



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

Annual Report – 2010



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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: The 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 28th 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 3rd April, 2004. 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.

Presidential Research Awards (for 2004 to 2006) were won by IBMBB staff and some members of the Board of Management in the year, two International Travel awards and one International scholarship were won by research students, one presentation also received "one of the three best posters award" at the World Congress on Gynecological Endocrinology. Twelve students registered at the IBMBB and 6 students registered at other Higher Educational Institutes carried out research work leading to MPhil/PhD at the IBMBB. One MPhil was 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 2010. A workshop on Bioinformatics was conducted in January, a Certificate Course in Molecular Biological Techniques in August and a Bioinformatics Forum in collaboration with University of Colombo School of Computing in December. IBMBB took part in the exhibition at the 5th Asian Biotechnology Conference in December. Ten original research papers were published (of these nine in International Journals) and 29 research presentations were made by IBMBB staff and students. These are described in detail elsewhere in this document.



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

Professor Ira Thabrew, UGC Nominee

Mr. Mahinda Rajapakse, Council Nominee

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

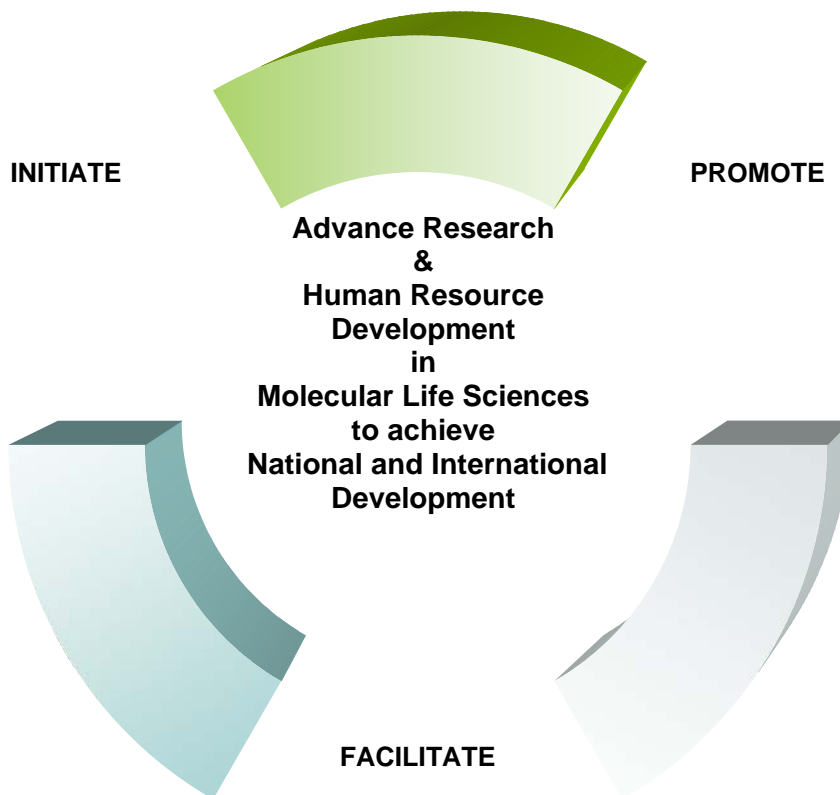
Director, University of Colombo School of Computing, Ex-officio



VISION

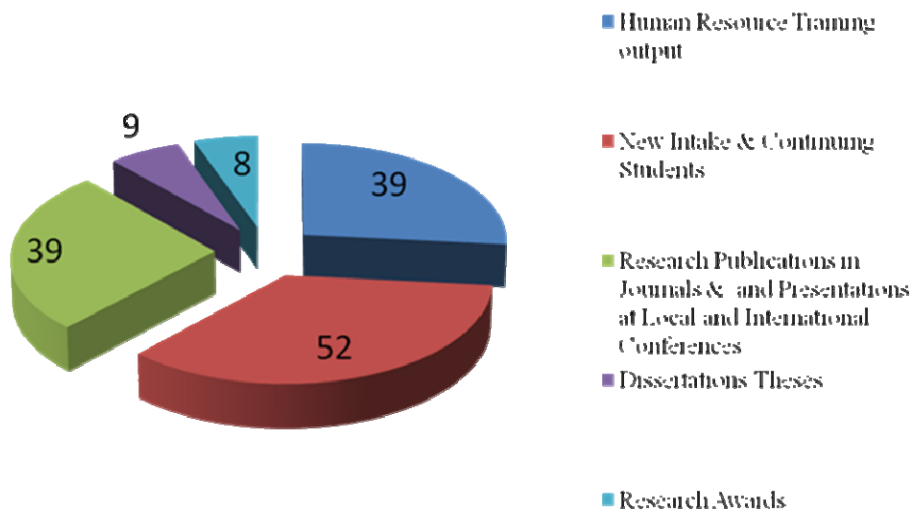
“To be
an
**International
Centre of Excellence**
in
Molecular Life Sciences”

MISSION





Performance-2010 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. Two PhD students won the under 34 competition held by the International Society for Gynecological Endocrinology (based on abstracts submitted by authors under 34 years) to present their work at the 14th World Congress on Gynecological Endocrinology in March 2010 in Florence, Italy and one of these was also awarded one of the three best posters award. Same student also won an scholarship from the San Antonio Breast Cancer Conference, USA to attend the event and present her work.

National Recognition: Presidential Research Awards were received by the Founder Director and Member of the Board of Management, Prof. Eric H Karunanayake; Director, Prof. Kamani H Tennekoon; two Senior Lecturers, Drs Shiroma Handunetti and Jagath Weerasena; Members of the Board of Management, Professors ER Jansz, MHR Sheriff, HR Seneviratne and Ira Thabrew.

Human Resource Development

Postgraduate Programmes

MPhil/PhD Programmes

Eleven students who registered previously at the IBMBB continued their work and there was one new registration (Table 1). Research programmes on which their work is based are described under Research activities.

Six 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 and one student registered at the University of Peradeniya (Table 1).

In addition to the 18 MPhil/PhD students mentioned above (12 registered at IBMBB and 6 registered in other HEI), IBMBB staff co-supervised one PhD student registered at the Faculty of Medicine and one PhD student and registered at the Faculty of Science, University of Colombo.



MSc Programmes

Sixth batch of students was admitted for the two MSc programmes in February, 2010 with 14 students registering for Molecular Life Sciences and 5 for Cellular and Molecular Immunology. 2010 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. 2009 intake continued with their second semester lectures, practicals, seminars, tutorials etc. and had the end of semester two examination. All students in the 2009 intake except one in Molecular Life Sciences who deferred the programme and one who defaulted and one in Cellular and Molecular Immunology who did not sit the first semester examination due to illness, qualified to proceed to third semester.

Three students in Molecular Life Sciences and three students in Cellular and Molecular Immunology completed their research projects and submitted the dissertations on time thus completing the course in the year 2010. Of the four students in 2008 intake in Molecular Life Sciences who had delayed commencement of the research projects, two successfully completed the course and the other two are continuing the research projects.

Professor Eric H Karunanayake Gold Medal for the Best Student in MSc in Molecular Life Sciences (2008 intake) was awarded to K L N S Perera, and the GlaxoSmithKline Gold Medal for the Best Student in MSc in Cellular and Molecular Immunology (2008 intake) was awarded to Ms A D D S Amarasekara.

Dr. OVDSJ 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. Dilantha Gunawardena (Temporary Senior Lecturer, IBMBB), Dr. John Bennett (Visiting Fellow, IBMBB), Dr. Nilanthi Dasanayake (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. Minoli Perera assisted with tutorials and Ms. Sudeshini Hewage and Ms Sumadee De Silva 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 Handunnetti (IBMBB), Prof. Preethi Randeniya (Faculty of Science, University of Colombo), Dr. Suranjith Seneviratne



(Clinical Immunologist, Imperial College, London), Dr. Enoke 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 Research Institute), 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 2011 intake of students were invited, selection examination was held and the interviews are scheduled for January 2011.

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 2nd August 2010 to 6th August 2010. In total 13 participants, (05 males and 08 females) participated in this course. The workshop was highly rated by the participants. The participants included 04 staff members from other Universities / Research Institutes/ Government Departments. Some of them were supported by their respective Institutes.

Workshop on Bioinformatics

A 5 day workshop on “Introduction to Protein Structures and Homology Modelling Bioinformatics was held from 4th to 8th January 2010 with Dr. Wimal Ubhayasekera, researcher at the MAX Lab (Swedish synchrotron radiation facility), Lund University and Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, University of Copenhagen, Denmark and Mrs. Sanjeevani Sooriyaarachchi, PhD student in Structural Biology/ Protein X-ray Crystallography / Molecular Biology, Swedish University of Agricultural Sciences, Uppsala, Sweden as resource persons. Mr. K S Senanayake (Assistant Network Manager) and Dr. Jagath Weerasena (Senior Lecturer) from the IBMBB coordinated and assisted in this activity. There were 17 participants including staff and students of the IBMBB (3), academics and postgraduate students from other Universities (7), and scientists from Research Institutes (7).

Bioinformatics Forum

In collaboration with University of Colombo School of Computing (UCSC) a Bioinformatics Forum was held to facilitate Bioinformatics research in Sri Lanka. Two key note speakers were Prof. Mahesan Niranjan, Head/Information, Signals, Images and Systems Research Group, University of Southampton, United Kingdom and Prof. Saman Halgamuge, Dept of Mechanical Engineering, University of Melbourne, Australia. The activity was coordinated by Dr. Ruwan Weerasinghe and Mrs Rupika Wiljasinghe (UCSC) and Mr. K S Senanayake and Dr Jagath Weerasena (IBMBB). Several students from the UCSC and Faculty of Science also presented their research projects.

There were more than 60 participants.



Supervision of research projects of Undergraduate students

Research Projects of four undergraduate students from the Faculty of Science, University of Colombo and one undergraduate student from the Spectrum Institute affiliated to Mysore University, India were supervised by IBMBB staff.

Exposure of Undergraduate students to Molecular Biology

Fifteen 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.

Exposure of School Children to Molecular Biology

Twenty five Advance Level students and their teachers from Rajasinghe Madhya Maha Vidyalaya, Ruwanwella made a one day visit to IBMBB to get an exposure to Molecular Biology and DNA based techniques.

Staff Development and Welfare

Director, two senior lecturers (Drs. Shiroma Handunnetti and Jagath Weerasena) and Senior Asst Registrar participated in the Workshop on Strategic Planning conducted by the Ministry of Higher Education. Dr. Shiroma Handunnetti participated in the Staff development Center training workshop on “Using assessment to promote student learning and skills development” and “Clinical Immunology Update, 2010” organized by the UK/Sri Lanka Immunology Foundation in collaboration with Ceylon College of Physicians. Senior Asst Registrar participated in a training programme on “Procurement procedures for the World Bank aided projects” from 14th to 25th June 2010 at Administrative Staff College of India, Hyderabad. Assistant Network Manager participated in a workshop on New Generation Sequencing held in conjunction with EMBnet meeting in Bari, Italy from 16th to 17th June 2010. Ms Anoma Jayasoma (Technical Officer) played for the University of Colombo Sports and Welfare Society Women’s Elle Team and Volley Ball Team, the former was runners up in the open division at the Sri Lanka Government Services Employees Elle competition.

Staff Development Programmes for other HEIS

Mr. Kanchana Senanayake (Asst Network Manager) and Dr. Dilantha Gunawardena (Temporary Senior Lecturer) functioned as resource persons for a Workshop on Bioinformatics conducted by the Wayamba University.

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, Faculties of Medicine and Science, University of Colombo, Sri Jayawardenepura University, Agri Biotechnology Centre, University of Peradeniya, Open 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 and as a member of the committee developing postgraduate courses in Physiology at the Postgraduate Institute of Medicine.

Dr. Shiroma Handunnetti served as a member of the Biotechnology Committee of the National Science Foundation and contributed as a member of this committee to compile the National Biotechnology Policy and Strategy and participated in the “Consultative meeting to discuss the issues on safeguarding Indigenous Biodiversity and Indigenous Knowledge” organized by the National Science Foundation. She also served as the Treasurer of the Allergy and Immunology Society of Sri Lanka (AISSL) and was a resource person for the Immunology Course to laboratory Technologists conducted by the AISSL in March 2010.

Dr. Jagath Weerasena functioned as a Visiting Lecturer to the Wayamba University and Postgraduate Institute of Medicine.

Mr. Kanchana Senanayake, Assistant Network Manager, 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 Filariasis, 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 10 full papers in peer reviewed journals (9 international including 4 Science citation indexed) and 29 research communications at scientific meetings in 2010 by IBMBB staff and students. 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. Details are given in Table 2.

A) Research Programmes on Parasitic and Infectious Diseases

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 quinquefasciatus*. 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, carbamazepine 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 myosin light chain gene and several other genes have been sequenced. These are likely to provide potential diagnostic methods or therapeutic targets for the development of new drugs for filariasis.

A Probationary Lecturer in Parasitology at the Faculty of Medicine, University of Jaffna carried out MPhil studies under this project. He successfully completed the Thesis and oral examination. DNA sequences generated are providing the basis for an MPhil degree registered at University of Colombo, School of Computing.

Related studies are being carried out by one student registered at the Faculty of Science for MPhil degree and carrying out experiments at the IBMBB. This project is supported by a National Science Foundation Research Grant (Principal Grantee: Dr. Ranil Dassanayake, Department of Chemistry; Co-Grantee: Dr. Jagath Weerasena, IBMBB). Some support is provided from the SAREC Grant.

Immunological studies on leptospirosis (rat fever) and malaria

MSc students carried out immunological studies on leptospirosis (rat fever) and malaria under collaborative research projects with Faculties of Medicine of Universities of Colombo and Kelaniya.

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 are now being studied by a MPhil/PhD student. This is a collaborative study with the National Cancer Institute, Maharagama and Faculty of Medicine, University of Colombo. Student carrying out this work won an International Travel Award to attend the 14th World Congress on Gynecological Endocrinology, in Florence, Italy and also received “one of the three best posters awards” at the same conference. Later in the year she also won a Scholarship (SABC scholarship) from the San Antonio Breast Cancer Conference, Texas, USA to attend the conference and present her research findings.

An MSc student carried out a project on the detection of metastasis of breast cancer using cytokeratin 19 RT-PCR.

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 laboratory 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 manuscript was accepted for publication in a Science Citation Indexed Journal and the PhD student won an under 34 Award to attend the 14th World Congress on Gynecological Endocrinology, in Florence, Italy. As a continuation of this project another MPhil project commenced in 2010 to investigate the polymorphisms of *H19* and *IGF-II* genes in relation to birth weight.

b) Leptin system and other proteomic markers for early detection of pregnancy induced hypertension / pre-eclamptic toxemia

Pregnancy induced hypertension (PIH)/pre-eclamptic toxemia (PE) are pregnancy complications with serious consequences for the baby and the mother. To date there are no biochemical or genetic markers that can identify women predisposed to PIH/PE. A collaborative study with the Castle Street Hospital for women, Colombo was carried out to evaluate the feasibility of using biochemical and genetic markers related to the leptin system for early detection of PIH/PE before clinical manifestation. Maternal leptin



levels, free leptin index and the leptin genotype are likely to identify those predisposed to developing PE/PIH. This programme funded by SAREC and NRC supported one PhD student during the year. One paper was published in a Science Citation Indexed Journal.

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 are being studied in a cohort of Sri Lankans belonging to major ethnic groups. Results to date have shown some ethnic group specific polymorphisms and a larger sample is currently being analysed. This project currently funded by the National Research Council supports one PhD student.

C) 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 are being used to assess the genetic variation and the genes conferring biotic and abiotic resistance in these varieties. This work is 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 Weerasena, Senior Lecturer, IBMBB and is supported by a National Research Council Grant awarded to him. In addition one MSc student worked on the identification of salt tolerant genes from rice supervised by the temporary lecturer Dr. Dilantha Gunawardena.

ii) 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 has submitted the Thesis.



iii) DNA phylogeny, morphology pathogenicity of *Macrophoma theicola* patch the casual agent of stem canker in Tea

Low country stem canker caused by the ascomycete *Macrophoma theicola* patch, 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. Morphological characterization of the pathogen is almost completed for different isolates of *M. theicola*

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

iv) 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 was supported by this project and he is now writing the Thesis. One MSc student also worked on Molecular Analysis of F1 hybrid plants to confirm the true hybridity between *Brassica juncea* (mustard) and *B. oleracea* (Broccoli).

v) 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 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 Lanka. One PhD student is supported by this project. In addition one undergraduate (BSc) student from Wayamba university worked on SDS-PAGE analysis of dipteran toxic δ -endotoxin protein crystals of Sri Lankan *Bacillus thuringiensis* strains.

D) Research on medicinal plants

i) Anti-inflammatory effects of Medicinal Plants:

Identification of active components and the mechanism of anti-inflammatory effects of medicinal plants

The focus of this study is on medicinal plants used in the treatment of diseases either associated with or caused by inflammatory responses. Three plants, *Vitex negundo* (*Nika*), *Alpinia calcarata* (*Araththa*) and *Ixora coccinea* (*Rathmal*) are currently under investigation. Reported anti-inflammatory activity of these three plants was confirmed. *In vitro* studies showed that anti-cytokine activities, inhibition of reactive nitrogen intermediates and reactive oxygen intermediates production by these medicinal plant extracts are responsible for their anti-inflammatory activity. Inhibition of human neutrophil activation and their main functions significantly contributed to the anti-inflammatory activities. This study conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB in collaboration with the Department of Chemistry, Faculty of Science, University of Colombo supported two MSc students and is sponsored by the National Research Council.

ii) Anti-malarial effects of Medicinal Plants:

Identification of active components and the mechanism of anti-malarial effects of medicinal plants

The focus of this study is on medicinal plants used in the treatment of malaria in Sri Lanka. Five plants, i.e., *Anisomeles indica*, *Andrographis paniculata*, *Caesalpinia bonduc*, *Toddalia asiatica* and *Vitex negundo* were used in this study. Treatment of malaria could be based on two strategies, i.e., anti-parasitic therapy or anti-disease therapy, or both. Anti-disease effects occur due to pro-inflammatory cytokines that are prevalent during acute malaria infections and other cellular mechanisms such as production of reactive nitrogen intermediates which can lead to endothelial damage and pathogenesis of severe and cerebral malaria. *In vitro* studies showed that these medicinal plant extracts have anti-cytokine activities and inhibition of reactive nitrogen intermediates production. These studies support the traditional use of these medicinal plants in treatment of malaria that contribute in reducing malaria symptoms and development of severe disease. This study conducted by Dr. Shiroma Handunnetti, Senior Lecturer at IBMBB in collaboration with the Departments of Zoology and Chemistry, Faculty of Science, University of Colombo supported two MSc students of IBMBB and one undergraduate student from Department of Chemistry, Faculty of Science, University of Colombo and is funded by the National Research Council.



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, who now holds Senior Research Fellowship from the National Science Foundation at the IBMBB. A probationary staff member of the Department of Biochemistry and Clinical Chemistry, University of Kelaniya reading for a PhD is examining expression of selected genes in a rat model of cancer and the effect of an herbal decoction on the same.

In order to assess the molecular mechanisms responsible, in-vitro studies were also carried out to examine the expression of anti-apoptic and pro-apoptic genes in Hep G₂ cells. A standardized hot water and ethanolic extracts of a mixture containing equal proportions of *Nigella sativa* seeds, *Hemidesmus indicus* roots and *Smilax glabra* rhizomes were developed. Hot water extract had a stronger cytotoxic activity and up regulated wild type p53 expression in Hep G₂ cells. Effects on the expression of other genes are currently being investigated. This work is carried out by an MPhil/PhD student registered at the IBMBB and is supported by National Science Foundation Fellowship to Prof. Thabrew and by SAREC Grant. One MSc student also worked on this project. Four papers were presented, three at International conferences and one at the 5th Asian Biotechnology Conference and one paper was published based on the results of these studies.

Visitors to the Institute: The Institute had several distinguished foreign overseas collaborators and resource persons during the year. The visitors in 2010 included Dr. E van Zalen, Mr. Jan Keijzer, and Mr. Richard Koning from the Netherlands Forensic Institute; Dr. Suranjith Seneviratne, Lead Clinician in Immunology, St Mary's Hospital and Senior Lecturer in Immunology, Imperial College, London; Dr Natkunam Ketheesan, Associate Professor & Team Leader, Infectious Diseases and Immunopathogenesis research Group, James Cook University Queensland, Australia; Prof. Mahesan Niranjan, Head/Information, Signals, Images and Systems Research Group, University of Southampton, United Kingdom and Prof. Saman Halgamuge, Dept of Mechanical Engineering, University of Melbourne, Australia.

Guest Lectures:

In addition to the lectures by overseas /local resource persons at the Workshops and Bioinformatics Forum held at the IBMBB the following two lectures were also held.

Models to determine host-pathogen interactions in bacterial infections by Dr Natkunam Ketheesan, Associate Professor & Team Leader, Infectious Diseases and Immunopathogenesis Research Group, James Cook University Queensland, Australia.

Identification and Characterization of a Novel Malarial Proteins Involved in Erythrocyte Binding and Invasion by Dr Thilan Wickramarachchi, Lecturer, Department of Chemistry, Faculty of Science, University of Colombo.



Human Resources

H New Appointments

Prof. Kamani H Tennekoon, incumbent Director was appointed to the Post of Professor of Molecular Life Sciences with effect from 09.02.2010. Dr. Dilantha Gunawardena was appointed as a Temporary Senior Lecturer for one year from 01.01.2010 Mr. Y B M N Y Bandara was appointed as Laboratory Attendant with effect from 01.11.2009 under the confirmation of primary level employees.

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 NSF Research Fellow. Dr. Faiz Marikar was appointed as a Honorary Post Doctoral Fellow on 05.10.2010.

Retirements, Resignations and Transfers

Mrs S. P. N. N. De Silva resigned from the post of Senior Assistant Bursar on 08.09.2010.

Leave

Dr. E Niroshini, Senior Lecturer continued to be on overseas leave on no pay in terms of Para 36 of the Chapter XII of the Government Establishment Code, which has been adopted by the UGC.

Staff as at 31st December 2010 are listed on page 164.

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. Unfortunately of the three Senior Lecturers only two continue to be available as one's spouse works for the Foreign Ministry and the IBMBB was reluctantly compelled to give her leave to accompany the spouse overseas in view of a currently implemented Cabinet decision adopted by the UGC. Having been appointed in 2005, she has been away from 2008 on overseas leave, leaving only 2 Senior Lecturers available for teaching and research activities. Furthermore, the only cadre professor appointed last year is also the Director. Sustainability of teaching and research programmes and expansion require additional academic cadre, postdoctoral fellows and scientific assistants.



Staff as at 31st December 2010

Permanent Cadre

Prof. Kamani H Tennekoon	Director and Professor of Molecular Life Sciences
Dr. Shiroma Handunetti	Senior Lecturer Grade I
Dr. OVDSJ Weerasena	Senior Lecturer Grade II
Dr. E Niroshini	Senior Lecturer Grade II (on no pay leave)
Mrs. Anoma Ratnayake	Senior Asst Registrar
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 Niranjana	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 / Acting Basis

Dr. Dilantha Gunawardena	Senior Lecturer
Ms. Inoka Sanjeevani	Acting Senior Asst Bursar (from 11.08.2010)
Ms. Sachinthika Gunatilleke	Teaching / Research Assistant (from 15.03.2010)
Ms. Sumadee De Silva	Teaching / Research Assistant (from 16.07.2010)
Ms. T Prabodha Liyanage	Accounts Trainee (from 01.10.2000)



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
Dr. Dilantha Gunawardena - Temporary Senior Lecturer, 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. W D Ratnasooriya - Professor of Zoology, Faculty of Science, UoC
Prof Senaka Rajapakse - Professor in Clinical Medicine, Faculty of Medicine, UoC
Prof MHR Sheriff - Professor of Clinical 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. Kumudu Fernando - Director, Agri Biotechnology Centre, UoP
Dr Ananda Jayanaga - Consultant Physician, Base Hospital, Homagama
Dr. J M Kumarasiri - Consultant Obstetrician Gynaecologist, Castle Street Hospital for Women
Dr Aloka Pathirana - Consultant Surgeon, Colombo South Teaching Hospital
Dr. R Samarasekera - Herbal Technology Division, Industrial Technology Institute, Colombo
Dr Praneetha Somaratne - 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. Ajita Wijesundera - Consultant Obstetrician Gynaecologist, formerly at Castle Street Hospital for Women
Mr. Harsha Wijewardena - Consultant, University of Colombo School of Computing



Research (MPhil/PhD) students

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



Research 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 given in bold italic

Research Papers published in Indexed / Refereed Journals

- 1) Arawwawala M, **Thabrew I**, Arambewela L, **Handunnetti S**. Anti-inflammatory activity of *Trichosanthes cucumerina* Linn. in rats. ***Journal of Ethnopharmacology***. 2010;131:538-543.
- 2) Gomes TS, Lindner U, **Tennekoon KH**, Karandagoda W, Gortner L, Obeid R. Homocysteine in small for gestational age and appropriate for gestational age preterm neonates from mothers receiving folic acid supplementation. ***Clinical Chemistry and Laboratory Medicine***. 2010;48:1157-1161.
- 3) **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*** (In press).
- 4) **Muruganathan A**, **Karunanayake EH**, **Tennekoon KH**. Cloning and characterisation of alkali myosin light chain gene (MLC-3) of cattle filarial parasite *Setaria digitata*. ***IIAOB Journal***. 2010
- 5) Pathirana PPSL, Ekanayake K, Howard RJ, Mendis KN, and **Handunnetti SM**. Expression of surface antigens, cytoadherence and their association with clinical symptoms in acute *Plasmodium falciparum* infections from Sri Lanka. ***The Journal of National Science Foundation***. 2010; 38:233-240.
- 6) **Samarakoon SSR**, **Thabrew I**, Galhena PB, De Silva D, **Tennekoon KH**. A Comparison of the Cytotoxic Potential of Standardized Aqueous and Ethanolic Extracts of a Polyherbal Mixture Comprised of *Nigella sativa* (seeds), *Hemidesmus indicus* (roots) and *Smilax glabra* (rhizome). ***Pharmacognosy Research***.2010;6 215-222.
- 7) Sawai H, Otani H, Arisue N, Palacpac N, de O Martins L, Pathirana S, **Handunnetti S**, Kawai S, Kishino H, Horii T and Tanabe K. Lineage-specific positive selection at the merozoite surface protein 1 (*mSP1*) locus of *Plasmodium vivax* and related simian malaria parasites. ***BMC Evolutionary Biology***. 2010; 10: 52.



- 8) **Sugathadasa BHKR, Tennekoon KH, Karunanayake EH,** Kumarasiri JM Wijesundere APDeS. Association of -2548 G/A polymorphism in the leptin gene with preeclampsia/ pregnancy induced hypertension. *Hypertension in Pregnancy*. 2010; 29:366-374.
- 9) Weerakoon SR, **Weerasena OVDSJ, Peiris PKD,** Somaratne S. Differentiation of Sri Lankan mustard (*Brassica juncea*) accessions using FALFP markers and Agro-Morphological data. *Research Journal of Bio Technology*. (In press).
- 10) Wickramarachchi T, Premaratne PH, Dias S, **Handunnetti SM** and Udagama-Randeniya PV. Genetic complexity of *Plasmodium vivax* infections in Sri Lanka reflected at the Merozoite Surface Protein-3 α locus *Annals of Tropical Medicine and Parasitology* 2010; 104:95-108.

Scientific Meetings where abstracts are published (print or electronic)

- 1) **De Silva S, Tennekoon KH, Karunanayake EH, De Silva JWN,** Amarasinghe I, Angunawala P (2010) Characterization of mutations and sequence variants in breast cancer susceptibility gene 2 (*BRCA2*) in a group of breast cancer patients in Sri Lanka.
San Antonio Breast Cancer Conference, Texas, USA, December 2010
- 2) **De Silva S, Tennekoon KH, Karunanayake EH, De Silva JWN,** Amarasinghe I, Angunawala P (2010) Characterization of mutations and sequence variants in breast cancer susceptibility gene 2 (*BRCA2*) in a group of breast cancer patients in Sri Lanka
14th World Congress on Gynecological Endocrinology, Florence, Italy, March 2010
- 3) **Galhena BP, Samarakoon SSR, Thabrew MI,** Solomon FD P, Venkatachalam P, and Chinnadurai M (2010) A preliminary study to determine the chemoprotective potential of a herbal decoction *Nigella sativa* (seeds), *Hemidesmus indicus* (roots) and *Smilax glabra* (rhizome)
International Conference on Radiation Biology, India, November 2010,
- 4) **Gunaratne RI, Rajapakse S, Bulathsinghalage MRC,** Somaratne P, De Silva HJ, **Handunnetti SM.** Serum nitrite Levels in Sri Lankan patients with Leptospirosis
Proceedings of the 5th Biennial Sessions of the AISSL 30th July, 2010; 28.



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- 5) **Jayanthiny P, Tennekoon KH, Karunanayake EH, Kumarasiri JM, Wijesundere APDeS (2010)**
Insulin-like growth factor (IGF) genotypes associated with birth size of Sri Lankan babies
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka, December 2010
 - 6) **Jayanthiny P, Tennekoon KH, Karunanayake EH, Kumarasiri JM, Wijesundere APDeS (2010)** Intron -2 CT repeat polymorphism of *IGF-I* gene and circulating levels of insulin-like growth factor-I (IGF-I) and IGF binding protein-1; Association with birth indices.
Annual Scientific Sessions of the Sri Lanka Medical Association, Colombo, June 2010,
 - 7) **Jayanthiny P, Tennekoon KH, Karunanayake EH, Kumarasiri JM, Wijesundere APDeS (2010)** insulin-like growth factor-I (IGF-I) and IGF binding protein-1 and dinucleotide (CT) repeat polymorphism of the intron 2 of *IGF-I* gene and their association with birth indices.
14th World Congress on Gynecological Endocrinology, Florence, Italy, March 2010
 - 8) **Murugananthan A, Karunanayake EH, Tennekoon KH**
Bio-informatic analysis of the alkali myosin light chain gene and protein of *Setaria digitata*.
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka, December 2010
 - 9) **Rajkumar G, Weerasena OVDSJ, Fernando KKS, Liyanage ASU (2010)**
Assessment of the genetic variability among Sri Lankan rice varieties by fluorescent AFLP (Amplified Fragment Length Polymorphisms) markers.
Second International Symposium on Genomic of Plant Genetic Resources, Bologna, Italy.P3.73: p153
 - 10) **Rajkumar G , Weerasena OVDSJ, Fernando KKS, Liyanage ASU (2010)**
AFLP Analysis of Genetic Relationships and Diversity of Sri Lankan *Oryza sativa* cultivars (Improved Varieties).
14th International Biotechnology Symposium and Exhibition “Biotechnology for the Sustainability of Human Society”. Rimini, Italy. Journal of Biotechnology. 150S (2010) S1–S539. doi:10.1016/j.jbiotec.2010.09.886
 - 11) **Rajkumar G, Weerasena J, Fermanado K, Liyanage A (2010)**
Utility of biosystematics and molecular genetics in differentiation of indigenous rice germplasm collections of Sri Lanka
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
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- 12) **Rajkumar G, Weerasena J, Fernando K, Liyanage A (2010)**
Assessment of the genetic diversity of Sri Lankan traditional rice varieties by fluorescent Amplified Fragment Length Polymorphisms Markers (fAFLP).
International Rice Research Conference, Hanoi, Vietnam
 - 13) **Ranasinghe RACR, Tennekoon KH, Karunanayake EH, Allen M, Sheriff R, Sheriff MHR (2010)**
Polymorphisms of the mitochondrial DNA hypervariable regions I and II in Sri Lankans
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
 - 14) **Rodrigo WWP, Dassanayake RS, Weerasena OVDSJ, Karunanayake EH, Chandrasekharan NV (2010)** Structural and functional characterization of uncharacterized proteins of *Setaria digitata*
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
 - 15) **Samarakoon SSR, Thabrew MI, Galhena PB, Tennekoon KH, De Silva ED (2010)**
Standard 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
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
 - 16) **Samarakoon S, Galhena P, Thabrew I, Tennekoon K (2010)**
Cytotoxic activity of hot water and ethanolic extracts of a poly-herbal preparation comprised of *Nigella sativa*, *Hemidesmus indicus* and *Smilax glabra*.
58th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research, Germany.
 - 17) **Samarakoon SSR, Galhena PB, Thabrew MI, Tennekoon KH (2010)**
Expression of wild type p53 is induced in HepG2 cells by a Sri Lankan herbal decoction comprised of *Nigella sativa* (seeds), *Hemidesmus indicus* (roots), and *Smilax glabra* (rhizome.)
9th International ISSX meeting, 2010, Istanbul, Turkey.
 - 18) **Samarakoon S, Galhena P, Thabrew I, Tennekoon KH (2010)**
In-vitro cytotoxic potential of the aqueous extract of *Securinega leucopyrus* (willd) on human hepatoma (HepG2) cells: A preliminary study.
16th Congress on Alternative Animal Testing, September 2010, Austria
 - 19) Samarasekera R, **Siriwardhana D A S**, Peiris M L, **Weerasena O V D S J**
Molecular characterization of *Bacillus thuringiensis* isolates from Sri Lanka.
Proceedings of InSym-SUSL 2010, Sabaragamuwa University of Sri Lanka, 26-28th August 2010.
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- 20) Samarasekera R, Peiris M L, **Siriwardhana D A S**, **Weerasena O V D S J**, Weerasinghe I S
Bacillus thuringiensis Sri Lankan Strain with mosquito larvicidal activity against *Culex quinquefasciatus* and *Aedes aegypti*.
Proceedings of 11th Euroasia conference on chemical sciences, Dead Sea, Jordan, 6-10th October, 2010, p. 146.
- 21) Samarasekera R, **Siriwardhana D A S**, Peiris M L, **Weerasena O V D S J**, PUNCHIHewa D W D, Kottearachchi.
Isolation and SDS-PAGE analysis of dipteran toxic δ -endotoxin protein crystals of Sri Lankan *Bacillus thuringiensis* strains.
Annual Sessions, Sri Lanka Association for the Advancement of Science, 66, December 2010, p.110
- 22) Samarasekera R, **Siriwardhana DAS**, Peiris ML, Herath HML, **Weerasena OVDSJ**, Ahangama D, Nugaliyadde MM, Nishantha KMDWP (2010)
Novel *Bacillus thuringiensis* strains to control vegetable pests in Sri Lanka
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
- 23) Samarasekera R, **Siriwardhana DAS**, Peiris ML, **Weerasena OVDSJ**, Weerasinghe I (2010)
Biotechnology based solutions to control mosquito breeding in Sri Lanka
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
- 24) **Siriwardhana D A S**, Peiris M L, Samarasekera R, **Weerasena O V D S J**, Ahangama, D
Insecticidal activity of Sri Lankan strains of *Bacillus thuringiensis* against diamondback *Plutella xylostella* L. and molecular characterization of their crystal toxins. Proceedings of International Symposium on Natural Products, University of Peradeniya, 26th June 2010, p. 61-66.
- 25) Weerakoon SR, **Weerasena OVDSJ**, **Peiris PKD** (2010) Genetic differentiation of Mustard (*Brassica juncea* (L.) Czern & Cross) germplasm in Sri Lanka by AFLP markers.
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
- 26) **Wickramasekara S**, Weerakoon SR, **Weerasena OVDSJ** (2010)
Production and molecular confirmation of true hybrids (3n, ABC) of *Brassica juncea* (AABB) and *B. oleracea*
5th Asian Biotechnology and Development Conference, Kandy, Sri Lanka
- 27) **Wickremesinghe NKRD**, **Kumara RR**, De Silva DE, Ratnasooriya WD and **Handunnetti SM**. Modulation of human neutrophil functions by aqueous and methanolic leaf extracts of *Ixora coccinea*.
Proceedings of the 5th Biennial Sessions of the AISSL 30th July, 2010; 19.
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- 28) Wijayalath AWWK, Cheeseman S, Rajakaruna J, Weerasinghe S, Kapliananda GMG, Gamage K, Perera K, **Handunnetti SM**, Carter R and Pathirana PPSL. Strain specific protective immunity by pre-erythrocytic infection of toque monkeys with *Plasmodium cynomolgi*. **Malaria Journal** 2010, 9 (Suppl 2); 48
[<http://malariajournal.com/supplements/9/S2>]
- 29) Wijayalath AWWK, Cheeseman S, Rajakaruna J, Weerasinghe S, Kapilananda GMG, Gamage K, Perera K, **Handunnetti SM**, Carter R and Pathirana PPSL. Immunity induced by live malarial sporozoites under chloroquine treatment is strain specific.
Proceedings of the Research symposium/Faculty of Medicine 2010



Table 1: MPhil/PhD Degrees in Progress and New Registrations – Year 2010

Name of research student	Degree registered for and the Institute	Tentative Title of the thesis	Names of supervisors
Sumadee De Silva	MPhil//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 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 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 E H Karunanayake 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 KKS Fernando (UoP)
S S R Samarakoon	MPhil/PhD-IBMBB	Effect of a herbal decoction used in traditional medicine on the expression of NFkB and p53 genes in HepG2 cells	MI Thabrew 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 toxemia / pregnancy induced hypertension	K H Tennekoon E H Karunanayake
A Murugananthan	MPhil, IBMBB	Cloning and characterizing of <i>Setaria digitata</i> myosin light chain gene as an immunopotential agent against <i>Wuchereria bancrofti</i>	E H Karunanayake KH Tennekoon
R R Kumara	MPhil - IBMBB	Identification of anti-inflammatory active components and the mechanisms of anti-inflammatory effects of three medicinal plants (<i>Ixora coccinea</i> , <i>Vitex negundo</i> , <i>Alpina calcarata</i>)	S Handunetti W D Ratnasooriya (UoC) S A Deraniyagala (UoC)



**Table 1 continued: MPhil/PhD Degrees in Progress and New Registrations
–Year 2010**

Name of research student	Degree registered for and the Institute	Tentative Title of the thesis	Names of supervisors
K S Premakumara	MPhil - IBMBB	Further studies on endometrial function	K H Tennekoon E H Karunanayake
P K D Peiris	MPhil-IBMBB	Differentiation of Sri Lankan mustard (<i>Brassica juncea</i>) varieties using AFLP markers and altering their fatty acid profile by interspecific hybridization with <i>Brassica napus</i> (canola)	OVDSJ Weerasena S R Weerakoon (OU)
N H L Pradeepa	MPhil-IBMBB	DNA phylogeny, morphology and pathogenicity of <i>Macrophoma theicola</i> patch, the causal agent of stem canker	S Abeysinghe (TRI) OVDSJ Weerasena R Wijesundera (UoC)
Sudeshini Hewage	MPhil-IBMBB	Selected polymorphisms of the <i>HI9</i> and <i>IGF-II</i> 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 S Thrimanne (UoC) 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, <i>Setaria digitata</i> and human filarial parasite <i>Wuchereria bancrofti</i>	R S Dassanayake (UoC) OVDSJ Weerasena EH Karunanayake
R Wijayasinghe	MPhil/ UCSC	An approach to protein structure prediction of <i>Wuchereria bancrofti</i>	E H Karunanayake A R Weerasinghe (UCSC) Eric Bongcam Rudloff (SLU)



Table 1 continued - MPhil/PhD Degrees in Progress and New Registrations – Year 2010

Name of research student	Degree registered for and the Institute	Tentative Title of the thesis	Names of supervisors
BP Galhena	PhD/UoK	An investigation of the anti-carcinogenic mechanisms of a herbal remedy and its ability to protect against radiation induced tissue injury	MI Thabrew KH Tennekoon
DAS Siriwardhana	MPhil/UoP	Biological control of agricultural pests by <i>Bacillus thuringiensis</i>	R Samarasekara (ITI) V Karunaratne (UoP) 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) OVDSJ Weerasena

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 Uppsala



Table 2: Research Funding

Grantee	Name of the Project	Funding Agency	Funds made available in 2010
Prof. Eric Karunanayake & Prof. Kamani Tennekoon	Molecular Biology & Biotechnology	Swedish Agency for Research Collaboration with Developing Countries	Rs. 6,258,273.42
Prof. Kamani Tennekoon	A genomic and a proteomic study on low birth weight	National Research Council*	Rs. 1,670,713.00
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. 1,361,391.00
Dr. Jagath Weerasena	Genetic differentiation of Sri Lankan rice varieties and screening of wild rice for identification and cloning of potential disease resistance genes	National Research Council*	Rs. 368,764.00
Dr. Jagath Weerasena (co-investigator)	Structural and functional characterization of putative nuclear cell envelope like parasitic nematode specific growth factor protein from goat and sheep parasite <i>Setaria digitata</i> and human parasite <i>Wuchereria bancrofti</i>	National Science Foundation	Rs. 145,122.18
Prf. Ira Thabrew	Further investigation of the anti-cancer activity of a herbal medicine used in Sri Lanka	National Science Foundation	Rs. 495,523.38
Total funds provided from research grants**			Rs. 10,299,786.98

* These Grants are administered directly by NRC

** Excludes equipment and reagents directly supplied from Sweden through the SAREC Grant



Table 3: MSc Dissertations – 2010

Name of the Student	Gender	Year of entry	Studies Completed	Degree Programme	Title of the Dissertation/ Thesis
D P Yasasni	F	2008	2010	MSc/MLS	The CA dinucleotide repeat polymorphism of the promoter of the IGF-I gene in preeclampsia / pregnancy induced hypertension
Y D De Silva	F	2008	2010	MSc/MLS	Detection of micrometastasis of breast cancer using Cytokeratin-19 based RT-PCR
SIC Silva	F	2008	In progress	MSc/MLS	Identification of genetic variation in black pepper (<i>Piper nigrum</i> L) cultivars by using AFLP markers
RML Tanthirige	F	2008	In progress	MSc/MLS	Development of specific AFLP markers for identification of jak fruit (<i>Artocarpus heterophyllus</i> Lam) varieties in Sri Lanka
K Kumarasivam	F	2009	2010	MSc/MLS	Restriction fragment length polymorphism of the <i>OSA3</i> gene in <i>Oriza sativa</i>



ARMMNK Ratnayake	F	2009	2010	MSc/MLS	Optimisation of PCR conditions for detection of survivin gene expression in hepatocellular carcinoma cell line
SS Wickramasekara	F	2009	2010	MSc/MLS	Molecular analysis of the F1 hybrid plants (triploids ABC) to confirm the true hybridity between <i>Brassica juncea</i> and <i>B. oleracea</i>
AS Gammulle	F	2009	2010	MSc/CMI	Effect of concentrated <i>Carica papaya</i> leaf extract on rat platelet count
TL Kalugalage	F	2009	2010	MSc/CMI	Studies on serum NOx levels in Sri Lankan patients with leptospirosis



Table 3 continued: MSc Dissertations – 2010

Name of the Student	Gender	Year of entry	Studies Completed	Degree Programme	Title of the Dissertation/Thesis
PDNN Sirisena	F	2009	2010	MSc/CMI	Effect of aqueous leaf extract of <i>Vitex negundo</i> on human phagocytic cells
R Tippalagama	F	2009	In progress	MSc/CMI	HLA typing MHC class I molecules by PCR and sequencing in Sri Lanka
AMDSD De Silva	F	2009	In progress	MSc/CMI	Studies on the effect of aqueous leaf extracts of <i>Ixora coccinea</i> and <i>Vitex negundo</i> on neutrophil chemotaxis
T Wickramasinghe	F	2009	In progress	MSc/CMI	Studies on humoral response to two strains of <i>Plasmodium cynomolgi</i> using cynomolgi toque monkey system



Visit by School Children from Ruwanwella, Rajasingha Central College



Certificate Course



Bioinformatics Forum





**INSTITUTE OF BIOCHEMISTRY, MOLECULAR BIOLOGY &
BIOTECHNOLOGY
UNIVERSITY OF COLOMBO
BALANCE SHEET AS AT 31ST DECEMBER 2010**
(Figures adjusted to the Nearest Rupee)

		2010	2009
		Rs.	Rs.
		N.B.V	N.B.V
<u>NON CURRENT ASSETS</u>	Note - 2		
Office Furniture & Equipments		3,199,235	2,954,031
Computers		1,108,928	1,057,093
Lab and Teaching Equipments		4,412,297	10,693,129
Fixtures and Fittings		56,619	66,194
Lab Tools		244,052	737,547
Library Books and Periodicals		449,857	329,959
		9,470,988	15,837,953
Investments - Endowment Fund		1,988,872	1,753,161
		11,459,860	17,591,113
<u>CURRENT ASSETS</u>			
Investments	Note - 03	11,837,273	15,771,444
Staff Loans	Note - 04	1,330,104	1,544,690
Advance A/C		3,840,351	2,042,573
Other Receivables	Note - 05	102,200	102,700
Investments in call deposits		1,750,000	8,250,000
Bank Balances	Note - 06	6,019,792	2,285,736
		24,879,720	29,997,143
Total Assets		36,339,580	47,588,256



**INSTITUTE OF BIOCHEMISTRY, MOLECULAR BIOLOGY &
BIOTECHNOLOGY
UNIVERSITY OF COLOMBO
BALANCE SHEET AS AT 31ST DECEMBER 2010(Contd..)**

	2010	2009
	Rs.	Rs.
FINANCED BY		
CAPITAL		
Capital Grant Spent	5,171,750	6,052,753
Capital Grant Unspent	4,644,778	2,941,550
Gifts & Donations	2,742,512	9,056,119
	12,559,040	18,050,422
Reserves		
Income and Expenditure A/C	11,991,357	14,358,964
Restricted Funds		
Endowment Fund	2,064,843	1,818,380
Research Grants	2,123,856	8,009,566
Institute Development Fund	892,901	879,249
MSc Research Projects in 2011	1,922,500	655,000
	7,004,100	11,362,195
<u>CURRENT LIABILITIES</u>		
Accrued Expenditure	1,985,345	1,897,193
Provision for Gratuity	1,725,127	1,266,873
Refundable Laboratory Deposits	989,000	594,000
Other Refundable Deposits	85,610	58,610
	4,785,083	3,816,675
	36,339,580	47,588,256

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 2010

(Figures adjusted to the Nearest Rupee)

		2010	2009
		Rs.	Rs.
INCOME			
Govt. Grant for Recurrent Expenditure		25,150,000	27,850,000
Govt. Grant for Rehabilitation of Capital Assets		1,050,000	1,000,000
Amortization of Donated Assets		10,358,589	9,952,782
Research Grants	Note - 09	5,841,715	3,364,376
Generated Income	Note - 10	3,007,295	4,796,732
Interest Income		917,291	1,278,271
Other Income	Note - 11	425,830	246,875
		46,750,720	48,489,036
Less : EXPENDITURE			
Personal Emoluments	Note - 12	10,992,460	9,142,526
Travelling		1,264,956	239,073
Supplies	Note - 13	10,317,486	6,701,508
Maintenance Expenditure	Note - 14	4,412,672	5,202,322
Contractual Services	Note - 15	9,957,444	10,946,549
Other Recurrent Expenses	Note - 16	954,432	2,586,626
Institute Development Fund		698,433	160,500
Depreciation		10,521,609	10,089,022
		49,119,491	45,068,126
Excess of Income over Expenditure		(2,368,772)	3,420,909



Income & Expenditure Appropriation Account

Balance B/F from Income & Expenditure A/C	(2,368,772)	3,420,909
Income & Expenditure Account B/F Balance	14,358,964	10,894,488
Adjustments in respect of previous Year	1,165	43,567
Balance C/F to Balance Sheet	11,991,357	14,358,964



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

UNIVERSITY OF COLOMBO

CASH FLOW STATEMENT

FOR THE YEAR ENDED 31ST DECEMBER 2010

	Rs.	Rs.
<i>Excess for the year</i>	(2,368,772)	
Add: Adjustments for items not involving movement of Funds		
Provision for Gratuity	458,255	
Interest from Investment	(917,291)	
Depreciation	163,020	
Operating excess before working capital changes	(2,664,788)	
Increase in Receivables	(1,582,692)	
Increase in Payables	510,153	
Net cash flow from operating activities		(3,737,328)
CASH FLOWS FROM INVESTING ACTIVITIES		
Acquisition of Fixed Assets	(2,196,272)	
Decrease in Investments	3,698,460	
Interest from Investments	917,291	
		2,419,479
CASH FLOWS FROM FINANCING ACTIVITIES		
Government Grant for Capital Expenditure	2,910,000	
Restricted Funds	(4,358,095)	
		(1,448,095)
NET INCREASE IN CASH EQUIVALENTS		(2,765,944)
Cash & cash equivalents at the beginning of the period		10,535,736
Cash & cash equivalents at the end of the period		7,769,792



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 31/12/2010

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 on 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.3.96 mn. The Grants that have been used for the operational activities for the year was Rs.25.15 mn. 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 Assets

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.



Audit Committee Report – 2010

Four (04) meetings were held in 2010.

The committee was constrained by the following:-

1. The Internal Audit Section of the University of Colombo serves IBMBB. There was no continuity in the Secretary post of the committee during the year.
2. Being largely limited to the Auditor General's report and other queries which had been already answered by the Director/IBMBB.

Judging from the data available to the committee, the IBMBB had performed satisfactorily.

The main Auditor General's comments arose from the following.

1. Discrepancies from circulars from the Treasury and UGC respectively regarding payment of language proficiency and calculation of Academic allowance. This problem is common to all Universities. A recommendation has been made to Director/IBMBB in this regard at the last meeting of the Audit Committee (AC) this year.
2. Misunderstanding of the function of IBMBB which is largely at the Postgraduate level. Recommendations have been made that the Director/IBMBB personally meets the officials concerned and clears up these misconceptions.

One of the problems is that the Auditor General wants replies from IBMBB within a very short time span. It has been recommended that the Director/IBMBB asks for time for reply so that the AC could make suggestions for reply. This is especially important as the AC has representations from the Auditor General's department and Treasury.

In response of to the Chairman/AC pointing out that the AC did not have terms of reference (at the last meeting of 2010 of the AC), subsequently attention was drawn to PED/GEN/2005 by PED/31. This will hopefully be taken up by the Board of the IBMBB, so that these procedures may be followed in 2011.

Mr.KEW Jayasiri
Secretary

Prof. E.R.Jansz
Chairman



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கணக்காய்வாளர் தலைமை அறிப்பதி திணைக்களம்
AUDITOR GENERAL'S DEPARTMENT



මගේ අංකය
எனது இல
My No

} CE/C/IBMBB/F/A/2010

ඔබේ අංකය
உமது இல
Your No.

}

දිනය
திகதி
Date

} 25 July 2011

The Director
 Institute of Biochemistry, Molecular Biology and
 Biotechnology Affiliated to the University of Colombo

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 2010 in terms of Section 108(2) 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 2010 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 17 of the Institute of Biochemistry, Molecular Biology and Biotechnology Affiliated to the University of Colombo Ordinance, No 1 of 2003 enacted in terms of Section 18 of the Universities Act, No. 16 of the 1978, Sections 108 (i) and (iii) of the Universities Act and Sub-sections (3), (4) and (7) of Section 13 of the Finance Act, No. 38 of 1971. This report is issued in terms of Section 108(2) of the Universities Act and Section 13(7)(a) of the Finance Act, No.38 of 1971. My comments and observations are contained in this report.

1.2 Responsibility of the Management for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Generally Accepted Accounting Principles. This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material

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කොළඹ 07, ශ්‍රී ලංකාව
දුරකථනය
தொலைபேசி
Telephone } 2691151

සහන්තිර සත්‍යාපන,
කොළඹ 07, ශ්‍රී ලංකාව
දුරකථනය
உமது இல
Fax No. } 2697451

INDEPENDENCE SQUARE,
COLOMBO 07, SRI LANKA
ඉගෙනුමේ දෙපාර්තමේන්තුව
#- மெயில
E-mail. } oaggov@slt.net.lk



misstatements, whether due to fraud or error, selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

1.3 **Scope of Audit and Basis of Opinion**

My responsibility is to express an opinion on these financial statements based on my audit. Audit opinion, comments and findings in this report are based on review of the financial statements presented to audit and substantive tests of samples of transactions. The scope and extent of such review and tests were such as to enable as wide an audit coverage as possible within the limitations of staff, other resources and time available to me. The audit was carried out in accordance with Sri Lanka Auditing Standards to obtain reasonable assurance as to whether the financial statements are free of material misstatements. The audit includes the examination on a test basis of evidence supporting the amounts and disclosures in financial statements and assessment of accounting policies used and significant estimates made by the management in the preparation of financial statements as well as evaluating their overall presentation. I have obtained sufficient information and explanations which to the best of my knowledge and belief were necessary for the purpose of my audit. I therefore believe that my audit provides a reasonable basis for my opinion. 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.

2. **Financial Statements**

2.1 **Opinion**

So far as appears from my examination and to the best of information and according to the explanations given to me, I am of opinion that the Institute of Biochemistry , Molecular Biology and Biotechnology Affiliated to the University of Colombo had



maintained proper accounting records for the year ended 31 December 2010 and except for the effects on the financial statements of the matters referred to in paragraph 2.2 of this report, the financial statements have been prepared in accordance with Generally Accepted Accounting Principles, give a true and fair view of the state of affairs of the Institute of Biochemistry, Molecular Biology and Biotechnology Affiliated to the University of Colombo as at 31 December 2010 and the financial results of its operations and cash flows for the year then ended.

2.2 Comments on Financial Statements

2.2.1 Non - compliance of Laws Rules & Regulations.

Although the approval of the General Treasury for investing funds by the Institute should be obtained in terms of Public Enterprises Circular No PED 25 dated 29 July 2004 the approval as per the Circular Institution had not been obtained in respect of fixed deposits amounting to Rs. 1,460,360 and Rs. 227,771 respectively deposited by the Institute during the year 2009 and 2010.

2.2.2 Transactions not Supported by Authority

A sum of Rs.13,570 had been paid in the year 2010 as allowances, for proficiency in the second and third languages in accordance with a Circular issued by the University Grants Commission contravening the Public Enterprises Circular No.95 of 14 June 1994. Contrary to the National Budget Department Circular No BD/INS/CLUS-A/078 dated 18 July 2003 an overpayment of Rs.81,255 had been made to the Universities Provident Fund and the Employees Trust Fund due to the erroneous computations made by adding the academic allowances to the salaries.



3. Financial and Operating Review

3.1 Financial Performances

3.1.1 Financial Results

According to the financial statements presented 31 December 2010, the operations of the Institute for the year under review before taking into account the Government Grants for recurrent expenditure had resulted a deficit of Rs. 28,568,771 as compared with the deficit of Rs. 25,429,090 for the preceding year. After taking into account the Government Grant of Rs. 26,200,000 for recurrent expenditure, the deficit for the year under review had been reduced upto of Rs.2,368,772 and due to the Government Grant of Rs.28,850,000 received for the recurrent expenditure of the preceding year the deficit had been converted to a surplus of Rs.3,420,909.

Decrease of revenue by Rs..1,738,316 and increase of expenditure by Rs.4,051,366 had been effected specially for Deficit for the year by Rs.5,789,682.

3.2 Operating Review

3.2.1 Performance

Following observations are made.

- (a) Two Master of Science courses had been conducted during the year under review and total number of students registered stood at nineteen. Ten students had completed the degree. The average cost per student amounted to Rs. 381,447 thus indicating an increment of Rs. 19,215 as compared with the preceding year
- (b) The total number of students registered for the Postgraduate Course in Master of Philosophy had been 6. Out of the said number, only one student had completed the degree. Duration of the courses (full time/part time) had been from 03 to 05 years.



-
- (c) The number of students registered for the course in Doctor of Philosophy had been 12 and only one student had completed the degree. Duration of the course (full time/part time) had been from 03 to 05 years.
- (d) The number of students who had followed and successfully completed the postgraduate courses as at the end of the year 2010 had been 41 and comprised 07 in Master of Philosophy, 20 in Master of Science and in Molecular Life and 14 in Master of Science in Cellular and Molecular Immunology.
- (e) Twenty Nine research projects covering 08 fields had been conducted. Research activities of 10 projects had been completed and the reports thereon had been issued. Research activities of 19 projects are being conducted.
- (f) Services of 22 visiting lecturers had been obtained for the postgraduate courses. Those lecturers had delivered 175 hours of lectures and the cost incurred on visiting lecturers amounted to Rs. 213,550. Thus the cost per lecture hour amounted to Rs. 1,220.
- (g) Examinations for twelve postgraduate courses had been conducted during the year under review and 78 students had sat for them. Results of those examinations had been issued during the year 2010.

H.A.S. Samaraweera
Auditor General



17.10.2011

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

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 2010 in terms of Section 108(2) Universities Act No. 16 of 1978 and Section 13(7) (a) of the Finance Act No. 38 of 1971.

The above report has been considered at the 22nd Audit Committee Meeting held on 13th October 2011 and detailed responses for the deficiencies are given below.

2. Financial Statements

Opinion

2.2 Comments on Financial Statements

2.2.1 Non compliance of Laws Rules & Regulations

Funds amounted Rs.1,330,000.00 were invested after obtaining approval of the Board of Management and written request is made to the Treasury by the Institute. This investment represents 60% of money paid by the students for their MSc Courses and will be needed for their course work in the 2nd year.

Investment amounted Rs.30,360.00 were related to a deposit which will be paid back against the liability. And investment amounted to Rs.100,000.00 is for a scholarship fund which is granted by Prof.Eric Karunanayake to award gold plated Medal for the Best Student in the MSc Molecular Life Sciences. According to the conditions of the scholarship fund, all expenses related to the award should be borne from the interest income. A request has been made by the Institute for the approval of the Treasury as stipulated by the relevant circular.

2.2.2 Transaction not supported by adequate authority.

- (a) The payment of Language Proficiency Allowance was made in terms of Circulars issued by the UGC. No Circular has been received by us from the UGC to the effect that the said payment was made in contravention of Government rules and regulations. Although



instructions have been sought again from the UGC as per audit opinions expressed during the previous years, no instruction has been received so far.

- (b) Calculation of UPF (by adding academic allowance to the salary) is done in terms of Circulars issued by the UGC. But according to the UGC Circular No.955 dated 28.04.2011, Academic Allowance will not be added to the salary for the purpose of calculating UPF w.e.f. 01.05.2011.

3. Financial and Operating Review

3.1 Financial Review

3.1.1 Financial Results

Agreed.

3.2 Operating Review

3.2.1 Performance

- (a) Agreed. The average cost per student has increased by Rs. 19,215/- due to the increased selling prices of materials used in the practicals.

- (b) and (c) Agreed.

The number of direct students following the MPhil. / PhD. Courses was 12 and the No. of indirect students was 6. (Indirect students are those who are registered in other higher educational institutes and are engaged in research work at the IBMBB)

All students applying for MPhil and PhD Degree programmes are initially registered for MPhil Degree in terms of the Regulations applicable to these Degree programmes. Thereafter, depending on their progress and if a student makes an application, registration is upgraded to PhD. Some students complete studies at MPhil level.

The minimum and maximum period of these Degree programmes depend on whether the students follow these programmes full time or part time. Accordingly, the course durations are as follows:

	M Phil	PhD
Full time (minimum)	2 years	2 years & 9 months
(maximum)	3 ½ years	5 years
Extension	2 years	2 years
Maximum with Extension	5 ½ years	7 years
Part time (minimum)	3 years	3 years & 9 months
(maximum)	5 years	7 years
Extension	2 years	2 years
Maximum with Extension	7 years	9 years

If a student does not complete studies within the prescribed period, he is deemed to have abandoned the study programme.



Summary of Annual Report and Accounts

1. Details of Resources & Students:

Faculty	Course	Total Students	Total Academic Staff	Total Non Academic Staff
	MSc in Molecular Life Sciences	19	4	15*
	MSc in Cellular and Molecular Immunology	12		
	MPhil	10		
	PhD	8		
Total		49	4	17

* Academic Support Staff

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				
	Immunology	English			1			
	Molecular Techniques	English			1			
	Molecular Biology	English			1			
Total				1	3			

5. Details of Non-Academic Staff

Faculty/Branch	Most Senior	Senior Staff	Junior Staff	Minor Employees
IBMBB	1- Senior Asst. Registrar 1- Senior Asst. Bursar	1- Staff Technical Officer	1- Technical Officer, Gr.II 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			
b. No of Innovations			
c. No of Journals			
d. No of Books			
e. No of Articles *	10		
f. Other (Research , Communications)			29
Total	10		29

* Journal Articles

7. Details of Programme, Seminars & Workshops:

Subject	Attended	Completed	Presented
a. No of Postgraduate Degree Programme	MSc – 24 MPhil - 9 PhD - 8	MPhil - 1 MSc - 8	9
b. No of Postgraduate Diploma Programme			
c. No of Degree Programme			
d. No of Diploma Programme			
e. No of Certificate Programme	13	13	13
f. Other (Workshop on Bioinformatics) Guest Lectures			
Total	54	22	22

8. Details of Awards Received:

Subject	No of Awards	No of Academics	No of Students
a. Local awards			
b. National Awards	5*	5*	
c. International Awards		1	4**
d. Other			
Total	5	6	4

* Includes awards to Emeritus Professor and Visiting Professor

** Include 2 international travel awards and one international scholarship to attend a conference



9. Details of New Course Started – 2010 Registration

Faculty	Course	Medium	Certificate	Diploma	Postgraduate Diploma	Master	MPhil	PhD
IBMBB		English	13			19	1	2
Total			13			19	1	2

10. Details of Recurrent Expenditure:

	Subject	2009 Rs.	2010 Rs.
a.	Personal emoluments	9,142,546	10,992,460
b.	Travelling	239,073	1,264,956
c.	Supplies	6,701,508	10,317,486
d.	Maintenance	5,202,322	4,412,672
e.	Contractual Services	10,946,549	9,957,444
f.	Other (including depreciation)	12,836,148	12,174,474
		45,068,126	49,119,491

11. Details of Capital Expenditure:

	Subject	2009 Rs.	2010 Rs.
a.	Acquisition of furniture & Office Equipments	501,988	693,004
b.	Acquisition of Machineries (Computers & Lab Equip.)	2,715,473	3,191,159
c.	Acquisition of Building & Structures	-	-
d.	Other (Library Books)	49,368	269,316
	Total	3,266,829	4,153,479

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 2009 Rs.	Exp in 2010 Rs.	Cumulative Exp as at 31.12.2010	% of Physical Progress
SAREC Grant		2,567,249	7,061,446	9,628,695	} Work planned for 2010 completed.
NSF Grant		477,380	486,300	963,680	
Total		3,044,629	7,547,746	10,592,375	

14. Details of Financial Progress (Expenditure) :

	Subject	Provision in 2010 Rs.	Exp in 2010 Rs.	Savings/Excess Rs.
a.	Recurrent except Project	25,150,000	31,046,170**	-5,896,170
b.	Capital except Project	3,960,000	3,280,198	679,802
c.	Project-Local funded – NSF Grant	486,300	486,300	-
d.	Project –Foreign funded-SAREC(Research Grant)	7,078,053	7,061,446	16,607
	Total	36,674,353	41,874,114	-5,199,761

**with depreciation

15. Details of Financial Progress (Generated Income) :

	Source of Revenue	Provision in 2010 Rs.	Collection in 2010 Rs.	Deficit/ Surplus Rs.
a.	Undergraduate Studies	Not relevant	Not relevant	-
b.	Postgraduate Studies	2,147,000	2,593,000	446,000
c.	Consultancies	-		
d.	Other	18,000	414,000	396,000
	Total	2,165,000	3,007,000	842,000



16. Financial Performance Analysis-2010:

	Subject	Formula	Exp.Per Student Rs.	
a.	Recurrent Expenditure per Student (RE)	RE/ No of Student strength	<u>Course</u> Mphil & PhD 1,085,143	14,106,859/13**
			MSc 381,446	7,247,491/19
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 2010:

Infrastructure Details	Expenditure Rs.	Physical Progress
-		

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

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