# *Institute of Biochemistry, Molecular Biology and Biotechnology*
# *University of Colombo*

## *Annual Report – 2011*

# *Contents*

## Quick Reference

**Registered Office:**

No: 90, Cumaratunga Munidasa Mawatha, Colombo 3, Sri Lanka
www.ibmbb.lk

**Telephone Numbers:**

| | |
|---|---|
| General: | +94-11-2552528 |
| Director: | +94-11-2552534 |
| Senior Assistant Registrar: | +94-11-2553672 |
| Senior Assistant Bursar: | +94-11-2553683 |

**Fax Numbers:**

| | |
|---|---|
| Director: | +94-11-2552529 |
| General: | +94-11-2553683 |

**E-mail:** director@ibmbb.cmb.ac.lk

**Director's Review**: Civil construction and equipment of the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB) was funded by a soft loan of 15 million Swedish Kroners (SEK) provided by the Swedish International Development Agency (SIDA) to the Government of Sri Lanka. The initial design of the IBMBB was funded by the Asian Development Bank's Science and Technology Personnel development project.

Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB) was ceremonially declared open on 28$^{th}$ April, 2004 by Her Excellency Anne Marie Fallenius, the Head of Mission, Embassy of Sweden, Colombo, and Prof. Ulf Pettersson, Vice-Rector, University of Uppsala, Sweden. The Ordinance of the Institute was gazetted by Gazette Extra-ordinary No. 1282/25 of 3$^{rd}$ April, 2003. The building is located in the main campus of the University of Colombo. The IBMBB is equipped with all modern instruments used in molecular life sciences such as fully automated DNA sequences, microarray scanner, FPLC, HPLC, Fluorescence and Phase contrast microscopes, laminar floor hoods, cell culture facilities, insectory, cold rooms, local area net working, access to internet via dedicated optical fiber cable and is fully air-conditioned.

The IBMBB does not admit undergraduate students but will cooperate with undergraduate teaching programmes of the university. The main thrust areas of activities are MSc, MPhil and PhD programmes. IBMBB conducts two full time MSc programmes one in Molecular Life Sciences and the second one an MSc in Cellular and Molecular Immunology. The main objective of these courses is to provide focused training in current areas of molecular life sciences relevant to the development of Sri Lanka and also to encourage young graduates to proceed for further advanced studies leading to PhD. Also novel methods of teaching such as assignments, workshops, seminars, formulation of research proposals are used.

Two International Travel Awards were won by research students. Eleven students registered at the IBMBB and eight students registered at other Higher Educational Institutes carried out research work leading to MPhil/PhD at the IBMBB. Two PhDs were successfully completed. Nine MSc students from 2009 continued their second year of work and 6 of them satisfactorily completed the course on schedule. Nineteen new MSc students were admitted in February 2011. A Cetificate Course in Molecular Biological Techniques was held in August. Four original research papers were published in International Journals, two original research papers were in press and three papers were under review by International Journals during the year 2011. Thirty two research presentations including 6 at International conferences were made by IBMBB staff and students.

**Director:**

Professor Kamani H Tennekoon

**Board of Management**

Director (Chairman)

Secretary/Ministry of Higher Education, Ex-officio or his/her nominee

Professor E R Jansz, UGC Nominee

Professor Eric H Karunanayake, UGC Nominee

Professor Rohan Rajapakse, UGC Nominee (until July 2011)

Prof.S Mohandas, UGC Nominee (from July 2011)

Professor Ira Thabrew, UGC Nominee

Mr. Mahinda Rajapakse, Council Nominee (until June 2011)

Mr. H.M.N. Warakulle, Council Nominee (from July 2011)

Mr C. Maliyadde, Council Nominee

Prof. M.H.R.Sheriff, Senate nominee

Ms. W. I. Nanayakkara, Senate Nominee

Dean/Medicine, University of Colombo, Ex-officio

Dean/Science, University of Colombo, Ex-officio

Head/Biochemistry & Molecular Biology, Faculty of Medicine, Ex-officio

Director, University of Colombo School of Computing, Ex-officio

## VISION

“To be

an

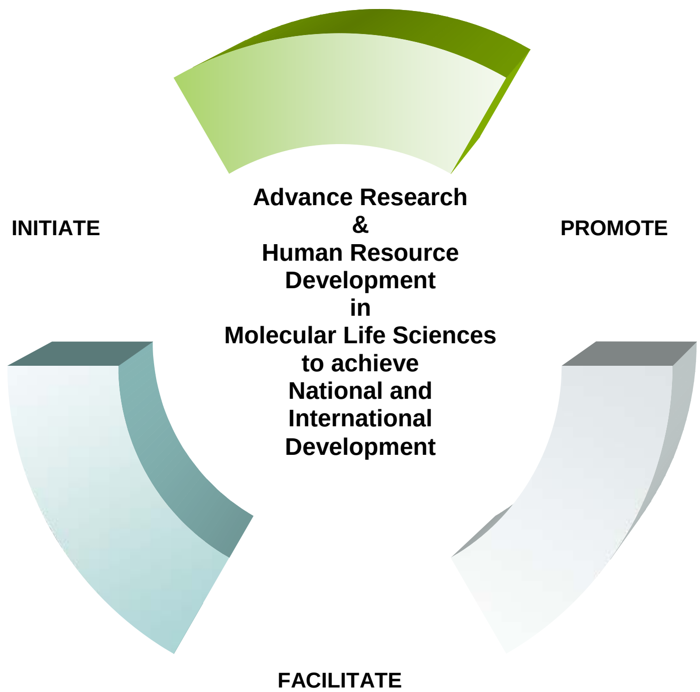
**International**

**Centre of Excellence**

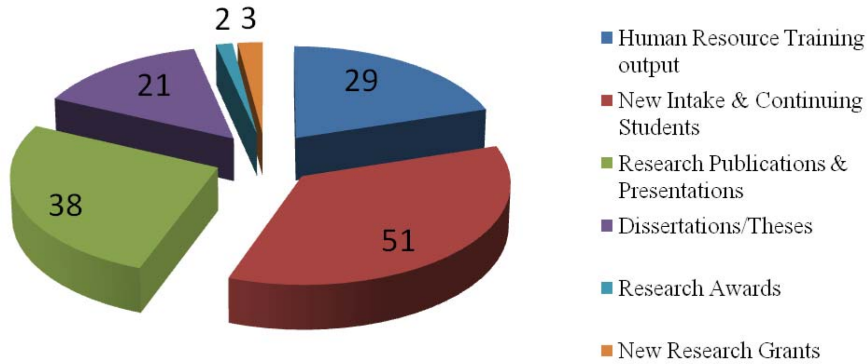
in

**Molecular Life Sciences**”

# MISSION


INITIATE
Advance Research
&
Human Resource
Development
in
Molecular Life Sciences
to achieve
National and
International
Development
PROMOTE
FACILITATE

# Achievements 2011 at a glance



**International Recognition**: IBMBB continued as a Resource Centre for Molecular Life Sciences in Asia for the International Programme in Chemical Sciences (IPICS), University of Uppsala and as the National Node for European Molecular Biology Network (EMBnet).

IBMBB staff and students were able to publish their research findings in International Journals and present their findings at several International conferences. Details are given elsewhere. One PhD student won a Travel Award from the International Society for the Study of Xenobiotics to present his work at the North American Meeting of International Society for the Study of Xenobiotics and another won the under 34 competition held by the International Society for Gynecological Endocrinology (based on abstracts submitted by authors under 34 years) to present his work at the 15th World Congress on Gynecological Endocrinology in March 2012 in Florence, Italy.

# Human Resource Development

## Postgraduate Programmes

### MPhil/PhD Programmes

Eleven students who registered previously at the IBMBB continued their work and Research programmes on which their work is based are described under Research activities.

Eight students registered at other Higher Educational Institutes for MPhil/PhD carried out all or part of the studies at the IBMBB. These included two students registered at the Faculty of Science, University of Colombo; one student registered at the University of Colombo School of Computing, one student registered at the University of Kelaniya, one student registered at the University of Moratuwa, one student registered at the University of Peradeniya and two students registered at the University of Sri Jayawardenapura (Table 1).

In addition to the 18 MPhil/PhD students mentioned above (11 registered at IBMBB and 7 registered in other HEI), IBMBB staff co-supervised one PhD student and two MPhil students registered at the Faculty of Graduate Studies, University of Sri Jayawardenapura.

## MSc Programmes

Seventh batch of students was admitted for the two MSc programmes in February, 2011 with 06 students registering for Molecular Life Sciences and 04 for Cellular and Molecular Immunology. 2011 intake had their first and second semester lectures, laboratory practicals, seminars, tutorials etc. Mid semester and end of semester one examination were also held during the year. In addition students received assignments which included written and oral presentations. 2010 intake continued with their second semester lectures, practicals, seminars, tutorials etc. and had the end of semester two examination. All students in the 2010 intake except two in Molecular Life Sciences qualified to proceed to third semester.

Twenty two MSc Research projects were carried out [two students in the 2008 intake who had to repeat course examinations, two students in the 2009 intake (one who delayed commencement of the project due to medical reasons and one who delayed completion of the research project) and seventeen students of the 2011 intake]. Of these seventeen (Ten in Molecular Life Sciences and seven in Cellular and Molecular Immunology) Dissertation examinations were either completed or Dissertations were submitted for examination in the year 2011.

Professor Eric H Karunanayake Gold Medal for the Best Student in MSc in Molecular Life Sciences and the GlaxoSmithKline Gold Medal for the Best Student in MSc in Cellular and Molecular Immunology were not awarded in 2011 as none qualified (for the 2009 intake).

Dr. OVSDJ Weerasena continued as the Coordinator of the MSc in Molecular Life Sciences and Dr. Shiroma Handunnetti continued as Coordinator of the MSc in Cellular and Molecular Immunology.

The following academics / visiting faculty gave lectures and/or conducted tutorials/ practical classes for the MSc in Molecular Life Sciences: Prof. Eric H. Karunanayake, Prof. Kamani H Tennekoon (IBMBB), Prof. Ira Thabrew, Prof. Vasanthi Arsaratnam (Faculty of Medicine, University of Jaffna), Prof. Rohini Fernandopulle (Faculty of Medicine, University of Colombo), Prof. Rohini Hewamanne (Faculty of Science, University of Colombo), Dr. Jagath Weerasena (IBMBB), Dr. Nilanthi Dassanayake (University of Sri Jayawardenapura), Dr T Eswaramohan (Faculty of Science, University of Jaffna), Mrs. Kantha Lankathilake (Faculty of Medicine, University of Colombo), Dr. Shyamala Tirimanne (Faculty of Science, University of Colombo), Dr. Sumithra Tissera (Family Planning Association), Mrs Sumedha Wijeratne (Faculty of Medicine, University of Colombo). Ms. Sudeshini Hewage and Ms Sumadee De Silva assisted with the practical course.

The following academics / visiting faculty gave lectures for the MSc in Cellular and Molecular Immunology. Prof. Eric H Karunanayake (IBMBB), Prof. Anura Weerasingha (Faculty of Medicine, University of Kelaniya), Prof. S Kotagama ( Faculty of Science, University of Colombo), Dr. Shiroma Handunetti (IBMBB), Dr.

Suranjith Seneviratne (Clinical Immunologist, Imperial College, London), Dr. Enoka Corea (Faculty of Medicine, University of Colombo), Drs. Rajiva de Silva, Sepali Gunawardena, Omala Wimalaratne, Nishali Ekanayake, Janaka Munasinghe and Preethi Perera (Medical Research Institute), Dr. Dharshan De Silva (Genetech), Dr. S. Ginige (Epidemiology Unit, Ministry of Health), Dr. Saroja Siriwardena (National Hospital, Sri Lanka), and Dr. Baddhika Jayaratne and Dr. Damayanthi Peiris (Cancer hospital, Maharagama). Mrs. S Goonetilleke assisted the practical course.

Applications for the 2012 intake of students were invited, selection examination was held and the interviews are scheduled for January 2012.

## Short Courses

### Certificate Course in Molecular Biological Techniques

In order to provide an exposure to molecular biology and genetics, a 5 day certificate course in molecular biological techniques was conducted from 8$^{th}$ August 2011 to 12$^{th}$ August 2011. In total 10 participants, (04 males and 06 females) participated in this course. The workshop was highly rated by the participants. The participants included 07 staff members from other Universities / Research Institutes/ Government Departments. Some of them were supported by their respective Institutes.

## Fourth Annual Scientific Sessions

Fourth Annual Scientific Sessions of IBMBB was held on 5$^{th}$ May, 2011. Vice Chancellor, University of Colombo, other distinguished academics/ scientists and members of the family of late Prof. Stanley Wijesundera attended the opening sessions. The highlight of this event was the Professor Stanley Wijesundera Memorial Lecture delivered by Prof. E Dilip de Silva, Senior Professor of Organic Chemistry, University of Colombo. He spoke on “Drugs from Nature: Harnessing Chemical Diversity in Biodiversity”. Dr. Erik Bongcam-Rudloff, Associate Professor, Swedish University of Agricultural Sciences, Uppsala, delivered a plenary lecture on “Next Generation Sequencing”. There were ten oral presentations and sixteen poster presentation. Out of these, seven oral presentations and fifteen poster presentations were from IBMBB researchers and postgraduate students.

## Seminars

A seminar on “Elimination, Emergence and Re-Emergence of Infectious Diseases-Research Needs” was organized by the IBMBB, coordinated by Dr. Shiroma Handunnetti. Prof. Nathkunam Ketheesan of James Cook University, Australia; Dr. Samith Ginige, Consultant Epidemiologist, Ministry of Health, Prof Mirani Weerasooriya, Professor of Parasitology, University of Ruhuna, Dr. Gawrie Galappaththi, Anti Malaria Campaign, Prof. Jennifer Perera, Professor of Microbiology, Faculty of Medicine, University of Colombo, Dr. Dharshan De Silva, GeneTech Research Institute, Dr. Shiroma Handunnetti, IBMBB were the resource persons for this one day seminar attended by students of the IBMBB and from outside as well as several scientists, researchers and clinicians.

**Supervision of research projects of MSc students and Undergraduate students registered at other Institutes and Faculties of the University of Colombo**

Research Projects of two MSc student (Department of Chemistry, Faculty of Science; MSc Molecular Medicine, Post Graduate Institute of Medicine) and three undergraduate students (Biochemistry and Molecular Biology, Faculty of Science) were supervised by IBMBB staff.

**Exposure of Undergraduate students to Molecular Biology**

Eleven students from the Faculty of Agriculture and Plantation- Management Wayamba University had a one day visit to the IBMBB for an exposure to Biotechnology Applications.
IBMBB staff conducted practical demonstrations in Molecular Biology for BSc (Hons) Biomedical Science students from BMS.

**Staff Development and Welfare**

Assistant Network Manager participated in a workshop on Next Generation Sequencing Data Management held in conjunction with EMBnet meeting in Oeiras, Portugal from 26$^{th}$ to 27$^{th}$ May 2011.

Two senior lecturers participated in the “QIG Training workshop for Postgraduate research Programme proposal Writers” held on October 4$^{th}$ 2011

**Staff Development Progarmmes for other HEIS and Research Institutes**

One probationary lecturer each from the Eastern University and Jaffna University continued their PhD studies at the IBMBB. These studies were fully supported by IBMBB research funds and were supervised by IBMBB staff. One probationary lecturer from University of Sri Jayawardenapura and one probationary lecturer from Institute of Indigenous Medicine carried out part of their PhD studies at the IBMBB. These studies were partially supported by IBMBB and were supervised by IBMBB staff.

One scientist from Tea Research Institute carried out her MPhil studies at the IBMBB and the research was co-supervised by IBMBB staff.

Dr. Shiroma Handunetti contributed to the Immunology Course for laboratory Technologists conducted by the Allergy and Immunology Society of Sri Lanka in March 2011 as Teaching faculty.

## National Development through National/International Agencies

Collaborative research programmes with the Tea Research Institute, Plant Genetic Resources Centre, National Cancer Hospital Maharagama, Castle Street Hospital for Women, National Hospital Sri Lanka, Base Hospital Homagama, Medical Research Institute, Faculties of Medicine and Science, University of Colombo and Sri Jayawardenepura University, Faculty of Medicine, University of Kelaniya, Agri Biotechnology Centre, University of Peradeniya, Open University, Wayamba University and Industrial Technology Institute were continued during the year.

Director, Prof. Kamani Tennekoon served as a member of the National Coordinating Committee on Reproductive Health Research. She also took part in the Stake Holders meeting on a Draft National Policy on Human Genetic Material and Data for Sri Lanka organised by the National Science Foundation in November 2011. She was a reviewer of manuscripts for the Ceylon Medical Journal and Archives of Medical Research, reviewer of research proposals and progress reports to the National Science Foundation and National Research Council.

Dr. Shiroma Handunetti served as a member of the Biotechnology Committee of the National Science Foundation and was a reviewer of progress reports, final reports and new research project proposals. She participated in the “Fourth Meeting of the SAARC Working Group on Biotechnology” organized by the Ministry of Technology and Research in April 2011 She was a Council Member of the Allergy and Immunology Society of Sri Lanka (AISSL). She was a member of the panel of Judges to evaluate the research presentations at “AGRES 2011” organized by the Faculty of Agriculture & Plantation Management, Wayamba University of Sri Lanka in September and a Dissertation examiner for Faculty of Science, University of Colombo.

Dr. Jagath Weerasena functioned as a Visiting Lecturer to the Wayamba University, as a Dissertation Examiner for the Faculty of Science, University of Colombo and as a Moderator and second examiner for the Bioinformatics and Computational Biology Module of the Informatics and Computational Biology course at the Vauniya Campus of the University of Jaffna. He was a reviewer of research proposals for the National Science Foundation and National Research Council.

Mr. Kanchana Senanayake, Assistant Network Manager who is also in charge of the EMBnet node at the IBMBB was involved in formulating the new structure of European Molecular Biology Network (EMBnet). As a member of the P & PR PC (Publicity & Public Relations Project Committee) he took part in a working meeting of the EMBnet to formulate the sponsorship and publicity policies and designing of the new EMBnet website. He also functioned as a Visiting Lecturer to the Wayamba University.

Emeritus Professor Eric Karunanayake continued to function as Chairman, National Research Council. He also served as a reviewer to International Science Foundation, Stockholm and Third World Academy of Sciences.

**Research Activities:** A number of research programmes are in progress at the IBMBB in the fields of Tropical Diseases, Molecular Medicine (Cancer Genetics, Reproductive and Developmental Biology, human DNA variation) and Plant Molecular Biology. Each research programme has several projects which provide research training for MPhil/PhD and MSc students under the supervision of the Director, Collaborating Scientists and some of the academic staff of the Institute. Students, research projects and supervisors are listed in Table 1. There were a total of 6 full papers in peer reviewed International Journals journals (4 published and 2 in press), and 3 papers were under review by International Journals. 32 research communications were presented at scientific meetings, 6 of them at International meetings. Publications and Communications are listed at the end of this document. Research Programmes and MPhil/PhD studies were funded by competitive research grants obtained by Academic Staff members, except two studies for which the PhD students (one student from the Tea Research Institute and the other student from the University Grants Commission and National Coordinating Committee on Reproductive Health Research) obtained funds. The latter two studies received partial support from the IBMBB. Details of funds obtained by Academic Staff / Visiting Professors are given in Table 2.

### A) Research Programmes on Parasitic and Infectious Diseases

#### i) Molecular biological approaches to Filariasis

Filariasis in Sri Lanka is caused by the filarial nematode parasite, *Wuchereria bancrofti*. The disease is transmitted by the vector mosquito, *Culex quinquefaciatus*. According to WHO data, currently more than 125 million people in tropical countries of the globe are infected. In the past few years we have been successful in the development of rapid and highly sensitive DNA based diagnostic techniques and also similar DNA based methods to detect the vector mosquito.

There are only two drugs presently available for the treatment of the disease, carbamazine and ivermectin. There is, therefore a great need to develop new drugs and identify potential drug targets in the parasite. The enzyme, cyclo-oxygenase, in the parasite has been hypothesized as a potential target for drug development. This enzyme was partially purified and characterized previously at the IBMBB.

The filarial parasite *W. bancrofti* causing lymphatic filariasis cannot be cultured. Only source of parasite material is from night blood samples collected from patients. This source is not sufficient to undertake molecular studies. A related cattle filarial parasite is *Setaria digitata*. The adult worm of this parasite can be obtained in large quantities from the abdominal cavity of cattle slaughtered at abattoirs. Using this parasite a cDNA library was established. The screening of this library for parasite specific genes is being continued and several genes were sequenced. These are likely to provide potential diagnostic methods or therapeutic targets for the development of new drugs for filariasis. One MSc project was based on this work.

Related studies are being carried out by one student registered at the Faculty of Science for PhD degree and carrying out experiments at the IBMBB. A growth factor like protein coding cDNA clone was identified from a Setaria digitata cDNA library. The coding region was cloned in expression vectors and the recombinant protein was expressed. Purification of the recombinant protein for X-ray crystallography is currently in progress. This study supervised by Dr. Jagath Weerasena and conducted at the IBMBB is a collaborative study with Faculty of Science.

**ii) Studies on immunodiagnosis and immunopathogensis of leptospirospirosis (rat fever) in Sri Lanka**

Leptospirosis or rat fever is a fatal disease, and early diagnosis is often missed due to lack of appropriate techniques to confirm the disease. Preliminary studies were conducted on immunopathogenic mechanisms of leptospirosis and these have shown increased serum nitrite levels in leptospirosis patients. Further, severe leptospirosis patients had significantly higher levels of nitrate and markers of oxidative stress. Several diagnostic methods were compared including the rapid immunodiagnostic assays, ie., IgM based ELISA and Leptocheck-WB, the latter showed promising data on their specificity and sensitivity emphasising the need for a larger scale study with an appropriate sample size for confirming these preliminary findings before recommending its clinical use.

This study was conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB in collaboration with the Department of Clinical Medicine, Faculty of Medicine, University of Colombo, Department of Medicine, Faculty of Medicine, University of Kelaniya and Department of Microbiology, Medical Research Institute. Three MSc students were sponsored by the MSc in Cellular and Molecular Immunology programme of the IBMBB to carry out this work during 2011.

### B) Research Programmes in Molecular Medicine

Several projects in biomedical sciences were carried out requiring either human or animal experimentation. These include studies on cancer, pregnancy and fetal growth, pregnancy induced hypertension and human DNA variation etc.

#### i) Cancer genetics

#### Mutation analysis of DNA from clinically confirmed breast cancer patients

Most cancers are now known to have a genetic predisposition. Two candidate genes, BRCA1 and BRCA2 are now implicated in the development of familial type of breast cancer. The prevalence of all forms of cancer and breast cancer in particular appear to show a global upward trend. Although cancer was regarded as a disease of the affluent society, this is now changing and according to experts at the Cancer Hospital at Maharagama, the trend in Sri Lanka is also on the increase.

Although mutation analysis per se is neither a cure nor a prevention, the collection of such data for the Sri Lankan population is extremely important, as mutations are known to vary among populations. In addition, it may also help the person carrying such a mutation to resort to regular screening such as mammography.

The first molecular genetics study on genes predisposing to breast cancer in Sri Lanka was carried out previously at the IBMBB where *BRCA 1* mutations in Sri Lanka were studied. *BRCA 2* mutations were studied by a PhD student. Several novel mutations and sequence variants including a pathogenic mutation which recurred in several patients were identified. Studies were also initiated to identify possible large genomic alterations in BRCA 1. Furthermore as an MSc project *BRCA 2* mutation screening in ovarian cancer patients commenced. These are collaborative studies with the

National Cancer Institute. One paper was published in an International Journal and one research communication was made based on these studies.

### ii) Reproductive and Developmental Biology

#### a) A genomic and a proteomic study of low birth weight

Low birth weight predisposes individuals to non communicable diseases such as ischemic heart disease, diabetes mellitus, hypertension, obesity etc later in life. Thus it is important to know genetic variations predisposing to low birth weight. In order to identify genetic variations in the insulin like growth factor system a study was carried out on 200 healthy mothers and newborns supported by SAREC and National Research Council Grant awarded to Prof. Tennekoon. Under this programme one PhD project commenced in 2006 and laboratoary work was completed in 2010. A particular polymorphism of the *IGF-I* gene associated with low birth weight in the first borns in Sri Lankans was identified. First born babies who had one or two copies of a particular allele of this polymorphism were smaller in birth size compared to others and also had lower levels of cord blood insulin like growth factor-I. Mothers with this allele also gave birth to smaller babies in the first pregnancy. A paper was published in a Science Citation Indexed Journal.

A preliminary study on the association of two other polymorphisms (one in *IGF-II* gene and the other in *H19* gene) with birth size was carried out in 60 mother, father, baby trios and one polymorphism in the mother was identified to be associated with higher birth weight. Further studies on these genes are in progress as an MPhil study.

Leptin system was also evaluated where cord blood leptin levels and cord blood soluble leptin receptor levels were analysed in relation to birth size as well as gender and parity in 110 healthy newborns.

These studies were supported by the National Research Council and also provided research projects for two MSc students at the IBMBB.

#### b) A study on oestrogenic effects of heavy metals on cultured endometrial stromal cells

Rampant environmental pollution with accumulation of oestrogenic compounds has been implicated in the aetiology of oestrogen dependent human diseases including endometriosis. Endometriosis affects an estimated 5-10% of females in the reproductive age group. Heavy metals such as cadmium are now termed metalloestrogens since they are capable of activating oestrogen receptors. Although oestrogenic effects of heavy metals have been demonstrated *in-vitro*, using Mcf-7 breast cancer cell lines, there has been no published report of any experiment that describes oestrogenic effects of heavy metals on endometrial cells from women with endometriosis in comparison to normal women who have no evidence of the disease. This project intends to study the oestrogenic effects of heavy metals on cultured endometrial stromal cells isolated from the eutopic endometrium of both groups. Towards this end, primary endometrial stromal cell cultures were established in the cell culture laboratory of the IBMBB. The resultant cultures have been used in various experiments to elucidate the oestrogenic effects of heavy metals viz. cadmium, nickel and lead.

This project is supported by a research grant awarded to a PhD student (a probationary lecturer from University of Sri Jayawardenapura) from the University Grants Commission (UGC) and from the National Coordinating Committee on Reproductive Health Research of Sri Lanka. The study is supervised by Prof. K Tennekoon (IBMBB), Prof Hemantha Senanayake (Faculty of Medicine, University of Colombo) and Prof Roshini John-Peiris (Sri Jayawardenapura University). An abstract that included the preliminary findings of the study was selected among the 100 best abstracts in the under 34 Competition of the 15$^{th}$ World Congress of Gynecological Endocrinology to be held in Florence, Italy, from 7$^{th}$ to 10$^{th}$ March 2012.

**iii) Human DNA variation**

Although all humans are 99.9% identical, the differences among them provide tools for genetic identification of individuals. Some of the methods used are not suitable when the material available is very limited or degraded and in such instances analysis of mitochondrial DNA has proved to be useful. In order to establish a data base of mitochondrial D loop sequences of Sri Lankans HV I and HVII genes were studied in a cohort of Sri Lankans belonging to major ethnic groups. One hundred and thirty seven haplotypes were identified of which 12 were shared either between a few individuals of different ethnic groups or between a few individuals of the same ethnic group indicating a common maternal ancestry. Haplogroup analysis was initiated to assign the individuals to specific haplogroups. This project currently funded by the National Research Council Grant to Prof. Kamani Tenekoon supports one PhD student and one MSc student.

### iv) Molecular studies on short stature

Mutations in the growth hormone (GH) gene as well as other genes in the growth hormone axis contribute to short stature. Children who have growth hormone deficiency can be treated with recombinant GH to enable them to attain adequate physical growth. Mutations in the growth hormone axis have not been studied in Sri Lanka. A study was initiated in collaboration with the Lady Ridgeway Children's Hospital to identify mutations and sequence variants in GH and GH releasing hormone receptor in a cohort of children clinically and biochemically confirmed to have GH deficiency. Preliminary work was carried out by two MSC students supported by the IBMBB. Subsequently funding was obtained from the National Science Foundation and work is currently in progress.

## D) Research programmes in Plant Molecular Biology

### i) Genetic differentiation of Sri Lankan traditional rice varieties using AFLP markers

Rice production in Sri Lanka has increased during the past 30 years. This has mainly been due to the effort of rice breeders developing new rice varieties. Most of the rice varieties currently grown in Sri Lanka belong to the category of New Improved Varieties (NIV), which were developed using foreign rice varieties. Although NIV's produce high yields, there is an increasing demand in export market for Sri Lankan traditional rice varieties because of their grain qualities such as high fiber content. Therefore analysis of the genetic diversity of these traditional varieties will be beneficial to plant breeders when developing new varieties. Fluorescent Amplified Fragment Length Polymorphism (AFLP) and resistance gene analog markers were used to assess the genetic variation and the genes conferring biotic and abiotic resistance in these varieties. This work was carried out by a PhD student who is a probationary lecturer of the Department of Botany, University of Jaffna. Research is supervised by Dr. Jagath Weerasens, Senior Lecturer, IBMBB and is supported by a National Research Council Grant awarded to him.

In addition two MSc student worked on rice molecular biology. One of these studies was aimed at identification of the molecular basis of fragrance in traditional rice variety 'Suwandel" and was carried out as a collaborative study with Dr. Nisha Kottearachchi from Wayamba University. The other study looked at the possibility of developing molecular markers to identify herbicide resistant and susceptible rice. This study was carried as a collaborative study with Dr. S Weerakoon of the Open University. Both MSc projects were co-supervised by Dr. Jagath Werasena.

**iii) Molecular characterization of tea (*Camellia sinensis L*) cultivars in Sri Lanka**

The tea-breeding programme, aimed at improving quality and growth traits, is in progress at the Tea Research Institute of Sri Lanka (TRI) although very little is known about the pattern of genetic variation in breeders' collection. Therefore, effective conservation and use of genetic resources of tea are essential for sustainability and for increasing productivity of this vital export plantation crop. One PhD student who is a junior scientist from TRI carried out genetic studies on Tea and completed PhD Examination.

One MSc study was carried out in collaboration with the Tea Research Institute on the use of microsatellite markers to analyze genetic diversity of old seedling tea (*Camellia sinensis L.*) in Sri Lanka.

**iv) DNA phylogeny, morphology pathogenecity of *Macrophoma theicola* petch the causual agent of stem canker in Tea**

Low country stem canker caused by the ascomycete *Macrophoma theicola* petch, is the most serious stem disease of *Camellia sinensis* L. (tea) at lower elevations in Sri Lanka. It causes branch canker or kills the young shoots and in severe attacks may kill the entire bush by girdling the stem. The objectives of this study are to use molecular methods and morphological characteristics to compare the isolates of *M. theicola* obtained from different locations of Sri Lanka and to identify induced genes of *Camellia sinensis* in response to *M. theicola* infection. The survey resulted in 40 fungal isolates which were identified as *M. theicola* based on morphological characteristics. However, molecular characterization revealed that some of these *Lassiodiplodia theobroma* and the pathogenicity of the isolates were established in healthy tea plants. Interestingly, canker samples from Dehiowita consistently yielded *Fusarium solani*, as the causative agent on sequence based analysis. This is the first report of *Fusarium solani* as the causative agent of stem canker in tea in Sri Lanka.

A junior scientist from TRI registered for an MPhil is working in this project.

**v) Differentiation of Sri Lankan mustard (*Brassica juncea*) varieties using AFLP markers and altering their fatty acid profile by interspecific hybridization with *Brassica napus* (canola)**

Mustard (*Brassica juncea*) is the most important species of the genus Brassica. predominant cruciferous species in the Indian subcontinent. Mustard has been grown as a crop for hundreds of years and seeds are used widely in cooking in Sri Lanka. However, mustard has high levels of fatty acids such as erucic acid which are unfavourable for human health, and leads to heart disease. A closely related species, *Brassica napus* **(**Canola) has a fatty acid profile more favourable for protection against heart disease. This project is aimed at differentiating Sri Lankan mustard (*Brassica juncea*) varieties using molecular markers. Interspecific hybridization with *Brassica napus* is being attempted aimed at improving fatty acid profile of mustard. Amplified fragment length polymorphism showed a significant polymorphism in mustard and canola accessions tested. Agronomic characteristics were assessed to document morphological differences among accessions. Antifungal activities of plant extracts of mustered varieties were tested for several plant pathogenic fungi.

This is a collaborative study between IBMBB (Co-investigator: Dr. Jagath Weerasena) and the Open University (PI: Dr. Mrs. S. R. Weerakoon), supported by National Science Foundation. One MPhil student supported by this project has submitted the Thesis for examination.

**vi) Biological control of agricultural pests by *Bacillus thuringiensis***

The development of microbial pesticides for effective pest control in the context of sustainable agriculture will be a major challenge and priority for the country. This research project aims at developing biological pesticides using Sri Lankan environmental isolates of *Bt* as an active ingredient, which could find use against major Lepidopteran, Coleopteran and Dipteran pests on agricultural crops. The objectives of the research are to determine insecticidal activity of Sri Lankan isolates of *Bt* against vegetable, fruit, rice and Tea pests, to develop microbial insecticides from *Bt*, to isolate and characterize toxins from *Bt* and to develop quality assurance procedures for microbial insecticides. Characterization of *Bt* strains by PCR based Cry gene identification was carried out. Molecular confirmation of Bti and Btk isolates by 16S rRNA and gyrb sequencing is currently in progress

This is a collaborative study between IBMBB (Co-investigator: Dr. Jagath Weerasena) and the Industrial Technology Institute, Colombo (PI: Dr. R. Samarasekera), supported by National Science Foundation and National Research Council, Sri Lanaka. One PhD student supported by this project completed the examination.

## E) Research on medicinal plants

### i) Research on medicinal plants with Anti-inflammatory & Immunomodulatory effects

The focus of these studies was on medicinal plants used in the treatment of diseases either associated with or caused by inflammatory responses or those used as immunomodulators.

#### a) Anti-inflammatory activity of aqueous plant extract (APE) of *Wallidda antidysenterica* (*Wrightia antidysenterica*) L. in rats.

*Wallidda antidysenterica* is an endemic plant in Sri Lanka which is used in traditional medicine for many ailments including inflammatory conditions such as tonsillitis, inflammation of epiglottis and snake bite. Anti-inflammatory activity was tested using rat paw-edema model and the activity was proven and scientifically validated. Anti-inflammatory mechanisms such as inhibition of cell migration, production of reactive nitrogen species and free radical scavenging were demonstrated. Our studies also showed no sub-acute toxicity and no neurotoxic effects of the aqueous plant extract (APE) of *Wallidda antidysenterica.*

This study was conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB in collaboration with the Department of Zoology, Faculty of Science, University of Colombo and Herbal technology Division of the Industrial Technology Institute. One MSc student was supported to carry out this study by the MSc in Cellular and Molecular Immunology programme of the IBMBB.

#### b) Immunomodulatory activity of combined hot water extract of *Coriandrum sativum* L. and *Coscinium fenestratum* L. in rats.

Many bioactivities have been shown for these two medicinal plants (*Kottamalli* & *venivelgeta* respectively) and the focus of our study was to demonstrate the immunomodulatory effects of the combined hot water extract of *Coriandrum sativum* and *Coscinium fenestratum* (CHWE) which is a commonly used home remedy for many conditions including colds, coughs, body pains and aches. The CHWE showed potent anti-inflammatory effects in the rat paw-edema model. More importantly the immunodulatory effects were elicited as shown by the enhancement of immune cell migration and antibody production against specific antigens showing that the combined extract has significant effects on both innate and specific responses of the human immune system.

This study was conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB in collaboration with the Department of Zoology, Faculty of Science, University of Colombo and Herbal technology Division of the Industrial Technology Institute. One MSc student was supported to carry out this work by the MSc in Cellular and Molecular Immunology programme of the IBMBB.

**c) Studies on anti-inflammatory mechanisms on *Pleurotus ostreatus, Aegle marmalos* and *Munronia pinnata***

Studies on *in vivo* anti-inflammatory activities of these three plants and their *in vitro* mechanisms *in vitro* mechanisms were performed. All three plants showed potent anti-inflammatory activities. Further *in vitro* studies are in progress.

This study was conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB as a collaboration with the Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayawardenapura. One PhD student and two MPhil students of Faculty of graduate studies, USJP are sponsored by Grants from the University Grants Commission and USJP.

**ii) Anti-malarial effects of medicinal plants**

The focus of this study was on five medicinal plants ie., *Anisomeles indica, Andrographis paniculata, Caesalpinia bonduc, Toddalia asiatica* and *Vitex negundo* used in the treatment of malaria in Sri Lanka. Treatment of malaria could be based on two strategies, i.e., anti-parasitic therapy or anti disease therapy, or both. Of the five medicinal plants, *A. paniculata, T. asiatica and V. negundo* showed highly potent anti-parasitic (schizontizidal) effects followed by *A. indica* and *C. bonduc.* These studies were performed using *in vitro* cultured *Plasmodium falcipraum* parasites. We have earlier shown that all five plant extracts have significant NO inhibitory activity thus reflecting their capacity to curtail the clinical disease and intensity of symptoms. *T. asiatica* and *A. paniculata* showed the highest inhibition of pro-inflammatory cytokine secretion followed by *A. indica* and *C. bonduc* showed a very low cytokine inhibitory activity. These results show that the anti-malarial effects of these plants would be attributed to a combination of their activity on malaria parasite (anti-parasitic activity) and on host immune cell functions (anti-disease; inhibition of anti-inflammatory mediators that cause malaria symptoms). These studies support the traditional use of these medicinal plants in the treatment of malaria that contribute in reducing parasite load, malaria symptoms and development of severe disease.

This study supported by the National Research Council was conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB in collaboration with the Departments of Zoology and Chemistry, Faculty of Science, University of Colombo. Two MSc students of IBMBB carried out the research.

**iii) Anti-cancer effects of medicinal plants**

Anti cancer effects of Medicinal Plants is being studied in collaboration with Prof. Ira Thabrew, formerly of the University of Kelaniya, currently a Visiting Professor at the IBMBB. A probationary staff member of the Department of Biochemistry and Clinical Chemistry, University of Kelaniya who studied the effect of a herbal decoction on expression of selected genes in an animal model at the IBMBB as part of his PhD studies submitted the PhD Thesis for examination in 2011.

In order to assess the molecular mechanisms responsible, *in-vitro* studies were also carried out to examine the expression of tumor suppressor, cell cycle regulators, anti-apoptotic and pro-apoptotic genes in Hep $G_2$ cells. Activity directed fractionation the decoction containing equal proportions of *Nigella sativa* seeds, *Hemidesmus indicus* roots and *Smilax glabra* rhizomes was carried out. Anti-proliferative effects, cell cycle arrest and induction of apoptosis by the active fraction in HepG2 cells were evaluated at the IBMBB laboratories. Isolation of active compounds of the active fraction was carried out by HPLC and other chromatographic techniques. Further spectroscopic analysis of the isolated active compounds was carried out in collaboration with the HEJ Institute of Chemistry, University of Karachi, Pakistan. This work consists of a PhD study at the IBMBB. One International Travel Grant from International Society for Study of Xenobiotics was received by the PhD student to present research findings at the North American ISSX Meeting in October, 2011. Six papers were presented, two at International conferences and four at local conferences. One paper was published, one paper is in press and two more papers are under review by International journals.

In addition to above two PhDs, preliminary screening of another medicinal plant purported to have anti cancer activity was also carried out. Two MSc students worked on this plant extract and evaluated its anti carcinogenic effects on endometrial carcinoma cell line (AN3CA). One paper was presented at an International conference and one paper is in preparation for submission to a peer review journal.

**Visitors to the Institute:** The Institute had several overseas visitors during the year. The visitors in 2011 included Dr. Erik Bongcam-Rudloff, Associate Profeesor, Swedish University of Agricultural Sciences, Uppsala, a team of Academics and Administrators from the Queensland University of Technology, Australia, Prof Banasri Hazra, Research Scientist, Jadaipur University, Kolkata; Prof. Mario Pinto, Vice President Research, Simon Fraser University, Canada; Dr. Suranjith Seneviratne, Lead Clinician in Immunology, St Mary's Hospital and Senior Lecturer in Immunology, Imperial College, London; Dr. Mahesh Iddawela, Medical Oncologist from United Kingdom, Dr Natkunam Ketheesan, Associate Professor & Team Leader, Infectious Diseases and Immunopathogenesis research Group, James Cook University Queensland, Australia.

**Guest Lectures:** Following guest lectures were held in 2011

"Next Generation Sequencing" - Dr. Erik Bongcam-Rudloff, Associate Professor, Swedish University of Agricultural Sciences, Uppsala

"Interferon Gamma Pathway and Complement" – by Dr Suranjith Seneviratne, Lead Clinician in Immunology, St Mary's Hospital and Senior Lecturer in Immunology, Imperial College, London

"Phytochemicals for Healthcare – Merits and Myths" – by Prof Banaris Hazra, Research Scientist, Department of Pharmaceutical Technology, Jadaipur University, Kolkata, India

"Using formalin fixed paraffin embedded tissue for molecular marker studies in breast cancer" – by Dr Mahesh Iddawela, formerly Consultant Medical Oncologist, Addenbrookes Hospital, Cambridge

# Human Resources

**New Appointments**

Mrs Dammika Galkaduwa was appointed as Senior Asst Bursar with effect from 14th March 2011. Professor Eric H Karunanayake, Founder Director and Emeritus Professor continued to work at the IBMBB in an Honorary capacity, contributing significantly to teaching programmes and supervision of postgraduate students. Prof. Ira Thabrew continued to work at the IBMBB as a Visiting Professor.

**Retirements, Resignations and Transfers**

Dr. E Niroshini, resigned from the Post of Senior Lecturer with effect from 31st July 2011.

Staff as at 31st December 2011 are listed on page 212.

## Corporate Social Responsibility Activities

Staff and students organized a blood donation campaign for the National Cancer Institute on 30th June 2011, 49 persons donated blood. A donation of plastic items for the use of Intensive Care Unit of the National Cancer Institute was also organized by students and staff on 5th December 2011.

**Constraints:** Human Resources and Financial Resources have been the major constraint in implementing the activities as per Corporate Plan 2007-2011. Full time MSc courses conducted by the IBMBB has a full time research component for one Semester requiring 1:1 supervision of students. MPhil and PhD programmes are based on full time research. IBMBB's training programmes have provided human resources to local Universities, Research Institutes and Private Sector. Unfortunately without adequate academic cadre IBMBB is finding it difficult to expand its high quality human resource training programmes. It has only 4 cadre positions for Academic staff (one Professor and 3 Senior Lecturers), and the ongoing programmes have so far been sustained due to the significant contributions of the Founder Director (who holds an Emeritus Professorship) and other retired Senior Academics. Sustainability of teaching and research programmes and expansion require additional academic cadre, postdoctoral fellows and scientific assistants.

# Staff as at 31st December 2011

## Permanent Cadre

| | |
|---|---|
| Prof. Kamani H Tennekoon | Director and Professor of Molecular Life Sciences |
| Dr. Shiroma Handunnetti | Senior Lecturer Grade I |
| Dr. OVDSJ Weerasena | Senior Lecturer Grade II |
| Dr. E Niroshini | Senior Lecturer Grade II (resigned on 31.07.2011) |
| Mrs Anoma Ratnayake | Senior Asst Registrar |
| Mrs. Dammika Galkaduwa | Senior Asst Bursar (from14.03.2011) |
| Mr. Kanchana Senanayake | Asst Network Manager |
| Ms. Sudeshini Hewage | Scientific Assistant |
| Mr. C S P Abeysinghe | Staff Technical Officer |
| Ms. Anoma Jayasoma | Technical Officer |
| Mr. N C A Gunasekera | Technical Officer |
| Ms. Thanuja Atapattu | Book Keeper |
| Ms. N K S Champika | Computer Applications Assistant |
| Ms. K W C S Fernando | Computer Applications Assistant |
| Mr. Sashika Niranjan | Computer Applications Assistant |
| Ms. Nadeesha Jayawardena | Computer Applications Assistant |
| Mr. H A S Chandrasoma | Library Assistant |
| Ms. W S R Jayalath | Receptionist / Telephone Operator |
| Mr. Y B M N Y Bandara | Laboratory attendant |
| Mr. W G P M Thilakaratna | Laboratory Attendant |
| Mr. T S R Ruberu | Labourer |

## Temporary / Assignment

| | |
|---|---|
| Ms. Inoka Sanjeevani | Acting Senior Asst Bursar (until 13.03.2011) |
| Dr. FMMT Marikar | Temporary Senior Lecturer |
| | (from 03.01.2011 to31.03.2011) |
| Ms. Sachinthika Gunatilleke | Teaching / Research Assistant |
| | (from 15.03.2011 to 12.09.2011) |
| Ms. Sumadee De Silva | Teaching / Research Assistant |
| | (from 01.03.2011) |
| Mr. Sameera Samarakoon | Scientific Assistant (from 01.03.2011) |
| Ms. Priyanganie Dabare | Accounts Assistant (from 24.07.2011) |

# Current Researchers

| | |
|---|---|
| Prof. Kamani H Tennekoon | - Director & Professor of Molecular Life Sciences, IBMBB |
| Prof. Eric H Karunanayake | - Emeritus Professor & Founder Director/IBMBB |
| Prof. Ira Thabrew | - Visiting Professor & NSF Research Fellow, IBMBB |
| Dr. Shiroma Handunnetti | - Senior Lecturer/Immunology, IBMBB |
| Dr. O V D S J Weerasena | - Senior Lecturer/Molecular Techniques, IBMBB |
| Ms. N Jayasekera | - Entomologist, SAREC Project, IBMBB |

# Research Collaborators

| | |
|---|---|
| Prof. Preethika Angunawela | - Professor in Pathology, Faculty of Medicine, UoC |
| Prof. Dilip De Silva | - Professor of Organic Chemistry, Faculty of Science, UoC |
| Prof Janaka De Silva | - Professor of Medicine, Faculty of Medicine, UoK |
| Prof. Sunil Premawansa | - Professor in Zoology, Faculty of Science, UoC |
| Prof. W D Ratnasooriya | -Professor of Zoology, Faculty of Science, UoC |
| Prof Senaka Rajapakse | - Professor in Clinical Medicine, Faculty of Medicine, UoC |
| Prof. Hemantha Senanayake | - Professor in Obstetrics and Gynaecology, UoC |
| Prof MHR Sheriff | - Professor of Clincal Medicine, Faculty of Medicine, UoC |
| Dr. Marie Allen | - Associate Professor, Genetics and Pathology, University of Uppsala |
| Dr. Indrani Amarasinghe | -Consultant Surgeon, National Cancer Institute, Maharagama |
| Dr. Erik Rudloff-Bongcam | - Associate Professor, Swedish Agricultural University,Uppsala |
| Dr. Ranil Dassanayake | -Senior Lecturer, Dept of Chemistry, Faculty of Science, UoC |
| Dr Nandana Dikmadugoda | - Consultant Physician, Base Hospital, Homagama |
| Dr. Shamya De Silva | - Senior Lecturer, Department of Paediatrics, UoC |
| Dr. Kumudu Fernado | - Director, Agri Biotechnology Centre, UoP |
| Dr. Lilani Karunanayake | - Consulatnt Microbiologist, Medical Research Institute, Colombo |
| Dr. Nisha Kottearachchi | - Senior Lecturer, Wayamba University |
| Dr. J M Kumarasiri | - Consultant Obstetrician Gynaecologist, Castle Street Hospital for Women |
| Dr Aloka Pathirana | - Consultant Surgeon, Colombo South Teaching Hospital |
| Dr. GA Sirimal Premakumara | -Senior Deputy Director, Industrial Technology |

| | |
|---|---|
| | Institute, Colombo |
| Dr. Gayani Premawansa | - Consultant Physician, North Colombo Teaching Hospital, Ragama |
| Dr. R Samarasekera | -Herbal Technology Division, Industrial Technology Institute, Colombo |
| Dr Praneetha Somaratne | - Consultant Microbiologist, Medical Research Institute, Colombo |
| Dr Sugandi Suresh | - Senior Lecturer, Dept of Biochemistry, Faculty of Medical Science, USJP |
| Dr S Weerakoon | - Senior Lecturer, Open University |
| Dr. Hasith Wickramasinghe | -Consultant Physician, Base Hospital, Homagama |
| Dr. Ajita Wijesundera | - Consultant Obstetrician Gynaecologist, formelry at Castle Street Hospital for Women |
| Mr. Harsha Wijewardena | - Consultant, University of Colombo School of Computing |

## Research (MPhil/PhD) students

| | |
|---|---|
| Ms. Sumadee De Silva | |
| Ms. P Jayanthiny | Probationary lecturer in Human Biology, Faculty of Health Sciences, Eastern University |
| Ms. Sudeshini Hewage | Scientific Assistant, IBMBB |
| Mr. R R Kumara | |
| Mr. K Mewan | Research Officer, Tea Research Institute |
| Ms. N.H.L. Pradeepa | Research Officer, Tea Research Institute |
| Mr. Kelum Peiris | |
| Ms. Ruvindi Ranasinghe | |
| Mr. Sameera Samarakoon | |
| Mr. B H K R Sugathadasa | Laboratory Manager, Hemas Hospital |
| Mrs. Gowri Raajkumar | Probationary lecturer in Botany, Faculty of Science, University of Jaffna |
| Dr. B P Galhena | Probationary lecturer in Biochemistry, Faculty of Medicine, University of Kelaniya |
| Ms. Wasana Rodrigo | |
| Ms MDRL Silva | University of Moratuwa |
| Dr. Y N Silva | Probationary lecturer in Physiology, Faculty of Medical Sciences, University of Sri Jayawardenapura |
| Mr DAS Siriwardhana | Research Officer, Industrial Technology Institute |
| Ms. Rupika Wijesinghe | UCSC |

**R**esearch Publications: In the Authors names, staff/students /research assistants of IBMBB are indicated in bold. Students registered at other HEIs and carrying out work at the IBMBB are gven in bold italic

## Research Papers published in Indexed / Refereed Journals

**De Silva S, Tennekoon KH, Karunanayake EH, De Silva W**, Amarasinghe I, Angunawela P (in press) Novel sequence variants and common recurrent polymorphisms of *BRCA2* in Sri Lankan breast cancer patients and a family with *BRCA1* mutations. ***Experimental and Therapeutic Medicine*** Published online on: Wednesday, August 17, 2011

**Jayanthiny P, Tennekoon KH, Karunanayake EH**, Kumarasiri JM, Wijesundera APDeS. Di-nucleotide repeat polymorphisms of the insulin-like growth factor-I (*IGF-I)* gene and their association with IGF-I, insulin-like growth factor binding protein-1 and birth size in a Sri-Lankan cohort. ***Neonatology*** 2011; 100:37-43.

***Galhena BP***, **Samarakoon SSR**, **Thabrew MI**, Solomon FD Paul, Venkatachalam P, and Chinnadurai M, A preliminary study to determine the chemoprotective potential of a herbal decoction *Nigella sativa* (seeds), *Hemidesmus indicus* (roots) and *Smilax glabra* (rhizome), ***Phototherapy Research***.-under review.

***Galhena BP***, **Samarakoon SR**, **Thabrew MI**, Thammitiyagodage MG, Rathnasooriya WD, **Tennekoon KH**. Anti-inflammatory activity is a possible mechanism by which the polyherbal formulation comprised of Nigella sativa (seeds), Hemidesmus indicus (root), and Smilax glabra (rhizome) mediates its anti-hepatocarcinogenic effects. ***Journal of Ethnopharmacology***-under review

**Gunaratna RI, Handunetti SM,** Bulathsinghalage MRC, Somaratne P, Jayanaga A, De Silva HJ, Rajapakse S. Serum nitrite levels in Sri Lankan patients with leptospirosis. ***Asian Pacific Journal of Tropical Medicine*** (in press)

**Rajkumar G, Weerasena OVDSJ,** Fernando KKS, Liyanage ASU and Rangika S. Genetic differentiation of Sri Lankan traditional rice (*Oryza sativa*) varieties and Wild rice species by AFLP markers. ***Nordic Journal of Botany*.** 2011; 29 (2): 238–243.

**Rajkumar G, Weerasena OVDSJ**, Fernando KKS, Liyanage ASU. Assessment of Genetic Diversity among Sri Lankan Rice varieties by AFLP

Markers. ***Plant Genetic Resources: Characterization and Utilization*.** 2011; 9:224-228.

**Samarakoon SR, Thabrew I**, Galhena PB, **Tennekoon KH**. Effects of a standardized preparation of a decoction comprised of *Nigella sativa* (seeds), *Hemidesmus indicus* (roots), and *Smilax glabra* (rhizome) on the expression of p53 and p21 genes in human hepatoma cells (HepG2) and livers of mice with chemically induced hepatocarcinogenesis. ***Tropical Journal of Pharmaceutical research*** (In press).

**Samarakoon S**, **Thabrew I, Tennekoon K**, Modulation of apoptosis in human hepatocellular carcinoma (HepG2 cells) by a standardized herbal decoction with anti- hepatocarcinogenic effects. BMC Complementary and Alternative Medicine- under review

## Scientific Meetings where abstracts are published (print or electronic)

**Aluwihare WBWMRYC, Weerasena** OVDSJ. Isolation and characterization of putative plant disease resistance gene analogues from Sri Lankan rice varieties. Fourth Annual Scientific Sessions of the IBMBB. Colombo, May 2011, pp 27.

**De Silva S, Tennekoon KH, Karunanayake EH , De Silva JWN,** Amarasinghe I, Angunawala P Novel sequence variants and common recurrent polymorphisms of *BRCA2* in a group of breast cancer patients in Sri Lanka. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 13.

**De Silva D S D**, De Silva E D and **Handunnetti S M**. Antioxidant activity of aqueous and solvent extracts of *Ixora coccinea* and *Vitex negundo* Proceedings of the Annual Sessions of the SLAAS 2011; 67*:*pp 140**.**

**De Silva WHYD**, Pathirana A, **Weeasena OVDSJ**, **Handunnetti SM**. Application of cytokeratine-19 based reverse transcriptase polymerase chain reaction for detection of mirometastasis of breast cancer. Proceedings of the Second International Symposium on Breast Cancer Prevention**,** $9^{th}$-$11^{th}$ October 2011, Rennes, France; pp 43.

**De Silva WHYD**, Pathirana A, Weerasinghe A, **Weerasena OVDSJ, Handunnetti SM**. Detection of micrometastasis of breast cancer using cytokeratine-19 based reverse transcriptase polymerase chain reaction, Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 33

***Galhena BP***, **Thabrew MI, Samarakoon SSR**, Solomon FDP, Venkatachalam P, **Tennekoon KH** *In-vitro* protective role of a polyherbal preparation comprised of *Nigella sativa* (seeds), *Hemidesmus indicus* (roots) and *Smilax glabra* (rhizome) against bleomycin induced cytogenetic damages in human peripheral blood lymphocytes: A preliminary study. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 23.

**Gammulle AS**, Ratnasooriya WD, Randeniya PV. Effect of *Carica papaya* leaf concentrate on rat platelet count. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 40.

**Gowri R, Weerasena OVDSJ**, Fernado KKS**.** Revealing Genomic diversity of Sri Lankan traditional, improved and wild rice species. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 21.

**Hewage AS, Jayanthiny P, Tennekoon KH, Karunanayake EH**, Kumarasiri JM, Wijesundere APDeS. A preliminary report on 1737 A/G Polymorphism in *H19* gene in a Sri Lankan cohort of mother-baby pairs. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 29.

**Jayanthiny P, Tennekoon KH, Karunanayake EH**, Kumarasiri JM, Wijesundere APDeS Association of 2992 C/T polymorphism in *H19* gene with cord blood levels of insulin-like growth factor (IGF)-II and birth size. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 15

**Kalugalage TL**, Vithanage TDP, Somaratne P, De Silva HJ, Rajapakse S, **Handunnetti SM** Studies on serum $NO_x$ levels in severe leptospirosis patients in Sri Lanka. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 34.

**Kalugalage TL**, Vithanage TDP, Somaratne P, De Silva HJ, Rajapakse S, **Handunnetti SM**. Increased serum NO levels in severe leptospirosis patients in Sri Lanka. Proceedings of the Annual Sessions of the Institute of Biology, Sri Lanka 2011; 31: pp 49**.**

**Kannangara UM, Weeresena OVDSJ**, Dasanayake PN. Genetic Diversity Assessment of Finger millet using microsatellite markers. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 36.

**Kariyawasam K W J C, Sirisena PDNN**, De Silva ED, Ratnasooriya WD and **Handunnetti SM**. Inhibition of pro-inflammatory cytokine secretion by human mononuclear cells and phagocytic activity of human neutrophils by aqueous leaf extract of *Vitex negundo*. Proceedings of the Annual Sessions of the SLAAS 2011; 67:57

**Karunanayake GA, Jayanthiny P, Silva NY, Tennekoon KH, Karunanayake EH**, Senanayake L Placental growth factor levels in normal pregnancy, gestational diabetes mellitus and pregnancy induced hypertension: A preliminary report. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 32.

**Karunanayake GA, Samarakoon SR, Perera ME, Murugananthan A, Tennekoon KH, Karunanayake EH**. Preliminary characterization of some cDNA clones of Setaria digitata. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 35.

**Karunanayake GA, Tennekoon KH, Jayosoma AA, Jayanthiny P, Karunanayake EH**, Kumarasiri JW, Wijesundere APDeS. Cord blood leptin levels in newborns from normal uncomplicated singleton pregnancies: Effect of gender and parity. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 28.

**Kotalawala SD**, Premakumara GAS, **Handunnetti SM**, Ratnasooriya WD. Immunomodulatory activity of combined hot water extract of *Coriandrum sativum* L., and *Coscnium fenestratum* L., in rats. Proceedings of the Third International Conference on Medicinal Plants and Herbal Medicines, 19th - 21st December, 2011, Colombo, Sri Lanka; pp 81.

**Kotigala SB, Gammana-Liyanage I, Samarakoon SR, Thabrew I, Tennekoon KH** In vitro anti-carcinogenic effects of a decoction of Fluggea leucopyrus (aerial parts) on human endometrial carcinoma (AN3CA) cells. The 3rd International conference on medicinal paltns and herbal products, Colombo, December 2011. S 8.

**Kumarasivam K, Gunawardana D.** Restriction Fragment Length Polymorphism Analysis of the *OSA3* Gene in *Oryza sativa.* Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 38.

Kumari KDKP, **Handunnetti SM** , Suresh TS, Samarasinghe K. Anti-inflammatory activity of dried flower extracts of *Aegle marmelos* in Wistar rats. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 24.

Kumari KDKP, **Handunnetti SM**, Suresh TS, Samarasinghe K. Hypoglycemic and anti-inflammatory activity of dried flower extracts of *Aegle marmelos* in Wistar rats. Proceedings of the Third International Conference on Medicinal Plants and Herbal Medicines, 19th - 21st December, 2011, Colombo, Sri Lanka; pp 39.

**Ranasinghe RACR, Tennekoon KH, Karunanayake EH**, Allen M, Sheriff R, Sheriff MHR,Wijayawardhana H. A study of genetic polymorphisms in mitochondrial DNA hypervariable regions I and II of the Sri Lankan population. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 14.

**Ratnayaka ARMNNK, Samarakoon SR, Thabrew MI.** Survivin gene expression in hepatocellular carcinoma cell line: optimization of PCR. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 42.

***Rodrigo WWP*,** Dassanayake RS**, Weerasena OVDSJ, Karunanayake EH.** Chaperone mediated over expression of parasitic nematode specific growth factor like protein of *Setaria digitata*. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 18.

**Samarakoon SR**, **Thabrew MI**, ***Galhena PB***, **Tennekoon KH**, De Silva ED Standardized aqueous extract of *Nigella sativa* (seeds), *Hemidesmus indicus* (roots), and *Smilax glabra* (rhizome) induced apoptosis in human hepatocellular carcinoma (HepG2) cells via regulating Bax and Bcl-2 genes. International Conference on Natural Products and Biomedical Technology January 2011, organized by the University of Annamalai, Tamil Nadu, India.

**Samarakoon SR, Thabrew I, *Galhena PB***, **Tennekoon KH**, de Silva ED. Effects of a standardized preparation of a decoction comprised of *Nigella sativa* (seeds), *Hemidesmus indicus* (roots), and *Smilax glabra* (rhizome) on the expression of key genes that are involved in tumour suppression, cell cycle arrest and apoptosis in human hepatoma (HepG2) cells. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 22.

**Samarakoon SR, Thabrew MI, *Galhena PB*, Tennekoon KH**. A Standardized Decoction of *Nigella sativa* seeds, *Hemidesmus indicus* roots and *Smilax glabra* rhizomes induces apoptosis in human hepatocellular carcinoma (HepG2) Cells. 17th North American Regional ISSX meting October 2011 in Atlanta, USA.

**Sinnathamby S, Jayanthiny P, Sugathadasa BHRK, Tennekoon KH, Karunanayake EH**, Kumarasiri JM, Wijesundera APDeS. *H19* polymorphism in newborns born to mothers with pregnancy induced hypertension/ pre-eclampsia: A preliminary report. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 31.

**Sirisena PDNN, Wickremesinghe NKRD**, De Silva ED, Ratnasooriya WD, **Handunnetti SM.** Inhibition of intracellular killing mechanisms of human neutrophils and the longevity of bioactivities of aqueous leaf extract of *Vitex negundo*. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 41.

**Yasasni HDP, Jayanthiny P, Sugathadasa BHRK, Tennekoon KH, Karunanayake EH**, Kumarasiri JM, Wijesundera APDeS. The CA promoter polymorphism of *IGF1* Gene in pre-eclampsia/ pregnancy induced hypertension: A preliminary report. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 30.

**Wickramasekera S**, Weerakoon SR, **Weerasena OVDSJ.** Molecular analysis of the $F_1$ hybrid plants (triploids, ABC) to confirm the true hybridity between *Brassica juncea* and *Brassica oleracea*. Fourth Annual Scientific Sessions of the IBMBB, Colombo, May 2011, pp 39.

## Table 1: MPhil/PhD Degrees in Progress and New Registrations – Year 2011

| Name of research student | Degree registered for and the Institute | Tentative Title of the thesis | Names of supervisors |
|---|---|---|---|
| Sumadee De Silva | PhD-IBMBB | Characterization of mutations and sequence variants in breast cancer susceptibility BRCA 2 gene in a selected group of Sri Lankan breast cancer patients | K H Tennekoon<br>E H Karunanayake |
| P Jayanthiny | PhD-IBMBB | Study of the insulin-like growth factor (IGF)-I and II genotypes in Sri Lanka and their association with birth weight | K H Tennekoon<br>E H Karunanayake |
| RACR Ranasinghe | PhD-IBMBB | A study of genetic polymorphisms in mitochondrial DNA hypervariable regions I and II of the Sri Lankan population | K H Tennekoon<br>E H Karunanayake<br>Marie Allen (UU) |
| G Raajkumar | PhD-IBMBB | Genetic differentiation of Sri lankan rice varieties and identification of genes responsible for biotic and abiotic resistance in wild and weedy rice of Sri Lanka | OVDSJ Weerasena<br>KKS Fernando (UoP) |
| S S R Samarakoon | PhD-IBMBB | Effect of a herbal decoction used in traditional medicine on the expression of NFkbB and p53 genes in HepG2 cells | MI Thabrew<br>KH Tennekoon |
| B H K R Sugathadasa | PhD-IBMBB | The predictive value of maternal leptin levels, soluble leptin receptor and leptin genotype in detecting pre-eclamptic toxaemia / pregnancy induced hypertension | K H Tennekoon<br>E H Karunanayake |

| **Name of research student** | **Degree registered for and the Institute** | **Tentative Title of the thesis** | **Names of supervisors** |
|---|---|---|---|
| R R Kumara | MPhil - IBMBB | Studies on anti inflammatory activity of learn of *Ixora coccinea.* | S Handunetti<br>W D Ratnasooriya (UoC)<br>S A Deraniyagala (UoC) |
| K S Premakumara | MPhil - IBMBB | Further studies on endometrial function | K H Tennekoon<br>E H Karunanayake |
| P K D Peiris | MPhil-IBMBB | Differentiation of Sri Lankan mustard (*Brassica juncea)* varieties using AFLP markers and altering their fatty acid profile by interspecific hybridization with *Brassica napus* (canola) | OVDSJ Weerasena<br>S R Weerakoon (OU) |

**Table 1 continued - MPhil/PhD Degrees in Progress and New Registrations – Year 2011**

| Name of research student | Degree registered for and the Institute | Tentative Title of the thesis | Names of supervisors |
|---|---|---|---|
| N H L Pradeepa | MPhil-IBMBB | DNA phylogeny, morphology and pathogenecity of *Macrophoma theicola* petch, the causal agent of stem canker | S Abeysinghe (TRI)<br>OVDSJ Weerasena<br>R Wijesundera (UoC) |
| Sudeshini Heawage | MPhil-IBMBB | Selected polymorphisms of the *H19* and *IGF-II* genes in a Sri Lankan birth cohort: Effect of maternal and newborn genotype on birth size | KH Tennekoon |
| K M Mewan | PhD, Faculty of Science, UoC | Genetic diversity of tea accession in Sri Lanka assessed by RAPD markers | E H Karunanayake<br>S Thrimanne (UoC)<br>JMDT Everad (CRI) |
| W W R Rodrigo | MPhil, Faculty of Science, UoC | Structure and functional characterization of putative nuclear cell envelop like parasitic nematode growth factor protein from goat and sheep parasite, *Setaria digitata* and human filarial parasite *Wuchereria bancrofti* | R S Dassanayake (UoC)<br>OVDSJ Weerasena<br>EH Karunanayake |
| R Wijayasinghe | MPhil/ UCSC | An approach to protein structure prediction of *Wuchereria bancrofti* | E H Karunanayake<br>A R Weerasinghe (UCSC)<br>Eric Bongcam Rudloff (SLU) |
| BP Galhena | PhD/UoK | An investigation of the anti-carcinogenic | MI Thabrew |

| | | | |
|---|---|---|---|
| | | mechanisms of a herbal remedy and its ability to protect against radiation induced tissue injury | KH Tennekoon |
| DAS Siriwardhana | PhD/UoP | Biological control of agricultural pests by *Bacillus thuringiensis* | R Samarasekara (ITI)<br>V Karunaratne (UoP)<br>OVDSJ Weerasena |
| MDRL Silva | MPhil/UoM | Comparative sequence analysis and statistical approach to identification of genes and molecular markers for biotic and abiotic stress resistance in rice | N Wickramaratne (UoM)<br>OVDSJ Weerasena |
| YN Silva | PhD/ USJP | A study on oestrogenic effects of heavy metals on cultured ectopic endometrial cells from Sri lankan women of Reproductive age group | Roshini John-Peris (USJP)<br>H Senanayake (UoC)<br>KH Tennekoon |

CRI: Coconut Research Institute; ITI: Industrial Technology Institute; RRI: Rubber Research Institute; TRI: Tea Research Institute; OU: Open University; SLU: Swedish Agricultural University; UCSC: University of Colombo, School of Computing; UoC: University of Colombo, UoK: University of Kelaniya; UoM: University of Moratuwa; UoP: University of Peradeniya; UU: University of Uppsal

**Table 2: Research Funding**

| Grantee | Name of the Project | Funding Agency | Funds made available in 2011 |
|---|---|---|---|
| Prof. Kamani Tennekoon | A study on the genetic polymorphisms of Mitochondrial hypervariable regions I and II regions in Sri Lankans | National Research Council* | Rs. 1,297,871.31 |
| Prof. Kamani Tennekoon | Characterisation of mutations and sequence variants in growth hormone and growth hormone releasing hormone receptor in a cohort of children with growth hormone deficinecy | National Science Foundation | Rs. 423,638.72 |
| Dr. Shiroma Handunnetti | Identification of active components and the mechanisms of anti-inflammatory and anti-malarial effects of medicinal plants of Sri Lanka | National Research Council* | Rs. 284,523.65 |
| Prf. Ira Thabrew | Modification of Bleomycin induced cryogenic damages by Sri Lankan herbal decoction of Nigella sativa, Hemidesmus indicus, on peripheral blood lymphocytes and its direct cytotoxicity on human hepatoma HepG2 cells | Dept of Ayurveda | Rs. 101301.90 |
| Total funds provided from research grants** | | | 2,107,335.58 |

* These Grants are administered directly by NRC

** Excludes material supplied for a PhD project amounting to Rs. 1,200,000.00 from Tea Research Institute ; material and funds supplied for a PhD project amounting to Rs. 878,000.00 by the University Grants Commission through the University of Sri Jayawardenapura (Rs 638,000.00) and from the National Coordinating Committee on Reproductive Health Research (Rs. 240,000.00) and funding of MSc projects from MSc course fees.

## Table 3: MSc Dissertations – 2011

| Name of the Student | Gender | Year of entry | Studies Completed | Degree Programme | Title of the Dissertation/Thesis |
|---|---|---|---|---|---|
| RML Tanthirige | F | 2008 | 2011 | MSc/MLS | Development of specific AFLP markers for identification of jak fruit (*Artocarpus heterophyllus* Lam) varieties in Sri Lanka |
| S I C Silva | F | 2008 | 2011 | MSc/MLS | Differentiation of selected *Piper nigrum* L (Black pepper) cultivars in Sri Lanka using morphology and AFLP markers |
| AMDSD De Silva | F | 2009 | 2011 | MSc/CMI | Studies on the effect of aqueous leaf extracts of *Ixora coccinea* and *Vitex negundo* on neutrophil chemotaxis |
| R Tippalagama | F | 2009 | 2011 | MSc/CMI | HLA typing MHC class I molecules by PCR and sequencing in Sri Lanka |
| KVPK Bandara | M | 2010 | In progress | MSc/MLS | Screening of ovarian cancer patients for a pathogenic mutation in *BRCA 2* gene |
| MDM Fernando | F | 2010 | 2011 | MSc/MLS | Mutations in growth hormone releasing hormone receptor (GHRH-R) and sequence variations in children with growth hormone deficiency- a preliminary study |

| Name of the Student | Gender | Year of entry | Studies Completed | Degree Programme | Title of the Dissertation/Thesis |
|---|---|---|---|---|---|
| N Kanthakumaran | M | 2010 | In progress | MSc/MLS | Molecular characterisation of inland and coastal populations of *Anopheles subpictus* in Sri Lanka: A mitochondrial DNA based analysis |
| UGIU Kariyawasam | F | 2010 | 2011 | MSc/MLS | Growth hormone mutations and sequence variants in children with growth hormone deficiency- a preliminary study |
| KHT Karunaratne | M | 2010 | 2011 | MSc/MLS | Development of molecular markers to identify herbicide resistant and susceptible rice varieties |
| EPM Keshawa | M | 2010 | 2011 | MSc/MLS | Use of microsatellite markers to analyze genetic diversity of old seedling tea (*Camellia sinensis L*.) in Sri Lanka |
| SB Kotigala | M | 2010 | 2011 | MSc/MLS | Effect of an herbal extract on the Caspase-3 and Caspase-9 expression in endometrial carcinoma cells |
| WAM Peiris | F | 2010 | 2011 | MSc/MLS | Identification of allelic diversity in Badh 2 locus of traditional rice varieties in Sri Lanka |
| GLIM Premathilake | F | 2010 | 2011 | MSc/MLS | Effect of an herbal extract on BCl-2 and Bax expression in endometrial carcinoma cells |
| B Sanchev | F | 2010 | In progress | MSc/MLS | Molecular characterisation of cellulose degrading fungi and extraction and purification of cellulose |

| Name of the Student | Gender | Year of entry | Studies Completed | Degree Programme | Title of the Dissertation/Thesis |
|---|---|---|---|---|---|
| NHKS Senathilake | M | 2010 | 2011 | MSc/MLS | Characterisation of selected clones from a cDNA library of *Setaria digitata* |
| B Sinthanaichselvan | F | 2010 | In progress | | A preliminary analysis of mitochondrial haplogroups |
| EJ Eugene | F | 2010 | 2011 | MSc/CMI | Comparison of serological diagnostic methods for leptospirosis |
| SD Kothalawala | F | 2010 | 2011 | MSc/CMI | Immunomodulatory activity of combined hot water extract of *Coriandrum sativum* L/ and *Coscinium fenestratum* L. |
| MJR Niloofa | F | 2010 | 2011 | MSc/CMI | Sero-conversion following vaccination with tetanus toxoid to diagnose specific antibody deficiency in patients with recurrent infections |
| YS Wahalathanthri | F | 2010 | 2011 | MSc/CMI | Anti-inflammatory activity of aqueous plant extract (APE) of *Wallidda antidysenterica* (*Wrightia antidysenterica*) L. In rats |
| SA Wickramasinghe | F | 2010 | 2011 | MSc/CMI | Assessment of oxidative stress in severe leptospirosis patients |

## Inauguration of the Annual Scientific Sessions

## Prof. Stanley Wijesundera Memorial Lecture

Founder Director -IBMBB presenting the medal to Prof. Dilip de Silva

Prof. Dilip de Silva delivering the memorial Lecture

## Plenary Lecture by Dr. Erik Bongcam Rudloff

## Certificate Course

## Seminar on Infectious Diseases

**INSTITUTE OF BIOCHEMISTRY, MOLECULAR BIOLOGY & BIOTECHNOLOGY**

**UNIVERSITY OF COLOMBO**

**BALANCE SHEET AS AT 31ST DECEMBER 2011**

(Figures adjusted to the Nearest Rupee)

| | | 2011 | 2010 |
|---|---|---|---|
| | | Rs. | Rs. |
| | | N.B.V | N.B.V |
| **NON CURRENT ASSETS** | Note - 02 | | |
| Office Furniture & Equipments | | 3,412,264 | 3,199,235 |
| Computers | | 1,386,855 | 1,108,928 |
| Lab and Teaching Equipments | | 8,472,982 | 4,412,297 |
| Fixtures and Fittings | | 143,835 | 56,619 |
| Lab Tools | | 191,673 | 244,052 |
| Library Books and Periodicals | | 577,339 | 449,857 |
| | | 14,184,948 | 9,470,988 |
| Investments - Endowment Fund | | 2,186,620 | 1,988,872 |
| | | **16,371,568** | **11,459,860** |
| **CURRENT ASSETS** | | | |
| Investments | Note - 03 | 9,001,374 | 11,837,273 |
| Staff Loans | Note - 04 | 1,999,146 | 1,330,104 |
| Advance A/C | Note - 05 | 968,444 | 3,840,351 |
| Other Receivables | Note - 06 | 75,349 | 102,200 |
| Investments in call deposits | | 2,024,296 | 1,750,000 |
| Bank Balances | Note - 07 | 16,648,842 | 6,019,792 |
| | | **30,717,451** | **24,879,720** |
| | | | |
| **Total Assets** | | **47,089,019** | **36,339,580** |

**INSTITUTE OF BIOCHEMISTRY, MOLECULAR BIOLOGY & BIOTECHNOLOGY**

**UNIVERSITY OF COLOMBO**

**BALANCE SHEET AS AT 31ST DECEMBER 2011(Contd..)**

| | | 2011 | 2010 |
|---|---|---|---|
| | | **Rs.** | **Rs.** |
| **FINANCED BY** | | | |
| **CAPITAL** | | | |
| Capital Grant Spent | | 7,681,819 | 5,171,750 |
| Capital Grant Unspent | Note - 08 | 8,974,690 | 4,644,778 |
| Gifts & Donations | | 1,774,239 | 2,742,512 |
| | | **18,430,748** | **12,559,040** |
| **Reserves** | | | |
| Income and Expenditure A/C | | 13,068,932 | 11,991,357 |
| **Restricted Funds** | | | |
| Endowment Fund | | 2,262,592 | 2,064,843 |
| Research Grants | Note - 09 | 3,182,388 | 2,123,856 |
| Institute Development Fund | | 1,347,755 | 892,901 |
| MSc Research Projects in 2012 | | 2,200,000 | 1,922,500 |
| | | **8,992,735** | **7,004,100** |
| **CURRENT LIABILITIES** | | | |
| Accrued Expenditure | | 2,302,102 | 1,985,345 |
| Provision for Gratuity | Note - 10 | 3,126,703 | 1,725,127 |
| Refundable Laboratory Deposits | | 1,096,000 | 989,000 |
| Other Refundable Deposits | | 71,800 | 85,610 |
| | | **6,596,605** | **4,785,083** |
| | | **47,089,019** | **36,339,580** |

Prepared & Certified by Senior Assistant Bursar : ……………………..

For and on behalf of the Board of Management

………………………. Director

……………………………….. Senior Asst. Registrar

**INSTITUTE OF BIOCHEMISTRY, MOLECULAR BIOLOGY & BIOTECHNOLOGY**

**UNIVERSITY OF COLOMBO**

**INCOME & EXPENDITURE ACCOUNT**
**FOR THE YEAR ENDED 31ST DECEMBER 2011**
(Figures adjusted to the Nearest Rupee)

| | | 2011 | 2010 |
|---|---|---|---|
| | | Rs. | Rs. |
| **INCOME** | | | |
| Govt. Grant for Recurrent Expenditure | | 34,010,806 | 25,150,000 |
| Govt. Grant for Rehabilitation of Capital Assets | | 1,577,500 | 1,050,000 |
| Amortization of Donated Assets | | 3,066,896 | 10,358,589 |
| Research Grants | Note - 11 | 207,625 | 5,841,715 |
| Generated Income | Note - 12 | 3,719,667 | 3,007,295 |
| Interest Income | | 687,851 | 917,291 |
| Other Income | Note - 13 | 240,955 | 425,830 |
| | | **43,511,299** | **46,750,720** |
| **Less : EXPENDITURE** | | | |
| Personal Emoluments | Note - 14 | 13,436,767 | 10,992,460 |
| Travelling | | 312,132 | 1,264,956 |
| Supplies | Note - 15 | 7,581,235 | 10,317,486 |
| Maintenance Expenditure | Note - 16 | 5,698,930 | 4,412,672 |
| Contractual Services | Note - 17 | 10,942,747 | 9,957,444 |
| Other Recurrent Expenses | Note - 18 | 1,327,426 | 954,432 |
| Institute Development Fund | | 419,115 | 698,433 |
| Depreciation | Note - 19 | 3,335,609 | 10,521,609 |
| | | **43,053,960** | **49,119,492** |
| **Excess of Income over Expenditure** | | **457,339** | **(2,368,772)** |

**Income & Expenditure Appropriation Account**

| | | |
|---|---|---|
| Balance B/F from Income & Expenditure A/C | 457,339 | (2,368,772) |
| Income & Expenditure Account B/F Balance | 11,991,357 | 14,358,964 |
| Adjustments in respect of previous Year | 620,236 | 1,165 |
| **Balance C/F to Balance Sheet** | **13,068,932** | **11,991,357** |

**INSTITUTE OF BIOCHEMISTRY, MOLECULAR BIOLOGY & BIOTECHNOLOGY**

**UNIVERSITY OF COLOMBO**

**CASH FLOW STATEMENT**
**FOR THE YEAR ENDED 31ST DECEMBER 2011**

| | | Rs. | Rs. |
|---|---|---|---|
| ***Excess for the year*** | | **457,339** | - |
| Add: | Adjustments for items not involving movement of Funds | | |
| | Provision for Gratuity | 1,401,575 | |
| | Interest from Investment | (687,851) | |
| | Depreciation | 268,713 | |
| | Prior Year Adjustments | 620,236 | |
| Operating excess before working capital changes | | 2,060,013 | |
| | Decrease in Receivables | 2,229,716 | |
| | Increase in Payables | 409,947 | |
| | **Net cash flow from operating activities** | | **4,699,676** |
| **CASH FLOWS FROM INVESTING ACTIVITIES** | | | |
| | Acquisition of Fixed Assets | (7,750,965) | |
| | Decrease in Investments | 2,638,150 | |
| | Interest from Investments | 687,851 | |
| | | | **(4,424,964)** |
| **CASH FLOWS FROM FINANCING ACTIVITIES** | | | |
| | Government Grant for Capital Expenditure | 8,640,000 | |
| | Restricted Funds | 1,988,634 | |
| | | | **10,628,634** |
| **NET INCREASE IN CASH EQUIVALENTS** | | | **10,903,346** |
| | Cash & cash equivalents at the beginning of the period | | 7,769,792 |
| | **Cash & cash equivalents at the end of the period** | | **18,673,138** |

# Notes to the Financial Statement

# Institute of Biochemistry, Molecular Biology & Biotechnology University of Colombo

## 1. Significant Accounting Policies

### 1.1 Reporting Entity

IBMBB has been incorporated under the Ordinance No.1285/25 and gazetted on 23rd April 2003. The main administration is at No 90, Cumaratunga Munidasa Mawatha.Colombo 03. The Financial Statement of the IBMBB are prepared for the year ending 31/12/2011.

### 1.2 Basis of Preparation

The Financial Statements are prepared on the historical basis of accounting, whereby the transactions are recorded at values prevailing at the dates when the assets were acquired, the liabilities were incurred and funds obtained; in accordance with generally accepted Accounting Principles and Sri Lanka Accounting Standards (SLAS) laid down by the Institute of Chartered Accountants of Sri Lanka.

The financial statements are prepared in Sri Lanka Rupees, which is the functional and presentation Currency. Figures and phrases relating to the previous year have been restated where necessary, for comparison with the current year presentation.

### 1.3 Conversion of Foreign Currencies

All foreign currency transactions are accounted for at the exchange rates prevailing at the date of the transactions; gains and losses resulting from the settlement of such translation and from the translation of monetary assets and liabilities denominated in foreign currencies are recognized in the income statement. Monetary assets and liabilities denominated in foreign currencies are translated at exchange rates prevailing on the balance sheet date.

## 1.4 Assets and the bases of their valuation

### 1.4.1 Property Plant and Equipment (PPE)

Property, Lab and Teaching Equipments include the items purchased out of government grant, research grants and internally generated funds.

Property and Equipment are recorded at cost of purchase together with any incidental expenses thereon. The assets are shown at cost less accumulated depreciation. Assets received as grants have been valued at their fair value.

### 1.4.2 Impairment

An asset's carrying amount is written down immediately to its recoverable amount, such reduction is recognized as an expense immediately.

### 1.4.3. Amortization

Amortization is recognized in income statement on a straight line basis over the estimate useful life of the assets.

### 1.4.4. Gain or loss on disposal

Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in the income statement

### 1.4.5. Subsequent cost

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the items will flow to the institute and the cost of items can be measured reliably. All other repairs and maintenance are charged to income statement during the financial period in which they are incurred.

### 1.4.6. Depreciation

Assets, for which dates of purchase are known, depreciation is provided in proportion to the number of months completed or such assets were used from the date of purchase. Assets of which exact date of purchase is not known depreciation is provided for the whole year in which they were purchased. Depreciation will be provided on the year of the sale/ disposal in proportion to the number of months the assets over the estimated useful life of assets.

Depreciation has been charged to income statement on all property and equipment on the straight line basis at the following rates per annum in order to write off the cost of such assets over their estimated useful lives.

**Rates of Depreciation**

- Fixtures & Fittings - 10% per annum
- Office Furniture & Equipment - 10% per annum
- Computers - 20% per annum
- Laboratory & Teaching Equipment - 20% per annum
- Lab Tools - 20% per annum
- Library Books and Periodicals - 20% per annum

## 1.5 Income and Expenditure

### 1.5.1. Government Grant

The total Capital Grant received for the year was Rs.10.217 Mn. The Grants that have been used for the operational activities for the year was Rs.4.310 Mn and have been recognized as revenue in the Income Statement.

### 1.5.2 Revenue Recognition

**(a) Government Grants (Recurrent)**

The Government Recurrent grants are recognized in the period in which they are received.

**(b) Government Grant (Capital)**

Grant relating to purchase of property and equipment are included in non-current liabilities as deferred income and are credited to the income statement on a straight line basis over the expected life of the related assets.

**(c) Student Registration**

Student Registration fees are recognized as revenue only on the receipt of fees.

**(d) Course Fees**

Course fees are recognized over the period of instruction. Where adequate information is not available to make such allocation to different financial periods, fees are recognized as income on a cash basis.

**(e) Investment Income**

Interest income received out of Investment is accounted on accrued basis.

**1.6 Receivables**

Receivables are stated at the amounts that they are estimated to realize.

**1.7 Cash & cash equivalents**

Cash & cash equivalents comprise cash & bank balances and short term investments.

**1.8 Current Assts**

Current Assets classified in the balance sheet are those which will be recovered within one year after the Balance Sheet date.

**1.9 Current Liabilities**

Liabilities classified as current Liabilities in the balance sheet are those that fall due for payment within one year from the Balance sheet date. All known liabilities have been accounted for in preparing the final statements.

**1.10 Cash flow statement**

The cash flow statements have been prepared using the "Indirect Method" for the purpose of the statement of cash flow. Cash & cash equivalents are comprised cash & bank balances, short term deposits.

**1.11 Employee Benefits**

**(a) Defined benefit plans**

Provision is made in the accounts for retirement gratuities at rates applicable under the payment of Gratuity Act No.12 of 1983. Although employees should complete a minimum period five years of continued employment to qualify for gratuity payments under the Act, provision is made from the commencement of employment on the assumption that all employees intend to continue in employment to at least five years.

**(b) Defined Contribution Plans- UPF & ETF**

Employees are members of the University Provident Fund and Employees Trust Fund. Contribution to defined contribution plans, UPF, EPF & ETF are recognized as an expense in the income statement as incurred.

# Annual Report of Audit Committee – 2011

The Audit Committee has one(01) special meeting and four(04) other meetings in 2011.
The terms of reference was in accordance with PED/31.

According to data available to this committee there were two major problems.

1. The institute (IBMBB) has self-financing courses which run more than one year. Therefore funds have to be carried over especially to finance research project work. Treasury approval had to be sought to invest funds but unfortunately Investments were made prior to a reply from the Treasury. This reply is still awaited.

2. There is a gross inadequacy in cadre and therefore some items of the corporate plan were impossible to be carried out.

3. The management has pointed out the following difficulties which take up valuable time.

(i) Problems such as repair of Canopy (ii) waste water from canteen entering the IBMBB premises and causing pollution and additional financial burden.

The net result is that the Director who is the only cadre Professor being distracted from more important academic and administrative activities. It also results in added pressure on the Senior Assistant Registrar. The Senior Assistant Bursar post having a high turnover also did not help.

The bottom line is that although IBMBB has a superb infrastructure, the non-availability of Swedish funding in view of termination of bilateral agreement with Sri Lanka, grossly inadequate cadre and insufficient Treasury funds especially to update instruments is deterrent to in reaching the Institute's maximum potential.

The misconception in cadre allocation seems to have arisen by calculation of cadre as in Universities carrying out mainly undergraduate courses. The IBMBB is a Postgraduate Institute and even at MSc level supervision of projects is often on a 1:1 basis (teacher: student) as is the case with MPhil's and PhD's. Therefore the system of calculating cadre for standard Universities cannot be applied.

If the requested cadre was allocated at inception of IBMBB both the output of IBMBB and the Financial situation would have been considerably better.

The matter of taking into account Academics allowance for calculation Provident Funds was settled by the UGC but the matter of payment of Language proficiency allowance to employees remains unsolved.

Regarding the delays in submission of the Annual Report as brought up by the University of Colombo Internal Audit report, the committee noted that there are reasons beyond the control of the Institute. The committee suggested that a Draft Annual report along unaudited annual accounts be submitted before the deadline.

| | |
|---|---|
| K.E.W. Jayasiri | Emeritus Prof. E.R. Jansz |
| Asst. Internal Auditor | Chairman Audit Committee & Board |
| Univ. of Colombo | Member/ IBMBB |
| Secretary A/C. IBMBB | |

විගණකාධිපති දෙපාර්තමේන්තුව
கணக்காய்வாளர் தலைமை அதிபதி திணைக்களம்
**AUDITOR GENERAL'S DEPARTMENT**

මගේ අංකය / எனது இல / **My No** } CE/C/IBMBB/2011/FA

ඔබේ අංකය / உமது இல / Your No. }

දිනය / திகதி / **Date** } 24 May 2012

The Director
Institute of Biochemistry, Molecular Biology and Biotechnology

**Report of the Auditor General on the Financial Statements of the Institute of Biochemistry, Molecular Biology and Biotechnology Affiliated to the University of Colombo for the year ended 31 December 2011 in terms of Section 108(2) of the Universities Act, No. 16 of 1978 and Section 13(7)(a) of the Finance Act, No. 38 of 1971.**

The audit of financial statements of the Institute of Biochemistry, Molecular Biology and Biotechnology Affiliated to the University of Colombo for the year ended 31 December 2011, comprising the balance sheet as at 31 December 2011 and the income statement, statement of changes in equity and cash flow statement for the year then ended and the summary of significant accounting policies and other explanatory information, was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13(1) of the Finance Act, No. 38 of 1971 and Section 17 of the Institute of Biochemistry, Molecular Biology and Biotechnology Ordinance No. 1 of 2003 enacted under Section 18 of the Universities Act, No. 16 of 1978. My comments and observations which I consider should be published with the Annual Report of the Institute of Biochemistry, Molecular Biology and Biotechnology in terms of Section 13(7)(a) of the Finance Act appear in this report.

## 1.2 Management's Responsibility for Financial Statements

The management is responsible for the preparation and fair presentation of those financial statements in accordance with the Sri Lanka Accounting Standards and for such internal control as the management determines is necessary to enable the preparation of financial statements that are free from material misstatements whether due to fraud or error.

අංක 306/72, පොල්දූව පාර, බත්තරමුල්ල, ශ්‍රී ලංකාව
දුරකථනය / தொலைபேசி / **Telephone** } 2887028 - 34

இல.306/72,பொல்துவ வீதி, புத்தரமுல்லை, இலங்கை.
ෆැක්ස් අංකය / பக்ஸ் இல / **Fax No.** } 2887223

**No.306/72, Polduwa Road, Battaramulla, Sri Lanka**
ඉලෙක්ට්‍රොනික් තැපෑල / ஈ- மெயில் / **E-mail.** } **oaggov@sltnet.lk**

## 1.3 Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Sri Lanka Auditing Standards. Those Standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgments, including the assessment of the risks of material misstatements of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Institute's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Institute's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of financial statements. Sub-sections (3) and (4) of Section 13 of the Finance Act, No. 38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my qualified audit opinion.

## 1.4 Basic for the Qualified Opinion

My opinion is qualified based on the matters described in paragraph 2.2 of this report.

## 2. Financial statements

### 2.1 Qualified Opinion

In my opinion, except for the effects of the matters described in paragraph 2.2 of this report, the financial statements give a true and fair view of the financial position of the Institute of Biochemistry, Molecular Biology and Biotechnology as at 31 December 2011 and its financial performance and its cash flows for the year then ended in accordance with the Sri Lanka Accounting Standards.

### 2.2 Comments on Financial Statements

#### 2.2.1 Presentation of Financial Statements

The financial statements of the Institute of Biochemistry, Molecular Biology and Biotechnology Affiliated to the University of Colombo for the year under review had been presented for audit on 22 February 2012. The accounts were audited and the draft report was issued on 30 March 2012. Accounting deficiencies amounting to Rs.456,967 were pointed out in the draft report. The revised financial statements after rectification of accounting deficiencies amounting to Rs.337,380 had been presented on 20 April 2012. The possibility of further such deficiencies outside the selected sample cannot be ruled out in audit.

#### 2.2.2 Unreconciled Control Accounts

The following differences between the Schedule of Fixed Assets furnished with the financial statements for the year under review and the Register of Fixed Assets were observed.

| | Schedule of Fixed Assets | Register of Fixed Assets | Difference |
|---|---|---|---|
| | Rs. | Rs. | Rs. |
| Refrigeration Bath | 895,767 | 904,953 | 9,186 |
| Control Head | 13,061 | 169,042 | 155,981 |
| Biospe Nano | 1,530,738 | 1,512,894 | 17,844 |
| Microplate Reader | 3,232,877 | 3,494,606 | 261,729 |
| | | | 444,740 |

### 2.2.3 Non-compliance with Laws, Rules, Regulations and Management Decisions

Even though the Daily Running Charts and the Monthly Performance Summaries of Motor Vehicles should be presented to audit before 15th day of the month following, those had been furnished after delays ranging from 01 month to 10 months. The Daily Running Charts presented did not include the milometer readings, the distance run and records of fuel consumption while the officer using the motor vehicle had not signed the Daily Running Charts in terms of Financial Regulation 1646 of the Government of Sri Lanka

### 2.2.4 Transactions not supported by Adequate Authority

A sum of Rs.13,816 had been paid in the year 2011 for the proficiency in the second and third languages contrary to the provisions in the Public Administration Circulars No. 29/98, No. 29/98(i), No. 07/2007(1) and 2/2009 and in accordance with circulars issued by the University Grants Commission.

## 3. Financial Review

### 3.1 Financial Results

According to the financial statements presented, the working of the Institute for the year ended 31 December 2011 had resulted in a deficit of Rs.35,130,967 before taking into account the Government grant for recurrent expenditure and the corresponding deficit for the preceding year amounted to Rs.28,768,772. The financial result for the year under review had been converted to a surplus of Rs.457,339 after taking into account the Government Grant of Rs.35,588,306 received for recurrent expenditure and maintenance expenditure and the deficit for the preceding year had been reduced to Rs.2,368,772 after taking into account the Government Grant of Rs.26,200,000 received for recurrent expenditure of that year. The favourable status of the financial result had been mainly due to the increase in the Government Grants received in the year under review.

## 4. Operating Review

### 4.1 Performance

The Institute had conducted 04 Postgraduate Courses comprising 02 courses on Master of Philosophy and Doctorate of Philosophy and 02 courses on Master of Science. The following matters were observed in that connection.

(a) Information on the admission of new students during the last 05 years is given below.

| Year | Master of Science | Master of Philosophy and Doctorate of Philosophy |
|---|---|---|
| 2007 | 11 | 01 |
| 2008 | 13 | 05 |
| 2009 | 12 | 01 |
| 2010 | 19 | 01 |
| 2011 | 10 | -- |

In addition, 07 students registered with other institutions had been conducting researches during the year under review.

(b) Ten students had registered for the Degree in Master of Science during the year under review while not even one student had registered for the Degree in Master Philosophy/ Doctorate of Philosophy. Nine students had obtained Postgraduate Degrees and left during the year.

(c) The number of students of the Institute had been 51 and comprised 10 new students of the year 2011 and 19 students for Master of Science Degree, 11 students for Master of Philosophy and Doctorate of Philosophy Degree, 04 failed students and 07 indirect students. Nevertheless, the Institute is being maintained in a four storeyed building with 27000 square feet of floor area valued at Rs.116,864,648. Even though recurrent expenditure and capital expenditure amounting to Rs.42,909,707 and Rs.7,750,965 respectively had been incurred in the year under review, in consideration of the resources allocated for the Institute and the expenditure incurred, underutilization of resources had prevailed.

## 4.2 Stores Control

The following matters were observed at an examination of a sample of 24 item out of 329 items in the Inventory of Chemicals and a sample of 18 items out of 63 items in the Inventory of Enzymes.

(a) Non-moving stocks of 15 items in the Inventory of Chemicals valued at Rs.572,119 and non-moving stocks in the Inventory of Enzymes valued at Rs.944,431 were observed.

(b) A slow moving stock of 10 items in the Inventory of Chemicals valued at Rs.465,985 was observed.

### 4.3 Under Utilization of Funds

A year end Bank balance of Rs.12,085,507 in the Bank Current Account of the Institute was observed. The minimum monthly balance during the year amounted to Rs.3,287,888 and attention had not been paid to earn an income by investing such surplus cash in short term basis.

## 5. Systems and Controls

Weaknesses in systems and controls observed during the course of audit were brought to the notice of the Director of the Institute from time to time. Special attention is needed in respect of the following areas of control.

(a) Advances
(b) Accounting
(c) Inventory Control

H.A.S. Samaraweera
Auditor General

-/dk.

21.06.2012
Mr. H.A.S.Samaraweera,
Auditor General
Auditor General's Department,
Independence square,
Colombo 07

**The report of the Auditor General in terms of section 108(2) of the Universities Act No.16 of 1978 and section 13(7)(j) of the Finance Act No.38 of 1971 on the financial statements of the Institute of Biochemistry, Molecular Biology and Biotechnology for the year ended 31 December, 2011.**

With reference to your above report bearing no CE/C/ IBMBB/2011/FA and dated 24 May 2012.

**2. Financial Statements**

**Opinion**

**2.2 Comments on the financial statements**

**2.2.1 Presentation of o the financial statements**

Action was taken to correct the accounting deficiencies highlighted.

**2.2.2 Non-reconciled administrative accounts**

Action was taken to correct the differences in the fixed asset registers as per the relevant accounting standards.

**2.2.3 Non-compliance with laws, rules and regulations**

Action has been taken to submit daily running charts and monthly summaries accurately on due date.

**2.2.4 Transactions not confirmed by sufficient authority**

The relevant payments for the proficiency in the second and third languages were made as per the circulars issued by the University Grants Commission. Up to now we have not received any circular from the University Grants Commission stating that the said payments were in violation of the government rules and regulations.

**3. Financial Review**

**3.1 Financial outcomes**

Agrees.

**4. Operational Review**

4.1

(a) Noted

(b) Students can be admitted to MPhil/PhD Degree programmes only when the Academic staff have obtained research funds to support these programs. As the number of academic staff is limited number of

Research Grants that can be obtained is limited. An application was made to the HETC programme for research funding but it was not successful. It is expected to enroll four students in the MPhil/PhD Degree programmes supported by Research Grants obtained from National Research Council.

(c) There are several reasons as to why this should not be considered as under utilization.

1) Although from the inception it has been indicated as 27000 sq. feet, the area utilizable for laboratories and lectures is much smaller. Also for several sensitive equipment and several sensitive laboratory procedures dedicated space need to be allocated, if the equipment are to be maintained properly and if the experiments are to be conducted successfully. It is very difficult to explain this in writing.

2) HETC project of the Ministry of Higher Education has estimated that the minimum cost of a PhD is about Rs. 3 million. National Research Council has estimated the minimum cost of a PhD in the subject areas undertaken by our Institute to be about Rs. 5 million. These values have not taken into consideration the value of buildings, salaries of staff, electricity, water and telecommunication/internet bills etc. It means that by providing this sum of money in addition to available physical and human resources, studies necessary for a PhD Degree can be undertaken.

   If these studies are to be undertaken overseas, depending on the country a MSc degree will cost Rs. 2 to 3 million and a PhD Degree will cost Rs.15 to 30 million in tuition fees alone. Recently when an Australian University discussed with us about enacting a Memorandum of Understanding to admit our students for their PhD programmes we were informed that either the Institute or the student selected will have to bear a cost of Rs. 3 million. They further informed us that they invest about Rs 30 million per scholarship. Therefore even if we consider a cost of Rs 2 million per MSc, and a cost of Rs 10 million and 15 million respectively per MPhil and PhD, to date this Institute has saved approximately Rs. 214 million in foreign exchange.

3) For experiments in the subject areas of this Institute it is necessary to have specialized dedicated laboratories. Otherwise it is not possible to obtain accurate results. Equipment and reagents needed are expensive. Most of the time these need to be imported from overseas.

4) In order to increase the number of students additional academic staff is needed. Although requests were made to University Grants Commission several times a satisfactory response has not yet been received. As per vision at the time of establishment of the Institute it was estimated that the Institute need 4 Professors, 12 post doctoral fellows and 20 graduate students (MPhil/PhD students). However having taken into consideration the MSc programmes and cadre designations in the University system a request was made for 3 posts of Professor and 7 posts of Senior Lecturer when the Institute was established. Only one post of Professor and three posts of senior lecturer were made available. Of the three Senior Lecturers one had to be reluctantly given 3 years of no pay leave to accompany the spouse in the Foreign Service. Institute has been able to achieve the current out put mainly because of the strong support for teaching and research programmes rendered by its founder Director even after his retirement and support received from Professor Ira Thabrew, a member of the Board of Management and during the first few years from Professor E.R. Jansz, a member of the Board of Management. Furthermore if one considers the output of postgraduate students, International and National research publications, International and National research communications and National and International Research Awards per academic staff member, it is most likely that the Institute will achieve the highest.

5) About 80% of the students in this Institute complete degree programmes successfully. Duration of a MSc programme is 1 ½ years. PhD students of this Institute have received International recognition frequently.

6) This Institute is involved in research of National importance. For example the first PhD study on genes causing breast cancer was completed in this Institute and the 2$^{nd}$ PhD is in progress. Based on the findings of these two studies it is now planned to provide a service to patients. Several other similar important research programmes needed for the development agriculture and health sectors have been/ are being conducted at this Institute.

7) Several probationary lecturers have obtained MPhil and PhD degrees at this Institute and they are currently serving Universities such on Jaffna, Eastern and Kelaniya. Several more are currently being trained.

8) As such this Institute has been able to save on the foreign exchange by conducting Internationally comparable postgraduate programmes.

## 4.2 Stores Control

(a, b)

When purchasing reagents needed for practical classes and for research, time taken for acquisition (direct importation or if there is a local supplier in Sri Lanka time taken to obtain goods from them), cost of freight, usage during the preceding years, requirements in the forseeable future need to be considered. Requirement for deep cold storage, approval form import control and other relevant authorities etc need to be considered. When these are needed for research and practical classes if one has to wait for several weeks or months, duration of study programmes will become longer. It is also necessary to obtain reagents and chemicals based on the package sizes available from the suppliers.

Although auditors have identified slow moving and non moving items all these are needed for practical classes and research. Most of these items were purchased from Research Grants. Items identified as non moving and slow moving by Auditors are not those with a short life span and are needed for ongoing experiments in due course.

Even if a very small amount of enzyme is needed for an experiment one has to purchase these according to the pack size available. For example if 5 units are needed for an experiment and if the smallest pack size available is 1000 units, then this has to be purchased.

Therefore when a very small quantity (a few microlitres) has been used such items are indicated as items in stock. Balance has been kept for practical classes/research of next batch of students.

## 4.3 Underutilization of funds

Measures will be taken in the future to earn revenue through the short-term investment of these excess funds with the relevant approval.

## 5. Systems and Controls

Attention was paid to the shortcomings conveyed to the Director and noted down for correction.

Professor Kamani H. Tennakoon
Director

Copies : Secretary, Ministry of Finance and Planning
Secretary, Ministry of Higher Education
Chairman, University Grants Commission
Vice Chancellor, University of Colombo
Ms. S.Padmini, Audit Superintendent, Government Audit Division,
University of Colombo

**(Annexure 1)**

Table: Number of students graduating from IBMBB with internationally comparable MSc, Mphil, PhD degree and the approximate amount of foreign exchange saved.

| Degree | No of students completing studies | | Approximate amount of foreign exchange saved | |
|---|---|---|---|---|
| | by 31.12.2011 | by 31.03.2012 | by 31.12.2011 | by 31.03.2012 |
| MSc | 40 | 57 | 80 to 200 million rupees | 114 to 285 million rupees |
| MPhil | 04 | 04 | 60 to 120 million rupees | 60 to 120 million rupees |
| PhD | 04 | 04 | 40 to 80 million rupees | 40 to 80 million rupees |
| Total | 48 | 65 | **180 to 400 million rupees** | **214 to 485 million rupees** |

## Failures and Justifications

Human Resources and Financial Resources have been the major constraint in implementing the activities as per Corporate Plan 2007-2011. Full time MSc courses conducted by the IBMBB has a full time research component for one Semester requiring 1:1 supervision of students. MPhil and PhD programmes are based on full time research. IBMBB's training programmes have provided human resources to local Universities, Research Institutes and Private Sector. Unfortunately without adequate academic cadre IBMBB is finding it difficult to expand its high quality human resource training programmes. It has only 4 cadre positions for Academic staff (one Professor and 3 Senior Lecturers), and the ongoing programmes have so far been sustained due to the significant contributions of the Founder Director (who holds an Emeritus Professorship) and other retired Senior Academics. Sustainability of teaching and research programmes and expansion require additional academic cadre, postdoctoral fellows and scientific assistants. Considering that the IBMBB's Masters programmes have approximately 80% completion rate with approximately 80% of the students completing the course in the first scheduled attempt; and that several of IBMBB PhD students have won International Awards, supporting the IBMBB by providing adequate cadre will be a very cost effective way to enhance postgraduate training and international standing of the Sri Lankan University system.

# Plan of work for 2012

**Teaching:**

Establishment and maintenance of a comprehensive resource pool of Faculty
Strengthening modern teaching /learning methods
Implementation of MSc programme in Bioinformatics
Strengthen existing MSc programmes
Improving English Language, Scientific Writing, Communication and IT skills of students subject to availability of requested funds

**Research:**

Generate new knowledge through Research programmes based on genomics, proteomics in biomedical sciences (ie: cancer, reproduction and development, parasite and vector biology, human identification etc.), plant molecular biology (eg: rice, tea, rubber and other agricultural crops) and medicinal plants (eg: anti cancer, anti inflammatory, anti malarial)
Continue/Strengthen and Expand existing MPhil/PhD programmes
Establishment of new MPhil/PhD programmes subject to obtaining required funds
Maintain and update existing Laboratory Equipment
Obtain new laboratory equipment in keeping with developments in the field
Maintain appropriate dust free temperature controlled environment needed for laboratory work
Rehabilitation of buildings
Strengthen collaborations with research institutes, hospitals and academia

**Service:**

Establishment of DNA diagnostic services for Cancer, other diseases and for the plantation sector
Training of professionals and technocrats in the application of Molecular Life Sciences and bioinformatics through workshops, certificate courses
Maintenance of mirrors of biological databases providing access to other HEIs in Sri Lanka
Dissemination of knowledge through scientific sessions, guest lectures etc

**Maintaining International Standards:**

Presentation of findings at International Conferences
Publications in International peer reviewed journals
Performance based appraisal to take into account on SCI indexed publications
Acquisition of competitive International Research Grants
Short term overseas training for faculty and academic support staff to update themselves in current technologies
International collaborations

**Governance:**

Corporate Social Responsibility – eg: human resource training for newly established Universities

# Summary of Annual Report and Accounts - 2011

## 1. Details of Resources & Students:

| Faculty | Course | Total Students | Total Academic Staff | Total Non Academic Staff |
|---|---|---|---|---|
| | MSc in Molecular Life Sciences | 22 | 3 | 17* |
| | MSc in Cellular and Molecular Immunology | 11 | | |
| | MPhil | 08 | | |
| | PhD | 10 | | |
| | | | | |
| **Total** | | **51** | **3** | **17** |

* Include <u>Academic Support Staff-02</u>
01 - Assistant Network Manager
01 - Scientific Assistant

## 2. Details of Local Students: No undergraduate students

| Faculty | Course | Medium | Intake 2010 | 1st Year Students | 2nd Year Students | No of Graduated |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **Total** | | | | | | |

## 3. Details of Foreign Students: None at present

| Faculty | Course | Medium | Intake 2010 | 1st Year Students | 2nd Year Students | 2nd Year Students | 2nd Year Students | No of Graduated |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **Total** | | | | | | | | |

## 4. Details of Academic Staff

| Faculty | Subject | Medium | Senior Prof | Professor | Senior Lecturer | Lecturer | Asst. Lecturer | Instructors |
|---|---|---|---|---|---|---|---|---|
| | Molecular Life Sciences | English | | 1 | | | | |
| | Cellular & Molecular Immunology | English | | | 1 | | | |
| | Molecular Techniques | English | | | 1 | | | |
| **Total** | | | | **1** | **2** | | | |

## 5. Details of Non-Academic Staff

| Faculty/ Branch | Most Senior | Senior Staff | Junior Staff | Minor Employees |
|---|---|---|---|---|
| IBMBB | 1- Senior Asst. Registrar<br>1- Senior Asst. Bursar | 1- Staff Technical Officer | 1- Technical Officer, Gr.II<br>1-Trainee Technical Officer | 2- Laboratory Attendant |
| | | | 4- Computer Applications Assistant | 1- Labourer |
| | | | 1- Book Keeper | |
| | | | 1-Library Assistant | |
| | | | 1-Telephone Operator cum Receptionist | |
| | | | | |
| **Total** | **2** | **1** | **9** | **3** |

## 6. Detail of Research, Innovation and Publications:

| Subject | Published | Commercialized | Presented |
|---|---|---|---|
| a. No of Researches | | | 07 |
| b. No of Innovations | | | |
| c. No of Journals | | | |
| d. No of Books | | | |
| e. No of Articles ***** | 09 | | |
| f. Other (Research , Communications) | | | 32 |
| **Total** | **09** | | **39** |

***** Journal Articles

## 7. Details of Programme, Seminars & Workshops:

| Subject | Attended | Completed | Presented |
|---|---|---|---|
| a. No of Postgraduate Degree Programme | MSc – 22<br>MPhil -<br>PhD - 18 | MSc - 08<br>MPhil – 01<br>PhD-02 | 09 |
| b. No of Postgraduate Diploma Programme | | | |
| c. No of Degree Programme | | | |
| d. No of Diploma Programme | | | |
| e. No of Certificate Programme | 10 students | 10 students | 10 |
| f. Other<br>(Workshop on Bioinformatics)<br>Guest Lectures | | | |
| **Total** | | | |

## 8. Details of Awards Received:

| Subject | No of Awards | No of Academics | No of Students |
|---|---|---|---|
| a. Local awards | | | |
| b. National Awards | | | |
| c. International Awards | | | 2 |
| d. Other | | | |
| | | | |
| | | | |
| **Total** | | | |

## 9. Details of New Course Started – 2011 Registration

| Faculty | Course | Medium | Certificate | Diploma | Postgraduate Diploma | Master | MPhil | PhD |
|---|---|---|---|---|---|---|---|---|
| IBMBB | | English | 01 | | | 19 | 1 | 2 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **Total** | | | **01** | | | **19** | **1** | **2** |

## 10. Details of Recurrent Expenditure :

| | Subject | 2010 Rs. | 2011 Rs. |
|---|---|---|---|
| a. | Personal emoluments | 10,992,460 | 13,406,041 |
| b. | Travelling | 1,264,956 | 312,132 |
| c. | Supplies | 10,317,486 | 7,587,294 |
| d. | Maintenance | 4,412,672 | 5,698,930 |
| e. | Contractual Services | 9,957,444 | 10,823,160 |
| f. | Other (including depreciation) | 12,174,474 | 5,082,150 |
| | | 49,119,491 | 42,909,707 |

## 11. Details of Capital Expenditure :

| | Subject | 2010 Rs. | 2011 Rs. |
|---|---|---|---|
| a. | Acquisition of furniture & Office Equipments | 693,004 | 813,428 |
| b. | Acquisition of Machineries (Computers & Lab Equip.) | 3,191,159 | 6,642,965 |
| c. | Acquisition of Building & Structures | - | - |
| d. | Other (Library Books) | 269,316 | 294,571 |
| | Total | 4,153,479 | 7,750,965 |

## 12. Details of Projects (Local/ Foreign Funded) :

| Name & Detail | Loan/Grant | Funding Agency # | TCE Rs. | RFA Rs. | DF Rs. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| Total | | | | | |

# (GOSL /ADB /IDA /WB /…)

## 13. Details of Project Expenditure (Local/ Foreign Funded):

| Name | TCERs. | Exp in 2010 Rs. | Exp in 2011 Rs. | Cumulative Exp as at 31.12.2011 | % of Physical Progress |
|---|---|---|---|---|---|
| SAREC Grant | | 7,061,446 | 339,177 | 7,400,623 | Work planned for 2011 completed. |
| NSF Grant | | 486,300 | 262,269 | 748,569 | |
| | | | | | |
| Total | | 7,547,746 | 601,446 | 8,149,192 | |

## 14. Details of Financial Progress (Expenditure) :

| | Subject | Provision in 2011 Rs. | Exp in 2011 Rs. | Savings/Excess Rs. |
|---|---|---|---|---|
| a. | Recurrent except Project | 34,010,806 | * 37,261,848 | -3,251,042 |
| b. | Capital except Project | ** 10,217,003 | 4,579,404 | 5,637,595 |
| c. | Project-Local funded –NSF Grant | 262,269 | 262,269 | - |
| d. | Project –Foreign funded-SAREC(Research Grant) | 339,177 | 339,177 | - |
| Total | | 44,829,252 | 42,442,696 | 2,386,553 |

*****with depreciation
** Including 5 mn UGC special allocation for the purchase of DNA Sequencer( order has been issued)

## 15. Details of Financial Progress (Generated Income) :

| | Source of Revenue | Provision in 2011 Rs. | Collection in 2011 Rs. | Deficit/ Surplus Rs. |
|---|---|---|---|---|
| a. | Undergraduate Studies | Not relevant | Not relevant | - |
| b. | Postgraduate Studies | 3,900,000 | 3,283,500 | (616,500) |
| c. | Consultancies | - | | |
| d. | Other | 45,000 | 436,167 | 391,167 |
| | | | | |
| Total | | 3,945,000 | 3,719,667 | (225,333) |

## 16. Financial Performance Analysis-2011:

| | Subject | Formula | Exp.Per Student Rs. |
|---|---|---|---|
| a. | Recurrent Expenditure per Student (RE) | RE/ No of Student strength | <u>Course</u><br>Mphil & PhD<br>7,672,335/11** 697,485<br><br>MSc<br>8,756,000/33 265,333 |
| b. | Capital Expenditure per Student (CE) | CE/ No of Student strength | |
| Total | | | |

** Includes funds from NRC Grants which are not operated by IBMBB

## 17. Details of Infrastructure Facilities Received in 2011:

| Infrastructure Details | Expenditure Rs. | Physical Progress |
|---|---|---|
| - | | |
| | | |
| | | |
| | | |
| | | |

**18. Any Other Details/ Performance Relevant to this Report:**