows you to check your work using *Turnitin* (on line plagiarism detection software) before you submit it for assessment. Work submitted to *Turnitin* via the KEATS resource is not seen by tutors, and it is not stored in the *Turnitin* database, so using this facility will not trigger a match with the work you finally submit for assessment. You can submit work for checking via this facility as many times as you like, but you will only receive one originality report every 24 hours i.e. if you submit your work, revise it and then resubmit it one hour later, you will have to wait 24 hours to receive the report on your second submission.

When using the KEATS resource, please note the following:

1) Examiners never rely solely on *Turnitin* to determine whether an assignment is plagiarised. They will always use academic judgement. All that *Turnitin* does is flag up possible issues with a student's approach to written work, and you should use it appropriately in order to develop your writing skills and your own academic judgement. Following the advice below should help you.

   a. Make use of the teaching element of the KEATS resource (preferably before you start your assignment) as well as the *Turnitin* facility.

   b. When using *Turnitin*, do not over-focus on a numerical originality score. Look at the full report. A piece of work that gives a low score may contain plagiarised sections if blocks of text (even small ones) are exact matches to external sources, while work that gives a higher score may not be plagiarised if it contains a high proportion of technical terms that cannot be rephrased.

   c. An essay or dissertation that too closely follows the structure of one or two review articles is not an original piece of work, even if the wording has been paraphrased so as to give a low *Turnitin* score. Even though it may not be detected via *Turnitin*, this form of plagiarism can be spotted by experienced examiners.

   d. If you are in doubt about your *Turnitin* report or have any other questions about plagiarism and collusion **SEEK ADVICE**. People you can speak to are: module organisers and tutors, your personal tutor or the Senior Tutor or Assessment Sub-Board Chair (Prof Sue Brain: sue.brain@kcl.ac.uk).

e. Other useful advice is available at

http://www.kcl.ac.uk/library/help/plagiarism/index.aspx

2) Given that obtaining a *Turnitin* report, interpreting it, and obtaining advice and revising your work if necessary all take time, it makes sense to check your work early, **NOT** just before the submission deadline.

3) Finally, please note that submission of your work to *Turnitin* via the KEATS plagiarism resource does **NOT** constitute submission for assessment. Please make sure that you follow **ALL** the instructions you are given for final submission of your assignment and respect all deadlines.