3 臨床検査技師養成学校部門活動実績

SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

JICA - MRI PROJECT 1993 - 1995

01. Staff : No additional staff joined the school since 1991
Present Staff
M.M. Dassanayake (Principal)
L.A.D. Lenagala
W.M.M. Weeraratne
A.C.B. Jayawardena (MLT)
One labourer
Two casual labourers

02. Itemized Expenditure : A considerable amount of expenses were locally borne for the provision of following:
- two split type air conditioners
- one window type air conditioner
- two sets of amplifiers
- a computer with a page maker
- a TV monitor
- text books

03. School housings : No additional developments were made during the period specified.

04. Student intake : 1993 = 52 Students
1995 = 50 Students

Student out put : 1993 = 26 Students
1994 = 10 Students
1995 = Nil

05. Employees of Graduates : Most of the graduates joined the department of health.
Balance in police, armed forces, local Govt, and Republic of Maldives.
All graduates found employment.

06. Commentaries and Prospective views : a) Actively engaged in the teaching programme of trainee MLTT.
b) Conducted examinations for Kalutara and Peradeniya training Schools.
c) Functioned as the examination centres for the Post Graduate Institute of Medicine and Ministry of Health to conduct Efficiency bar examinations for in service officers.

d) A series of lectures were conducted to in service officers to widen their knowledge.

e) Three refresher courses were conducted to in service MLTT selected from all over the island with a view of educating them on recent advances in medical technology, quality assurance, introduction of WHO techniques, standardization and also to refresh their knowledge.
No. of participants: 130 in service MLTT

f) A hand book of 180 pages was prepared for one of the aorkshops for inservice officers.

g) Three laboratory manuals were produced in Clinical chemistry,
Histopathology and Hematology
Copies of these manuals were issued to all trainees in 3 schools free of charge.

Future recruits to training schools too will be furnished with manuals by this project.

The manual in Blood Bank Serology is awaiting print.
The manual of Microbiology completed half way and expected completion soon.

h) Provided assistance to outstation MLTT who attended the refresher courses by solving their problems connected with technical data, certain standards, controls reagents were supplied on their requests.

i) We are in the process of shifting over to recent methodology in teaching with the aid of JICA provided audio visual equipment.

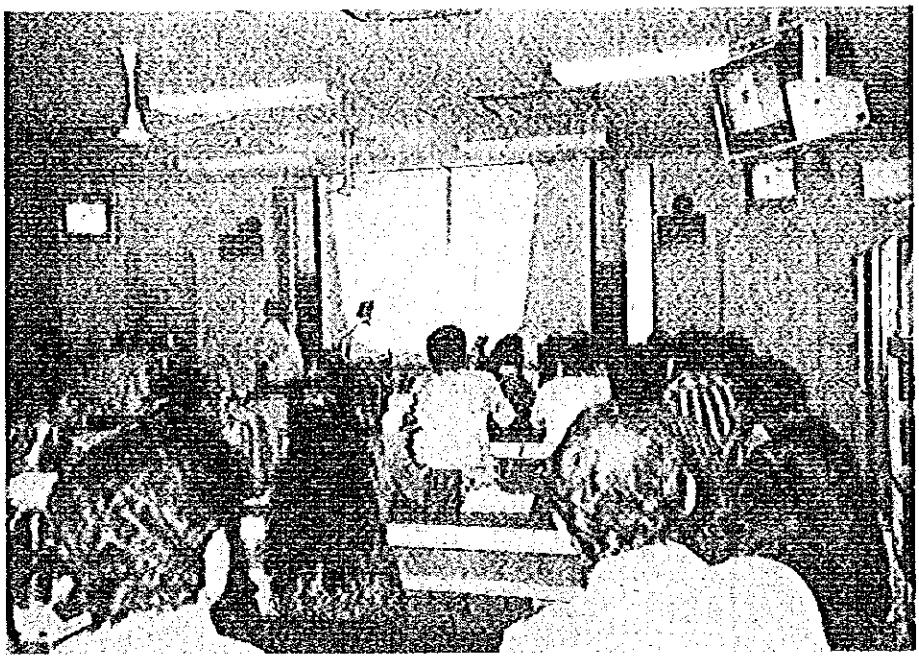
j) Raising the entry qualifications of recruits to training course.

Actively engaged in the preparation of draft memorandum to be forwarded to various committees appointed by the ministry. Participated in discussions with the Minister, his officials and various committees to this effect.

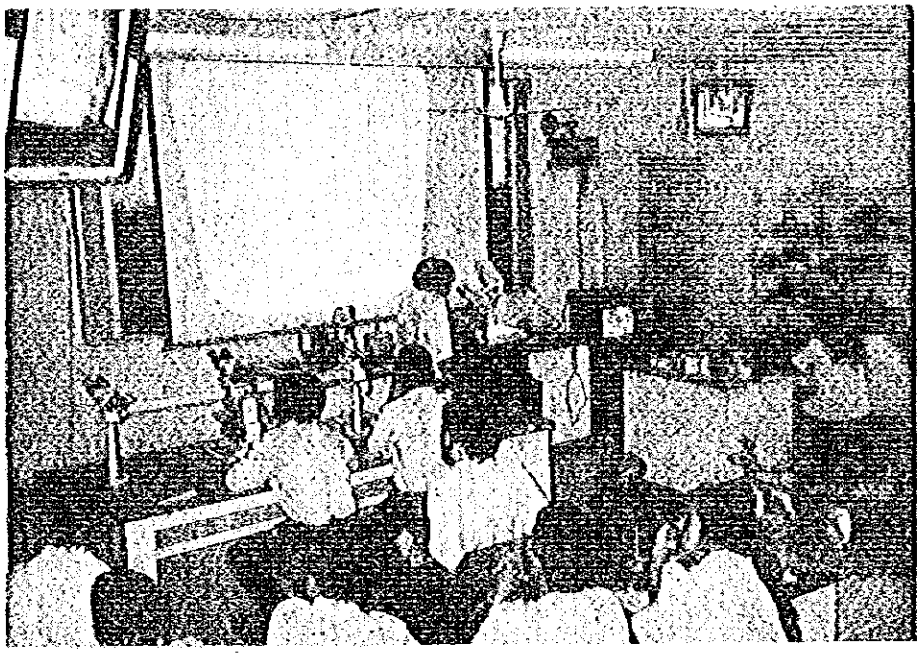
k) Increasing the course duration to 3 years. The same course of action as above (j). It has been agreed to recruit the 1996 batch of trainees for a 3 year programme leading to a diploma on principle.

l) A draft curriculum and proposals were drawn to initiate a BSc degree in medical technology in Sri Lanka. Participated at the initial discussions at the UGC. The matter is being studied by the UGC and OUSL Sri Lanka.

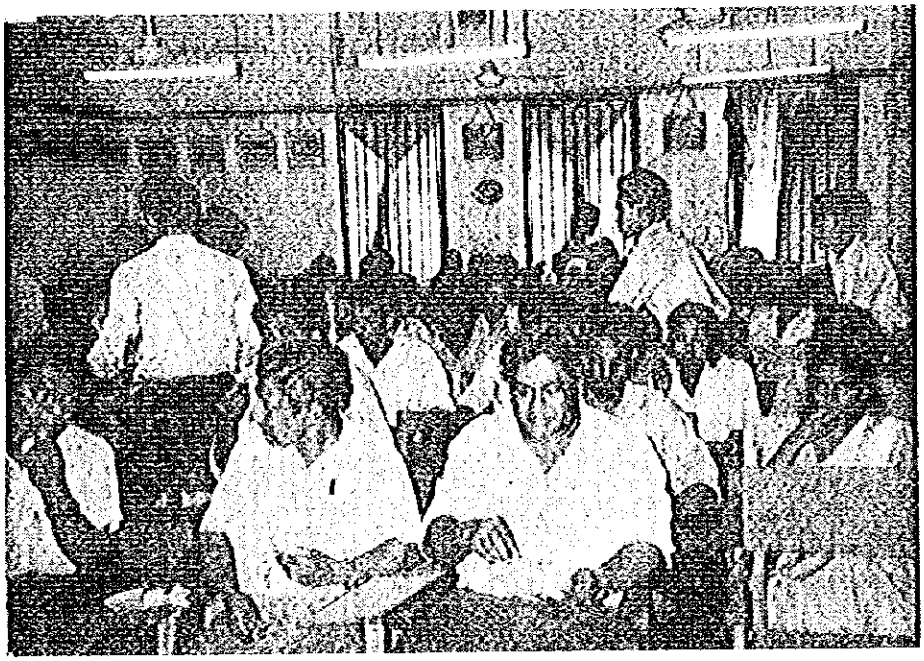
m) Latest editions of the printed text books were provided to students for their reference work.



▲ 写真 1　臨床検査技師養成学校の新実習室における校長の講義（1）
（視聴覚施設利用）

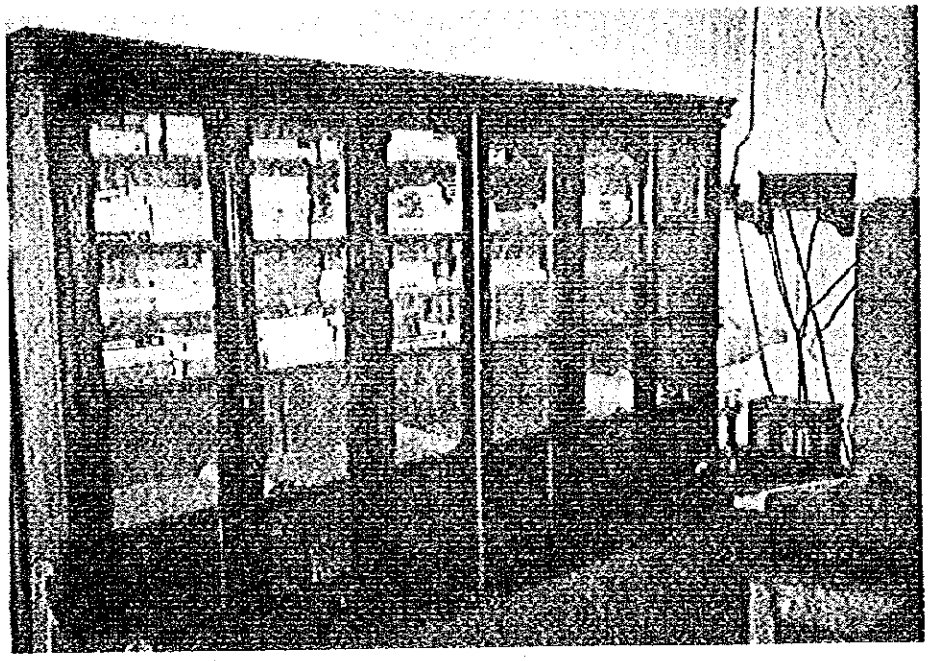


▲ 写真 2　臨床検査技師養成学校の新実習室における校長の講義（2）
（視聴覚施設利用）左下はディスカッション顕微鏡

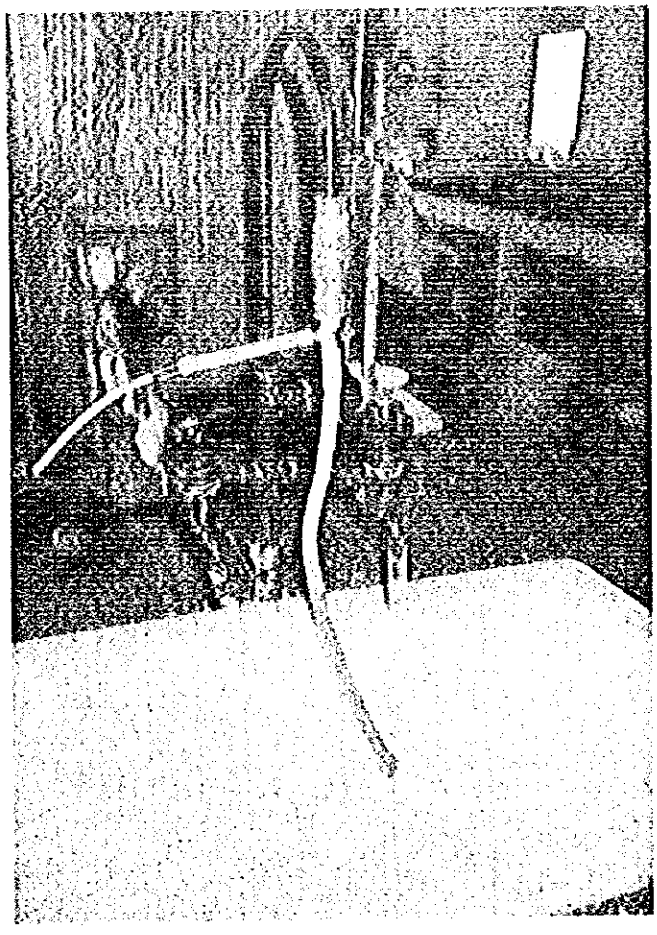


▲ 写真 3　旧研究所を改修して作られた講義室
壁面の写真は各年次卒業生の記念写真

▲ 写真 4　旧研究所を改修して作られた実習室
WHO供与の古い単眼顕微鏡による微生物学観察



▲写真５　古い棚を塗り直し、貸与教科書を並べる



▲写真６　古い水道蛇口を替えて、水流ポンプに利用

JICA

Japan International Co-operation Agency
Medical Research Institute Project

This is to certify that

_____

attended the Refresher Course in

HAEMATOLOGY

Conducted by the

Medical Research Institute

Japan International Co-operation Agency

from 28th to 31st March 1995

at the

SCHOOL OF MEDICAL LABORATORY TECHNOLOGY - COLOMBO

Prinicipal
School of MLT
MRI

Director
MRI

Deputy Director
General of Health Services
(Laboratory Service)
Ministry of Health

Date

資料3-2 国立病院の検査設備・検査技師数調書（渡辺専門家調査）

PROVINCIAL HOSPITALS (1994.8.)

EQUIPMENT AVAILABLE IN THE LABORATORY

Please fill the cages with the number in use.

			CGH T.H.					Highway H. R.H						
6.1	MICROSCOPES :	MONOCULAR	২		৩	৩	৪	৭						
6.	:	BINOCULAR	৫	৪	১	৫	৫	৫						
6.2	CENTRIFUGES :	ELECTRICAL	৫	৬	৩	৫	২	৪						
6.3	BALANCES :	TWO PAN		১	১	২		২						
6	:	DIGITAL	১	১	১	৫	২							
6.4	REFRIGERATORS :	ELECTRICAL	৭	৫	৫	৪	২	৭						
6.5	AUTOCLAVES :	ELECTRI.	২	১	২	৩	২	২						
6.6	WATER STILL :	METAL	২	১	১			১						
6.7	DEEP FREEZERS :							১						
6.8	WATER BATH :		৫	৩	২	৪	২	৫						
6.9	HOT AIR OVEN :		৩	৩	৩	৪	১	৪						
6.10	DRYING CABINET :		১	১				১						
6.11	INCUBATORS :		১	১	৩	২		২						
6.12	COLORIMETERS :			১	১	৩		১						
6.13	SPECTROPHOTOMETERS :		১	২		২	৪	৩						
6.14	pH METERS :					১	১	১						
6.15	FLAME PHOTOMETERS :		১	১		১	১	২						
6.16	TISSUE PROCESSOR :		১	১										
6.17	MICROTOME :		২	১		২		২						
6.18	ELECTROPHORETIC APPERATUS :		১			১		১						
6.19	STOP WATCHES/TIMERS :		৫	১	৩	৫	১							
		MLT	৫ P-1 ০	১১	৭	৭ ১	৬ ১	১৬						

04. AVERAGE AMOUNTS OF INVESTIGATIONS PERFORMED

4.1	HAEMATOLOGY	৫.৫৮	৭.১৪৪	৪৬০	৬৪৫৫	২২৪৫							
4.2	CHEMICAL PATHOLOGY	২৯৯৪	৭.১৫০	১৫.৪৩০	৪৪১১	১.০৭৬							
4.3	PARASITOLOGY		১.৫০০	৪২০	৬.৪৯৬	২৩৬							
4.4	BACTERIOLOGY	৭৬৬	৩৭৪	৬২০	১.১৪৫								
4.5	HISTOPATHOLOGY	২৪৭	১০৪		১৭০								

BASE HOSPITALS

EQUIPMENT AVAILABLE IN THE LABORATORY

Please fill the cages with the number in use.

			1	3	5	6	8	10	11	15	18	21	
6.1	MICROSCOPES :	MONOCULAR	2	1	1		2	1	1	2	3	3	
6.	:	BINOCULAR	1	3	2	2	3	3	2	2	1	2	
6.2	CENTRIFUGES :	ELECTRICAL	1	4	1	1	4	3	1	3	1	4	
6.3	BALANCES :	TWO PAN	1	1	1		1		2	1	2	1	
6	:	DIGITAL	1	1	1	1	2	1		1	2	1	
6.4	REFRIGERATORS :	ELECTRICAL	2	3	1	1		2	1	1	1	2	
6.5	AUTOCLAVES :	ELECTRI		1		1	2	1		1	1		
6.6	WATER STILL :	METAL	1	1	1	1	2	2	1	1	1	2	
6.7	DEEP FREEZERS :												
6.8	WATER BATH :		1	2		1	2	2	1	1	1	2	
6.9	HOT AIR OVEN :		1	3	1	2	3	1	1	1	1	2	
6.10	DRYING CABINET :										1	1	
6.11	INCUBATORS :			1	1	1	2	2	1			1	
6.12	COLORIMETERS :		1	1	1	1	2	2	1	1	1	1	
6.13	SPECTROPHOTOMETERS :		2				1		1		1	1	
6.14	pH METERS :		1		1	1	1				1		
6.15	FLAME PHOTOMETERS :		1	1	1			1		1	1	1	
6.16	TISSUE PROCESSOR :												
6.17	MICROTOME :			1									
6.18	ELECTROPHORETIC APPERATUS :												
6.19	STOP WATCHES/TIMERS :		2	2	1	2	6	4	2	2	3		

			5	7	2	4	5	9	4	4	5	11	
04. AVERAGE AMOUNTS OF INVESTIGATIONS PERFORMED			①	①				①					
4.1	HAEMATOLOGY		3.444	3.156	2.886	1.326	2.161	12.562	581	1.300	4.055	5.030	
4.2	CHEMICAL PATHOLOGY		1.214	2.650	1.415	951	3.826	3.140	1.287	300	1.773	14.312	
4.3	PARASITOLOGY		424	1.210		280	125	164	2		195	2.578	
4.4	BACTERIOLOGY			154			108	275				503	
4.5	HISTOPATHOLOGY			3									

DISTRICT HOSPITALS

EQUIPMENT AVAILABLE IN THE LABOR ORY

Please fill the cages with the number in use.

			1	2	3	4	5	6	7	8	9	10	11
6.1	MICROSCOPES :	MONOCULAR	2		1	2	1	1	1	1	1	1	1
6:	:	BINOCULAR		1					1		2	1	1
6.2	CENTRIFUGES :	ELECTRICAL	1	1	1	2	1	1 [11]	1	1	1		
6.3	BALANCES :	TWO PAN			1						1	1	
6	:	DIGITAL		1		1					1		
6.4	REFRIGERATORS :	ELECTRICAL		1		1			1		1		
6.5	AUTOCLAVES :	ELECTRI											
6.6	WATER STILL :	METAL			1	1			1				1
6.7	DEEP FREEZERS :												
6.8	WATER BATH :								1				
6.9	HOT AIR OVEN :					1	1		1	1	1	1	
6.10	DRYING CABINET :												
6.11	INCUBATORS :												
6.12	COLORIMETERS :								1		1		
6.13	SPECTROPHOTOMETERS :												
6.14	pH METERS :												
6.15	FLAME PHOTOMETERS :												
6.16	TISSUE PROCESSOR :												
6.17	MICROTOME :												
6.18	ELECTROPHORETIC APPERATUS :												
6.19	STOP WATCHES/TIMERS :		2		2			2	1	1		1	
			1	1	1	1	1	1	1	1	2	1	1

04. AVERAGE AMOUNTS OF INVESTIGATIONS PERFORMED

4.1	HAEMATOLOGY	44	67	18	150	177	268	300	120	200	251	26
4.2	CHEMICAL PATHOLOGY	36		108	227	180	497		344	560	200	
4.3	PARASITOLOGY			11	12	9	27	20	10	86	20	
4.4	BACTERIOLOGY											
4.5	HISTOPATHOLOGY											

DISTRICT HOSPITALS

EQUIPMENT AVAILABLE IN THE LABORATORY

Please fill the cages with the number in use.

			12	13	14	15	16						
6.1	MICROSCOPES :	MONOCULAR	1	2	1	1	1						
6.	:	BINOCULAR											
6.2	CENTRIFUGES :	ELECTRICAL	1	1	1	1	1						
6.3	BALANCES :	TWO PAN	1	1	1								
6	:	DIGITAL				1							
6.4	REFRIGERATORS :	ELECTRICAL											
6.5	AUTOCLAVES :	ELECTRI											
6.6	WATER STILL :	METAL		1									
6.7	DEEP FREEZERS :												
6.8	WATER BATH :												
6.9	HOT AIR OVEN :			1	1								
6.10	DRYING CABINET :												
6.11	INCUBATORS :												
6.12	COLORIMETERS :												
6.13	SPECTROPHOTOMETERS :												
6.14	pH METERS :												
6.15	FLAME PHOTOMETERS :												
6.16	TISSUE PROCESSOR :												
6.17	MICROTOME :												
6.18	ELECTROPHORETIC APPERATUS :												
6.19	STOP WATCHES/TIMERS :			1	1	1	1						
			1	3	1	1	1						

04. AVERAGE AMOUNTS OF INVESTIGATIONS PERFORMED

4.1	HAEMATOLOGY	91	1.400	215	182	780							
4.2	CHEMICAL PATHOLOGY	138	780	373	328	900							
4.3	PARASITOLOGY	29	210	120									
4.4	BACTERIOLOGY		105										
4.5	HISTOPATHOLOGY												

School of MLT MRI Colombo　　資料3-3　年次別検査技師学校入学生数・卒業生数

Year	Intake	Deserte d	Graduated
59-60	26	2	24
60-61	29	2	27
61-63	25	1	24
62-64	28	3	25
63-65	33	6	27
64-66	33	2	31
65-67	33	2	31
66-68	31	4	27
67-69	32	6	26
70-72	37	2	35
73-75	33	13	20
72-74	34	12	22
74-76	22	2	20
75-77	24	4	20
77-79	28	2	26
79-81	30	2	28
81-83	33	3	30
81-83	40	1	39
84-86	46	-	46
87-89	51	8	43
87-89	45	8	37
88-90	51	4	47
89-91	44	1	43
91-93	38	1	37
93-95	53	10	Pending Final Exan Aug 95
95-97	45	2	Joined School June 95

Total No of batches trained	28
Total No of batches passed out	26
Total No of Graduates passed out	821

These graduates were trained for Government and semi government institutions in Sri Lanka.

All of them found enployment on graduation.

Principal
School of MLT

資料3-4　検査技師学校入学資格格上げ動議

Your No.

My No.

SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

MEDICAL RESEARCH INSTITUTE
COLOMBO 08. SRI LANKA.
Tel. No. 693532-33-34

Raised Entry Qualifications for Training Course on Medical Laboratory Technology

Over 90% of the students entering the course on the results of the competitive examination carry GCE (Adv Level) or higher qualifications. The balance 5 - 10% is usually comprised of departmental promotees from minor grades selected by limited examination, the nominees from armed forces, University of Sri Lanka & Local Government bodies.

The present GCE (Ord Level) offers only one subject termed 'Science' in place of former basic science subjects viz. Physics, Chemistry, Botany and Zoology. The students carrying GCE (Ord Level) though few in number are a liability in the hands of their teachers.

Tutorial staff conduct special classes to introduce simple laboratory equipment and theories in basic sciences such as Physics, Chemistry, Botany & Zoology. Such students usually fail at the final examination. There are instances where such students were returned to where they came from at the end of the first year examination.

Though the technologists receiving appointments from the health ministry after passing out from the training schools carry GCE (Adv Level) qualifications, they are recognised as GCE (Ord Level) qualified officers on paper. This has led to frustation among the staff as they are often faced with various difficulties when dealing with their subordinate staff.

Most of the parallel courses of the state sector consider the GCE (Adv Level) as the entry qualification. eg: Teachers training, Agriculture Instructors training, Surveyers course, RMP and NDT courses etc.

The training course of Medical Laboratory Technologists though carrying a history of over 30 years still considers GCE (Ord Level) as entry qualification on paper and recruits candidates carrying GCE (Adv Level) or even higher qualifications.

Two committees viz. Prof Ismail and Subewickreme were appointed on succession by the Ministry of health to study and report on the matter. These reports are now available at the Ministry of health.

We appeal the presidential committee,

1. to make suitable recommendations to recognise the GCE (Adv Level) as the minimum entry qualification for the training course in Medical Laboratory Technology.
2. to formulate a scheme of recruitment, for calling applications from students who have scored over 180 marks at the GCE (Adv Level). This will place the Sri Lankan MLTT in para with their contemporaries all over the world. It will also, to some extent alleviate the frustation of students who miss the entry to universities by a few marks.

Increased training periods from two to three years leading to a Diploma in Medical Laboratory Technology

The service of Medical Laboratory Technologists is an internationally recognised profession. The International Association of Medical Laboratory Technologists (IAMLT) was granted with the NGO status by United Nations.

Over the years with the advancement of scientific medicine much specialisation has been injected into this field. The modern scientific medicine is highly dependent on the field of medical laboratory technology. Many new investigations are on the increasing demand by the clinicians. More and more advanced sophisticated instruments are being introduced to the field. The subject area to be covered at the training schools has become wider.

In 1991 a JICA/MRI workshop to update the curriculum was held. This workshop was well attended by various experts of medical profession. They were of the opinion that the course duration should be made 3 years. The syllabus was drafted for a course duration of 3 years. But as the request for increasing the course duration is ignored by the ministry the syllabus is not properly covered at the training schools at present. Provision of proper practical training which is an integral part of their education has become a problem. Trainees are made to rush through their practical training. Despite various expert committee recommendations the health hierarchy ignores this issue.

The School of MLT, MRI, Colombo was inaugurated in 1959, under the sponsorship of WHO. Similar training courses started in the countries of the region much later than ours, have improved to become full time degree courses of 3-4 years duration. The latest BSc course was astarted in Napal last year. Sri Lanka, the pioneer in the Medical Technology education in SE Asian region still awards a 'certificate of proficiency' at the end of a two years teaching programme.

We bring to the notice of the committee that Saturdays are normal working days for our schools. At times, even Sundays are used as lecture days amidst the protests of the students. No vacations are granted during the two years of the course.

The 3 training schools carry a well organised infra structure. Our lecturers are drawn from the teaching staff of universities and PGIM. The advisory board is comprised of authorities such as Professors and Dean of Medical Faculty. The first year and final examination papers are set and corrected by a board of post graduate examiners.

We appeal to the Presidential committee to consider granting us at least a national diploma on successful completion of a three years training course. This again, would place us in para with the contemporaries of the region.

Mode of Recruitment For Schools of Medical Laboratory Technology

We request that the recruitments to Schools of Medical Laboratory Technology be made by calling applications by a seperate gazette notification.

GCE (Adv Level) with an aggregate of over 180 with passes in Chemistry, Physics, Zoology and Botany be made the minimum entry qualification.

The duration of the training course be made 3 years leading to a national diploma.

An annual flow of recruitment be followed as there is a dearth of MLTT in the country.

විශ්වවිද්‍යල ප්‍රතිපාදන කොමිෂන් සභාව
பல்கலைக்கழக மானியங்கள் ஆணைக்குழு
UNIVERSITY GRANTS COMMISSION

දුරකථන / தொலைபேசி / Telephone } 695301, 695302
තැපැල් පෙට්ටිය / அஞ்சல் பெட்டி / Post Office Box } 1406

මගේ අංකය / எனது இலக்கம் / My Number } UGC/AC/05/01/45

20, වෝඩ් පෙදෙස, කොළඹ 7, ශ්‍රී ලංකාව
20, வார்ட் இடம், கொழும்பு 7, இலங்கை
20, Ward Place, Colombo 7, Sri Lanka

ඔබේ අංකය / உமது இலக்கம் / Your Number }

28 April 1995

Mr. W.M.W. Weerasinghe

Dear Sir/~~Madam~~,

HIGHER EDUCATIONAL FACILITIES FOR MEDICAL LABORATORY TECHNOLOGISTS

I am pleased to inform you that the next meeting of the above committee will be held on **Thursday, 11 May 1995, at 10.00 a.m. in the Board Room of the U.G.C.**

Please find enclosed herwith the minutes of the meeting of the Committee appointed to study the feasibility of commencing a B.Sc. degree programme in Medical laboratory Technology held on 30 March 1995.

Yours faithfully,

(Mrs. M S Sivalingam)
Asst.Secretary/Academic
for Secretary

Sgd/- R H M Piyasena
Addl.Secretary/Academic

Encl:

cw:

MINUTES OF THE 1ST MEETING OF THE COMMITTEE APPOINTED TO STUDY THE FEASIBILITY OF COMMENCING A BSC DEGREE PROGRAMME IN MEDICAL LABORATORY TECHNOLOGY HELD ON 30 MARCH 1995

PRESENT	Prof SB Ellepola	-	Chairman
	Dr Lalith Mendis	-	Dep. Dir. Gen./Min. of Health
	Prof MM Ismail	-	Professor/Parasitology/Colombo
	Prof L Mendis	-	Professor/Microbiology/Colombo
	Dr T Vargunam	-	Medical Education Unit, Pdn.
	Dr M Atapattu	-	Director/MRI
	Dr N Vithana	-	Virologist/MRI
	Mrs MS Sivalingam	-	Asst. Secretary/Academic

At the outset, the Chairman welcomed the members. He briefed the members on the activities of the Working Committee.

The Committee considered in detail, the draft proposal on the proposed BSc degree programme.

1. Entry requirements

The Committee while accepting the proposed entry requirement suggested the following amendments:-

(a) The practical experience be a minimum of three years.
(b) Requirement (4) be amended as follows:-

4. Should be successful at a selection test which should include a knowledge of English. This would be developed in due course.

The Committee was of the view that the students for the above course of study should have a good standard of English since the course will be conducted in the English Medium.

2. Duration of the course

The duration of the course should be 3 years.

3. Prof L Mendis suggested that this facility should be extended to University Laboratory Technicians too. Prof Ellepola explained that places in the schools of Medical Laboratory Technology have been given to University Lab. Technicians provided they have the educational requirements laid down by the Ministry of Health. The University Technicians who are successful in the Certificate/Diploma will be eligible for selection to the degree programme. This would apply to University Technicians in the Faculties of Medicine, Dental Sciences and Veterinary Sciences.

Speaking on the numbers admitted to the MLT Schools the Deputy Director General/Health explained that already the Schools were faced with accommodation problems. However, he indicated that work on the proposed degree programme should progress.

4. Appointment of Course Director/ Course Co-ordinators

Prof Ellepola further explained on the teaching methodology of the Open University. He stated that a Programme Director and Course Co-ordinators will have to be appointed for the various disciplines. He explained that the Course Co-ordinators will have to organise the teaching material for which a payment will be made.

Accordingly, the Committee decided as follows:-

i. Prof SB Ellepola to function as the Programme Director/ Co-ordinator.

ii. The following were appointed as Course Director/ Co-ordinators for the discipline mentioned against each name:-

1. Prof. PAJ Perera - Chemical Pathology
2. Dr T Vitharana - Haematology & Blood bank Serology
3. Prof LR Amarasekera - Histopathology & Cytology
4. Nominee/Health Min. - Lab. Management & Med.Auditing
5. Dr S Wickremasinghe - Bacteriology
6. Dr M Atapattu - Mycology
7. Dr N Vithana - Virology
8. Prof L Mendis - Immunology
9. Dr T Naotunne - Med. Entomology & Parasitology
10. Prof Dulitha Fernando - Research Methodology
11. Prof E Karunanayake - Molecular Biology
(or Dr Maya Gunasekera)

Prof Ellepola stated that the functions of the Course Co-ordinators will be decided in due course.

Dr Varagunam suggested that the course content should also contain clinical aspects. He suggested Clinical Management which is part of patient care should be included as a discipline. It was decided to inquire from Prof WAS de Silva, Professor of Medicine of University of Ruhuna whether he would be willing to serve as a Course Co-ordinator in Clinical Management.

Accordingly it was decided that the Additional Secretary pursue action on this matter.

5. Location

The Director/MRI informed the Committee that at present the Institute was faced with a problem of shortage of staff on the MLT programme. She further stated that the MLT School Labs. will have to be utilized for this purpose and that the consumables will have to be provided by the Institute that will be conducting the proposed course. At this stage Prof Ellepola stated that as seed money a sum of Rs 5 million will have to be sought from the Ministry of Health or a donor agencies.

The Committee stressed the importance of having a place located at the Open University specifically for the proposed course to do preparator

6. Syllabus

It was decided to obtain the syllabus for the Degree programme in Medical Lab. Technology of the Mahidol University in Thailand to be used as a guide for drawing up of the syllabus of the proposed course. The Asst. Secretary was requested to obtain the syllabus of the Maidol University.

7. Library facilities

The Committee indicated that books relevant to this field of study should be made available in the OU Library for the use of the students.

The Committee requested the Asst. Secretary to obtain from the OU the following details regarding the methodology and procedure in

(i) Conduct of practical classes
(ii) Evaluation

After further discussion it was decided that Prof Ellepola and Dr Varagunam prepare a project proposal on the BSc degree in MLT to be submitted for consideration by the OU.

It was decided to hold the next meeting on 11th May 1995, with all Course Directors.

(Mrs. MS Sivalingam)
Asst.Secretary/Academic

වෛද්‍ය පරීක්ෂණාගාර තාක්ෂණවේද ශිල්පායතනය

வைத்திய பரிசோதனை ஆய்வுகூட தொழில்நுட்பவியல் கல்லூரி

THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

සෞඛ්‍ය අමාත්‍යාංශය

சுகாதார அமைச்சு

Ministry of Health

ශ්‍රී ලංකා ප්‍රජාතාන්ත්‍රික සමාජවාදී ජනරජය

இலங்கைச் சனநாயக சோசலிசக் குடியரசு

Democratic Socialist Republic of Sri Lanka

ප්‍රවීනතා සහතිකය

தேர்ச்சிச் சான்றிதழ்

CERTIFICATE OF PROFICIENCY

.....

වෛද්‍ය පරීක්ෂණාගාර තාර්මික විද්‍යාඥ දෑවුරුදු පූර්ණකාලීන පුහුණුවීමේ පාඨමාලාව හැදෑරීමෙන් පසු

.....

வைத்திய பரிசோதனைகூட நொழில்நுட்பவியல் இருவருட முழுநேர நெறியின், 19.....ல் நடாத்தப்பட்ட இறுதிப் பரீட்சையில் பின்வரும் பாடங்களில் சித்தி அடைந்தமைக்காக இத் தேர்ச்சிச் சான்றிதழ் வழங்கப்பட்டுள்ளது.

.....

has completed two years fulltime training course in Medical Laboratory Technology and has been awarded this Certificate of Proficiency, having passed the Final Examination held on 19.....

The subjects passed at the Examination were :-

1. ක්ෂුද්‍රජීව විද්‍යාව
   நுண் உயிரியல்
   Microbiology
2. ජීවරසායන විද්‍යාව
   உயிரியல் இரசாயனம்
   Chemical Pathology
3. රක්තවිද්‍යා හා රුධිර ඖෂධවේදය
   குருதியியலும் குருதிவங்கி நிரம்பலியலும்
   Haematology & Blood Bank Serology
4. පරපෝෂිත විද්‍යාව හා කෘමි විද්‍යාව
   தட்டைப்புழுவியலும் பூராந்துவ பூச்சியியலும்
   Parasitology & Medical Entomology
5. පටකවිද්‍යා තාක්ෂණය හා රසායනාගාර කළමනාකරණය
   இழையவியல் தொழில் நுட்பமும் ஆய்வுகூட முகாமைத்துவமும்
   Histopathological Techniques and Laboratory Management

..... සභාපති, විභාග මණ්ඩලය. தலைவர், பரீட்சைக் குழு. Chairman, Examination Board.	..... සභාපති, උපදේශන කමිටුව. தலைவர், பாடசாலை ஆலோசனைக் குழு. Chairman, Advisory Committee of the School.	..... අධ්‍යක්ෂ ජනරාල්, සෞඛ්‍ය සේවා. பணிப்பாளர் நாயகம், சுகாதார சேவைகள். Director-General, Health Services.

දිනය/திகதி/Date :.....

ශ්‍රී ලංකා රජයේ මුද්‍රණ දෙපාර්තමේන්තුව

PROPOSED CURRICULUM FOR A THREE YEAR COURSE IN

MEDICAL LABORATORY TECHNOLOGY

PREPARED AT THE SCHOOL OF MLT
MEDICAL RESEARCH INSTITUTE
COLOMBO 08, SRI LANKA

MEDICAL LABORATORY TECHNOLOGY COURSE

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

Course Duration : 3 years

Course Description : Full time course
6 day weeks
total teaching hours per week 33 hours

Total Teaching Hours :

Year	Teaching Hrs	Assessment Hrs
1	1584	66 (2/52)
2	1584	66 (2/52)
3	1584	66 (2/52)

: Total 4950 hours

Course Programme :

Year 1	Semester I	24 weeks	792 hours
	Semester II	24 weeks	792 hours
Year 2	Semester III	24 weeks	792 hours
	Semester IV	24 weeks	792 hours
Year 3	Semester V	24 weeks	792 hours
	Semester VI	24 weeks	792 hours

MEDICAL LABORATORY TECHNOLOGY COURSE

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

SEMESTER I : BASIC SCIENCES

Duration : 24 weeks 792 hours

Disciplines :
1. Administrative System in Sri Lanka
2. English Language
3. Basic Biology & Biological Chemistry
4. Anatomy & Physiology
5. Laboratory Instruments & Physics
6. Mathematics, Statistics & Introduction to Computers
7. Introduction to Pathology
8. Medical Laboratory Management

Mode of Teaching:
Lectures
Demonstrations
Practicals

Teaching Staff :
Medical Consultants
Medical Officers
Research Officers
Administrative Officers & Tutors

SEMESTER I

DURATION 24 WEEKS

ADMINISTRATIVE SYSTEMS IN SRI LANKA

01. The executive president
02. The legislature
03. The judiciary
04. The parliament
05. Prime minister and the cabinet of ministers
06. Minister
07. Permanent secretary
08. DGHS
09. DDGHS
10. Divisional heads

ENGLISH LANGUAGE

All students entering school have followed English as the second language in their primary and secondary education.

During the semester the students should be given a course in English language.

SEMESTER I

DURATION 24 WEEKS

BASIC BIOLOGY AND BIOLOGICAL CHEMISTRY

01. Basic Zoology practicals using toads, prawns, rats, cockroach
02. Basic Chemistry
03. Carbohydrate and its metabolism
04. Protein and its metabolism
05. Lipids and its metabolism
06. Enzymes
07. Hormones
08. Vitamins
09. An elementary knowledge of energy transformation, nucleic acid metabolism precursors and breakdown product of clinical importance, porphyrins, haemoglobin - related product and derivatives
10. Fluid and electrolyte regulation
11. Acid and base balance
12. Calcium and phosphorus metabolisms
13. Basic understanding of important homeostatic mechanisms

SEMESTER I

DURATION 24 WEEKS

ANATOMY AND PHYSIOLOGY

01. Cell
    Its structure and function
    Difference between mamalian and bacterial cells
02. Skeletal system
    Its formation, structure and function
03. Respiratory system
    Lungs. Exchanges of gases
04. Alimentary system
    Alimentary canal
05. Digestion, absorption and utilization of food
06. Circulatory system
    Heart, blood and blood vessles
    Blood components - plasma and cells, plasma and serum
07. Nervous system
    Brain and its function
08. Excretory system
    Structure of kidney and its function
09. Autonomic Nervous system
10. Skin and Sense organs
11. Liver and Pancreas
    Its structure and functions
12. Endocrine system and organs
13. Reproductive system
    Male and female
14. Lymphatic system
15. Reticuloendothelial system and its function
16. Muscle and its functions

SEMESTER I

DURATION 24 WEEKS

LABORATORY INSTRUMENTS AND PHYSICS

01. Elementary theories of Light, Magnetism and Electricity
02. Elementary theories of Electronics
03. Cells and Batteries
04. Laboratory instruments
    Uses, Principle, Care and Maintenance
    Balance
    Colorimeter
    Spectrophotometer
    Flamephotometer
    pH meter
    Microscope
    Centrifuge
    Refrigerators
    Deep freezers
    Hot air ovens & incubators
    Autoclave
    Cell counters
    Tissue processors
    Microtomes
    Distilling apparatus
    Electrophoresis apparatus
    etc.
05. Use of Eppendorf pipettes

SEMESTER I

DURATION 24 WEEKS

MATHEMATICS / STATISTICS / BASIC COMPUTER

01. Theories of indices
02. SI units
03. Logarithms and proportions
04. Calculation of results
05. Basic concept of probability
06. Histogram and Pie - chart
07. Mean, median and mode
08. Standard deviation
09. Simple distribution curves
10. Use of scientifical and statistical calculators
11. Basic Computer
    1). Introduction to computer
        i). Classification of computers
        ii). Micro - computer system
        iii). Basic elements of a computer
        iv). Computer peripherals
            a). software
            b). hardware
            c). liveware
        v). Computer files
        vi). Types of computer languages
            a). low level languages
            b). high level languages
    2). Computer operating systems
    3). Computerization of laboratory work
        i). Inventory
        ii). Laboratory records
        iii). Statistics
        iv). Laboratory reports
    4). Manipulation of a Data base for research purposes

SEMESTER I

DURATION 24 WEEKS

INTRODUCTION TO PATHOLOGY

01. Guide to Medical Terminology
02. Cellular Pathology
03. Inflamation and Tissue repair
04. Trauma and Poisons
05. Infectious Diseases
06. Immunologic Disorders
07. Neoplasia
08. Nutritional Diseases
09. Congenital Abnormalities
10. Diseases of Newborn
11. Cardiovascular, Respiratory and Circulatory systems
12. Gastrointestinal tract, Liver, Gall bladder, Pancreas, Salivary gland, Urinary system, Spleen and Lymph nodes.
13. Musculoskeletal system, Endocrine system, Breast, Reproductive and Central nervous system.

SEMESTER 1, 2, & 3

LABORATORY MANAGEMENT

THEORY

01. Laboratory services in the health services of Sri Lanka
02. Medical laboratories and laboratory staff
03. Organisation of laboratories
04. The hospital administration
05. Instrumentation
06. Chemicals and glassware
07. Cleaning handling and storing of glassware
08. Administration and financial regulations
09. Duties and responsibilities of laboratory staff
10. Attendance and leave
11. Duty rosters and laboratory records
12. Co-ordination and co-operation with hospital staff
13. Receiving of laboratory specimens and duplication of specimens to reference laboratories
14. Laboratory hazards and safety
15. Issue of laboratory reports and responsibility
16. Duties of the pathologists, MO, Chief MLT, SMLT
17. Administration of minor grades
18. Disposal of laboratory waste
19. Breakdown of supplies, gas, electricity & water
20. Ordering laboratory stores and indents
21. Unserviceable stores
22. Inventory and consumable registers
23. Verification of stores and audit queries
24. Heavy instruments and Bio Medical Engineering Division
25. Monthly and annual reports and statistics

PRACTICALS

01. Familiarisation of printed forms used in health services
02. Handling and storage of laboratory specimens
03. Identification, cleaning and storage of laboratory glassware
04. Handling and care of laboratory instruments and attending minor repairs
05. Decontamination, sterilisation & disinfection of laboratory glassware & equipments.
06. Laboratory reports
07. Maintenence of laboratory registers
08. Preparation of indents and consumable registers
09. Preparation of reagents and storage
10. Glass blowing - simple techniques

MEDICAL LABORATORY TECHNOLOGY COURSE

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

SEMESTER II : MEDICAL LABORATORY SCIENCES

Duration : 24 weeks 792 hours

Disciplines :
01. Haematology
02. Parasitology
03. Microbiology
04. Basic Genetics & Immunology
05. Laboratory Management
06. Basic Histopathology
07. Chemical Pathology

Mode of Teaching :
Lectures
Demonstrations &
Practicals

Teaching Staff :
Medical Consultants
Medical Officers
Research Officers
Tutors

Assessment :
Examination
Theory & Practicals
End of Semester II
Unsuccessful candidates are permitted to complete the relevent subject areas on a second sitting while attending semester III

MEDICAL LABORATORY TECHNOLOGY COURSE

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOOGY

SEMESTER III : MEDICAL LABORATORY SCIENCES

Duration : 24 weeks 792 hours

Disciplines : 01. Haematology & Blood Bank Serology
02. Parasitology & Medical Entomology
03. Microbiology, Virology and Mycology
04. Immunology
05. Laboratory Management
06. Histopathology & Cytology
07. Chemical Pathology

Mode of Teaching : Lectures
Demonstrations &
Practicals

Teaching Staff : Medical Consultants
Medical Officers
Research Officers
Guest Lecturers
Tutors

Assessment : Students are expected to maintain practical record books duly signed by the tutors.
Tutorials should be answered for all subjects.

MEDICAL LABORATORY TECHNOLOGY COURSE

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

SEMESTER IV : MEDICAL LABORATORY SCIENCES FIELD EXPERIENCE

Duration : 24 weeks 792 hours

Disciplines :
01. Chemical Pathology
02. Parasitology & Medical Entomology
03. Microbiology, Virology and Mycology
04. Haematology
05. Blood Bank Serology
06. Histopathology & Cytology
07. Immunology

Mode of Teaching : Students are allowed to perform laboratory investigations at the work benches of leading laboratories under the supervision of the specialist officers and the senior medical laboratory technologists. Each student is issued with a list containing the minimum number of various tests he or she is expected to carry out during this period.

Places of training : Medical Research Institute
Bacteriology
Anaerobic Bacteriology
Enteric Bacteriology
Food & Water Bacteriology
Media Preparation
Mycology
Virology
Leptospira
Serology
Haematology
Immunology
Biochemistry
Parasitology
Medical Entomology
Animal Technology
Vaccine Production

General Hospital Colombo
- Bacteriology
- Histopathology
- Biochemistry
- Haematology

Pathology Department of the Lady Ridgeways
Childrens Hospital
- Haematology
- Microbiology
- Biochemistry
- Pathology

Central Blood Transfusion Service
- Blood Bank Serology

Anti VD Campaign Colombo
- Direct Smears
- Serological Tests
- Diagnosis of AIDS Infection

Castle Street Maternity Hospital
- Histopathology & Cytology

Cancer Institute Maharagama
- Histopathology & Cytology

Teaching Staff : Specialist Officers
Research officers
Medical Officers
Chief Medical Laboratory Technologists
Senior Medical Laboratory Technologists

Assessment : Field record books maintained by students are checked and certified by the respective specialist officers at various laboratories. These books should be examined weekly on Saturdays by the tutors themselves.
On recomendations of a supervising officer a student may be ordered to repeat a certain practical session.

Examination : An assessment examination will be held at the end of Semester IV.
This will include theory, practicals and spot testing. This examination carries almost the same standard as the final examination.

2. Criteria for passing a subject

Theory	minimum	40 %
Practicals	"	50 %
Aggregate	over	100 marks

3. To offer a distinction should score over 75% in both theory &practicals for the relevent subject.

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

SEMESTER V : **MEDICAL LABORATORY SCIENCES SPECIAL LECTURES**

Duration : 24 weeks 792 hours

Disciplines :
1. Chemical pathology
2. Parasitology & Medical Entomology
3. Microbiology, Virology & Mycology
4. Haematology & Blood Bank Serology
5. Histopathology & Cytology
6. Immunology

Mode of Teaching : Consultants

Assessment : Final examination at the end of Semester V
Theory papers of 3 hour duration
Practical Tests
Spot Testing
Viva

Subjects of the final examination
1. Chemical pathology
2. Parasitology & Medical Entomology
3. Microbiology
4. Haematology & Blood Bank Serology
5. Histopathology & Cytology
6. Laboratory Management
7. Immunology

Final Examination (Conditions) :
1. Eligibility to sit for the final examination
   80 % attendance
   Completion of Assessment tests
   Practical record books duly certified
   Field record books certified by the specialists
2. Criteria for passing a subject:
   Theory minimum 40 %
   Practicals " 50 %
   Aggregate over 100 marks
3. To offer a distinction, should score over 75 % in both theory and practicals for the relevent subject.
4. Seniority will be decided on the merit of the final examination.

AT THE SCHOOL OF MEDICAL LABORATORY TECHNOLOGY

SEMESTER VI	: MEDICAL LABORATORY SCIENCES (INTERNSHIP)
Duration	: 24 weeks
Disciplines	: 01. Chemical pathology 02. Haematology & Blood Bank Serology 03. Microbiology, Virology & Mycology 04. Histopathology & Cytology 05. Parasitology & Medical Entomology 06. Immunology
Mode of Teaching	: This internship appointments are made by the Ministry and the students perform the duties under the supervision of Pathologists, Biochemists, Parasitologists, Microbiologists and other consultants. They may undergo rotation of stations in order to gather more experience.
Assessment	: The students are not considered eligible to obtain the certificate unless certified by the specialist officer that he served a satisfactory internship.

APPOINTMENTS OF MEDICAL LABORATORY TECHNOLOGISTS

On successful completion of the 3 years course the appointments of MLTT are made by the Ministry of Health.

It is recommended that these appointments should be made to the General Hospitals, Base Hospitals, Specialised Campaigns and institutes where there are more than two MLTT are employed.

This enables the junior officers to gather experience working in rotation in all fields of Medical Laboratory Technology.

This will also stregthen their knowledge and understanding of the Hospital administration.

SEMESTER 2, 3, 4, 5

MEDICAL LABORATORY TECHNOLOGY COURSE

BACTERIOLOGY, VIROLOGY & MYCOLOGY

THEORY

I. BASIC BACTERIOLOGY I

1. Overview of the course.
2. Laboratory safety.
3. Higher and Lower Protista.
4. Bacteria - cell biology.
5. Bacterial staining and microscopy.
6. Classification of bacteria.
7. Growth and nutrition of bacteria.
8. Enumeration of bacteria.
9. Culture media I.
10. Sterilization and disinfection.
11. Biochemical tests I.
12. Methods of bacterial identification.
13. Antibiotic and sensitivity testing.
14. Culture methods.
15. Microorganisms and Disease I.
16. Anaerobic techniques.
17. Collection and despatch of specimens.
18. Normal bacterial flora.

II. SYSTEMATIC BACTERIOLOGY I

1. Gram positive non-sporing bacteria.
2. Gram positive spore bearing bacteria.
3. Gram negative fermentative bacteria.
4. Gram negative non-fermentative bacteria.

III. DIAGNOSTIC BACTERIOLOGY

Laboratory diagnosis of :

1. Upper respiratory tract infections.
2. Lower respiratory tract infections.
3. Tuberculosis.
4. Gastrointestinal tract infections I.
5. Sexually transmitted diseases I.
6. Infections of the circulatory system I.
7. Infections of the central nervous system.
8. Urinary tract infections.
9. Skin and wound infections.

IV. IMMUNOLOGY I

1. Antigen antibody reactions.
2. Widal agglutination test.
3. VDRL test.
4. Serodiagnosis of Syphilis.
5. TPHA.
6. ASOT.

V. VIROLOGY I

1. Some common viral infections.
2. AIDS I.
3. Hepatitis I.

VI. VIROLOGY II

1. Collection and transportation of specimens for viral diagnosis.
2. Haemagglutination inhibition tests.
3. Fluorescent antibody technique.

VII. MYCOLOGY I

1. Classification of fungi.
2. Candida albicans.

VIII. MYCOLOGY II

1. Laboratory diagnosis of mycoses I.
2. Cryptococcus neoformans.

SEMESTER 2, 3, 4, 5

MEDICAL LABORATORY TECHNOLOGY COURSE

BACTERIOLOGY, VIROLOGY & MYCOLOGY

PRACTICAL

I. BASIC BACTERIOLOGY I
   1. Staining techniques I.
   2. Pure culture methods.
   3. Basic tests employed in identification of bacteria.
   4. Preparation of simple bacteriological media.
   5. Preparation of stains and reagents.
   6. Methods of enumerating bacteria.
   7. Antibiotic sensitivity testing.
   8. Sterilization equipment - observation/demonstration.
   9. Culture media - observation/demonstration.

II. BASIC/SYSTEMATIC/DIAGNOSTIC BACTERIOLOGY II
   1. Preparation of culture media II.
   2. Processing of clinical specimens - urine,blood,sputum,faeces,throat swab,pus,body fluids and CSF.
   3. Identification and reporting of isolates.

III. SYSTEMATIC BACTERIOLOGY I
   1. Organism study based on the following :-
      - cultural characteristics
      - staining morphology
      - biochemical characters
      - antigenic characters
   2. Processing of selected clinical specimens.

IV. IMMUNOLOGY I
   1. Widal agglutination test.
   2. VDRL test.
   3. TPHA.
   4. ASOT.

V. VIROLOGY I
   1. Demonstration/observation of simple virological tests.
   2. HIA test.
   3. Fluorescent antibody technique.

VI MYCOLOGY
   1. Organisms study-Candida albicans.
   2. Mycological techniques-Cultivation methods
      Staining methods.

SEMESTER 2 & 3

DURATION 24 WEEKS

GENETICS

01. The nature and the function of the genes
02. The meaning of chromosomes and genes
03. The normal constitution, Sex chromosomes, Autosomes
04. The theory of inheritance
05. Basic molecular biology (DNA, RNA and structure of chromosomes)
06. Basic moecular genetics
07. Cell division - mitosis and meiosis
08. The human karyotype and aberrations theories
09. Basic techniques used to study karyotypes
10. The basic concept of the abnormalities of autosomes and X - chromosomes
11. Gene interaction

MEDICAL LABORATORY TECHNOLOGY COURSE

BASIC COURSE Semester 2,3,4 &5

IMMUNOLOGY

THEORY

Organs and cells of the immune system
Plasma cell as a source of immunoglobulins
Specific & non specific immunity
The immune response - Antigens, Immunogens and Haptens
Structure and function of immunoglobulins
Antigen - Antibody reactions
Humoral immunity
Cell mediated immunity
Immunity to infection
The biology of the complement system
Hypersensitivity
Immunodeficiency and autoimmunity - Clinical significance and role in disease
The meaning of cloning

PRACTICALS

Widal agglutination test
VDRL reaction
Serodiagnosis of syphilis TPHA
Serodiagnosis of streptococcal infection
HCG estimations
Standard agglutination test
ASOT
Rheumatoid factor
Immunoperoxodase test for scrub typhus
ANF
Fluorescent antibody test for filaria
HBS Ag
Rubella
Diagnosis of HIV infection
Preparation of Ag and Anti sera eg: Cholera, SAT etc.

SEMESTER 2, 3, 4, 5

CHEMICAL PATHOLOGY I

THEORY

I. The collection of specimens for common biochemical tests.
II. Changes in urine and blood on standing.
III. The Kidney and Kidney Function I
    1. Common renal function tests
        a). The physical examination of urine; S.G. of urine
        b). Tests for proteins in urine (albumin & Bence Jones Proteins)
        c). Urine pigments
        d). Blood and Urine Urea estimations.
        e). Blood and Urine Creatinine estimations.
        f). Urea clearance.
        g). Creatinine clearance.
IV. Carbohydrates I
    1. Diabetes mellitus; hypoglycaemia & hyperglycaemia.
    2. Glycosuria and reducing substances in urine.
    3. Qualitative tests for urinary sugars/ reducing substances/ ketone bodies.
    4. Blood sugar estimations.
    5. GTT.
V. Plasma proteins I
    1. Serum total proteins estimation.
    2. Serum albumin estimations.
    3. Serum protein electrophoresis.
VI. Lipids I
    1. Cholesterol and serum cholesterol estimations.
    2. Lipid profile.
VII. Liver and Liver Function I
    1. Bile pigment metabolism.
    2. Qualitative tests for bile pigment metabolism products.
    3. Serum bilirubin estimations.
VIII. Gastro - intestinal and Pancreatic Functions I
    1. Serum amylase estimations.
IX. Serum Electrophoresis
X. Calcium and Phosphorous I
    1. Calcium estimations.
    2. Inorganic phosphate estimations.
XI. Seminal Fluid Analysis.
XII. Pregnancy Diagnosis. (Detection of HCG)
XIII Enzyme and diagnostic Enzymology:
    1. Principles and methods of enzyme assays-2point techni
    2. Interferences in enzyme estimations. ne
XIV. Cerebrospinal fluid - Biochemistry
XV. Quality control in a Chemical Pathology Laboratory.

Semester 2,3,4 &5

CHEMICAL PATHOLOGY I

PRACTICAL

Urine qualitative test of the following :

- reaction
- specific gravity
- proteins
- Bence Jones Protein
- sugar
- bile salt
- bilirubin
- urobilin & urobilinogen
- ketone bodies
- reducing substances
- microscopic examination
- calcium
- chloride
- occult blood
- phenylketonuria
- prophobilinogen
- salicylates

Test for occult blood in stools

Blood/serum/plasma test of the following :

- glucose
- urea
- uric acid
- triglyceride
- cholesterol
- proteins, total
- albumin
- albumin/globulin ratio
- alkaline phospharous
- acid phosphatase
- amylase
- inorganic phosphatase
- alanineminotransferase (ALT)
- aspartate aminotransferase (AST)
- bilirubin
- calcium
- chloride
- creatinine

Cerebrospinal fluid test for the following:

glucose
proteins
globulin
chloride
cell count

Examination of seminal fluid

colour, volume, liquifaction time
motility
cell count
morphology

Detection of HCG in urine

MEDICAL LABORATORY TECHNOLOGY COURSE

SUBJECT - HAEMATOLOGY

SEMESTER - 2 3 4 & 5

DURATION : 24 x 4 weeks

SUBJECT CONTENT : THEORY

1. GENERAL ASPECT :

1.1 Anticoagulants for haematological specimen and preparation of specimen bottle.

1.2 Standard staining procedure and preparation of reagents.

1.3 The theory of formation of blood cells.

1.4 Common normal values , the concept of normality and the 'normal range'.

1.5 Meaning and common causes of leucopenia, leucocytosis basophilia, monocytosis and lymphocytosis .

1.6 The examination of the phetipheral blood film.

1.7 The importance of blood film examination in diagnosis.

1.8 Common abnormalities in red cells and white cells.

1.9 The E.S.R. The factors affecting E.S.R. - Acute phase proteins eg. C. reactive protein.

1.10 The role of rouleaux formation and its relationship to plasma protein.

1.11 The effect of abnormal red cell morphology on E.S.R.

1.12 Basic concept of blood counts and staining techniques.

The concept of dyserythropoeisis. General principle of iron, folate and Vit B 12 metabolism. Serum component as source of antibody and complement . Plasma component as a source of platelet and coagulation factors. Basic concept of quality control in haematological tests with special reference to blood counts , haematological [illegible] and staining techniques.

2. ANAEMIA

2.1 Classification of anaemia by morphology and by cause.

2.2 Iron deficiency anaemia their causes and changes in the PBF.

2.3 The application of red cell indices.

2.4 Folate and B 12 deficiency anaemia their causes and changes in the peripheral blood film.

2.5 Hypochromic anaemias.

3. LEUKAEMIA

3.1 The meaning of acute and chronic leukaemias.

3.2 The important aspects of common types of chronic and acute leukaemia.

3.3 The differetiation of leukaemoid reaction from leukaemias. Important aspects of the common types of chronic myeloid leukaemia and chronic lymphocytic leukaemia and of acute leukaemias , including the general age of the incidences in each type.

The use of cytochemistry in the classification of acute leukaemias.

4. HAEMOLYTIC ANAEMIA

4.1 The meaning of haemolysis and its causes.

4.2 The synthesis and structure of haemoglobin molecule.

4.3 Its function as oxygen carrier.

4.4 The meaning of the term : 'Haemoglobinopathy' and 'Thalassaemia".

4.5 Laboratory diagnosis of hereditary spherocytosis , autoimmune haemolytic anaemia , G6PD deficiency .

5. HAEMOGLOBINOPATHIES

5.1 The basic genetic concepts related to Hb S, Hb E , alpha-thalassaemia and beta-thalassaemia . Basic ideas of the clinical manifestations of these disorders. Basic laboratory

techniques for the detection of these disorders including sickling test and the measurement of Hb A2 for the detection of beta-thalassaemia trait, supravital staining for 'H' inclusion. Alkaline Denaturation method for Hb F.

6. COAGULATION

Basic theory of the mechanism of Haemostasis.

7. PLATELET FUNCTION

The basic concept of platelet function in haemostasis and simple tests for it. The meaning of prolonged bleeding time and an abnormal Hess's test . The use of platelet count and clot retraction test.

8. THROMBOCYTOPENIA AND THROMBOCYTOSIS.

Their causes.

9. POLYCYTHAEMIA

Polycythaemia. The anaemia of chronic disorders - Basic concept.

SUBJECT MATTER TO BE COVERED FOR BLOOD TRANSFUSION SERVICES.

THEORY

1. Collection , processing and storage of blood specimens.
2. Maintenance of glassware, equipment, records and labelling .
3. Basic Immunology pertaining to immunohaemtology.
4. Basic genetics pertaining to inheritance of blood group antigen.
5. The ABO blood group system.
6. The Rhesus blood group system.
7. Introduction to other blood group system.
8. Haemolytic Disease of the Newborn 1.
9. The blood components and their uses.

Blood transfusion services contd.

10. The Anti-human Globulin Test.
11. Laboratory safety measures in the blood bank.
12. Compatibility Test.

HAEMATOLOGY - PRACTICALS BASIC TECHNIQUES

White cell count red cell count, platelet count, eosinophil count, and differential count in normal and common abnormal conditions . Haemoglobinometry, haematocrit, erythrocyte sedimentation rate and red cell indices. Preparation and staining of peripheral blood films. Preparation of dilut g fluids for full blood count. Preparation of Leishman's stain. Calibration of Hb standard graph. Errors inherent in sampling and techniques. PBF examination for acute and chronic leukaemia, Bleeding Time. Clotting Time and Prothrombin Time. PBF examination for Iron deficiency anaemia.

Preparation and staining of bone marrow smears. Preparation of May-Grundwald/Giemsa stains.

Special Techniques

Laboratory Methods for haemoglobinopathies . Hb electrophoresis. principles and techniques. Hb A2 estimation , significance of abnormal levels. Hb F estimation by alkaline denaturation method . Estimation of other Hb components e.g. Hb E, Hb Barts, Hb H etc. Staining for 'H' inclusions. Sickling Test.

CYTOCHEMISTRY

The principles and uses of cytochemical studies. The importance of controls , Iron stain for bone marrow and urine sediments . Leucocyte Alkaline Phosphatase (LAP) scoring and controls . Periodic acid Schiff's. Peroxidase reaction , Sudan Black B for the diagnosis of different types of acute leukaemias.

OSMOTIC FRAGILITY TEST

Its methodology and the meaning of the 'Shift to the left' and their significance.

ANTI-NUCLEAR FACTOR AND L.E FACTOR

Methods of demonstration of anti-muclear factor and L.E cell. Tart cells and their differences from L.E. cells.

THE INVESTIGATION OF HAEMOLYTIC ANAEMIAS

G 6 PD screening test by dye decolorization and ultra-violet fluorescence methods. Principles, advantages and disadvantages of each method.

INVESTIGATION OF BLEEDING DISORDERS:

The thrombin time, prothrombin time, APTT or Partial thromboplastin time with kaolin , whole blood coagulation time, bleeding time (both Ivy and Duke's method) clot retraction test.

BLOOD TRANSFUSION SERVICES

PRACTICALS

1. Preparation of cell suspensions .
2. Full ABO grouping 'Forward and reverse grouping).
3. Testing of ABO typing seras for avidity , potency and specificity).
   ABO discrepancy cases.
4. Use of lectins and controls.
5. Rhesus (D) typing.
6. Du and CDE testing
7. Compatibility testing in routine and emergency situations.
8. Preparation and uses of Coomb's control cell.
9. Screening for 'Emergency O' blood.

SEMESTER 2 - 5

DURATION 24 X 4 WEEKS

HISTOPATHOLOGY I

THEORY

1. Basic Histology, Pathology of specific disease, diseases of the organ system.
2. Structure of cells and tissues.
3. Fresh tissue and fixed tissue examination.
4. Preservation of biopsy materials.
   a). Aims of fixatives
   b). Fixatives
   c). Action and preparation of fixatives
5. Decalcification.
6. Routine tissue processing.
   a). Tissue processor
   b). Dehydration
   c). Clearing
   d). Wax impregnation
7. Blocking out of tissues, Block holders.
8. Microtomes and Microtome knives.
   a). Sharpening of knives
   b). Section cutting
   c). Faults in section cutting.
9. Theory of staining.
   a). Different types of dyes and mordants
   b). Preparation and storage of stains.
10. Routine stains - H & E stain.
11. Special stains.
    a). Reticulin
    b). Van - Gieson
    c). Elastic
    d). PAS
    e). Fat
    f). Iron
    g). Amyloid
    h). melanin
    i). Gram stain
    j). Z. N. stain
12. Faults in staining techniques.
13. Mounting of stained slides.
14. Museum specimen technique.
15. Storage of slides,tissue blocks and tissues.

HISTOPATHOLOGY I

PRACTICALS

1. Preparation of simple fixatives.
2. Tissue processing and embedding with wax.
3. Knife sharpening.
4. Section cutting.
5. Staining with H & E stain.
6. Preparation of stains.
7. Staining for Reticulin, Glycogen, Fat, Iron, Elastic, Gram's stain, Z. N. stain, Calcium, Amyloid.

SEMESTER 3, 4 & 5

DURATION 24 X 3 WEEKS

CYTOLOGY I

THEORY

1. Introduction to cytology.
2. Cell and cell constituents.
3. Tissues and component cells.
4. Collection of specimens / materials.
5. Preparation of smears.
6. Fixation and fixatives.
7. Staining, PAP stain.
8. Identification of cells, and cell reactions to the stain.
9. Benign and malignant appearances of cells.
10. Diagnosis of cyrological preparation and mode of reporting in cytology.
11. PAP stain and the theory of the stain.
12. Preparation of specimens and smears to be transported to referance labs.

PRACTICALS

1. Labelling of specimens.
2. Preparation of smears.
   a). Centrifugation
   b). Cytospin technique
3. Fixation.
4. Staining of cells with PAP stain.
5. Identification of normal and abnormal cells.
6. Detailed study of nucleus of the cells and staining reaction.

SEMESTER 2, 3, 4 & 5

MEDICAL PARASITOLOGY & ENTOMOLOGY I

THEORY

01. Introduction to Medical Parasitology and classification of parasites.
02. Collection, preservation and transportation of stool, blood and other specimens for parasitology.
03. The life cycle, distribution, morphology, mode of infection and laboratory diagnosis of the following parasites.
    - 3.1. Principles of Prevention & Control
    - 3.2. Protozoa
        - a). Entamoeba histolytica
        - b). Balantidium coli
        - c). Giardia lamblia
        - d). Trichomonas vaginalis
        - e). Entamoeba coli
        - f). Plasmodium falciparum
        - g). Plasmodium malariae
        - h). Plasmodium vivax
        - i). Toxoplasma gondii
    - 3.3. Nematodes
        - a). Ascaris lumbricoides
        - b). Necator americanus/ Ancyclostoma duodenale
        - c). Trichuris trichiura
        - d). Strongyloides stercoralis
        - e). Enterobius vermicularis
        - f). Brugia malayi
        - g). Wuchereria bancrofti
    - 3.4. Trematodes
        - a). Fasciola hepatica
        - b). Fasciolopsis buski
        - c). Schistosoma japonicum
        - d). Schistosoma haematobium
        - e). Schistosoma mansoni
        - f). Clonorchia sinensis
    - 3.5. Cestodes
        - a). Taenia solium
        - b). Taenia saginata
        - c). Diphyllobothrium latum
        - d). Hymenolepis species

04. The principles of prevention and control of above mentioned parasites
05. Artefacts in blood film/ faecal smears
06. General knowledge on the following
    a). Entamoeba gingivalis
    b). Dientamocba fragilis
    c). Endolimax nana
    d). Iodamoeba biistchlii
    e). Chilomastix mesnili
    f). Trichomonas hominis
    g). Trichomonas tenax
07. Classification of insects and life cycle of mosquito
08. Elementary knowledge in the identification of Anopheline and Culicines mosquitoes in all stages of development. (with emphasis on Aedes aegypti and Aedes albopictus)
09. Basic knowledge on the morphology and disease born by the following
    a). Fleas
    b). Lice
    c). Bed bugs & other bugs
    d). Flies
    e). Cockroaches
10. Classification of Acari
11. General information on the biology, morphology and identification of ticks & mites
12. Filariasis vectors, their distribution, habbits & life cycles

PARASITOLOGY & ENTOMOLOGY I

PRACTICALS

1. Protozoa/ Nematodes/ Trematodes/ Cestodes :
   - 1.1. Preparation of direct smear from stools, Simple staining with saline, iodine and eosin
   - 1.2. Concentration techniques on stools specimens
     - 1.2.1. Zinc sulphate technique
     - 1.2.2. Formaline - ether technique
     - 1.2.3. Brine floating technique
     - 1.2.4. Ova counting technique : Kato - Katz technique
     - 1.2.5. Kato's thick smear
   - 1.3. Demonstration of ova and adult worms
   - 1.4. Identification of microfilaria in blood/urine
     - 1.4.1. Preparation of wet smear
     - 1.4.2. Counting technique on calibrated thick blood smear
     - 1.4.3. Staining of thick blood smear by Giemsa and Delefield's
     - 1.4.4. Membrane - filtration techniques
   - 1.5. Preparation of Giemsa, Delafield's & Leishman stains
   - 1.6. Identification of malaria parasites :
     - 1.6.1. Preparation of thick and thin blood smears
     - 1.6.2. Staining of thick and thin blood films by Giemsa and Delafield's stains
     - 1.6.3. Counting of malarial parasites using Plus system and parasite/ ul methods

2. Demonstration of rhabditiform and filariform larvae of Hookworm and Strongyloides spp.

3. Demonstration of all stages of development of the Anopheline and Culicines mosquitoes, including identification of Aedes aegypti and Aedes albopictus.
4. Demonstration of fleas, lice, bed bugs flies and cockroaches

PROPOSED MODULES FOR THE DEGREE COURSE IN MEDICAL LABORATORY TECHNOLOGY AT THE OPEN UNIVERSITY OF SRI LANKA

PREPARED AT THE SCHOOL OF MLT
MEDICAL RESEARCH INSTITUTE
COLOMBO 8, SRI LANKA.

DEGREE COURSE FOR IN SERVICE MEDICAL LABORATORY TECHNOLOGISTS AT THE OUSL

Entry Requirements

01- Certificate of proficiency in Medical Laboratory Technology issued by the Ministry of Health Govt of Sri Lanka

02. Minimum of 3 passes in Science subjects at the GCE AL examination

Viz. Zoology, Botany, Chemistry, Physics applied maths, Mathematics

03. OUSL may insist in a minimum aggregate

04. Certificate of post basic experience

the applicants should carry experience of working in a laboratory recognised by the ousl for a period of 3 years.

The ousl will specify such laboratories. These are laboratories supervised by qualified specialist officers.

The certificate of post basic experience will be issed by such specialist officers.

05. Applicant may have to satisfy OUSL authorities of his eligibility and competence in English language

06. An applicant may have to face an interview with the OUSL authorities.

Number of Candidates per batch

25 (tentative)

Course Details

01. This is a part time course of 2 years duration designed for MLTT in service

02. Of these 4 years 2 years will be considered as equivalent to the training they received at the Schools at MRI, Kalutara & Peradeniya

03. Students enter the OUSL to follow the 3 rd and 4 th years of the course.

04. During the 3 rd year the students follow a polyvalent course in Medical laboratory technology (see annexture please)

End of the 3 rd year an examination will be held On the merits of this examination the candidates could select a specialised subject to be studied for the next (4 th) year.

05. During the 4 th year the students : ...

Follow lectures and practicals

Follow special assignments at the bench under supervision of examiners

attend discussions, seminars

engage in research projects

(Details annexed)

End of the 4 th year an examination will be held in theory and practicals

The research project will be considered as a part of the practicals.

Selection of the project	Proposed by the candidate subject to the approval of the OUSL
	Supervisor will be a specialist officer named by the OUSL
Final Examination	End of 4 th year examination

Venue for the coures

School of MLT/ MRI Colombo
OUSL Lecture halls and laboratories
School of MLT Peradeniya (seminars & Discussions

The school of MLT Colombo is to be recognised as a teaching laboratory by the OUSL

Course Director

Director MRI

He will also be the co ordinator for the teaching staff and the OUSL

Laboratory Facilities

Lecture Halls

Lecture halls & Ultra Modern Laboratory of the School of MLT Colombo

Laboratories of MRI, General Hospital Colombo & University of Peradeniya are available for practicals and project work.

School of MLT Peradeniya is available for seminars, discussions and even practicals when the lecturers are from University of Peradeniya.

Equipment — Most of the Instrument & equipment requirement will be met by the facilities available at the School of MLT Colombo

Glassware — -do-

Labrary Facilities

MRI
School of MLT Colombo
School of MLT Kandy
University Library Peradeniya

Funds — The selected candidates are required to pay the OUSL a fee of Rs 10,000 per year at the begining of each acedemic year.

Payments to the lecturers

to be made by the OUSL

Degree Course in Medical Laboratory Technology

At the OUSL

Year 3 (polyvalent)

Duration	: 48 weeks
Disciplines	: Chemical pathology Medical Microbiology, Virology & Mycology Haematology Blood Bank Serology Histopathology & Cytology Parasitology & Medical Entomology Immunology
Mode of Teaching	: Theory Lectures Practicals Demonstration Self Study Modules Tutorials Discussions Seminars
Place of study	: Premises of the School of MLT Colombo Premises of the OUSL Premises of the School of MLT Peradeniya
Places specified for Students	: Students following this course are requested to be attached to Laboratories specified by the OUSL.
Teaching Staff	: Lecturers of the OUSL Visiting lecturers from Peradeniya University MRI General Hospital Colombo PGIM

Assessment : End of the 3 rd year examination
conducted at the OUSL
On the merit of this examination
the programme of education for the
4 th year will be selected.

Degree Course in Medical Laboratory Technology

At the OUSL

Year 4 (monovalent)

Duration	: 48 weeks
Disciplines	: One subject should be selected by the student with the approval of the OUSL authorities
Mode of Teaching	: Lectures Practicals Special practical ssignments at specified laboratories iunder direct supervision of examiners
Special Project	: Each student should forward a project for this year. OUSL will approve the project a supervisor, a laboratory and the funds necessary for such projects. The project report will be considerd as a part of the final(practical) examination.
Assessment	: End of the 4 th year examination. Theory and practicals Project report Recommendations of the examiners supervising the special assignments
Certificate	: A certtificate conferring Bachelor's degree may be issued to those successfully completing the course of study.

Medical Laboratory Technology Degree course OUSL

Duration 2 years

Teaching Staff (proposed)

*1.Microbiology	Dr. (Mrs) M.C.Attapattu
	Dr. S.D.Athukorale
	Dr. (Mrs) V.Thevanesan
	Dr. R.S.B.Wickramasinghe
Virology	Dr. U.T.Vitarana
	Dr. (Mrs) N.Withana
Mycology	Dr. (Mrs) M.C.Attapattu
2. Haematology	Prof. D.B.Ellepola
	Dr. (Mrs) A.P.M.Ganegoda
	Dr. (Mrs) K.Amaratunga
	Dr. Merryl Perera
Blood Bank Serology	Dr. (Mrs) Nandani S.de Soysa
	Dr. R. Vithana
3. Chemical Pathology	Prof. P.A.J.Perera
	Dr. (Mrs) K.Amaratunga
	Dr. (Mrs) P. Premachandra
	Prof. E.H.Karunanayake
	Dr. T.M.J.Munasinghe
	Mr. H.weerawarna
	Dr. S.W.Gunasekara
4. Parasitology	Prof. M.M.Ismail
	Prof. Sarath J. Edirisinghe
	Dr. C.D.S.Wijesundera
	Dr. S.Samarasinghe
Medical Entomology	Mrs. N.Jayasekara
	Mrs. I.S.Weerasinghe
5. Histopathology & Cytology	Prof. N.Amarasekara
	Dr. H.R.Wickramasinghe
	Dr. (Mrs) K.Amaratunga
	Dr. (Mrs) A de Tissera
	Dr. (Mrs) P.Agunawela
6. Immunology	Dr. Anura Weerasinghe
	Dr. (Mrs) Sepali Gunawardena
	Dr. R. de Silva

OUSL COURSE

YEAR 3 & 4

CHEMICAL PATHOLOGY II

THEORY

1. Sample Collection, Handling and Storage.
2. Calculi Analysis.
3. Electrolytes and Water Homeostatis.
4. Disorders of Calcium, phosphorus and magnesium metabolism.
5. Acid - base Homeostatis.
6. Disturbance of Hydrogen Ion metabolism.
7. Carbohydrates 3 - Diabetes and other disorders of glucose metabolism.
8. Lipids 3 - Disorders of Lipid metabolism.
9. Plasma Proteins and Disorders of Protein Metabolism.
10. Vitamins and its metabolism.
11. Plasma Enzymes and Diagnostic Enzymology
    a). Diagnostic usefulness of Enzyme and Isoenzymes Estimations.
    b). Discrepant enzyme results and causes.
12. Endocrinology and Related Disorders.
13. Inborn Errors of Metabolism.
14. Pancreatic Functions - Laboratory Tests for Pancreatic diseases.
15. Tumor Markers.
16. Disorders of iron metabolism.
17. Toxicology
    Screening Tests for detection of drugs in body fluids.
18. Analytical Technique and Instrumentations
    Spectrometric analysis.
    Spectrofluorometry.
    Nephelometry.
    Chromatography (including TLC, Paper, Ion - Exchange and Absorption.)
    Electrophoresis.
    Immunoassays.
    Enzyme analysis.
    Micromethods/Automated analysis.
    Enzyme Immunoassays.
19. Gastro Intestinal Pancreatic function.
20. Reflectance spectroscopy.
21. Rescent Advances in Automated Analysis in Clinical Chemistry.
22. Quality Control in a Chemical Pathology Laboratory
23. Automation in clinical chemistry.

CHEMICAL PATHOLOGY II

PRACTICAL

1. Tests on Urine
   a). Morphine and Barbiturates
   b). VMA
   c). Catecholamines
   d). 17 - Oxo steroids and 17 - oxogenic steroids
   e). Estrogens
   f). Pregnanediol
   g). Amino Acids and Cystine
   h). 5 Hydroxyindoles
2. Test on Blood, Serum or Plasma
   a). Thyroxine
   b). Cortisol
   c). CK
   d). LD
   e). HBD
   f). GGT
   g). Magnesium
   h). Iron/TIBC.
   i). Protein Electrophoresis
3. Tests on amniotic fluid - lecithin - sphingomyelin Ratio.
4. Exposure to Partial Automated System.
5. Faecal Fat Quantitative Estimation.
6. Reflectance spectroscopy.
7. Flamephotometry estimation of electrolytes and Lithium.

MEDICAL LABORATORY TECHNOLOGY OUSL COURSE

YEAR 3 & 4

BACTERIOLOGY

THEORY

I. ADVANCED BACTERIOLOGY

1. Preservation and maintenance of stock cultures and lyophilisation.
2. Preparation of common vaccines.
3. Bacteriological analysis of food.
4. Sterility testing of pharmaceutical and biological products.
5. Antibiotic sensitivity testing - MIC
6. Sterilization and disinfection - in - use testing.
7. Use of laboratory experimental animals.
8. Nosocomial infections.
9. Investigation of outbreaks.
10. Quality control in medical microbiology.
11. Epidemiological principles.
12. Anaerobes.
13. Mycobacteria.
14. New bacterial pathogens.

II.

1. Culture media II.
2. Biochemical tests II.
3. Microorganisms and disease II.

III. VIROLOGY

1. Principles of viral replication; virus-host interactions.
2. Knowledge of viruses of medical importance.
3. AIDS II.
4. Hepatitis II.
5. Cultivation and isolation techniques
   - animal/arthropod : inoculation
6. Hemorrhagic viral fevers.
7. Viral exanthemas.
8. Congenital viral infections : Rubella
9. C. M. V.
10. E. B. V.

IV MYCOLOGY

1. Mycoses
2. Laboratory diagnosis of mycoses.

MEDICAL LABORATORY TECHNOLOGY OUSL COURSE

YEAR 3 & 4.

BACTERIOLOGY

PRACTICAL

I. DIAGNOSTIC BACTERIOLOGY III

1. Microscopy - dark ground illumination
   - fluorescent
2. Preparation of complex media and quality control of media.
3. Antibody assay - MIC.
4. Performance of complex tests for species identification.
5. Laboratory investigation of nosocomial infections.
6. Sterility testing of pharmaceutical and biological products.
7. Processing of clinical specimens from various systemic infections.
8. Study of mycobacteria.
9. Maintenance and quality control of laboratory equipment.
10. Phage typing and serotyping of Salmonella.
11. Colicine typing of Shigella sonnei.
12. Lancefield grouping of Streptococci.
13. Maintenance of stock cultures.

II. VIROLOGY

1. Enzyme - linked immunosorbent assay (ELISA).
2. Western Blot - observation.
3. Haemagglutination inhibition tests.
4. Fluorescent antibody tests.
5. Tissue culture - demonstration.
6. Animal/arthropod inoculation - observation.
7. Preparation and maintenance of tissue culture stock - observation.

III. MYCOLOGY

1. Mycological techniques in laboratory diagnosis.
2. Identification of fungi of medical importance.

OUSL YEAR 3 & 4

HISTOPATHOLOGY II

THEORY

1. Detailed study in fixed tissue technique.
2. Dyes and their action on tissue constituents.
3. Frozen section
   a). Cryostat
   b). Cryostat sectioning
4. Histochemistry.
5. Histochemical methods.
6. Immuno histochemistry methods.
   a). Study and identification of cell functions
   b). Hormones
   c). Enzymes
   d). Proteins
   e). Peptides
7. Enzyme labeled methods.
   Peroxidase and anti - peroxidase method (PAP)
8. Demonstration of Immunoglobulin in cryostat sections.
9. Fluorescent dyes and their applications.
10. Special staining techniques.
    a). Staining Alpha & Beta cells (Pancreas)
    b). Nerve fibers
    c). Myelin sheath
    d). Muscle
    e). Mucin
    f). Fungus
    g). Viral antigen
    h). DNA & RNA
    i). Collagen
    j). Basement membrane & etc.
11. Automation in Histopathology.
12. Museum Techniques and preservation of animals and animal tissues.

HISTOPATHOLOGY II

PRACTICALS

1. Frozen section cutting.
2. Cryostat sectioning.
3. Demonstration of immunoglobulins.
4. Special staining techniques to demonstrate cell constituents, DNA, RNA & hormones, CEA, enzymes and etc.
5. Connective tissue stains.
6. Bacterial, viral & fungal stains.
7. Stain for carbohydrates, mucin, collagen.
8. Stain for nerve fibers & myelin sheath.

OUSL YEAR 3 & 4

CYTOLOGY II

THEORY

1. Extra - uterine malignancies of the female genital tract.
2. Respiratory tract cytology.
3. Urinary tract cytology.
4. Cytology of Effusions and Aspirates.
5. Cytological changes following radiotherapy and chemotherapy.
6. Needle biopsy techniques.
7. Mode of reporting malignant findings.

PRACTICAL

1. Process cytology specimen for routine diagnostic work.
2. Prepare cytological smears from specimens other than gynaecological
3. Examine smears of non gyne and recognise premalignant and malignant changes.
4. Special staining techniques.
5. Routine screening of PAP smears.

1.0 General Pathology of diseases.

THEORY

1.1 Causes of diseases.
1.2 Inflammation necrosis and Repair.
1.3 Dysplasia and Neoplasia.

2.0 Gynaecology

2.1 Tumors - general concepts.
2.1 Cytological changes following radiotherapy, chemotherapy.
2.3 Neoplasia of the female genital tract.
a). non - invasive leocovis - diplasia, CIS
b). Invasive leocovis

Medical Laboratory Technology

Degree Course

Year 3 &4

Immunology

Theory

01. Quantitation of immunoglobulins and other protein changes in disease
02. Autoantibodies clinical significance and role in disease
03. The complement system - reaction mechanism
04. The immune system II
05. Regulation of the immune response
06. Quantitation of immunoglobulins and other proteins
07. Isolation and characterisation of lymphocytes
08. Basic concepts of HLA typing
09. Immunodeficiency
10. Autoimmunity
11. Hypersensitivity
12. Immunofluorescence
13. Immunology of parasitic, bacterial and viral infections
14. AIDS
15. Use of Gamma counters to count antibodies.

Practicals

01. The principles and performance of the following specialised diagnostic tests
02. Immunofluorescence
03. Enzyme linked immunosorbent assay (ELISA)
04. Assay of complement activity
05. Seperation of T & B Lymphocytes
06. HLA typing HLA typing
07. Techniques in cellular immunology
08. Radial immunodiffusion RID
09. Counter immunoelectrophoresis CIEP
10. Seperation of immunoglobulins
11. Quantitation of immunoglobulin
12. Identification of immunoglobulins by immunofluorescence.
13. Gamma counters and ultra centrifuges in anti body estimations.

MEDICAL LABORATORY TECHNOLOGY

OUSL YEAR 3

MEDICAL PARASITOLOGY & ENTOMOLOGY II

THEORY

01. Protozoa
    a. Trypanosoma cruzi
    b. Trypanosoma rhodesiense
    c. Trypanosoma gambiense
    d. Leishmania donovani
    e. Leishmania braziliense

02. Trematodes
    a. Paragonimus westermani
    b. Opisthorchis felineus
03. General knowledge on the morphology of tape worms
    Dipylidium caninum
04. Principles and use of permanent stains like Trichrome and Iron - haematoxylin
05. Protozoology
    5.1. Parasitic protozoa in man with special emphasis on
        a. Entamoeba histolytica
        b. Giardia lamblia
        c. Trichomonas vaginalis
        d. Toxoplasma gondii
        e. Blastocystis hominis
        f. Cryptosporidium spp.
        g. Pneumocystis carinii
    5.2. General knowledge of the important antimalarial drugs; principles of therapy and drug suppression
    5.3. General knowledge of the principles of malaria control; common methods of control
    5.4. Elementary knowledge of recent developments in malaria research and control
    5.5. General knowledge and identification of avian and mammalian malaria
06. Helminthology
    6.1. General knowledge of other filarial worms
07. Entomology
    7.1. Chief arthropods of medical importance including details of anatomy and life history of house flies, blow flies, lice, fleas, bedbugs, sandflies and mosquitoes and the diseases carried by them

7.2. Filariasis vectors: their distribution habits and life cycle (Mansonia mosquitoes)
7.3. Dengue vectors : their names and habitats
7.4. Elementary knowledge on the recent advances in medical entomology
7.5. Familiarity with common usage insecticides and techniques for testing them
7.6. Techniques for obtaining experimental malaria infection in Anopheles and ability to dissect for oocysts and sporozoites
7.7. Techniques for obtaining experimental infections of filaria in mosquito hosts and ability to dissect for various stages of larvae

08. Acarology
8.1. The general morphology, ecology, general life cycle, medical importance and control of 4 suborders of Acari : Astigmata, Mesostigmata, Metastigmata and Prostigmata
8.2. The epidemiology, vector ecology and control of acarine - related diseases of medical importance: Scrub typhus, Scabies, mite allergy
8.3. Laboratory colonization and field collection of mites and ticks. Examination of trapped animals for ectoparasites

09. General
9.1. The use of animals in maintaining strains of parasites
9.2. Various culture techniques for parasites
9.3. Principles of serology and the basic knowledge of the use of various techniques in serological tests for different parasites

10. Ecology
10.1. General knowledge of commensal rodents and their medical importance
10.2. Rodent control
10.3. General knowledge of poisonous snakes in Sri Lanka
10.4. Zoonotic diseases prevaent in Sri Lanka

PARASITOLOGY II

PRACTICALS

01. Preparation of permanent stains - Trichrome and Iron - haematoxylin and fixative like Polyvinyl alcohol (PVA)
02. Preparation of faecal smears and staining with Trichrom, Iron - haematoxylin for examination of intestinal protozoa
03. Demonstration of other amoebae and flagellates in faecal smears / other specimens.
04. Demonstration of Trypanosome spp., Leishmania spp. and Toxoplasma gondii.
05. Demonstration of trematodes and cestodes (adults and ova)
06. Identification of hard and soft ticks and mites (with the aid of keys)
07. Protozoology
    - 7.1. Performing direct smears and concentration techniques
    - 7.2. Performing permanent staining
    - 7.3. Special staining for Blastocystis hominis, Cryptosporidium spp. and Pneumocystis carinii
    - 7.4. Performing Full Blood Picture, Erythrocyte Sedimentation Rate and Osmotic Fragility Test for malaria cases
    - 7.5. Examination of thick and thin blood films for human and non-human malaria parasites. (avian & mammalian malaria)
    - 7.6. Performing special culture techniques
    - 7.7. Immunological tests
    - 7.8. Post - mortem and examination of animal hosts
08. Helminthology
    - 8.1. Performing wet smear, preparation of 60 microlitres thick blood film and staining by Giemsa
    - 8.2. Performing concentration techniques: Knott's and Nucleopore membrane filtration
    - 8.3. Performing special staining on thick blood films
    - 8.4. Identification of other species of human filaria parasites (Nematodes/ Trematodes/ Cestodes)
    - 8.5. Performing direct smears and concentration techniques
    - 8.6. Performing special staining like aceto-carmine
    - 8.7. Performing various methods for quantification of ova
    - 8.8. Performing special culture techniques
    - 8.9. Immunological tests

09. ENtomology

9.1. Identification of all stages of development of the mosquitoes.

9.2. Identification of fleas,lice,bed-bugs,flies and cockroaches.

9.3. Dissection of mosquitoes for various stages of malaria and filaria infections.

9.4. Mounting of mosquito larvae,fleas and bugs.

9.5. Laboratory colonization of mosquitoes.

10. Acarology

10.1. Identification of the four suborders of acari.

10.2. Mounting of chiggers and other mites.

10.3. Laboratory colonization, field collection and examination of ticks and mites, including ectoparasites an trapped animals.

11. Ecology

11.1. Identification and dissection of animals for endoparasites,

11.2. Preparation, staining and examination of thick blood films for endoparasites.

11.3. Mounting of specimens.

11.4. Demonstration of poisonous snakes.

MEDICAL LABORATORY TECHNOLOGY DEGREE COURSE AT OUSL

Year 3 & 4

HAEMATOLOGY & BLOOD BANK SEROLOGY

General Laboratory Methods:

1. A good knowledge in commonly applied methods of haematological investigations and their advantages and disadvantages.
2. A reasonable grasp of cytology of blood cells and changes occuring in diseases.
3. The application of chemical, biochemical, radioisotopic immunological and genetic techniques relevant to haematological investigations.
4. The use of automation in haematology.

THEORY AND PRACTICALS in

Blood Genetics and Cellular Biology:

The sub-cellular structure of cells. The function of ribosomes in protein synthesis and the mitochondrial in energy generation and its role in Haem synthesis in the erythroblast. Lysosomes. The meaning of chromosomes, genes. The basic concept of protein systhesis in relation to the function of genes.

Autosomes and sex chromosomes.

The normal karyotype in man. Meiosis and mitosis. Lyon's hypothesis for inactivation of X-chromomes.

The basic concept of the abnormalities of autosomes and X-chromosomes.

The mapping of autosomes and X-Chromosomes.

Dominant and recessive inheritance. X-linked inheritance. Association linkage and allelism. Gene interaction. Chimeras, Mutation. Hardy-Weiberg equilibrium, genetic drift in breeding.

The role of family studies in determining inheritance, population study for gene frequency.

Principles of cytogenetic analysis. Monosomy, Triscomy, Translocation. Non -disjunction, deletion and duplication. Iso chromosomes and ring chromosomes. Turner's syndromes, Klinefelter's syndrome and Down's syndrome as Examples of aforementioned.

BLOOD CELLS

The origin and function of granulocytes, monocytes, red cells and platelets. The monocyte-macrophage system (Reticuloendothelial system). The nature and function of Red cell membrane, Maintenance of its intergrity, transfer process across it.

Cytology of bone marrow and common variation in disease.

IRON METABOLISM:

Sources of dietary iron.The physiology of iron absorption.Factors affecting its regulation.Transportation,distribution and storage of iron.Utilisation of iron in Heam synthesis. The use of serum iron and total iron binding capacity to demonstrate disturbance of iron metabolism.

HAEMOGLOBIN STRUCTURE,SYNTHESIS AND BREAKDOWN:

The genetic concept of haemoglobin synthesis.The structure of normal haemoglobins and variations in disease. The synthesis of haem and its disturbance in lead poisoning. The function of haemaglobin as Oxygen carrier. The oxygen disassociation curve and the factor affecting it,including the Bohr effect and the effect of 2,3 -DPG.

Haemoglobin binding protein in plasma and their estimation. Knowledge of the mechanism of removal of haemoglobin from the Plasma in intravascular haemolysis.

Identification and significance of methaemoglobin,sulphaemoglobin and Carboxyhaemoglobin.

THE HAEMOGLOBINOPATHIES

The genetic basis of alpha and beta-thalassaemias.The clinical aspects of the thalassaemia syndrome.

The laboratory diagnosis of alpha and beta-thalassaemia traits and difficulties therein. Principle and application of techniques used to detect abnormal haemoglobin variants including electrophoresis.Knowledge of the clinical aspects of Hb.S, E,C and D. Interaction between haemoglobin variants and the thalasseamia defect. Congenital methaemoglobinaemia,unstable haemoglobins,haemoglobins with altered affinity for oxygen as further examples of the effect of structural abnormalities. Turbidity test, Itano's solubility tests for Hb.S and Kleuhaeaur test and its modification. Tests for unstable haemoglobins. Supervital staining.

RED CELL METABOLISM

The glycolytic pathway and the hexosemonophosphate shunt and their respective function.

The role of NADPH and reduced glutathione in maintaining red cell intergrity and maintenance of haemoglobin in the reduced state. Red cell ageing.Enzymic defects of red cells leading to haemolytic aneemia and methaemoglobinaemia.Methods for the diagnosis of common enzyme deficiencies with special emphasis of G6PD Deficiency and the principle underlying them.

The defects in hereditary spherotosis,elliptocytosis/ovalocytosis Methods for their detections.

IMMUNOPROLIFERATIVE DISORDERS:

The haematological features of multiple myeloma. Laboratory methods for the study of paraproteins, including immunoelectrophoresis.

THE THEORY OF COAGULATION (Haemostasis)

Basic theory of the mechanisms of haemostasis. The interplay between coagulation,platelet function,vascular intergrity and fibrinolysis.

The defect in Haemophilia,Chrismas diseases and Liver disorders.

The principles of methods for detecting coagulation defects.

Preparation of reagents used in coagulation tests including thromboplastin extracts and platelet substitute. Assays of coagulation factors by one-stage and two- stages methods.

Fibrinolysis and defibrination and laboratory tests for them.

The interrelationship between coagulation and fibrinolysis.

Fibrin/fibrinogen degradation products, ATIII their production, clearence,effects and laboratory assays.

Dessiminated intravascular coagulation disorders. Platelet funct structure and platelet aggrigometry.

Prothrombin Consumption test as screening test for Platelet abnormalities.

ACQUIRED HAEMOLYTIC ANAEMIA:

Autoimmune haemolytic anaemia.Mechanisms of red cell damage in cold antibody-mediated and warm antibody mediated haemolytic anaemia.The Donath-Lansteiner antibody-its nature,specificity, association and detection.

The serelogical investigation on immune haemolytic anaemia.

Paroxysmal nocturnal haemoglobinuria (PNA) and its investigation

The nature of red cell defect in above condition and its recogni

Association of this condition with other haematological disorder

Mechanism: of red cell distruction in dessiminated intravascula coagulation and other red cell fragmentation syndromes.

DRUG - INDUCED HAEMOLYTIC ANAEMIA:

The anaemia caused by malaria. Haemolytic anaemia caused by toxi caused by 'Clostridium welchii' septicaemia.

VITAMIN B 12 AND FOLATE METABOLISM

The role of the vitamin B 12 and folate in DNA synthesis,the causes and effects of deficiency of these vitamins.

Methods of diagnosing the above deficiencies.

Microbiological assay of serum B 12 and folate and red cell folate.

Protein binding methods for serum B12/folate.

HAEMATOLOGICAL MALIGNANCIES:

The classification and etiology of the myeloproliferative disorders and Lymphoproliferative disorders and their relationship.

Chronic granulocytic leukaemia (CGL) and chronic lymphatic leukae-mia (CLL) and thier haematological features.The place of myelomo-nocytic leukemias and hairy cell leukaemia in relation to these chronic leukaemias.

Concept of myelodysplasia and classification of the myelodysplastic syndromes. The acute leukaemias. Aetiology,classification and clinical features. The use of cytochemical methods in clasification including the PAS method,Perooxidase|Sudan Black B,esterases and Acid phosphatase.

Morphological,Immunological,Cytogenetical clasification, FAB Clasification.

Principle of Flowcytometry.

MEDICAL LABORATORY TECHNOLOGY DEGREE COURSE AT THE OUSL

Year 3 & 4

BLOOD TRANSFUSION SEROLOGY & SERVICES

THEORY

1. ABO and Rhesus blood grouping system.
2. The applications and importance of the coomb's test.
3. Incompatible crossmatch.
4. Preparation and storage of Blood components.
5. Hemolytic disease of the newborn.
6. Screening of donor's blood.
7. Introduction to transfusion hazards .
8. Trasfusion -dependent patients.
9. Blood banking mamagement.
10. Lewis typing and determination of secretor status.
11. Quality assurance in blood transfusion service.
12. Antenatal screening and neonatal jaundise investigations.
13. Antibody identification.(single & mixtures of antibodies)
14. Investigations of transfusion reactions.
15. Blood component therapy.
16. Spread of infections through blood transfusions.
17. Developments in blood transfusion techniques.

PRACTICALS

1. ABO & Rh. grouping.
2. Rhesus phenotyping and determining the genotypes.
3. Testing for other blood group antigens.
4. Antibody screening tests.
5. Titration of antibodies.
6. Crossmatching (to include use of LISS &enzyme techniques)
7. Selection & crossmatch of blood for exchange transfusion.
8. Secretor studies
9. Antibody identifications.
10. Absorption and elution techniques.
11. Antenatal testing.
12. Tests for AIDS. Hb.S Ag.,VDRL and other antibodies.
13. Preparation of Blood grouping sera.

4　ウイルス学部門活動実績

Department of Virology.

STATISTICS 1994/95

Tests	1994	1995 up to end of June
1. Hepatitis B		
No. of samples tested	3528	1717
No. positive for HBs Ag	391	169
2. Japanese Encephalitis		
No, of CSF tested	1766	589
No. positive for JE	80	57
No. single blood tested	1667	640
No. showing JE antibody	868	369
No. of paired blood tested	144	41
Evidence of recent infection	11	9
3. Dengue		
a) Dengue haemorrhagic Fever (DHF)		
No. of DHF cases	512	193
Serologically positive DHF cases	72	29
b) Dengue Fever		
No. of paired sera tested	352	106
Evidence of recent infection	34	18
No. of single sera tested	3027	1219
No. of positive for dengue antibody	1751	679
4. Rubella		
No. of blood tested	2085	1068
No. of positive for rubella antibody	1416	695
Evidence of recent infection	71	66
Congenital infections	103	141
Rubella in Pregnancy	138	35
5. Cytomegalovirus		
No. of blood tested	254	103
No. of positive for CMV antibody	122	49

	1994	1995 up to end of June
6. Measles/SSPE		
No. of CSF tested	53	43
No. of positive for measles antibody	23	34
7. Hantavirus infection		
No. of blood tested	953	258
No. positive for Hantavirus antibody	57	05
8. Herpes Simplex Virus Isolation		
No. of ulcer swabs tested	850	412
No. positive for HSV	322	85
9. Enteroviruses		
a)No. of stools from AFP cases	81	45
No. positive for poliovirus	01(Polio type-2 Sabin-like)	01(Sabin-like)
NO.positive for non-polio Entrovirus	22	05
b) No. of contacts tested	238	293
No. positive for polio viruses	03(Polio type 1-2 Polio type 3-1) All Sabin-like)	08(Sabin like)
No. positive for Enteroviruses (non-polio)	11	19
10. Hepatitis A		
No. of specimens tested		328
No. positive for HAV IgM		90

5 細菌学部門活動実績

DEPT. OF BACTERIOLOGY & MYCOLOGY. 18

Research work by Dr. Maya Attapattu - 1994 & 1995

1 Atypical presentation of pulmonary tuberculsis diagnosed by fibreoptic bronchoscopy. Postgraduate Medical Journal London. (1993) 69 621-623 - Joint 2nd author.

2 Vibrio cholera 0139 (Bengal strain) isolated in Sri Lanka Maya Attapattu. Accepted for publication - The Ceylon Medical Journal. 1994 Vol. 39 No. 4 : Pages 192 - 194

3 Acute rhinocerebral mucormycosis caused by Rhizopus arrhizus from Sri Lanka.Accpetedfor publication by teh Journal of tropical Medicine and Hygiene. Ref No. TM 2007.

4 Cryptoccus meningitis in a Sri Lankan AIDS patient. Annual academic sessions of the Sri Lanka College of Microbiologists 1994

5. Drug resistant tuberculosis in Sri Lanka - Annual academic sessions of the Sri Lanka College of Microbiologists. 1994

6 Chromoblastomycosis - Clinical and mycological study of 71 cases from Sri Lanka. Paper submitted for publication by the MYcopathologia. U.S.A.

7 Fungi and I : Presidential address for the Sri Lanka College of Microbiologists. February 1995.

8 2 cases of Nocardia brain abscess in immunocompromized patients. Paper submitted at teh Sri Lanka Medical association. Clinical meeting February 1995.

Papers in preparation- Dr Maya Attapattu

9 Subcutaneous phycomycosis caused by basidiobolus ranarum in Sri Lanka -first reports and sucessful treatment.

10 2 cases of rhinofacial zygomycosis caused by conidiolbolus coronatus - First reports in Sri Lanka.

11 Serological studies for systemic fugus disease in Sri Lanka.

8, 9, & 10 & 11 will be presented at teh annual academic sessions of teh Sri Lanka College of Microbiologists which will be held in first week of December 1995.

Department of Bacteriology & Mycology

Anaerobic Bacteriology - 1994

Hospital Cross Infection

Institute	No. of specimens
L.R.H.	110
Kuliyapitiya	05
Polonnaruwa	64
S.J.G.H.	49
C.S.G.H.	22
Kegalle	12
C.S.H.W.	45
Ratnapura	14
D.H.H.	04
Kegalle	16
Ragama	38
Kurunegala	33
Karapitiya	24
C.I. Maharagama	10
Wathupitiwala	04
Negombo	06
Matara	24
T O T A L	450

Isolated organisms are

01. Staphylococcus pyogenes
02. α haemolyticus Streptococcus
03. Coliforms
04. Klebsiella Species
05. Micrococcus
06. Pseudomonas aeruginosa

Anaerobic Culture 1994

Institute	Nof of Specimen	Positive
L.R.H.	06	
Polonnaruwa	02	
S.J.G.H.	04	
Avissawella	02	
C.S.H.W.	06	05
Kurunegala	01	
Peradeniya	02	
Trincomalee	01	
C.I. Maharagama	01	
Matara	11	05
Staff	07	01
D.N.H.	01	
T O T A L	44	11

Isolated Organisms

01. Clostridium ramosum
02. Bacteroides melanogenicus
03. Propinobacterium acnes
04. Clostridium difficle
05. Cl. innocuum
06. Fusobacterium varium
07. Capnocytophagen
08. Cl. bifermantans
09. Cl. perfringens

High Pressure Sterilizers Testing

Institute	No. of. Specimens	Efficiancy
L.R.H.	02	not satisfactory
Fridsro Medical Centre	03	not satisfactory
C.S.H.W.	02	Satisfactory
Chest Hospital, Welisara	02	Satisfactory
Grandpass Maternity Hospital	02	satisfactory
S.J.G.H.	05	not satisfactory
Durdans Hospital	02	not satisfactory
Nawaloka Hospital	02	satisfactory
General Hospital Ragama	04	satisfactory

Institute	No. of specimens	Effioiancy
Durdans Hospital	04	satisfactory
Base Hospital Panadura	02	satisfactory
Rajagiriya Nursing Home	02	not satisfaotory
Nawaloka	02	satisfactory

Latex Flocculation Test

No. of. Specimens	Positives
1410	76

Department of Fc & Water Bacteriology

Annual Report - 1994

Staff

Bacteriologist - 01
M.O. 's - 02
MLTT - 02
R.S.K. - 03

Descriptions		Total No. Samples	No. of Govern-ment samples	No. of Private samples	No. of satisfactory	No. of unsatisfactory
	Water	585	445	140	424	161
	Food					
01.	Sea food (Raw)	55	-	55	45	10
02.	Sea food (cooked)	04	03	01	02	02
03.	Canned food	05	-	05	04	-
04.	Desiccated coconut	10	-	10	10	-
005.	Syrup (Medicated)	07	-	07	07	-
06.	Milk & milk products Drink packets, Ice packets, Ice palam, Ice lollies & Ice cream	32	32	-	14	18
07.	Meat & meat products (Raw)	08	01	07	02	06
08.	Meat & meat product (cooked)	01	-	01	-	01
09.	Other cooked food	04	04	-	01	03
10.	Meals packet (Rice & curry)	09	09	-	-	09
11.	Miscelanious	07	07	-	07	-
	Clinical specimen vomitus	04	04	-	03	01
		731	505	226	519	212

Bacteriology
25-07-95

Bacteriology
D Lukemann

1994 – Statistics

Specimens	No of cultures	ABST
Urine	3409	1877
Pus	685	559
Serous fluid	149	38
Sputum	320	128
Throat swab	384	68
Blood cultures	196	83
C.S.F cultures	318	85
Disinfectants	10	
Legionella serology	28	
Legionella cultures	-	
Myroplasma serology	130	
Quality control	12	
Pernasal swabs	34	

Ayşe Mungan
etc.

1994 Mycology

Work Output	1994
	No. of samples.
Face & Neck	136
Trunk	195
Groins, Scrotum, Perineum	186
Toe nails	173
Finger nails	175
Hair & Scalp.	176
Axillae	68
Toe webs & Soles	109
Arms	81
Legs	144
Gms & Finger webs	39
Corneal smears	—
Mouth & Throat swabs	14
Ear swabs	02
Stools	02
Sputum	187
Urine	06
Vaginal Swabs	09
C. S. F.	06
Serology	142
Biopsy for culture	52
Blood	02
Miscellaneous	33
Biopsy for Histology.	28
Total	1965

HEAD

ENTERIC BACTERIOLOGY SECTION

Department of Bacteriology - Medical Research Institute
Statistics for Annual Report 1994

01.	Total No of stool cultures done	-	2590
	No. of positives - Salmonella species	-	38
	Shigella species	-	336
02.	Total No. of stool cultures done for Enteropathogenic E. Coli	-	1236
	No. of positives	-	50
03.	Total No. of stool cultures for cholera	-	227
	No. of positives for cholera	-	0
04.	Total No. of stool cultures	-	664
	No. of positives - Salmonella typhi	-	18
	- Salmonella paratyphi	-	0

1994

Leptospirosis - Statistics Jan. 1994 - Dec. 1994

Monthly Analysis

Test	Leptospira Agglutination Test		Culture	
	Total	Positives		Positives
Jan.	155	23		
Feb.	84	14		
Mar.	226	68		
Apr.	166	36		
Mayo	126	12		
June	171	14		
July	75	02		
Aug.	67	05		
Sep.	105	08	01	-
Oct.	64	08		
Nov.	155	34	01	-
Dec.	118	24		
Total	1512	248	02	-

N Panchbhaya
Med Leptospirosis

6 薬理学部門活動実績

Department of Pharmacology.

Routine work

The following endocrime assays were performed by this department.

1994	No of tests	Positives
V.M.A.	472	5
17-Ketosteroids	91	20
17-Ketogenic steroids	25	2
5 H I A A	14	2

1995 up to June	No of tests	Positives
V.M.A.	202	3
17-Ketosteroids	55	6
17-Ketogenic steroids	12	4
5 H I A A	6	-

Research activity

Research was carried out with a view to develope a H P L C assay system to measure serum levels of anticonvalsant medication in blood.

7 病理学部門活動実績

DEPARTMENT OF PATHOLOGY STATISTICS - 1994

1.	Histopathological examinations	-	2838
	No. of slides	-	3201
	Special stains	-	20
	Immunohistochemistry	-	15
2.	Hematology	-	
	Routine (Hb,PCV,ESR,WBC/DC)	-	487
	BT	-	06
	CT	-	06
	Platelet Aggregation Test	-	27
	LE Cells	-	05
	Hb Electrophoresis	-	583
	HbF	-	55
	AS	-	05
	A	-	28
	E	-	28
	A 2	-	03
3.	Urine Analysis	-	368
	ANA	-	3717
	Special (24 hrs., protein porphyrin etc.)	-	15
	Occult Blood	-	02
	CSF	-	10
	S.F.	-	01
	Total		11,420
	Immunofluorescent staining-skin biopsies	-	27
	Total		11,447

DEPARTMENT OF PATHOLOGY STATISTIC - 1995 JANUARY 1ST - MARCH 31ST.

1.	Histopathological examinations	-	647
	No. of slides	-	902
	Special Stains	-	05
	Immunohistochemistry	-	01
2.	Hematology		
	Routine (Hb, PCV,ESR,WBC/DC)	-	83
	BT	-	02
	CT	-	02
	Platelet Aggregation Test	-	06
	LE Cells	-	-
	Hb Electrophoresis	-	129
	HbF	-	08
	AS	-	06
	A	-	-
	E	-	04
	A 2	-	-
3.	Urine Analysis	-	-
	ANA	-	928
	Special (24 hrs., protein porphyrin etc.,)	-	05
	Occult blood	-	-
	CSF	-	01
	S.F.	-	-
	Total		2,729
	Immunofluorescent staining skin biopsies		20
	Total		2,749

8 免疫学部門活動実績

Division of Immunology

NUMBER OF ROUTINE TESTS CONDUCTED DURING 1ST JANUARY TO 31ST MARCH, 1995

	Test	Number
1.	Simple Electrophoresis	71
2.	Immuno Electrophoresis	02
3.	Immuno Globulin Levels -	
	IgG -	56
	IgA -	57
	IgM -	56
4.	Complement C_3	46
5.	Complement C_4	16
6.	Cryoglobulin	03
7.	CD_4 Count	11
8.	Neutrophil function test	-

Division of Immunology
NUMBER OF ROUTINE TESTS CONDUCTED FOR 1994.

	Test	Number
1.	Simple Electrophoresis	168
2.	Immuno Electrophoresis	06
3.	Immuno globulin Levels -	
	IgG -	186
	IgA -	184
	IgM -	182
4.	Complement C_3	237
5.	Complement C_4	90
6.	Cryoglobulin	10
7.	CD_4 Count	08
8.	Neutrophil function test	06

No. of specimens processed in E.M. Unit for 1994 & till 31st March, 1995.

TEM

1.	Viral Diarrhoeal Samples -	304
2.	Histology (Ultrastructural Studies)-	63
3.	Private Hospital Samples - (Viral Diarrhoeal)	02

SEM

4.	Asses the morphological changes of the Dental Restoration - (Project) (specimens)	25

9 動物実験部門活動実績

Management activities of animal centre during the two year extension period.

1. Staff Panel:

Veterinary Surgeons	-	02
MLTT	-	01
Animal Supervisors	-	04
RKSS	-	01
Labourers	-	08
Substitute labourers	-	05

2. Itemized expenditures for the management of animal centre

3. Animal species grown and maintained in animal centre

Mice - ICR, C 57B1, C3H, BALA/c
Rats - Wistar
Hamster - Syrian (albino & golden)
Guinea Pigs - Hartley
Rabbits - NZW

Geese
Sheep
Poultry

4. Usage of experimental animal in the departments of MRI, that supplied by animal centre and others (the species and numbers of animals per supplier)

Number of animals issued to different departments in the M.R.I, - By the animal centre Jan. 94 - April 95.

Department or Section	Mice	Mice	Mice	Mice	Mice	Rat	Hamster	G.Pig	Rabbit
	ICR	ICR SUC	C57 BL	C3H	Balb c	Wis tar	Syrian	Hart ley	NZW
Virology	1613	146			36		10	04	
Entomology & Parasitology	104				06	05	04	10	
Pharma-cology & Natural Products									
Pathology & Immunology	08					02			
Biochemis-try & Nutrition	20								
Biological Production	795							22	10
Bacteriology							02		
Rabies	38								
Animal Centre	188		135	52	43	52	05	15	
EM	04								
MLT School				01					
Total	2770	146	135	53	85	59	21	51	15

Animal issued to other institutions under the Department of Health Jan. 94 - April 95.

Institution	Mice (ICR)	G.Pigs (Hartley)	Rabbits (NZW)
NDQAL	108	21	06
Blood Bank			22
Anti Malaria Camp.		02	
Total	108	23	28

Goose blood, sheep blood & poultry blood too is supplied by the animal centre to various departments of the MRI.

5. Feeds for experimental animals, as produced and purchased by animal centre

1994 - Rat & Mice feed pellets - 4649 kg
Rabbit & guinea pig pellets - 5412.95 Kg

1995 (up to 26th April) - Rat & mice feed pellets - 1622.15 Kg
Rabbit & guinea pig pellets - 1533.85 Kg

6. Commentaries and prospective views on animal centre

At present MRI animal centre is the only animal centre from which a researcher could obtain specific laboratory animals. Therefore researchers outside the M.R.I. too depend on animals produced at the M.R.I. animal centre for their work.

10 寄生虫学部門活動実績

Department of Parasitology	1994	1995 (upto May)
1. Microscopic Examination of Stools for parasites	224	49
2. Culture for Amoebae	02	-
3. Blood for Malarial Parasites	33	09
4. Blood for Microfilariae	28	06
5. IFAT for Filariasis	8,428	2,081
6. IFAT for Toxoplasmosis	1,481	549
7. Vaginal smears for T.vaginalis	-	-
8. Examination of pus for Amoebae	01	01
9. Identification of snakes	03	02
10. Identification of worms	02	01
11. Urine for Schistosoma species	-	-

11 生物製剤部門活動実績

Natural Products Chemistry Division.

Research Activities.

The following research activities were carried out in the sections

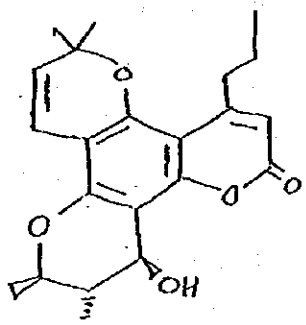
(1) Chemical investigations were carried out on the leaves and twigs of the plant species,

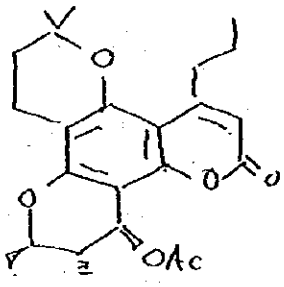
(a) Calophyllum blongatum and

(b) Calophyllum Moonii,

to isolate and characterize novel HIV - inhibitory, class of Coumarins derivatives.

The National Cancer Institute of USA, has isolated eight new Coumaricas, by anti-HIV bioassay - guided fractionation of an extract of the plant species, Calophyllum langigerum. 1. Two of the isolated compounds, calanolide A and calanolide B, were completely protective against HIV-1, replication and Cytopathicity.





Calanolide A

Calanolide B

The above mentioned plant species, are known to have compounds with the same activities as calanolide A and B. Therefore, they were subjected to chemical investigation and several compounds were isolated. by us.

When the necessary spectral data are obtained the compounds will be sent to NCI, USA, for anti - HIV activity testing.

(2) A number of fungi were grown in large scale and investigated chemically to isolate and characterize new antibiotic and anti- cancer compounds.

The dichloromethane and ethyl acetate extracts of filterates and Mycelia of the fungi were subjected to repeated column chromatography and a number of compounds were isolated. Some of them showed antibacterial activity.

The structure elucidation of the compounds were carried out by using high resolution spectroscopy and chemical means.

Part of the results have been published.[2] Five more papers are being prepared to send for international journals.

Some Marine fungi are also under investigation.

(4) We have initiated a cell - line method to screen compounds for anti - cancer activity.

(5) The dichloromethane and ethyl acetate extracts of the plant Acalypha wilkensiana showed activity against MRSA.

Chemical investigations of these extracts are in progress.

Chemical work on another Acalypha species, A. godsefiana, is also in progress. This plant is known to have activity against the toxic secretions of centipeads.

References

01. The Calanolides, a Novel HIV - Inhibitory class of Coumarica Derivatives from the Tropical Rainforest Tree, Calophyllum Lanigerum, Y. Kashman, K.R. Gustafson, R.W. Fuller, J.H. Cardellina, J.B. Mcmahon, M.J. Currens, R.W. Buckheit, Jr., S.H. Hughes, G.M. Crass and M.R. Boyd.

(2) Bisbynen, A novel secondary Metabolite from the fungus Stachybotrys bisbyi (Srinivasan) Barron, L.B.De. Silva, W.H.M.W. Herath, D.S.S. Gunawardena, R.L.C. Wijesundera, S.A. Medis, M.I. Choudhary and Jon Clardy, Tetrahedron letters 1995, 36 (12), 1997

ROUTINE DIAGNOSTIC TESTS AND PRODUCTION ACTIVITIES.

Rabies Dept.

	1994	1995 up to June
Direct Smears	985	468
Fluorescent Antibody Tests	417	199

Production Unit
Vaccines

Typhoid	101,116 ml	63,305 ml
Cholera	16,251 ml	10,739 ml
Anti Rabies	265,600 ml	28,800 ml

Phamaceuticals
Ampoules

Normal Saline	18,750 ml	10,750 ml
Sodium Citrate	13,400 ml	5,000 ml
Distilled water	3,650 ml.	-

Bulk Preparation

ARV Buffer	240,000 ml	60,000 ml
Tuberculin Buffer	3,150 ml	-
Phosphate Buffer	5,000 ml	2,000 ml
Normal Saline for laboratory use	190,000 ml	100,000 ml
Normal Saline for TAB	133,000 ml	50,000 ml
Normal saline for Cholera	10,000 ml	5,000 ml

Annual Statistics – 1994
Serology

Test.	Jan:	Feb:	March	April	May	June	July	August.	Sept:	Oct:	Nov:	Dec:	Total
SAT	93	67	75	54	71	40	31	21	25	44	18	24	606
ASOT	186	231	261	173	304	320	250	169	217	255	206	196	2768
Paul Bunnel	50	28	64	45	46	52	51	49	33	44	30	43	535
Brucella.	22	20	05	–	–	–	–	–	–	–	–	–	47
Weil felix	38	26	38	48	32	20	23	27	21	20	09	12	315
Antigen Preparation (ml) 'O'	500	–	300	200	200	400	–	300	–	–	500	–	2200
" 'H'	–	5000	–	3000	–	5000		4000	–	–	1000	5000	23000
'Pa'		5000	–	300	–	3000	–	3500	–	–	4000	–	20500
'Vi'			–	–	–	–	–	–	400	–	–	–	400
'OX 19'	–	–	150		–			–		400	–	–	550
'OX K'	–	–	150					–		400			550
'OX 2'										400			400
													47600

12 合同評価報告書

JOINT EVALUATION REPORT

ON

JAPANESE TECHNICAL COOPERATION

FOR

THE MEDICAL RESEARCH INSTITUTE PROJECT

IN

THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

August 7, 1995
Colombo
Sri Lanka

Mutually attested and submitted

to all concerned

Colombo
Sri Lanka
August 7, 1995

Tadahiro Hamada

Dr. Tadahiro Hamada
Leader,
Japanese Evaluation Team,
Japan International Cooperation Agency

Dr. Dudley Dissanayake
Secretary,
Ministry of Health, Highways and Social Services

Dr.Maya Attapattu,
Project Director,
The Medical Research Institute

Date : August 1- August 7, 1995
Place : Medical Research Institute, Colombo, Sri Lanka

Attendants :

JAPANESE EVALUATION TEAM

JAPANESE PANEL

Dr. Tadahiro Hamada	Professor, Niigata University School of Medicine
Dr. Yoshihisa Ohnishi	Director, Saitamaken Saiseikai Kawaguchi Hospital
Dr. Kenichi Kojima	Head, The Japanese Red Cross Niigata Blood Center
Dr. Hajime Katayama	Professor, Niigata College of Pharmacy
Dr. Katsutoshi Komuro	Director, The Department of Safety Research on Biologics, National Institute of Health, Japan

TEAM MEMBERS

Mr. Kiyoshi Torii	Official, Higher Education Bureau, Ministry of Education
Mr. Kazuhiro Tomizawa	Staff, First Medical Cooperation Division, JICA

JAPANESE EXPERT TEAM

Dr. Isao Sakashita	Project Leader
Mr. Akira Naruse	Coordinator
Mr. Hitoshi Watanabe	Expert in clinical investigation (laboratory technology)
Mr. Masatsugu Nakaso	Expert in animal experimentation
Mr. Shoichi Shimizu	Expert in biomedical engineering

JICA SRI LANKA OFFICE

Mr. Shinji Yoshiura	Assistant Resident Representative

SRI LANKAN PANEL

Dr Lalith Mendis	Deputy Director General Laboratory Services, Ministry of Health, Highways and Social Services (MOH)
Dr D Amarasinghe	Director Castle Street Hospital for Women, Colombo
Dr Maya Attapattu	Project Director for MRI/JICA Evaluation
Dr R S B Wickramasinghe	Consultant Microbiologist Medical Research Institute
Prof. Refvi Sheriff	Professor of Medicine The University of Colombo
Dr V Jaganathan	Deputy Director General Medical Services

I . INTRODUCTION

The Japanese Evaluation Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Tadahiro Hamada visited the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka") August 1 to August 7, 1995 in order to evaluate jointly with the Sri Lankan authorities concerned the past achievements of the Medical Research Institute Project (hereinafter referred to as "the Project") on the basis of the Record of Discussions on Japanese Technical Cooperation signed on August 30, 1988, Joint Evaluation Report on Japanese Technical Cooperation for the Medical Research Institute Project signed on August 2, 1993 and the Record of Discussions on the Extension of Japanese Technical Cooperation signed on September 29, 1993. During its stay, the Team together with the Sri Lankan evaluation panel discussed and studied on the progress and achievements of the Project, as well as fulfillment of the commitments. Through careful studies and discussions, both sides summarized their findings and observations as described in the following chapters.

II . METHOD OF EVALUATION

1. Materials used as reference

(1) Record of Discussions between the Japanese implementation survey team and the authorities concerned of the Government of Sri Lanka on the Japanese technical cooperation for the Project.

(2) Record of Discussions between the Resident Representative of the JICA Sri Lanka office and the Government of Sri Lanka on the extension of the Japanese cooperation for the Project

(3) Joint Evaluation Report on Japanese Technical Cooperation for the Medical Research Institute Project in Sri Lanka

(3) Tentative implementation schedule of the Project.

(4) Official requests by the Government of Sri Lanka:
Form A1, A2, A3, and A4.

(5) Minutes of Discussions between the Japanese team and the authorities concerned of Sri Lanka on the Project

(6) Other reports, documents, and listings on the institutional achievements for supplements

2. Discussion and Observation

First, the team discussed with Sri Lankan authorities diverse aspects of the Project and observed the buildings, facilities, and apparatus/equipment made available for the Project.

Second, to assess the effectiveness of technical training in Japan, the Sri Lankan counterpart sent to Japan were interviewed and requested to answer the questionnaire.

Third, to discuss prospective roles and functions of the MRI, the team joined the Steering Committee Meeting of the MRI and the Coordinating Committee Meeting at the Ministry of Health.

III . OBJECTIVE AND ACTIVITIES OF TECHNICAL COOPERATION FOR THE PROJECT

1.Objective of the Technical Cooperation

According to the Record of Discussions signed on August 30, 1988, the objective of the technical cooperation is to develop the overall functions of MRI as the sole national laboratories workable to enable it to play a more active role in the control of diseases in Sri Lanka.

2. Activities of Technical Cooperation

In order to achieve the above-mentioned objective, the following functions of MRI was planned to be strengthened through the Japanese Technical Cooperation:

a. Diagnosis;
b. Education;
c. Reference;
d. Biological Production; and
e. Basic Research.

Japanese Technical Cooperation was implemented in the following seven departments, three centers, and two units (electron microscopy and molecular biology) upon the agreement of both sides. The sectionings herein were those proposed by the Japanese study team to reorganize the pre-existing 21 working groups for effective conduct of the Project.

1) Department of Bacteriology and Mycology
   a. Bacteriology-I
   b. Bacteriology-II
   c. Mycology
   d. Leptospirosis
   e. Enteric Bacteriology
   f. Food and Water Bacteriology

2) Department of Virology
   a. Virology-I
   b. Virology-II

3) Department of Pathology and Immunology
   a. Histopathology
   b. Haematology
   c. Immunology

4) Department of Biochemistry and Nutrition
   a. Biochemistry
   b. Nutrition

5) Department of Natural Products and Pharmacology
   a. Natural Products
   b. Pharmacology

6) Department of Entomology and Parasitology
   a. Entomology
   b. Parasitology

7) Department of Biological Production
   a. Vaccine
   b. Anti-venin
   c. Quality control

8) Experimental Animal Center

9) Electronmicroscopy Unit

10) Molecular Biology Unit

11) Center for Medical Instrumentation

12) Center for Education and Training of MLT (Medical Laboratory Technologist)

3. Japanese technical cooperation was extended for additional two years from January 1, 1993 until December 31, 1995. The major components of the cooperation during the extension period were as follows:

   1) Surveillance of infectious diseases in Sri Lanka with particular emphasis on:
   a. Acute respiratory infectious diseases among infants and children
   b. Outbreaks of diarrhoea by bacterial and viral agents

   2) Analytical studies on the causative factors of coronary artery sclerosis in Sri Lanka based on the nation-wide lipid profile survey.

   3) Basic studies on snake venoms anticipating the production of anti-venins for particular snake species to Sri Lanka.

4) Other relevant research activities mutually agreed upon as necessary.

Ⅳ . CONDUCT OF THE PROJECT (As of August, 1995)

1.PROJECT INPUTS

(1) STAFFING

During the course of the project overall, a total of fifty two Sri Lankan counterpart personnel have been assigned to its effective impl ementation and successful transfer of technology. List of the personnel including medical laboratory technologists is presented in Annex 1.

(2) JAPANESE EXPERTS

During the course of technical cooperation (1989-1993), JICA dispatched eight long-term and sixty one short-term experts. This was according to the Record of Discussions signed on August 30, 1988. During the course of extension of the Project (1994-1995), three long-term and ten shot-term experts were dispatched for additional cooperation. List of these experts (during the extension) is presented in Annex 2.

(3) SRI LANKAN COUNTERPART PERSONNEL TRAINING IN JAPAN

Sri Lankan counterpart personnel, twenty six in total with nine during the extension period, have been sent to Japan for either observation or technical training of the Project concerns. The personnel and subjects for the observation and training during the extension are listed in Annex 3. These personnel conducts covered most of the fields agreed in the Record of Discussions, August 30, 1988 and were amply effective for obtaining useful informations and technology.

(4) EQUIPMENT

During the entire course of the Project, equipment worth approximately 160 million yens, including 54 million yens for the extension period, was provided by the Government of Japan. The main equipment items together with reagents for the extension are listed in Annex 4. Equipment provided were observed to have been effectively used in the activities of the Project.

(5) BUDGET

A summing of the project costs spent by the Japanese and Sri Lankan Governments is shown in Annex 5 following the respective partitions. Both parties were recognized to have made the utmost effort to secure the budget needed for implementation of the Project.

2. PROJECT OUTPUTS

Outputs are marked for the respective departments, centers and units, giving the highlight achievements cited.

1) Department of Bacteriology and Mycology
   * PCR (polymerase chain reaction) technique was introduced for the subspecies classification of pathogenic microbes.
   * Reference functions were systematized with immunological methodologies.

2) Department of Virology
   * The department was designated as a regional reference laboratory for polio in the Southeast Asia by WHO (World Health Organization).
   * PCR technique was introduced for subtypic classification of viruses.
   * Monoclonal antibody technique was introduced for referential analysis of viruses.

3) Department of Pathology and Immunology
   * Diagnostic procedures for blood coagulation/platelet aggregation disorders were systematized.
   * Methodologies for lymphocyte analysis were introduced.

4) Department of Biochemistry and Nutrition
   * The department was lifted up for the function to a national reference center for nutrition and metabolism analysis.

5) Department of Natural Products and Pharmacology
   * Bioactive products from natural sources were analyzed at academic standard.
   * Assay of urinary metabolites of endocrine secretion was systematized.

6) Department of Entomology and Parasitology
   * Methodologies for genetic analysis of insecticide refractoriness were introduced.

7) Department of Biological Production
   * Pilot studies for production of anti-venin were conducted with a successful outcome.
   * Tissue culture method for propagation of rabies virus was introduced.

8) Electronmicroscopy Unit
   * The Unit was newly established for national necessity.
   * Survey technology of viral agents in the clinical specimens was established.

9) Molecular Biology Unit
   * The Unit was newly established for institutional necessity.
   * PCR technique for multipurpose was introduced.

10) Centre for Animal Experimentation
   * Breeding system of experimental animals at specific-pathogen-free level was established for supply to inside and outside of the institute.

11) Centre for Medical Instrumentation
   * Instruction for maintenance routines was edited and published for general use.

12) Centre for Education and Training of MLT (medical laboratory technologist)
   * Text manuals for practicals were edited and published.
   * Audiovisual system for the education and training was arranged to systematic use.
   * Facilities of the old building for lectures and practicals of MLT students were remolded by the aid of the Government of Sri Lanka.

Remarks:
*The accomplishments of technical cooperation during the extension period are shown in ANNEX 6.
*Annual schedule for the Medical Research Institute Project is attached as Annex 7.

V . CONCLUSION AND RECOMMENDATION

As a result of the joint evaluation and discussions on the achievement of the MRI project, both sides reached the following conclusion and recommendation.

Conclusion:

In reference to the Record of Discussions for the original and extended cooperations, the Project was overviewed to have been conducted effectively. The JICA action for the Project transferred much of technology and information to the Sri Lankan counterparts involved. In order to fulfill the initial intention and objectives to the desirable extent, the MRI is expected for further promotion of the institutional activities by the execution of Sri Lankan authorities concerned. With the wishes to this end, the Evaluation Panel recommended the followings for forthcoming activities by all of the personnel and organizations related.

Recommendations:

1) As the sole national laboratories workable, the MRI should be strengthened for and maintain the reference activities as the national standard.

2) With respect to the reference activities, those for infectious microbes in particular, the techniques of monoclonal antibody and PCR (polymerase chain reaction) should be expertized to academic standard.

3) Adequate amount of budget should be allocated to the maintenance of the facilities and instruments for uninterrupted and effective utilization.

4) Qualified full-time staff are desirable to be assigned to the maintenance of the facilities and instruments, or appropriate private agents should be contracted for that purpose.

5) Sri Lankan counterparts trained in Japan and in the countries of cooperation with the Project should be fully active for dissemination of the gained technologies, not only in the institution but also into the branches scheduled to be established/any other institute as decided by the Ministry of Health.

6) Epidemiology Unit is desirable to be newly established for institutional assignment for effective disease control.

7) Accurate records should be maintained at an institutional level regarding the use and disposal of radioisotopes. Regulations governing such processing should be strictly enforced and monitored by the Atomic Energy Authority of Sri Lanka.

8) A higher priority should be given to the reference and research functions of the MRI. To promote this, steps should be taken to reduce the workload of the MRI staff with respect to simple routine tests which can be performed at hospital laboratories.

9) To facilitate the above recommendation (8), the peripheral laboratories should be strengthened with regard to staff and training. The training needed for introduction of new tests in the periphery should be performed by the MRI.

10) Meaningful steps should be taken to introduce and continue to perform more sophisticated investigations including rapid diagnostic techniques in the MRI.

11) Also, the Panel recognized the necessity of all the items of Recommendations in the Joint Evaluation Report (August 2, 1993) according to their extents except for the item 1 of duplication.

Remarks:

Issues of rabies vaccines and anti-snake venins of Sri Lankan locality were raised but separated from the mission agenda for their inappropriateness to the Project. The Panel records the discussion of the issues due to their nation-confronting importance.

ANNEX 1

LIST OF RESEARCH OFFICERS

As of June, 1995

Department of Natural Products & Pharmacology

MD/MBBS : 2 persons	Dr T M J Munasinghe
	Dr Ms C Rajapakse
PhD/B.Sc.: 3 persons	Dr W H N W Herath
	Dr E M K Wijaratne
	Dr L B De Silva

Electronmicroscopy Unit

MBBS : 1 person	Dr M A A Razak

Department of Virology

Masters : 1 person	Dr Ms N Withana
MBBS/B.Sc.: 11 persons	Dr Ms G Colombage
	Dr Ms W Bandaranayake
	Dr Ms S Gunasena
	Dr Ms A Shivanandan
	Dr Ms G Galagoda
	Dr D Devapura
	Dr K Kulathunge
	Dr G Wickremasinghe
	Dr Ranjan
	Ms Punsha Jenette
	Mr Ramesh

Department of Pathology & Immunology

MBBS/B.Sc.: 7 persons	Dr Ms R K A De Tissera
	Dr Ms S Gunawardena
	Dr R De Silva
	Dr Ms R Ramalingadevar
	Dr H Ratnayke
	Dr Ms S Jayasuriya
	Dr Thilakaratne

Department of Bacteriology & Mycology

Ph.D : 1 person	Dr Ms M C Attapattu
Masters : 1 person	Dr R S B Wickremasinghe
MBBS/B.Sc.: 9 persons	Dr Ms P Somaratne
	Dr Ms P Perera
	Dr Ms R Seneviratne
	Dr K J Cooray
	Dr Ms P Chandrasiri
	Dr Ms S Nanayakkara
	Dr Ms N Pallewatne
	Dr Ms Udalamatta
	Ms K Kulathunga

Department of Entomology & Parasitology

MS : 1 person	Dr Ms I S Weerasinghe
MBBS : 2 persons	Dr Ms P D S M Gunawardena
	Dr Ms S Samarasinghe

Department of Biochemistry & Nutrition

Ph.D : 1 person	Dr Ms P Premachandra
MS : 1 person	Dr Ms P Uluwita
MBBS : 5 persons	Dr D G R Gunawardena
	Dr Ms C L Piyasena
	Dr Mahamithawa
	Dr Ms Goonarathne
	Dr W A D K Gunathunge

School of Medical Laboratory Technologists

MBBS/B.Sc.: 1 person	Ms M K Jayawardena

Animal Centre

B.Sc. : 2 persons	Dr Ms S Jayasekera
	Dr Mayuri Geethanjalie

Department of Biological Production

Masters : 1 person
MBBS/B.Sc.: 3 persons

Dr A Sathasivam
Dr Ms O Wimalaratne
Dr Nagiswaran
Ms D Perera

LIST OF MEDICAL LABORATORY TECHNOLOGISTS

Mr D K C Amarasinghe
Mr U H Bandula
Mr D K L W Jayamanne
Mr P S V W Jinapala
Mr P Wickremasinghe
Mr U C Hettiarachchi
Ms M Pattiarachchi
Ms K S N Jayaratne
Ms M A De Silva
Ms D K D Silva
Ms H H K K Jinapala
Ms K Goonesekera
Ms Nanda Jayawardane
Mr P K Jayaweera
Ms K L Peiris
Ms D M L C Hettiarachchi
Mr S A L P Suraweera
Mr K S T Karunapala
Mr B C Suraweera
Ms B Y Gamage
Ms K C R Perera
Ms R N Abeyweera
Ms Dhammika P Athukorale
Ms D S S Goonewardane
Ms M A Malkanthi
Mr S K Tennekoon
Ms G R D Wimalawickrema
Mr D K A De Soyza
Mr A L C T K Munidasa
Ms R A D T Priyadhashanee
Mr S K Nanayakkara
Ms H H Lakshmi Udayangance
Ms R R N Rajapakse
Ms Thamara Kumaru Meinike
Mr L B R W A M R K Lankatillake
Mr M A T N Kularatne
Ms H M H Kumarihamy
Mr C K Basnayake
Mr J K J B Dissanayake
Mr N A U Samaranayake
Mr B M B Gnanangs
Mr K P R Premawansha
Mr L A S Rajapakse
Mr W G S Sisira Kumara
Mr M Jayantha Peiris
Mr B D Lankananda
Ms L D Preethimala
Ms C S C Chandanee Sriyakanthi
Mr N A Rajapakse
Mr K T K Hasantha
Mr R W Munasinghe
Mr M S G Perera
Ms Anusha Thyagarajah
Ms M L Perera
Ms N C N Seneviratne
Mr W S A Fernando
Mr D N Gallage
Mr K Munasinghe
Mr N H S Navaratne
Ms E A N S Peiris
Ms B S Wijesinghearachchi
Mr M K Baddage
Mr B Chandana Dharmapriya

ANNEX 2

LIST OF JAPANESE EXPERTS DISPATCHED BY JICA

NO.	JAPANESE FISCAL YEAR	NAME	PERIOD	FIELD
1.	1993-1993	Ms. Kikuko Miyamura	93.07.25-93.08.03	Epidemiology
2.	1993-1993	Dr. Atsushi Koyama	93.07.25-93.08.03	Electron Microscope
3.	1993-1993	Dr. Yoshihisa Onishi	93.11.19-93.12.26	Pathology
4.	1993-1993	Dr. Kazumasa Sato	93.11.19-93.12.26	Pathology
5.	1993-1995	Mr. Akira Naruse	94.02.10-95.12.31	Coordination
6.	1993-1993	Dr. Nobuo Sakuragawa	94.03.08-94.03.17	Haematology
7.	1993-1995	Mr. Shoichi Shimizu	94.03.15-95.12.31	Biomedical Engineering
8.	1994-1994	Dr. Tadahiro Hamada	94.04.02-94.04.10	Virology
9.	1994-1995	Dr. Masako Matsuyama	94.04.19-95.04.18	Virology
10.	1994-1994	Dr. Shigeru Kobayashi	94.08.08-94.08.22	Electron Microscope
11.	1994-1995	Mr. Hitoshi Watanabe	94.09.07-95.12.31	Clinical Investigation
12.	1994-1994	Dr. Masao Mitsuyama	94.09.26-94.10.06	Bacteriology
13.	1994-1994	Dr. Seiichi Ichikawa	94.10.17-94.10.31	Epidemiology
14.	1994-1994	Dr. Toru Abo	94.10.21-94.1030	Immunology
15.	1994-1994	Dr. Masaaki Arakawa	94.12.17-94.12.24	Cooperation Planning
16.	1994-1994	Dr. Yoshihisa Onishi	94.12.22-95.01.27	Pathology
17.	1994-1995	Dr. Tadahiro Hamada	95.03.25-95.04.02	Cooperation Planning
18.	1995-1995	Dr. Shigeru Kobayashi	95.07.24-95.08.14	Electron Microscope

ANNEX 3

LIST OF SRI LANKAN COUNTERPARTS SENT TO JAPAN

NO.	JAPANESE FISCAL YEAR	NAME	TRAINING PERIOD	TRAINING FIELD
1.	1993	Mr.P Wickramasinghe	1993.05.31-1994.03.29	Haematology
2.	1993	Dr.P Perera	1994.01.10-1994.12.20	Mycology
3.	1993	Dr.A Razak	1994.01.10-1994.12.20	Electron Microscope
4.	1993	Dr.N R Silva	1994.02.24-1995.01.31	Pathology(Allergy)
5.	1994	Dr.P V R Kumarasiri	1994.12.12-1995.11.30	Epidemiology
6.	1994	Dr.E M K Wijerathne	1994.12.12-1995.12.01	Natural Product
7.	1994	Ms.I S Weerasinghe	1994.01.19-1995.12.01	Entomology
.	1994	Ms.P U Uluwita	1995.03.26-1996.03.10	Biochemistry

ANNEX 4

PROVISION OF EQUIPMENT
(TECHNICAL COOPERATION ITEMS)

JAPANESE FISCAL YEAR	ITEMS OF MAIN EQUIPMENT	AMOUNT CIF ¥ (Thousand Yen)	
1993	Ultra-low temperature freezer	798	22,846
	Ultrasonic pipet washer	421	
	Spectrophotometer	820	
	Low temperature incubator	600	
	Laboratory Sterilizer	540	
	Cutting blade for pelleting machine	550	
	Pharmaceutical refregirator	330	
	High performance liquid chromatograph column	369	
1994	High pressure steam strerilizer	585	28,851
	Analytical balance	265	
	Medical freezer	830	
	Tissue embedding console system	1,850	
	Sledge microtome	800	
	Rat metabolism cage	985	
	Inverted microscope	1,250	
	Copy machine	835	
	Landcruiser	2,000	
	HAM(N)EIA	1,412	
	HSV REAGENT SET	512	
	Enzygnost anti HBC	720	
1995	High speed cold micro centrifuge	700	25,526
	Class II biological safety cabinet	1,130	
	Straight screw for pelleting machine	1,200	
	Absolute filter	1,000	
	Rat cage	860	
	Fixed angle rotor	1,890	
	Filter element for exhaust(Steam sterilizer)	552	
	Low speed refregirated centrifuge	650	
	Spare parts for electron microscope	736	
	Carbon dioxide incubator	1,000	

PROVISION OF EQUIPMENT
(EXPERT BROUGHT ITEMS)

JAPANESE FISCAL YEAR	ITEMS OF MAIN EQUIPMENT	AMOUNT CIF ¥ (Thousand Yen)
1993	FITC standard anti-mouse IgG(H+L)	¥4,021
	Aniti-human CD3,CD4,CD8	
	Micro syringe	
	HPLC column	
	Adenosin 5 diphosphatas	
	Collagan reagent	
	FDC kit	
1994	Taq DNA polymerase	¥8,002
	Primer for PCR	
	DNA size marker(λ/Hind IIIdigest)	
	Electron microscope	
	Ethidium bromideie	
	Changeable silicon	
	Cesium chloride	
	Bromphenol blue	
	Pristane	
	Phenol	
	Glass feeder	
	Slide glass pack	
	Blood diluting pipet	
	Blood calculation plate	
	Pipet	
	Test tube	
	Table top steam sterilizer	
	P.C. board for sterilizer	
	Three-in-one type ph electrode	
1995	CPU plate assembly for a natural oven	¥ 257
	Ultra-violet lamp	
	Temperature senser for an incubator	
	Air drier	

ANNEX 5

SUMMARY OF PROJECT COST

1. Japanese Side (Unit:Thousand Yen)

JAPANESE FISCAL YEAR	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	TOTAL
COST OF PROVISION OF EQUIPMENT	0	32,930	39,530	38,103	27,464	22,846	28,851	25,526	215,250
EXPERT BROUGHT EUQIPMENT	0	4,168	25,274	2,283	6,878	4,021	8,002	257	50,883
OTHER LOCAL RUNNING COSTS	0	3,957	12,909	9,606	14,521	2,621	15,001	11,991	71,606
OTHERS	0	818	406	667	298	1,947	799	0	4,935
TOTAL	0	41,873	78,119	50,659	49,161	32,435	52,653	37,774	342,674

·This table is as of June.1995.

·Japanese fiscal year is from April 1 to March 31.

·Cost of training of counterpart personnel is not included in this table.

2. Sri Lankan Side (Unit: 1000Rs)

SRI LANKAN FISCAL YEAR	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	TOTAL
ALLOCATION	7,300	19,303	21,519	33,191	29,709	27,934	31,833	35,071	205,860
EXPENDITURE	10,645	14,663	21,507	21,516	25,530	30,475	35,888	16,696	176,920

·This Table is as of June.1995.

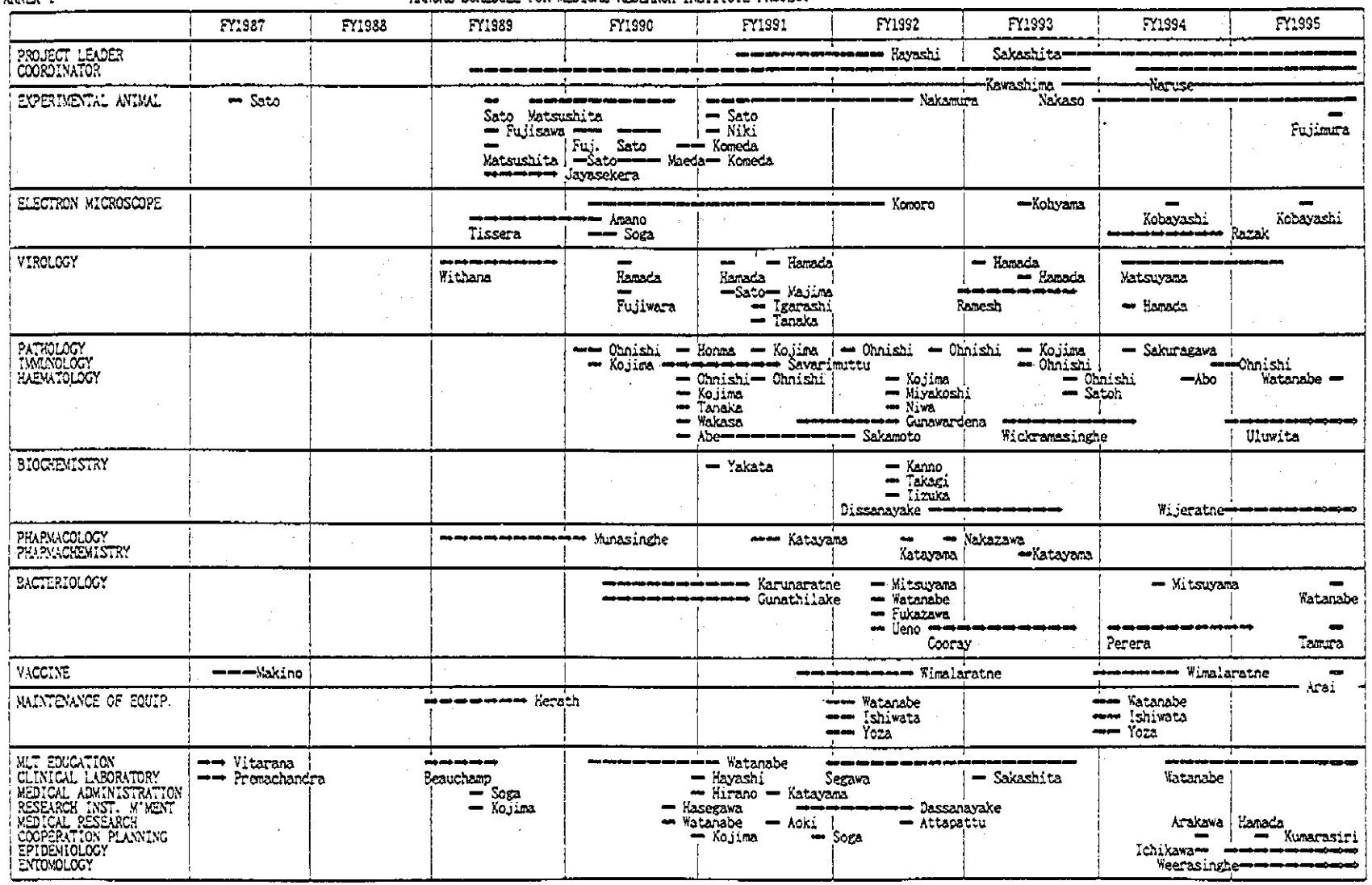
·Sri Lankan fiscal year is from Jan.1 to Dec 30.

ANNEX 6 MAJOR ACHIEVEMENT OF THE MEDICAL RESEARCH INSTITUTE PROJECT

	DIAGNOSIS	REFERENCE	
Department of Bacteriology a. Bacteriology I b. Bacteriology II c. Mycology d. Leptospirosis e. Enteral Bacteriology f. Food and Water Control	*PCR technique for detection of tubercle bacilli *PCR technique for identification of fungal species *Isolation, identification and serodiagnosis of mycoplasma pneumoniae *Immunological classification of pathogenic bacteria *Drug susceptibility testing for fungi	*Refer to Annex 6 in Joint Evaluation Report on Japanese technical Cooperation for the Medical Research Institute in the Democratic Socialist Republic of Sri Lanka published in March 1994.	*Acute respiratory diseases among infants and children *Outbreaks of diarrhea by bacterial and viral agents *A study on incidence of legionellosis in Sri Lanka *A study of microbiological agents in the aetiology of meningitis in Sri Lanka
Department of Virology a. Virology I b. Virology II	*Monoclonal antibody formation-HSV and RSV *Laboratory diagnosis of HCV antibody *Viral diarrhea detection and epidemiology	ditto	*Acute respiratory diseases among infants and children *Outbreaks of diarrhea by bacterial and viral agents *A study on the role of hepatitis C virus infection in the aetiology of chronic liver diseases in Sri Lanka
Department of Pathology and Immunology a. Histopathology b. Haematology c. Immunology d. Electron microscopy	*Recent techniques for diagnosis of blood coagulation disorders *Recent techniques for diagnosis of platelet aggregation disorders *Diagnosis of viral diarrhea with electron microscope *Use of immune electron microscope *Lymphocyte transformation *Detection of T lymphocyte subsets	ditto	*Surveillance of immunodeficiency among the Sri Lankans *Preparation of snake antivenom
Department of Biochemistry a. Biochemistry b. Nutrition		ditto	*Lipid profile project of various sectors in Sri Lanka *Surveillance of iodine deficiency disorders in selected districts
Department of Pharmacology a. Pharmacology b. Natural Product		ditto	*Isolation of bioactive compounds from natural sources
Department of Entomology a. Entomology b. Parasitology	*Recent technology for diagnosis related to cryptosporidium, microsporia, and blastocystis hominis	ditto	
Department of Biological Production a. Vaccine b. Anti-venin c. Quality control	*Refer to Annex 6 in Joint Evaluation Report on Japanese technical Cooperation for the Medical Research Institue in the Democratic Socialist Republic of Sri Lanka published in March 1994.	ditto	*Rabies antibody project
Center for Medical Instruments	*Completion of manual: Basis Technical Management for Medical Equipment/Instruments - Management, Maintenance and Troubleshooting Techniques *Practical Guidance *Distribution of the manual to related facilities (Sri Jayawardenapura Hospital, Biomedical Engineering Services MOH etc.)		
Animal Center	*Completion of Practical Manual: Standard Operating Procedure of Animal Breeding and Experiment *Practical Guidance		
Medical Technology School	*Completion of Practical Manual: a. Clinical Chemistry; b. Histopathology; c. Haematology; d. Blood Bank Serology; e. Microbiology *Introduction of audio-visual education *Refresher course for medical laboratory technologists: 2nd course Basic Concept of Laboratory Management 3rd course Haematology		
Others	*Establishment of Molecular Biology Unit *Laboratory diagnosis of HEV and laboratory/electromicroscopic diagnosis of viral diarrhoea at Electron Microscope Unit *Training of a counterpart staff in epidemiology		

ANNEX 7

ANNUAL SCHEDULE FOR MEDICAL RESEARCH INSTITUTE PROJECT



දුරකථන
தொலைபேசி
Telephones: 698171, 698175, 698490, 698507

Fax: 692913, 698520

සුවසිරිපාය
சுவசிரிபாய
Suwasiripaya

මගේ අංකය
எனது இல.
My No. IAB 37/89

ඔබේ අංකය
உமது இல.
Your No.

දිනය
திகதி
Date 31.07.1995

යෞවන, මහාමාර්ග හා සමාජ සේවා අමාත්‍යාංශය
சுகாதார, நெடுஞ்சாலைகள், சமூக சேவைகள் அமைச்சு
MINISTRY OF HEALTH, HIGHWAYS & SOCIAL SERVICES

Mr. Y. Nakanura
Resident Representative/Director
Japan International Cooperation Agency
Colombo

Dear Mr. Nakanura,

MRI/JICA Technical Cooperation Project - Joint Evaluation

I refer to your letter dated 7th July,1995 on the above subject.

In this connection Dr. Maya Atapattu, who was the Director of the Medical Research Institute until 04.07.1995, will represent and be responsible for the Director of the MRI at this joint evaluation made by both Governments.

She has been the Deputy Director, Actg. Director and the Director during the period under review and as such she is the most suitable person for this evaluation.

Yours sincerely,

Dr. Lalith Mendis
Deputy Director General of
Health Services (Laboratory
Services)

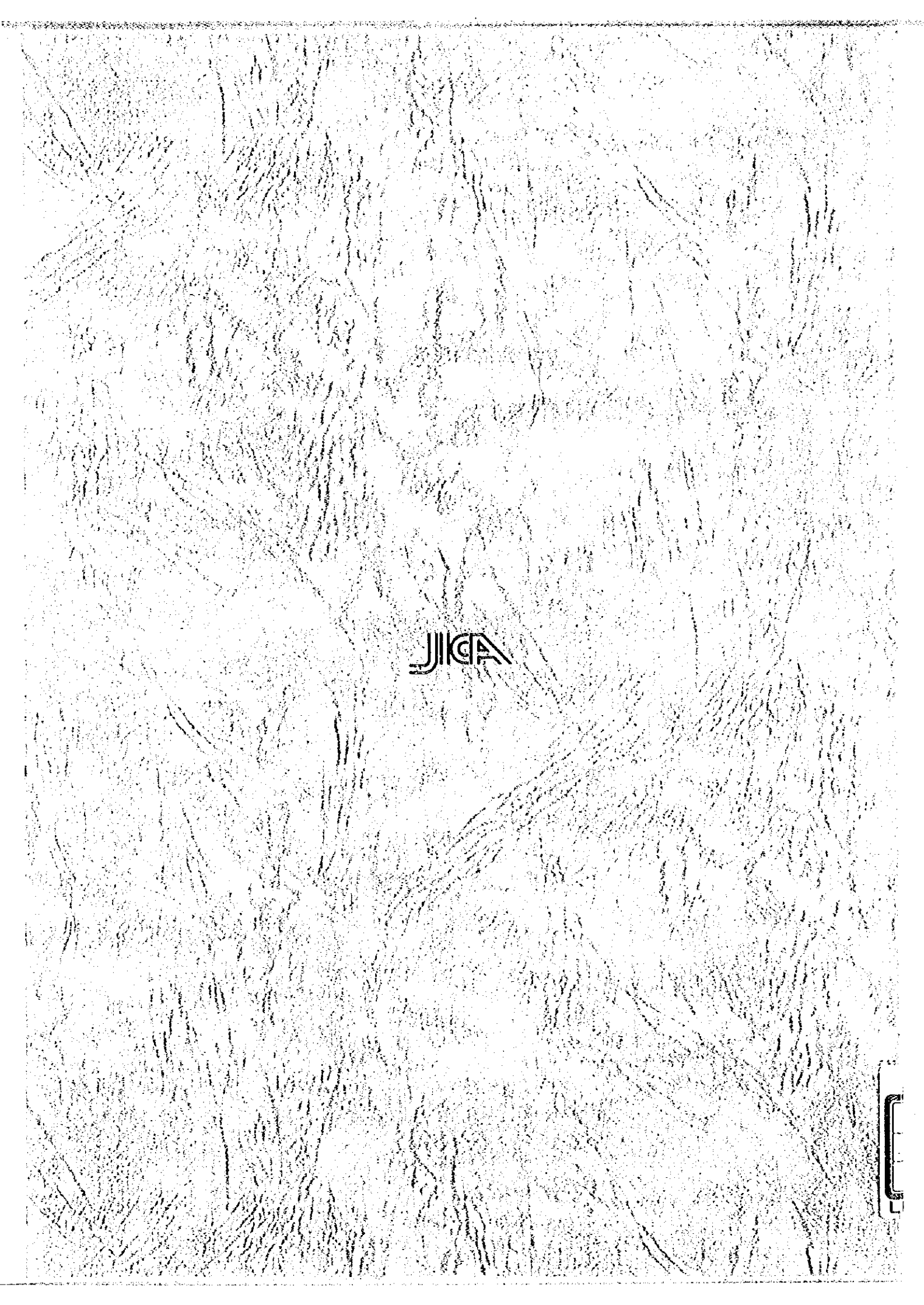
Sgd.Dr. Dudley Dissanayaka
Secretary/Health, Highways &
Social Services

cc. Dr. Amarasinghe
Actg. Director/MRI

Dr. Maya Atapattu
Consultant Microbiologist - for necessary action

JICA - Team Leader, MRI

385, Deans Road, Colombo 10. 385, டீன்ஸ் வீதி, கொழும்பு 10. 385, Deans Road, Colombo 10.


JICA