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**POSTGRADUATE INSTITUTE OF MEDICINE  
UNIVERSITY OF COLOMBO, SRI LANKA**



# **PROSPECTUS**

## **POSTGRADUATE DIPLOMA AND MASTER OF SCIENCE**

**IN**

## **MOLECULAR MEDICINE**

**2014**

**SPECIALTY BOARD MOLECULAR MEDICINE  
BOARD OF STUDY IN MULTI DISCIPLINARY STUDY COURSES**

**POSTGRADUATE DIPLOMA/ MASTER OF SCIENCE IN MOLECULAR MEDICINE**  
**POSTGRADUATE INSTITUTE OF MEDICINE**  
**UNIVERSITY OF COLOMBO, SRI LANKA**

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## **I. Background**

Biotechnology is the future wave and the 21st century is already considered as the “Biological age/Post genomic era” in which the efforts of the gene revolution are expected to blossom and bear fruit. This rapid advancement in all disciplines of Biological Sciences is due to the tremendous progress achieved in Genetics and Molecular Biology, especially owing to the number of genome projects unveiling the biological alphabet of cellular and biochemical processes. Today, Genetic engineering and other related techniques have become standard and indispensable tools in almost all disciplines of the life sciences including medicine. Hence, the Board of Management of the PGIM decided to conduct a Postgraduate Diploma/MSc in Molecular Medicine to fulfill the growing need for postgraduate trainees in Sri Lanka to get acquainted with the recent advances in Molecular Medicine.

## **II. Objective**

The aim of the Postgraduate Diploma/MSc Programme is to provide the trainees with knowledge and skills in Molecular Medicine relevant to research and services in a variety of settings in the field of Medicine in Sri Lanka.

## **III. Specific Objectives**

1. To develop basic and applied scientific knowledge and skills in Molecular Biology relevant to medicine.
2. To gain knowledge of the laboratory infrastructure, equipment and consumables used in molecular biology.
3. To develop awareness and to be acquainted with the concepts of bio-safety, bioethics, and good laboratory practices (GLPs)/ laboratory discipline (Quality Control (QC), validation, general lab practice and total quality management and accreditation) especially with regard to molecular biology.
4. To develop critical and analytical skills important in molecular medicine and to promote self and life-long learning.
5. To develop skills in proper interpretation of laboratory results.

## **PART I**

### **Postgraduate Diploma in Molecular Medicine**

#### **1. Eligibility Criteria**

- a) A medical degree registered with the Sri Lanka Medical Council.
- b) Satisfactory completion of internship acceptable to the Sri Lanka Medical Council.
- c) Satisfactory completion of one year of post internship in Medical/Clinical practice or teaching in a university/public/private sector institution in Sri Lanka acceptable to the PGIM.

- d) The criteria prescribe in paragraphs (a) to (c) must have been satisfied by the applicants as at the date of closure of applications, provided that where a short-fall has occurred due to any reasons including sick, maternity or other leave, the doctor concerned should complete such shortfall in order to become eligible to apply.

OR

Dental or Veterinary Science degree and three years work experience.

OR

B.Sc. Special or General Degree in Biological Sciences or Allied Health Sciences from a State University or Degree Awarding Institute recognized by the University Grants Commission or a B.Sc. Degree from a foreign University recognized by the University Grants Commission of Sri Lanka with Chemistry or Biochemistry as a subject and at least three years work experience.

## 2. Selection Examination

The content areas for the selection examination is given in Annex 1

### 2.1. Format of the examination

Multiple Choice Question paper – 20 Questions of the true / false type to be answered in 60 minutes – 200 marks

*Viva voce* examination (to be marked by two independent examiners) - 20 minutes – 100 marks.

### 2.2. Requirements to pass the examination

Candidates who obtain an overall mark of 50% or more in the above Examination will be considered to have passed the Selection Examination, and therefore eligible for selection to follow the programme..

### 2.3. Number to be selected for the programme

This will be indicated in the circular calling for applications. This number will be selected from candidates who have passed the Selection Examination based on rank order of the final mark.

## 3. Programme Details

3.1. The Postgraduate Diploma will be conducted during weekends over a period of 18 months. The Postgraduate Diploma is based on a modular structure consisting of 06 modules. The laboratory sessions of the Programme will be scheduled as *en-bloc* laboratory classes of 1-2 weeks duration.

3.2. The Postgraduate Diploma programme shall consist of a coursework component having 30 Credits, including lectures (23 Credits) and laboratory sessions (7 Credits). A Credit is 15 hours of lectures or 30 hours of laboratory work. (See table under 4.1)

- 3.3. The medium of instruction and examination will be in English.
- 3.4. The teaching-learning instruments will be in the form of lectures, small group discussions, seminars, laboratory classes, demonstrations etc.

#### 4. Curriculum

##### 4.1. Modules\*

The following table displays the teaching learning hours and allocated credits for the Postgraduate Diploma programme

15 lecture hours = 1 Credit C- Credit

30 laboratory hours =1Credit

Module Number	Module	Total No. of hours	No. of lecture Hours	No. Practical Hours
1	Molecular cell Bio. & Cyo	120	60 (4c)	60 (2c) weekdays
2	Human biology, Micro & Parasitology	90	60 (4c)	30 (1c)
3	Molecular Immunology & Pathology	90	60 (4c)	30 (1c)
4	Genetics and Human diseases	75	60 (4c)	15 (1/2c) weekdays
5	Molecular Diagnosis and therapeutics & Laboratory management	90	60 (4c)	30 (1c) weekdays
6	Special Topics	(Unit 1+2+3+4 = 3 Credits)		
Unit 1	Bioinformatics	42	12	30 (1c)
Unit 2	Research methods	24	9	12 (1/2c)
Unit 3	Medical biotech industry	12	12	
Unit 4	Bio-ethics Bio-safety Medico legal aspects	12	12	
		555	345 (23c)	210c)



**Module 1: Molecular Cell Biology and Cytogenetics**

**(4 Credits and Laboratory sessions 2 Credits)**

Introduction to Molecular Biology, Essential Techniques in Cellular & Molecular Biology.  
Early Development of Embryo and Foetus and Cytogenetics.

**Module 2: Human Biology and Medical Microbiology and Parasitology**

**(4 Credits and Laboratory sessions 1 Credit)**

Human Biology and General Microbiology and General Parasitology  
Concepts of Cellular Metabolism and Bioenergetics.

**Module 3: Molecular Immunology and General Pathology**

**(4 Credits and Laboratory sessions 1 Credit)**

General Immunobiology, Immune System in Health and Diseases, Cytokine Biology,  
Hypersensitivity, Autoimmunity, Stem Cell Biology, Laboratory Immunobiology.  
Molecular Oncology and Concepts in General Pathology.

**Module 4: Genetics and Human Diseases**

**(4 Credits and Laboratory sessions 0.5 Credit)**

Clinical Features, patterns of Inheritance and Prevalence of Common Genetic Diseases.  
Mechanisms Involved in the causation of Human Genetic Disease.  
Introduction to Diagnostic Methods for Human Genetic Diseases. Genetic Counseling and  
Ethical issues.

**Module 5: Molecular Diagnosis, Therapeutics & Laboratory Management**

**(4 Credits and Laboratory sessions 1 Credit)**

Molecular Diagnosis of Infectious Diseases, Molecular Therapeutics, Laboratory  
Management.

**Module 6: Special Topics**

**(3 Credits and Laboratory sessions 1.5 Credit)**

Unit 01 – Bioinformatics

Unit 02 – Research Methods in Molecular Medicine

Unit 03 – Medical Biotech Industry

Unit 04 – Biosafety, Bioethics and Medico Legal aspects

\*Visit the PGIM web site <http://www.cmb.ac.lk/pgim> for the curricula contents of the above modules

## **5. Eligibility to Appear for Postgraduate Diploma Examination**

- 5.1 A candidate shall not be permitted to register for the Examination unless the Director/ PGIM has certified that the candidate has satisfactorily completed the course modules leading to the examination by attending the required number of lectures, tutorials and assignments. An attendance of 80 % or more is required for all teaching activities.
- 5.2 A candidate shall take the Examination on the first occasion on which the examination is held after satisfactory completion of respective modules unless the candidate has submitted a medical certificate acceptable to the Board of Management of the PGIM.
- Or
- 5.3 The candidate has established to the satisfaction of the Specialty Board in Molecular Medicine and the Board of Management of the PGIM that there is an adequate reason for being allowed to postpone appearing for the examination.
- 5.4 A candidate who is unable to appear for any or all the papers of the examination on grounds of illness, or any other reason accepted by the PGIM (5.2 above) and who has not exhausted all the permitted attempts shall be required to appear for the examination at the next available opportunity.

## 6. Format of the Examination

The Postgraduate Diploma programme shall have 3 examinations.

Examination 1 will be held after completion of Modules 1 and 2

Examination II will be held after completion of Modules 3 and 4

Examination III will be held after completion of Modules 5 and 6

**The structure of the examinations are listed below:**

### **Examination I**

Module 1: Theory component- Structured Essay (SEQ) - 6 questions (3h)

Laboratory component - SEQ (2h) + Laboratory report

Module 2: Theory component - SEQ - 6 questions (3h)

Laboratory component - Objective Structured Practical

Examination (OSPE) (1h) 20 stations, 3 minutes per station

### **Examination II**

Module 3: Theory component- SEQ- 6 questions (3h)

Laboratory component – OSPE (1h) 20 stations, 3 minutes per station

Module 4: Theory component- SEQ- 6 questions (3h,)

Laboratory component - OSPE (0.5 h) 10 stations, 3 minutes per station

### **Examination III**

Module 5: Theory component- SEQ- 6 questions (3h)

Laboratory component- OSPE (1h)

Module 6: Theory component- SEQ- 6 questions (3h)

Computer-based practical exam (2 h) + Assignment report

## 7. Assessment Criteria

The apportioning of marks for the different components of each of the module examinations are given below.

<b>Examination</b>	<b>Module</b>	<b>Theory Paper (3hr)</b>	<b>Laboratory Component</b>
EI	1	SEQ 70%	30% {20% Written paper (2h) + 10% laboratory report }
	2	SEQ 80%	OSPE 20%
EII	3	SEQ 80%	OSPE 20%
	4	SEQ 90%	OSPE 10%
	5	SEQ 80%	OSPE 20%
EIII	6	SEQ 80%	20% { 10% practical (2h)+ 10% assignment report }

The candidate should obtain a minimum of 50% for the theory component (SEQ) and 40% for the laboratory components and obtain at least a C grade to pass a module. At the end of the three examinations, the Grade Point Average (GPA) will be computed using grade points assigned for all modules.

### 7.1 Grade Points and GPA

The Grades and Grade Points as follows.

<b>Marks Range</b>	<b>Grade</b>	<b>Grade Point</b>
85-100	A+	4.00
80- 84	A	4.00
75- 79	A-	3.70
70- 74	B+	3.30
65- 69	B	3.00
60- 64	B-	2.70
55- 59	C+	2.30
50- 54	C	2.00
45- 49	C-	1.70
40- 44	D+	1.30
30- 39	D	1.00
29- 00	E	0.00

The GPA will be computed using the following formula,

$$\text{GPA} = \frac{\sum w_i g_i}{\sum w_i}$$

Where,

$w_i$  - Number of credit units for the course

$g_i$  - grade points for the course

The GPA will be rounded to the second decimal place.

## 8. Eligibility for award of the Postgraduate Diploma

Candidates are required to obtain at least a C grade for each module examination and obtain an overall GPA of 2.00 or above and complete any other requirements as specified by the PGIM, to be eligible for the award of the Postgraduate Diploma in Molecular Medicine.

## 9. Second and later attempts

If a candidate fails any module examination the candidate shall re-sit that module examination, as scheduled in the PGIM examination calendar. In 2<sup>nd</sup> and subsequent attempts, the marks allocated for the laboratory report (Module 1) and the assignment report (Module 6) will not be considered when computing the final mark. The maximum grade a candidate can obtain at a 2<sup>nd</sup> or subsequent attempt is a C grade. Candidates are allowed to re-sit an examination 5 times (total of 6 attempts) and complete all the module examinations before the expiry of a continuous period of 8 years from the date of first attempt at the examinations for the Postgraduate Diploma in Molecular Medicine (Refer to PGIM General Regulation with regard to maximum number of attempts and completion of the course).

## 10. Award of Postgraduate Diploma in Molecular Medicine

A candidate shall be awarded the Postgraduate Diploma in Molecular Medicine if:

- a) The candidate has been duly registered for the programme of study leading to the Diploma, **and**
- b) The candidate has maintained registration and followed the programme satisfactorily, **and**
- c) The candidate has successfully completed the examination requirements (given in Section 6 and 7), **and**
- d) Obtained an overall GPA of 2.00 or above, **and**
- e) Obtain at least a C grade for each module, **and**
- f) The candidate has fulfilled all other requirements prescribed by the By-Laws, and any other requirements of the PGIM.

## **11. General Regulations and Rules**

All General Regulations and Rules relating to examination procedure, offences and punishment of the PGIM will be applicable to all candidates of the Postgraduate Diploma Programme.

## **12. Progression to MSc in Molecular Medicine**

A candidate who has successfully completed the Postgraduate Diploma and obtained a GPA of 2.3 or above in not more than two attempts at any one of the module examinations can apply to be enrolled in the MSc in Molecular Medicine programme. The Postgraduate Diploma will not be awarded to candidates proceeding to the MSc programme.

## **PART II**

### **Master of Science in Molecular Medicine**

#### **1. Admission to the Master of Science Programme**

- 1.1 Candidates who successfully complete the Postgraduate Diploma and obtain a GPA of 2.3 or above in not more than two attempts at any one of the module examinations will be eligible for the admission to the MSc programme.
- 1.2 The candidates are advised to register for the MSc programme immediately after successfully completing the Postgraduate Diploma. However, a period of one and a half years may be granted prior to registration for the MSc programme and such candidates should register with the next MSc intake.
- 1.3 The PGIM will display the list of candidates eligible to follow the MSc programme and the prospective candidates are required to apply for the enrollment of the programme.
- 1.4 Those selected will be intimated by the Director/PGIM. They will register for the programme by paying the prescribed fees.

#### **2. Programme Duration and Credits**

- 2.1 The MSc is a fulltime programme and a candidate shall be registered for a continuous period of 12 months.
- 2.2 The MSc programme consists of 35 Credits (a Credit is 45 hours of research work). (See Annex 2)

#### **3. The Research Project Leading to Dissertation**

- 3.1 The candidate shall commence a research project under the guidance of one or more supervisors. The title of the research project, place where the research will be carried out and the supervisor/s should be approved by the Specialty Board in Molecular Medicine and the Board of Management, PGIM prior to commencement of research. Research work has to be carried out in an academic/research/industrial institution where the necessary facilities are available.
- 3.2 Continuous attendance, other than approved leave, is required when research is carried out and the candidates should ensure marking of their attendance regularly during the period assigned for research work.
- 3.3 In the MSc programme, candidates may be required to follow preliminary short courses (1- 2 weeks duration) which will not carry Credits. These include courses in research methodology and statistics. The candidate shall bear the costs for these courses.
- 3.4 Allocation of research projects to candidates will be based on a ranking system.
- 3.5 Before the commencement of the research work the candidates will be required to write a project proposal (annex 3) under the guidance of the supervisor/s (annex 4 and 5) and submit it to the Specialty Board through the supervisor/s. The research proposal will be reviewed (annex 6). by a suitable reviewer. Thereafter, the candidates will be required to make an oral presentation on the research proposal.
- 3.6 The duration of the research project would be approximately 10 months.
- 3.7 A progress report should be forwarded 6 months after commencement of the research project by the supervisor (annex 7). to the Specialty Board on Molecular Medicine through the Course Co-ordinator. Progress review seminars will also be held regularly to monitor the progress of the research.

- 3.8 At the end of the research project the candidate will be required to submit a dissertation (based on the research) before the expiry of 12 months from the date of registration for the MSc programme (annex 8).

#### 4. Format of Examination and Assessment Criteria

- 4.1 The examinations for the Master of Science in Molecular Medicine shall be in the form of a dissertation submitted on the research project and a *viva voce* examination also based on the dissertation.
- 4.2 The apportioning of marks for the research project shall be maximum of:  
 Dissertation 80% (see Annex 9 for marking scheme)  
*Viva voce* 20% (See Annex 9 for marking scheme)

#### 5. Examination of the Dissertation

- 5.1 Three copies of the dissertation (in temporary bound form) and an electronic copy should be submitted to the examination branch of the PGIM. The dissertation should be in the form specified by the Specialty Board in Molecular Medicine and should be submitted on or before the assigned date for submission of dissertations.
- 5.2 A copy of the dissertation shall be sent to two examiners appointed by the Director, PGIM on the recommendation of the Specialty Board in Molecular Medicine and approved by the Senate. The supervisor/s may recommend appropriate examiners to the Specialty Board in Molecular Medicine. At least one of the examiners should be external to the place where the research was carried out.
- 5.3 A candidate will pass the dissertation when both examiners assigned at least a C+ grade. The final mark for the dissertation will be the average of the marks assigned by the two examiners.
- 5.4 A candidate will fail the dissertation when both examiners have assigned a grade lower than C+ grade. The final grade will be the average of the marks assigned by the two examiners.
- 5.5 Where a dissertation has been assigned a pass grade by one examiner (C+ or more) and a fail grade (less than C+) by the second examiner, a third examiner will be appointed to assess and award a mark for each such dissertation.
- 5.6 The final mark to decide on pass/ fail status of the candidates in section 5.5 will be decided on the marks assigned by all three examiners. If two of the three examiners have assigned  $\geq$ C+ grade the candidate passes the dissertation and if two of the three examiners have assigned a grade less than C+, then the candidate fails the dissertation. The final grade assigned to the dissertation will be the average of marks assigned by the two examiners who show concurrence as described above.
- 5.7 If the dissertation in its present form, though not of sufficient merit to pass (as in section 5.4 and 5.6 failures), but is of sufficient merit to justify such action, the examiners may recommend that the candidate be permitted to present the dissertation in a revised form for evaluation within a period of three months of intimation by the PGIM. The evaluation procedure for a revised dissertation will be the same as above.
- 5.8 If a candidate has been failed by both examiners (as in section 5.4 and 5.6 failures) and the dissertation is of insufficient merit to recommend for resubmission by the examiners, such candidates will be awarded the Postgraduate Diploma in Molecular Medicine.



## 6. The Viva voce Examination

- 6.1 Those candidates who pass the dissertation will be called for a *viva voce* examination.
- 6.2 The viva voce examination will be conducted by a Board of Examiners. The Board will consist of the Chief Examiner appointed by the Director PGIM (as the Chairperson) and the two dissertation examiners. The supervisors shall be present as observers.
- 6.3 A candidate should obtain an average of at least a C+ grade to pass the *viva voce* examination. The final grade will be the average of the marks assigned by the two examiners.
- 6.4 A candidate will fail the *viva voce* examination if the assigned average grade is lower than C+.
- 6.5 If a candidate fails to satisfy the examiners at the *viva voce* examination, the Board of examiners may recommend that the candidate be permitted to present the same dissertation again and submit to a further *viva voce* examination within a period of three months intimated by the PGIM.
- 6.6 A candidate presenting for the *viva voce* examination at the second attempt will pass the *viva voce* examination if an average of at least a C+ grade is obtained. A candidate will fail the *viva voce* examination if the assigned average grade is lower than C+.
- 6.7 In such instances the candidate will be awarded the Postgraduate Diploma in Molecular Medicine.

## 7. Final Submission of the Dissertation

- 7.1 Three copies of the dissertation, permanently bound with revisions, if any, together with an electronic copy should be submitted to the Director/PGIM. The principal supervisor is required to certify that the candidate has attended to the corrections suggested at the *viva voce* examination. The final submission should be made within six weeks of the date of the *viva voce* examination.

## 8. Eligibility for award of the MSc

- 8.1 A candidate is required to obtain at least a grade of C+ for both dissertation and the *viva voce* examination.  
AND
- 8.2 An overall GPA of 2.30 or above and complete any other requirement as specified. The overall GPA will be computed using grade points obtained for the,
  - a) Six modules of the PG Diploma programme
  - b) MSc Dissertation
  - c) *Viva voce* examination

(See Part 1 No. 6.1 for computation of grade points)

## 9. Rules and Regulations

All General Regulations and Rules relating to examination procedure, offences and punishment of the PGIM will be applicable to these candidates of the Master of Science Programme.

## 10. Award of the Degree of Master of Science in Molecular Medicine

The MSc degree may be awarded to a candidate who has,

- a) Fulfilled the admission requirements and has been accepted by the PGIM as a trainee in the MSc programme, **and**
- b) Been duly registered, **and**
- c) Successfully completed the research project and submitted a dissertation, **and**
- d) Successfully completed the Postgraduate Diploma and obtained a GPA of 2.30 or above in not more than two attempts at any one of the module examinations **and**
- e) Obtained a minimum grade of C+ for the dissertation and for the *viva voce* examination **and**
- f) Obtained an overall GPA of 2.30 or above **and**
- g) Fulfilled all other requirements prescribed by the By-Laws, and other relevant Regulations and Rules of the Postgraduate Institute of Medicine.

## **ANNEX 1**

### **SYLLABUS FOR THE SELECTION EXAMINATION**

Candidates are expected to have basic knowledge of the following content areas at the undergraduate level taught at a state university of Sri Lanka.

#### **Anatomy & Physiology**

1. Structure and function of cell including all subcellular organelles
2. Structure and function of cell membrane
3. Basic structure and function of genes and arrangement of DNA into chromosomes
4. Levels of structural complexity within the body: cell, tissue, organ, organ systems and organism
5. Process of cell division: mitosis and meiosis
6. Process of fertilization

#### Reading Material

1. Ross and Wilson Anatomy and Physiology in Health and illness  
Anne Waugh and Allison Grant
2. Basic Medical Genetics,-Rohan W. Jayasekara
3. Wheater's Functional Histology- a text and colour atlas  
Barbra Young, James S. Lowe, Allan Stevens and John W. Heath

#### **Biochemistry and Molecular Biology**

1. Cell division
2. Structure and function of nucleic acids
3. DNA replication, damage and repair
4. DNA transcription, RNA processing and protein synthesis
5. Common techniques used in the study of Cells and Molecular biology (Manipulation of Nucleic acids, PCR, hybridization, sequencing)
6. Metabolism of macromolecules (carbohydrates, lipids, proteins and nucleic acids)

Reading material- Biochemistry- Lippincott's Illustrated Reviews

#### **Microbiology**

1. Basic concepts of general bacteriology, mycology and virology
2. Principles of clinical specimen collection and processing related to microbiology

#### Reading Material

1. Medical Microbiology  
A guide to microbial infections: pathogenesis, immunity, laboratory investigations and control  
David Greenwood, Mike Barer, Richard Slack and Will Irving

#### **Immunology**

Innate and adaptive immune reactions

#### Reading material

1. Immunobiology by Janeway online version is also available
2. Immunology by David Male, Jonathan Brostoff, David B Roth 8<sup>th</sup> version

## **Parasitology**

1. Parasitic disease agents that infects man: names, type of agents, the mode of spread, vectors of diseases, principles of prevention and control

### Reading material

1. Basic Clinical Parasitology by Franklin A Neva and Harold W Brown. 6th Edition. Prentice Hall International Inc.

## **Pathology**

Basic concepts of general pathology:

1. Reactions of cells and tissues to abnormal stimuli.
2. Structure and function of cells involved in the tissue response to injury

### Reading material

1. Robbins Basic Pathology by Vinay Kumar, Abul K. Abbas, and Jon Aster. 9<sup>th</sup> Edition.

**ANNEX 2**

**MASTER OF SCIENCE IN MOLECULAR MEDICINE PROGRAMME**

**Master of Science** – 12 months (Fulltime)

Duration of research project = 10 months

45 research work hours = 1 Credit

Total Credits for MSc = 35 Credits (~ 160 hours per month x 10 months)

**ANNEX 3**  
**FORMAT OF DETAILED PROJECT PROPOSAL**

**Section 1**

1. Name of trainee
2. Name(s) of supervisor(s)
3. Training centre

**Section 2**

1. Project title
2. Background and justification
3. Objectives of study
4. Research plan
  - a. Design
  - b. Setting
  - c. Method
  - d. Sample size and sampling techniques
  - e. Outcome measures
  - f. Statistical analyses and plan of presentation of results
  - g. Ethical considerations
  - h. Work plan and time lines
5. References
6. Funding for study
7. Signature of trainee

**Section 3**

Recommendation of supervisor(s)

Signature of Supervisor 1

Signature of Supervisor 2

Date

Date

**Section 4**

Date of submission to PGIM

Date of approval by SBMM

Signature of Secretary SBMM

## ANNEX 4

### INSTRUCTIONS TO DISSERTATION SUPERVISORS

- The dissertation for the M.Sc in Molecular medicine is based on a 1 year research project.
- Acceptance of the dissertation is a requirement to obtain the M.Sc.
- The trainee should write up the project work as a dissertation conforming to the format approved by the Specialty Board in Molecular Medicine (SBMM).
- The supervisor should guide the student in planning and designing, carrying out the research and in presentation of the work.
- The supervisor should obtain recommendation of the research proposal from a reviewer.
- The supervisor should forward Progress Report(s) in the prescribed form at the end of 6 months after the trainee commences work on the research project.
- The objective of the dissertation is to prove the trainee's capability to plan, carry out and present his / her own research. The purpose of this training is to ensure maturity, discipline and scholarship in research.
- The dissertation should comprise the trainee's own account of his / her research.
- It must contribute to expand the knowledge in molecular medicine in Sri Lanka and afford evidence of originality as shown by independent, critical assessment and / or discovery of new facts in the area under study.
- It should be satisfactory as regards literary presentation.
- The dissertation should be certified by the supervisor as suitable for submission.
- General Comments on the contents: The objectives should be clearly stated and should be feasible to achieve within the time frame. Other published work relevant to the problem (both international and local) should be comprehensively covered and critically evaluated. An appropriate study design and method should be used to achieve the objectives stated. The results should be appropriately analysed, interpreted and presented effectively. The discussion should include comments on the significance of results, how they agree or differ from published work. If they differ, the probable reasons for these differences need to be discussed. Theoretical / practical applications of the results, if any should be given. The conclusions should be valid and be based on the results obtained on the study.
- Ethics: The candidate should confirm and document that procedures followed were approved by the Ethical Committee of the institution where the work was carried out and ethical approval was obtained by a recognized Ethical Review Committee.
- The trainee is required to make a short (10 min.) presentation of the project proposal prior to commencement of the project to obtain a feedback from other trainers and invitees, regarding feasibility, appropriateness of study design and method and statistical considerations.
- Prior to submission of the dissertation, the trainee will be required to make a short (15 – 20 minutes) presentation of the project once completed, to the BOS members and other invitees This will give the trainee an opportunity to discuss his / her work and obtain a feedback from peers and colleagues. It will not be used for evaluation in any form. The supervisors will also be invited for these presentations.
- The trainee will be questioned on the dissertation at the *viva-voce* examination.
- If at any time the supervisor is not satisfied with the work progress of the trainee, the trainee should be made aware of the deficiencies and corrective measures suggested. This should be conveyed in writing to the trainee with a copy to the SBMM. In such instances, a follow-up report should be forwarded within three months or earlier if necessary to the SBMM.





**ANNEX 6**  
**REPORT OF THE RESEARCH PROJECT REVIEWER**

**1. Name of Trainee:**

**2. Training Centre:**

**3. Supervisor:**

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**4. Reviewer:**

Name:

Designation:

Address Official:

Tel//Fax:

Email:

---

**5. Title of Project:**

---

**6. Please comment on each of the following headings.**

**6.1 Introduction :** Rationale(Justification) – problem identified and quantified. Hypothesis and expected outcome, impact and relevance of the study.

Comment : .....

**6.2 Literature Review:** Adequacy ( evidence of a systematic search for related. similar, relevant studies)

Comment : .....

**6.3 Objectives :** Clearly defined . relevant and stated in measurable terms .

Comment : .....

**6.4 Method:** Appropriate study design to address the objectives with clear detailed description of subjects, sampling technique and sample size, interventions , data collection and management. The study should be , internally valid and reproducible. Where specific details are available in the literature, reference should be made to the original papers, and comments kept to a minimum. If modifications have been made to the published techniques, these should be described in full. Appropriate statistical tests planned should be mentioned and ethical issues addressed

Comment : .....

**6.5 Results:** Order of presentation and appropriate presentation of tables, figures, graphs. Appropriate statistical analyses and interpretations

Comment : .....

**6.6 Discussion:** The findings of the study should be discussed taking into consideration findings of relevant studies, within and outside the country. The discussion should not be a repetition of the results only. Limitations should be included.

Comment : .....

**6.7 Conclusion and recommendation:** Based of the results of the study and to address the objectives

Comment : .....

**6.8 Limitations:** Any inherent and / or inadvertent biases and how they were dealt with.

Comment : .....

**6.9 References:** According to the Vancouver system and relevant to the study. Properly documented in the Bibliography and appropriately cited in the text

Comment : .....

**6.10 Institution(s) where work would be carried out:**

**6.11 Ethical considerations/institution from where ethical approval will be /has been obtained:**

Comment : .....

**6.12 Overall presentation:** Overall presentation of the proposal (grammar, spelling, typographical mistakes etc.

Comment : .....

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**7. Recommendation of reviewer:**

Comment : .....

- Is the dissertation acceptable? Yes / No

- If No, What corrections are required? ( Attach a separate sheet of paper if necessary)

**Signature:**

**Date:**

---

**8. Recommendation of the SBMM:**

**Signature of Chairperson/Secretary:**

**Date:**

**ANNEX 7**  
**DISSERTATION PROGRESS REPORT**

**To be forwarded by the supervisor to the SBMM after 6 months**

- 1. Name of trainee:**
- 2. Training Centre:**
- 3. Supervisor:**
- 4. Title of project:**
- 5. Description of work carried out to date:**

To be filled in by trainee: briefly describe progress in lab / field work and dissertation writing

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**Supervisor's comments**

- 6. Is the work on schedule?**                      Yes / No
- 7. Progress in dissertation writing:**    satisfactory / unsatisfactory
- 8. Constraints (if any)**
- 9. Recommendation of supervisor:**

Signature:

Date:

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**10. Recommendation of the SBMM:**

Signature of Secretary :

Date:

## **ANNEX 8**

### **DISSERTATION SUBMISSION FORMAT**

#### **General instructions**

It is essential to start writing the dissertation early and in all cases before the data collection is completed. At the same time, you should make arrangements to have your manuscript word-processed. Your supervisor should be consulted before you start to write and thereafter at regular intervals. It is much easier to make corrections if the draft is double-spaced and printed on only one side of the paper.

The past tense should be used. To avoid exceeding the given word limit, it is suggested that an approximate running total is kept. The metric system and the International System (SI) of units should be used whenever possible.

#### **Length**

An ideal length of text is approximately 10 000 words, which equals to about 40 pages. With figures, references, etc., the total length is likely to be in the region of 50 - 80 pages.

Three copies should be submitted to the Director/ PGIM, spiral-bound in the first instance. One will be retained in the PGIM, and the other two will be sent to external examiners. After acceptance (and necessary corrections), all three copies should be bound in hard covers (black) with the author's name, degree and year printed in gold on the spine. The front cover should carry the title, author's name and year printed in gold. One copy will be returned to the student, one retained by the supervisor, and the third housed in the PGIM library.

#### **Layout**

The dissertation should be word-processed and printed on both sides, on A4-size photocopying paper.

##### Layout of typescript

There should be 1.5" on left-hand and top margins, and 1.0" on right-hand and bottom margins. It is especially important that the left-hand (binding) margin is of the regulatory size.

Line spacing should not be less than 1.5.

Lettering should be in Calibri font size 11.

All pages should be numbered consecutively throughout, including appendices. Page numbers should be inserted in the bottom right hand corner.

##### Tables, diagrams, maps and figures

Wherever possible, these should be placed near the appropriate text. Tables should be numbered in continuous sequence throughout the dissertation. Maps, graphs, photographs, etc., should be referred to as Figures. Each of these should also be numbered in a continuous sequence. Colour should be avoided in graphic illustrations (unless it is essential) because of the difficulty of photographic reproduction; symbols or other alternatives should be used instead.

##### Notes

Notes, if essential, should be inserted, in reduced font, at the foot of the relevant page. If too voluminous for this to be practicable, they should be placed in an Appendix. Notes may be typed in single spacing.

##### Abbreviations

Where abbreviations are used, a key should be provided.

#### **Preliminaries**

The preliminaries precede the text. They should comprise the following:

1. Title page

Title of dissertation  
Author's name  
M.Sc. (Molecular Medicine)  
Post Graduate Institute of Medicine  
University of Colombo  
Date of submission

2. Statement of originality: The work presented in the dissertation should be the trainee's own and no part of the dissertation should have been submitted earlier or concurrently for any other degree. The statement should be signed by the author, and countersigned by the supervisor.
3. Abstract: Should be structured ( introduction, objectives, method, results, conclusions)  
Should not include figures, tables, graphs or references  
Should be limited to 500 words or less
4. Table of contents: The table of contents immediately follows the abstract and lists in sequence, with page numbers, all relevant divisions of the dissertation, including the preliminary pages.
5. List of tables: This lists the tables in the order in which they occur in the text, with the page numbers.
6. List of figures: This lists all illustrative material (maps, figures, graphs, photographs etc) in the order in which they occur in the text, with the page numbers.
7. Acknowledgments

**Text**

The dissertation should be divided into clearly defined chapters. Chapters may be subdivided and a decimal number system can be helpful to identify sections and subsections. Topics of the sections should not be mixed, e.g. Results should not appear in the Materials and Methods.

**6.1 Section 1 – Introduction**: The current position and the reasons for carrying out the present work ( Rationale /Justification and problem/s identified and quantified.) Hypothesis and expected outcome, impact and relevance of the study should be stated. Generally, only a few references should be cited here.

Section 2 – Literature Review: This section should be reasonably comprehensive, and most of the references to be quoted normally occur here. The relevant references dealing with the general problems should be reviewed first and this should be followed by a detailed review of the specific problem. The review is in many cases approached as a historical record of the development of knowledge of the subject.

Section 3 – Objectives Clearly defined, general, specific and any subsidiary objectives should be stated

Section 4 – Materials and Methods: Appropriate study design to address the objectives with clear detailed description of subjects, sampling technique and sample size, interventions, data collection and management. The study should be, internally valid and reproducible. Where specific details are available in the literature, reference should be made to the original papers, and comments kept to a minimum. If modifications have been made to the published techniques, these should be described in full. Appropriate statistical tests planned should be mentioned and ethical issues addressed

Section 5 – Results: Presentation of data in a logical sequence commencing with the basic / baseline characteristics of the subjects. Summarize the data with a figure, table or graph when appropriate Present appropriate statistical analyses and interpretations. Each figure, table or graph should be complete and clear without reference to the text. Concise explanations in legends and explanation of abbreviations are needed The text should complement the figure, table or graph not simply describe them but should give valid interpretations of the results. Complete (raw) data should not be included but should be contained in tables in an Appendix if needed. Only data from the present study should be included and in particular no comparison should be made at this stage with results from other studies.

Section 6 – Discussion: Interpret and explain the results so as to provide answers to the study question(s). Comment on the relevance of these answers to the present knowledge of the subject. Consider alternate interpretations. Comment on interesting or unexpected observations and about the method. Critically compare the results with results and conclusions of other published studies within and outside the country, and explain possible reasons for any differences observed. Comment on unexpected outcomes. Comment on further follow-up research required on the subject.

Section 7 Limitations Any inherent and / or inadvertent limitations / biases and how they were dealt with should be described

Section 8 Conclusions and recommendations : Based on the results of the study and to address the objectives

## References

These are given so that the reader can refer to the original papers for further study. Uniformity is essential, but errors and inconsistencies are very common and authors are advised to check the references most carefully. Examiners will mark students down for inconsistencies in their references, either omissions or failure to follow the recommended format as given in the following section.

References are very important and must be complete and accurate. All literature referred to should be listed in a consistent form and style, and must contain sufficient information to enable the reader to identify and retrieve them.

There are different styles of citing sources, listing references and compiling a bibliography. The Vancouver style is widely accepted in scientific writings, and is recommended for M.Sc. (Molecular Medicine) dissertation.

List all references that are cited in the text, using the Vancouver System

Type the references double - spaced in the Vancouver style (using superscript numbers and listing full references at the end of the paper in the order in which they appear in the text). Online citations should include date of access. Use Index Medicus for journal names. If necessary, cite personal communications in the text but do not include in the reference list. Unpublished work should not be included. References should be listed in the following style:

The arrangement of the references at the end of the dissertation should be in numerical order as they are cited in the text.

The order of the items in each reference should be:

- (a) for journal references: name(s) of author(s), title of paper, title of journal, year, volume number, page numbers.
- (b) for book references: name(s) of author(s), title of book, edition, volume, town of publication, publisher. year, chapter and/or page number

Authors' names should be in roman letters, and arranged thus:

Smith CO, James DE, Frank JD.

Where an author's name is repeated in the next reference it should also be spelt out in full.

The title of the paper is then included, without quotation marks. The journal title should be unabbreviated, *in italics*, and be followed by year; **volume number in bold** (the issue /number): and the first and last page numbers.

- 1 Mathiesen ER, Ringholm L, Damm P. Still birth in diabetes pregnancy. *Clinical Obstetrics and Gynaecology* 2011; **25**(1): 105 – 111.
- 2 Lestrud S. Bronch .Pulmonary Dysplasia. In: *Nelson Text Book of Pediatrics. 18<sup>th</sup> Ed , Vol 1:* Saunders, Elsevier New Delhi, India. 2008. p 1840-1841
- 3 World Health Organization. *Priority Medicines for Mothers and Children* 2011. Department of essential medicines and pharmaceutical policies. Geneva, World Health Organization 2011 (WHO/EMP/MAR/2011.1).

#### Websites

Author's name (if available) must be listed first, followed by the full title of the document in italics ,the date of publication or last revision (if available), the full http address (URL). and the date accessed in parentheses

#### Examples:

- 1 National Institute for Health and Clinical Excellence. *Induction of Labour NICE Clinical Guideline 70, 2008.* available at <http://www.nice.org.uk/CG070fullguideline> (Accessed 21 October 2011)
- 2 Hofmeyr JG. *Antenatal corticosteroids for women at risk of preterm birth: RHL Commentary* (last revised 2 February 2009) The WHO Reproductive Health Library 2011, Geneva, World Health Organization [www.who.int/rhl](http://www.who.int/rhl) . (Accessed 21 October 2011)
- 3 Crowther CA, Hardin JE. *Repeat doses of prenatal corticosteroids for women at risk of preterm birth for preventing neonatal respiratory disease.* Cochrane Data Base of Systematic Reviews 2007, Issue 3. Art .No: CD003935. DOI: 10.1002/ 14651858. CD003935 pub 2. (Accessed 21 October 2011)



**ANNEX 9**

**DISSERTATION MARKING GRID**

Dissertation 80%

*Viva voce* examination 20%

**Dissertation marks will be distributed as follows**

Abstract	05
Introduction	10
Literature review	10
Methodology	25
Results	15
Discussion and conclusion	25
References	05
Overall presentation	05
<b>Total</b>	<b>100 marks</b>

**Minimum mark for a C+ grade = 55**

***Viva voce* examination marks distribution**

Background and justification	15
Familiarity with the subject under review	25
Methodology	25
Discussion and how the project broadens candidate's perspective	35
<b>Total marks</b>	<b>100</b>

**Minimum mark for a C+ grade = 55**