Translational Health Science & Technology Institute

ANNUAL REPORT

2010-2011

Translational Health Science & Technology Institute

(An autonomous Institute of Department of Biotechnology, Govt. of India)

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MANDATE OF THE INSTITUTE

The THSTI is designed to be a dynamic and interactive organization with a mission to conduct innovative translational research and develop research collaborations across disciplines and professions to accelerate the development of concepts into tangible products to improve human health.

The THSTI will facilitate development, optimization and evaluation of technologies for public health and individual health as an independent interdisciplinary centre where basic scientists, physician scientists, technologists and chemical-epidemiologists would work together. The key feature of THSTI would be a dynamic inter-relationship of health, science and technology sectors and with small and medium biotech industry pursuing great challenges in public health to produce affordable technologies through group excellence.

The THSTI will have two components, one dealing with high end health science technology creation and the other extramural unit dealing with downstream translational issues such as toxicology, clinical trial, validated assay facility, validated data management. The Public Private Partnership of the high tech component will be through collaborative projects, with the objective to bring together different skills of public science and industry scale of skills.

The mission of the THSTI is to integrate the fields of medicine, science, engineering and technology into translational knowledge, and making the biomedical innovations accessible to public health, to improve the health of the most disadvantaged people in India and throughout the world.

As a networked organization linking many centers of excellence, THSTI is envisioned as a collective of scientists, engineers and physicians that will effectively enhance the quality of human life through integrating a culture of shared excellence in research, education and translational knowledge with the entrepreneurial spirit to take technologies into the public sphere. In fulfilment of its vision, the THSTI will work with other constituents of the technology cluster at Faridabad, such as the Regional Centre for Biotechnology (RCB) through long term partnerships.

PREAMBLE

Translational Health Science and Technology Institute (THSTI) had come into existence on 15th July, 2009, as a Society registered under the Societies Registration Act of 1860. THSTI is an autonomous institution of Department of Biotechnology which is coming up as a part of the interdisciplinary Biotech Science cluster in Faridabad (Haryana). While the development of the permanent campus at Faridabad is in progress, Institute is functioning from its interim laboratories at Udyog Vihar Phase III, Gurgaon.

The THSTI is designed to be a dynamic and interactive organization with a mission to conduct innovative translational research and develop research collaborations across disciplines and professions to accelerate the development of concepts into tangible products to improve human health. THSTI's research activities are currently focused in three broad areas, namely, vaccine & infectious diseases, paediatric biology, and bio-design & diagnostics development. These activities are attended to through the THSTI niche centres viz. the Vaccine and Infectious Disease Research Centre (VIDRC), the Paediatric Biology Centre (PBC), the Centre for Bio-design and Diagnostics (CBD) and the extra-mural centre, Clinical Development Services Agency (CDSA).

VIDRC conducts basic and clinical research to advance translatable knowledge to develop novel vaccines and biologics. VIDRC research would have focus on infectious disease biology, development of animal models, natural history of disease in population giving new insight into protective host responses and biomarker discovery for screening vaccine candidates, thus fulfilling the requirement of a scientific milieu for novel vaccine development. Objectives of VIDRC are further strengthened by THSTI and The International AIDS Vaccine Initiative (IAVI) jointly establishing a HIV Vaccine Design Programme.

The goals and objectives of PBC is to translate mechanistic & causal understanding into development of robust sustainable interventions critical for public health policies in reducing neonatal & child morbidity & mortality. The immediate core domains of the research program concern understanding the complex molecular cellular causality of childhood infections particularly with reference to host responses, and other childhood diseases, and generate hypotheses that will be tested rigorously. The emphasis will also be on developing inexpensive point of care diagnostic tests that can be made available at small hospitals and health facilities all over the country.

Centre for Bio design is set out to create medical technology innovation in India for affordable health care & to support services that extend from strategic bench work to commercialization. The Centre is geared to develop world class quality science in platform technologies for use in in-vitro diagnosis and for implants and devices and the major emphasis will be to develop low cost, high quality indigenous implants and devices. A Bio design Alliance consisting of National and International partners has been created with THSTI as anchor institute.

CDSA, which is an extra-mural Centre of THSTI, will focus on developing a cadre of investigators of global standard in regulatory product evaluations through a comprehensive and sustained training program. It will also create a support system for biotech product evaluation for products developed in India or licensed to India & being developed by public institutions or companies.

Thus during the year gone-by THSTI has established the foundations of an unique institution geared to impact science for human health ranging from a mechanistic approach to broad questions to specific domains. Institute has developed several training and education programs for the pre-doctoral, doctoral as well as post-doctoral students. THSTI has been actively involved in dissemination of scientific knowledge through organization/ participation in scientific meetings and workshops and inviting experts for lecturing in the wide range of areas that would influence translational health research.

In the endeavours towards bringing this institute where it is today, efforts of many within the institute, in the government and the collaborating institutions need to be genuinely acknowledged. I wish to thank active and unrelenting contributions from academic, administrative and technical staff of the institute; generous support from the Department of Biotechnology, Government of India and institute's Governing body and society for their guidance and cooperation from other partner Institutions within the cluster and the country.

Place: Gurgaon
Date: Oct. 2011

(Dinakar M. Salunke)
Executive Director

AIMS & OBJECTIVES

The Institute shall carry out major research and development functions within the overall goals and framework focused on health related biotechnologies. The specific aims and objectives would be –

To support and create a network of scientific collaboration and research resource centres, to provide seed funds for novel translational work facilitated by a separate evaluation process. The research resource centres shall be given core support.

To develop, de-novo or by acquisition of early leads generated by others, new and improved vaccines, adjuvants, bio-therapeutic products, bio-diagnostics and biomarkers, nutraceuticals, delivery systems for drugs and vaccines and cell based technologies.

To identify technologies that are relevant to primary, secondary and tertiary health care, irrespective of the source of development, optimize them and facilitate their diffusion. Support would be provided for scale up, validation and commercialization of the relevant technologies developed by other Institutions and Small Medium Enterprises (SMEs), internationally developed technologies provided, the technology is licensed to an Indian company with whom the Institute can partner.

To make the Institute's lab space accessible to researchers of small and medium companies on a user charge basis and to other extramural scientists but for translational purpose. These facilities may be in terms of developing novel and validated assays for product evaluation, clinical trial design and coordination, regulatory and IPR support, product design and refinement services access to platform technologies i.e. genomics, proteomics, imaging, NMR, chemical and molecular libraries, BSL3 and others.

To coordinate inter-institutional translational research such as cohort and molecular ecology studies for understanding the molecular mechanisms of disease molecular genetics. The knowledge generated by these studies will complement the technology development process and development of intervention.

To develop a centralized core equipment facility to be available on user charge basis to other institutes and SMEs.

To achieve the above, to recruit a unique faculty with basic scientists, technologists, physician researchers, engineers, statisticians, bio-informaticians to work under one roof.

To set up a unit for developing policies related to Health Science Technologies, identify needs, facilitate conceptualization and design of new technologies and product. This unit will create ready to use ideas and grand challenges for CSIR laboratories, ICMR, DST, SMEs and for programmes of DBT and its autonomous institutions. The unit will be funded from the budget of the translational centre but be manned only by contract appointees.

To initiate Masters/Fellowship course in Translational Health Science, interdisciplinary Ph.D. programme for physician scientists, short term training for SMEs and other professionals in product development, in regulation and IPR management and to support the activity in other medical schools in India.

To provide platform for active interaction among scientists, health specialist, technologists and entrepreneur both nationally and internationally.

RESEARCH PROGRAMMES

VACCINE AND INFECTIOUS DISEASE RESEARCH CENTRE

PAEDIATRIC BIOLOGY CENTRE (PBC)

CENTRE FOR BIO-DESIGN (CBD) & NATIONAL BIODESIGN ALLIANCE

CLINICAL DEVELOPMENT SERVICE AGENCY

VACCINE AND INFECTIOUS DISEASE RESEARCH CENTRE

Vaccine and Infectious Disease Research Centre Mission:

Globally, infectious diseases remain the leading cause of death, but these are particularly pernicious in developing economies like ours. In the context of India, the ever-increasing population density, migration of population to urban areas and associated changes in environment and ecology provide fertile ground for emergence of newer infectious agents. Vaccines, anti-virals, novel antibiotics, and antibody-based strategies remain the most cost-effective means to combat the infectious organisms. The scientific mission of the Vaccine and Infectious Disease Research Centre (VIDRC) is to study infectious diseases and pathogens to generate translatable knowledge for developing prophylactic and therapeutic measures against diseases prevalent in India.

Current Scientific program:

The current scientific activities of VIDRC are focused broadly in two areas: viruses that are spread through mosquitos and contaminated drinking water, and tuberculosis. These areas were chosen as they were important in the Indian context, and that we were able to recruit suitable scientific experts in these two areas. Dr. G. R. Medigeshi joined VIDRC with post-doctoral training in the USA working with West Nile virus uptake and replication. Dr. Sudhanshu Vrati moved from the National Institute of Immunology (NII) with considerable back ground in Japanese encephalitis virus replication and vaccine development. These two are driving various research programs at VIDRC related to Dengue, Japanese encephalitis and Rota viruses. Dr. Ramandeep Singh moved to VIDRC from the NIH, USA with post-doctoral training in areas related to Mycobacterial drug action. Dr. Nisheeth Agarwal came to VIDRC with post-doctoral training at the JHU, USA in areas related to Mycobacterial metabolism and genetics. These two scientists are driving the tuberculosis research program at VIDRC.

Dr. G. R. Medigeshi's efforts are directed at understanding the role of epithelial and endothelial cells in the pathogenesis of Japanese encephalitis (JE) and Dengue virus (DV) infection. He is also involved in establishing in vitro assays for different stages of viral replication for screening anti-viral compounds. In these directions he has established epithelial and endothelial cell culture models of virus infection and standardized various assays to measure the effects of JEV and DV on epithelial and endothelial permeability barrier functions. Dr. Vrati's group continues to focus on JEV biology with interest in identifying the receptor system for the virus. They are also interested in understanding the role of miRNAs in JEV replication. This information can be potentially used to generate genetically-engineered attenuated JE virus.

In terms of vaccines and vaccine technologies, Dr. Vrati's group is now gearing up for the phase III trial of an oral rotavirus vaccine 116E. In this direction a notable progress was made this year in the form of setting up of a FDA-compliant rotavirus vaccine efficacy testing laboratory. The laboratory has GLP-compliant QA/QC processes and fully validated equipment. The vaccine efficacy assays are internationally cross-validated and technicians are very well trained. Another activity relates to a research program aimed at developing novel vaccine delivery vectors. For this, adenoviruses are being isolated from buffalo and being characterized at the molecular level. Incidentally, adenoviruses have never been reported from these animals, and so far, at least two adenovirus isolations have been made at VIDRC from buffalo.

Eradication of tuberculosis requires new strategies aimed at targeting non-replicating bacteria that characterize the latent disease. However the physiology and metabolic processes of non-replicating bacteria are poorly understood. The main focus of Dr. Ramandeep Singh's research is to understand the mechanisms of persistence of M. tuberculosis in the presence of anti-tubercular drugs and screening of various synthetic molecules for their anti-tubercular activity. Besides, he is also focusing on validation of newer drug-target pathways for M. tuberculosis. In these directions his group is focusing on understanding the role of MazF toxins and PolyP metabolism pathways in persistence of Mycobacteria.

Additionally, ~500 compounds have been screened for anti-tubercular activity. Some diamine derivatives have shown MIC99 of ~3 μM. More libraries such as Triclosan derivatives / NIH synthetic libraries will now be screened for their activity against both replicative and non-replicative Mycobacteria. Vitamins, such as thiamine, nicotinic acid, pantothenic acid, pyridoxamine and biotin are essential co-factors involved in lipid, amino acid or

carbohydrate metabolism. Humans are unable to make most of these vitamins and acquire these essential nutrients from their diet thus making them attractive drug targets to combat infectious diseases. Experiments are in progress to validate thiamine metabolism pathway (Vitamin B1) as drug-target to combat tuberculosis.

Dr. Nisheeth Agarwal is studying the role of essential signaling molecules, p-loop GTPases in Mycobacterium. This will not only decipher a new physiological pathway of Mycobacterium but will also generate novel therapeutic targets. His group is also trying to understand the mechanism of protective immune response elicited by vaccine strain M. bovis BCG. BCG was created by serial passaging of virulent M. bovis for more than ten years and is currently the only vaccine available against tuberculosis. However, the microbial factors responsible for inducing Th1 immunity by the host are largely unknown. Using transposon insertion mutants, Dr. Agarwal's group is screening for the mutants eliciting reduced IL12 levels following infection of macrophage cell line. Subsequently these mutants will be characterized to nail down the underlying mechanisms. His group is also studying the secretion mechanisms in Mycobacteria that will not only help identifying the novel drug target but will also help creating a better vaccine strain by overexpression of the protein translocation machinery in BCG, and thus changing its antigenic repertoire.

Future scientific program and challenges ahead:

As can be seen from the various scientific projects underway at VIDRC, there is an interesting mix of discovery and translational projects. Now that the VIDRC laboratories are fully functional, it is proposed to recruit more scientists at the principal investigator level. VIDRC would like to reinforce its tuberculosis group and initiate a research program to study human immune responses in infections such as Dengue. Unfortunately, VIDRC has not been able to recruit a suitable individual so far with experience in studying human immune responses. The proposed Rotavirus vaccine trial will provide VIDRC a unique opportunity where a very large number of gastroenteritis (GE) stool samples from young children will be collected. These could be used to identify novel pathogens that may be involved in GE in humans by ruling out all known GE causing pathogens. In this direction VIDRC would like to build a new pathogen discovery platform based on high throughput methods. THSTI has entered into a collaborative agreement with the International AIDS Vaccine Initiative (IAVI) to set up a joint program on HIV vaccine research. On behalf of THSTI, the program will be administered by VIDRC. The program envisages setting up high throughput methods to identify suitable antigen/s for HIV vaccine design.

An immediate challenge before VIDRC now is to identify and recruit scientists with suitable expertise for its new programs. Because of the interim nature of the current VIDRC laboratories, there are limitations related to the availability and use of animals for experimentation. There are also limitations in terms of VIDRC scientists' ability to work with the BSL3 category pathogens for the lack of appropriate facility. VIDRC is working on making alternate arrangements to address these issues and with some help from the sister institutions in the neighbourhood VIDRC hopes to overcome these. VIDRC is also working with the Department of Biotechnology to seek funding support for constructing these facilities in its Faridabad campus where the permanent laboratories of VIDRC are expected to be built in the next couple of years.

PAEDIATRIC BIOLOGY CENTRE (PBC)

Paediatric Biology Centre (PBC) Mission

The Pediatric Biology Centre was proposed to bridge the gap between classical clinical and population epidemiology unconnected to molecular causality on the one hand and the more recent mechanistic biology insulated from community health problems on the other hand. The elucidation of causal biological processes that result in individual and public health consequences will critically contribute to hypotheses building for classical epidemiological research in these areas resulting in sustainable solutions for communities (Figure 1). The sanction for the Pediatric Biology Centre (PBC) was received on September 23, 2009. Since then the following activities have been undertaken at the centre.

Current research activity

The research activities have been developed as domain programs in keeping with the immediate objectives stated in the Pediatric Biology Centre proposal. They are at various stages of development and execution. Progress on these activities is summarized below:

- **Domain I: Immunobiology of perinatal period**

  In India, more than a quarter of the one million neonatal deaths are attributed to serious bacterial infections that include pneumonia, sepsis and meningitis. A void in the understanding of infectious diseases and immunology in newborns and young infants has been a lack of clear characterization of the development and maturation of the immune system in this period. The core research programme, evolved in electronic discussions with SAG members, is focused on immunological characterisation of leucocytes in human cord blood and early infancy. The initial study in this domain has been initiated by Dr. Nitya Wadhwa (Principal Investigator) and Drs. Shinjini Bhatnagar, Satyajit Rath, Dr. Vineeta Bal, Mouli Natchu and Department of Pediatrics, AIIMS (Drs. Vinod Paul, Neerja Bhatla and Ramesh Aggarwal) to study the cord blood immune markers in term appropriate for gestational age and small for gestational age neonates using a cross sectional design. The study is examining (i) the status of immune system maturation in a situation of intrauterine growth retardation, and (ii) other potential modifiers of the immune system maturation and development. Dr. Deepak Rathore is working on the laboratory assays and three medical doctors are responsible for collecting the clinical data. Collection of cord blood and the laboratory assays have been standardized. In preliminary analyses where cord blood was compared with healthy adult volunteer blood with respect to various categories of immune cells such as T cells (T helper, T cytotoxic cells, T regulatory cells, gamma delta T cells, natural killer T cells, naïve, effector and central memory subsets of T cells), B (naïve, memory and B1) cells, macrophages, dendritic cells and NK cells, peculiarities were observed in cord blood population cells, such as monocytes, which have not been reported so far.

- **Domain II: The biology of vaccine immunogenicity in Indian infants**

  Poor responses to vaccines have hampered efforts towards control and eradication of infectious diseases like poliomyelitis, rotavirus diarrhea, typhoid and tuberculosis in India and have been a major setback for public health programs. Apart from morbidity and mortality from the disease, the loss of credibility arising from poor effectiveness further affects vaccine coverage rates. As more and more vaccines are being added, discovery and evaluation of novel adjuvants that can improve vaccine responses will be critical to their success. As an initial step, Dr. Mouli in collaboration with Dr. Anna George (Senior Scientist at NII) is evaluating the ability of novel safe adjuvants like Vitamin D to enhance the quality and duration of systemic immune responses to antigens including the Inactivated Polio Virus (IPV) vaccine and its ability to generate priming at mucosal sites to cutaneously delivered vaccines. The study has received extra mural funding from DBT. The initial results show that mice immunized under cover of a single application of vitamin D show higher levels of total antibodies in serum as well as IgA antibodies in serum saliva and fecal pellets.

  As a second aim Drs. Mouli Natchu (Principal Investigator), Nitya Wadhwa, Shinjini Bhatnagar, Satyajit Rath and Vineeta Bal are assessing the impact of vitamin D supplementation on immune responses to vaccines in Indian infants. Vitamin D deficiency has broad consequences on the immune system and is hypothesized to affect a number of normal

processes in antigen presentation and the innate immune system that could have a bearing on immune responses to antigens. Also, the deficiency is highly prevalent (≈80%) at birth and early in life when most vaccines are delivered. A number of events, like the ability of murine dendritic cells (DCs) to migrate from skin sites of vaccination to mucosal lymphoid organs and migration of human CD8+ T cells to inflamed skin sites have been shown to be calcitriol (vitamin D) dependent.

Newborns born at Gurgaon Civil Hospital will be enrolled in a randomized controlled trial in Delhi. Infants will be randomized to (i) 400 IU of vitamin D or (ii) placebo for a period of 24 weeks and vaccinated according to the Universal Immunization Program. Seroconversion to OPV & Hepatitis B and response to tuberculin skin test will be evaluated as outcomes. This trial will allow us to examine the effects of Vitamin D on responses to three vaccines that implicate various components of the immune system (OPV –mucosal immunity, Hepatitis B – humoral immunity, BCG – primarily cell mediated immunity). Secondary analyses will include comparisons of seroconversion to OPV serotypes and Hepatitis B vaccine, GM antibody titres against OPV serotypes and Hepatitis B as well as scar and tuberculin skin test reactions in the intervention and control groups. This study is funded by DBT.

- **Domain III: Biology of specific paediatric diseases**

  This program proposes to explore specific components of pathogenesis of pediatric diseases that are important contributors to childhood morbidity and mortality. Finding clues to mechanistic pathways may enable identification of novel targets amenable to targeted therapeutic intervention. An initial program is on childhood renal disease, idiopathic Nephrotic syndrome. The pathogenesis of idiopathic NS, characterized by losses of large amounts of urinary proteins, is unknown. In health, glomerular selectivity against proteinuria is maintained by foot processes (podocytes) of visceral epithelial cells. Studies from AIIMS show that only 10% patients with NS have mutations in genes encoding podocyte proteins. In the majority, perturbations of cell mediated immunity are considered pathogenic with evidence of Th2 polarization. The research program utilizes multiple approaches and addresses issues with implications for therapy. Evaluation for evidence of Th1/Th2 cytokine imbalance and lymphocyte subsets in patients treated with rituximab shall explore the role of cellular immunity in pathogenesis of NS. Competence in culturing immortalized human podocytes shall enable an in vitro model for understanding disease biology, while assessment of urinary biomarkers in a prospective cohort may allow prediction of course and progression of NS. Two projects have been developed by Drs. Vineeta Bal, Aditi Sinha and Arvind Bagga (clinical partners at AIIMS). One project has already received funding from DBT and the other is submitted to DBT for consideration for funding.

- **Domain IV: Molecular biology of specific paediatric diseases**

  An important mandate of PBC is to understand potential biological/immunological mechanisms involved in the pathogenesis of various clinical diseases. CD80 expression in podocytes (of the glomerular epithelial cells) is found in genetic, drug-induced, immune-mediated, and bacterial toxin-induced experimental kidney diseases with Nephrotic syndrome. Expression of CD80 in podocytes modifies the glomerular filter by sequestration of SD proteins, nephrin, CD2AP, ZO-1. Moreover the full length membrane associated form of CD80 is elevated in urine of patients with Minimal Change Disease (MCD) of disease. Dr. Shailaja Sopory (Principal Investigator) is looking at the effect of artificially increasing CD80 levels in human podocyte cell lines (to mimic what is observed during MCD) on, (i) expression and localization of various podocyte specific proteins, and (ii) signaling in the podocyte and slit diaphragm. The human CD80 has been cloned in PGEMT Easy vector by RT-PCR from adult blood RNA. This construct has been subcloned in pCDNA3 for transfection in mammalian cells including kidney podocyte cell lines. A project proposal with the prime objectives to study molecular mechanisms of minimal change disease Nephrotic syndrome and the role of CD80' has also been submitted in response to the call for proposals under the Bio-care program of the Department of Biotechnology.

  The second study in this domain is to do gene expression profile with specific reference to genes involved in immune

responses and other related signaling pathways on cord blood collected from SGA and AGA neonates. This complementary information may explain why these babies show different immune responses to infections. This work is being done by Drs. Shailaja Sopory (Principal Investigator), Satyajit Rath, and Vineeta Bal. A standardized preparation of genomic DNA and RNA from whole cord blood has been done. The cord blood mononuclear cells are being separated using ficoll density gradient centrifugation followed by purification of CD3+ (T cells), CD19+ B cells and CD14+ monocytes using magnetic beads based purification protocols (IMagnet from BD). These sub populations of cells will be used for RNA extraction and subsequent micro array analysis.

- **Domain V: Innovative technologies for newborn and child health**

  Several cases of Celiac disease (CD) in India remain undiagnosed because of poor access to specialized expensive diagnostic tests. There is an urgent need to develop simple, inexpensive in-house point of care (POC) diagnostic tests that have high diagnostic accuracy for CD but are simple to perform and are easily accessible. These tests can be used effectively as a first step non-invasive CD screening method in both people with symptoms suggestive of CD and in high risk groups such as first degree family members or those with other autoimmune diseases. They would be valuable in large population studies for determining the true incidence and prevalence of the disease in the country. A multicentre study, funded by DBT, has been initiated to develop a rapid diagnostic test for diagnosis of celiac disease (CD) by Drs. Shinjini Bhatnagar (Principal Investigator), Nitya Wadhwa, and Uma Chandra Mouli with Dr. Navin Khanna at ICGEB, AIIMS and an industrial partner.

  An in-house point of care immunochromatographic test (POCT) designed to detect antibodies (IgA or IgA+IgM+IgG) in human blood or serum/plasma, against human recombinant tissue transglutaminase, and a ii) in-house diagnostic ELISA test for detection of antibodies (IgA or IgA+IgM+IgG) in human serum or plasma, against human recombinant tissue transglutaminase is being developed. Both tests are using a human recombinant tissue transglutaminase (tTG) as a capture antigen. The laboratory prototype tests is being adapted into the marketable kit for the detection of CD by the industrial partner. After the prototypes are ready the new kits will be validated using well characterized sera from children with CD stored at AIIMS. After the initial validation on the stored sera the diagnostic kits will be tested on children with CD across different geographical regions of the country. The next step will be to modify these kits such that they can be tested on whole blood instead of sera. The technology for the kits, once developed will be transferred to the commercial partner as per DBT norms.

  The patent for the diagnostic kit has been filed:Application No. 1133/DEL/2011; Title: A method and device for detection of anti-transglutaminase antibodies.

Stable Clinical Partners for human clinical research

In order to fulfill the mission of conducting large translational programs there is a need to have stable clinical partners. These partnerships will create models of implementable clinical research in hospitals and the community. PBC has established a **stable clinical partnership program with the Department of Pediatrics at AIIMS through the DBT Glue Grant scheme** (for linking basic and clinical science departments in inter-institutional linkages). This partnership proposes to establish a multidisciplinary research hub spanning the two institutions that will aim to comprehensively understand the cellular-molecular patterns of the casual mechanisms of child health and disease, and search for innovative solutions. A number of collaborative proposals with the department have been conceived that are being executed through this partnership programme.

Another stable clinical partnership program is being established with the **Gurgaon Civil Hospital, Haryana in collaboration with NBRC and RCB through the DBT Glue Grant scheme.** The partnership will create a model of 'grassroots' level implementable clinical research in hospitals and the community that can be conducted outside of tertiary academic medical centers. It will facilitate scientists at PBC to regularly interact with clinicians at the clinical centre and identify problem areas and needs that could act as seeds for translational research programs.

CENTRE FOR BIO-DESIGN (CBD) & NATIONAL BIODESIGN ALLIANCE

Centre for Bio-design (CBD) & National Biodesign Alliance

Mission

The primary mission is to promote science and application related to affordable implants, devices, in-vitro diagnostics and imaging. In the field of diagnostics the alliance will promote an effective translational route of basic findings ultimately into routine applications of major importance, through a multidisciplinary approach, combining new bio markers, novel technological concepts and clinical expertise. Major areas of research in the field of in-vitro diagnostics will include protein and antibody engineering, detection technologies and concepts, nucleic acid diagnostics, new clinical markers, decentralized diagnostics (Point-of-Care), bio-organic chemistry diagnostic technologies, bio-affinity test concepts and systems, micro-fluidics, miniaturization, different reporter alternatives and multiplexing.

The Partners of the National Biodesign Alliance are Dr. Shinjini Bhatnagar (THSTI), Dr. Navin Khanna (ICGEB, and adjunct Professor THSTI), Drs. Balram Bhargava, V.K. Paul, Nikhil Tandon, Jaya Tyagi, Pratima Ray (AIIMS), Dr. Alok Ray (IIT Delhi), Drs. Dinakar Salunke, Avinash Bajaj (RCB), Dr. Sudhanshu Vrati (THSTI), Dr. Gagandeep Kang (CMC, Vellore) Dr. Mohanshankar(IIT Madras), BIRAP/BCIL for support services, adviser and concerned officer of DBT/DBT nominee. Drs. Shinjini Bhatnagar (Director THSTI) and Navin Khanna (ICGEB and also adjunct Professor at THSTI) have been nominated as coordinators.

Research activities: Diagnostics

- **Rapid, simple and sensitive test modules for multiplex testing of infectious diseases in blood banks.**

  Principal Investigator Dr. Navin Khanna

  Blood transfusion saves lives and improves health. WHO recommends that, at minimum, all blood for transfusion should be screened for HIV, Hepatitis B, Hepatitis C, Malaria and Syphilis. The focus of this program is to develop an affordable robust, rapid, simple and sensitive test technology/system for multiplex testing of these infectious diseases in blood banks. A novel recombinant multiepitope diagnostic intermediate, r-HIV-MEP was designed from core and envelope proteins of HIV. The synthetic gene encoding r-HIV-MEP was in vivo biotinylated using cloning strategies in E. coli. A novel recombinant multiepitope diagnostic intermediate HCV-MEP V2 (r-HCV-MEP), was also designed from the non-structural and structural proteins of HCV. Respective antigens were purified to homogeneity using Ni-NTA affinity chromatography. An in-house TRF immunoassay was developed as single diagnostic intermediate for the detection of respective antibodies in infected human serum samples. Each individual assay was evaluated using commercially available and well-characterized serum panels from BBI. The immunoassay detected HIV and HCV infection from diverse geographical locations, with high specificity and sensitivity. Monoclonal antibodies (MAbs) 21B and 5S (from hybridoma clones available at ICGEB) specific for HBsAg were purified to homogeneity. An in-house HBsAg TRF immunoassay was developed using the two purified MAbs. Well-characterized serum panel from BBI was utilized to evaluate the HBsAg TRF immunoassay. The immunoassay detected HBV infection with high specificity.

  Individual TRF immunoassays developed based on r-Bio-HIV-MEP and r-Bio-HCV-MEP and HBsAg TRF immunoassays were combined to develop an HIV, HCV and HBV multiplexed TRF immunoassay for the simultaneous detection of one or more of the following analytes in human serum samples from the same well – anti-HIV antibody, anti-HCV antibody and HBsAg. The multiplex assay was evaluated with commercially available and well-characterized viral co-infection performance panel from BBI. The objective of multiplexing was successful as all the samples that were positive by individual in-house TRF immunoassays were also detected by the TRF multiplexed assay.The 'know-how' of the design and production of the novel r-HIV-MEP has been transferred to a leading diagnostics manufacturing company in India. (Funders: Department of Biotechnology, Department of Science And Technology (DST), and Finnish Funding Agency For Technology And Innovation (Tekes))

- **Development of a rapid diagnostic test for diagnosis of celiac disease (CD);**

  Principal Investigator Dr. Navin Khanna and Dr. Shinjini Bhatnagar

  Several cases of Celiac disease (CD) in India remain undiagnosed because of poor access to specialized expensive diagnostic tests. There is an urgent need to develop simple, inexpensive in-house point of care (POC) diagnostic tests that have high diagnostic accuracy for CD but are simple to perform and are easily accessible. These tests can be used effectively as a first step non-invasive CD screening method in both people with symptoms suggestive of CD and in high risk groups such as first degree family members or those with other autoimmune diseases. They would be valuable in large population studies for determining the true incidence and prevalence of the disease in the country. A multicentre study, funded by DBT, has been initiated to develop a rapid diagnostic test for diagnosis of celiac disease (CD) by Drs. Shinjini Bhatnagar (Principal Investigator), Nitya Wadhwa, and Uma Chandra Mouli with Dr. Navin Khanna at ICGEB, AIIMS and an industrial partner. An in-house point of care immunochromatographic test (POCT) designed to detect antibodies (IgA or IgA+IgM+IgG) in human blood or serum/ plasma, against human recombinant tissue transglutaminase, and a ii) in-house diagnostic ELISA test for detection of antibodies (IgA or IgA+IgM+IgG) in human serum or plasma, against human recombinant tissue transglutaminase is being developed. Both tests are using a human recombinant tissue transglutaminase (tTG) as a capture antigen. The laboratory prototype tests is being adapted into the marketable kit for the detection of CD by the industrial partner. After the prototypes are ready the new kits will be validated using well characterized sera from children with CD stored at AIIMS. After the initial validation on the stored sera the diagnostic kits will be tested on children with CD across different geographical regions of the country. The next step will be to modify these kits such that they can be tested on whole blood instead of sera. The technology for the kits, once developed will be transferred to the commercial partner as per DBT norms.

  The patent for the diagnostic kit has been filed:Application No. 1133/DEL/2011; Title: A method and device for detection of anti-transglutaminase antibodies.

- **Development of rapid diagnostic test for Tuberculosis meningitis;**

  Principal Investigator: Dr. Jaya Tyagi

  Tuberculosis (TB) remains one of the world's most pressing public health problems with a global prevalence of 14 million cases with 1.68 million deaths with India accounting for a fifth of the global burden of TB (WHO report, 2009). A pilot mode collaborative study between AIIMS and Dr. RML Hospital, New Delhi suggested that the detection of Mycobacterium tuberculosis antigen in pediatric CSF samples can provide value addition to the existing TBM diagnostic paradigm. The results further implied that diagnostic tests based on antigen detection would favourably impact the diagnosis of TBM and possibly other forms of extrapulmonary disease. Prof. Jaya Tyagi and her team have initiated work to develop these diagnostic tests by preparing selected recombinant M. tuberculosis antigens including but not restricted to HspX and MPT51, developing antigen detection reagents including high affinity monoclonal antibodies (capture antibody) for use in combination with polyclonal antibodies (detection antibody) and then use these reagents for preparing antigen detection tests in sandwich ELISA and lateral flow test formats. Candidate M. tuberculosis antigens including MPT51, GlcB, Ag 85B, PstS1 and HspX were chosen as they are expressed during various stages of growth/ infection and independent of the immune status of individual or the HIV status. Of these, HspX and MPT51 recombinant proteins (with His6 tag) were overexpressed in E. coli and purified by affinity chromatography by FPLC. Polyclonal antibodies have been raised against them in rabbits each with a titre of approximately 1:1,00,000. The generation of polyclonal antibodies/ monoclonal antibodies to various antigens is in progress. The next phase will be to apply these tests to the diagnosis of other extrapulmonary forms of TB using a variety of sample fluids such as aspirates from joints, lymph node, pleural effusion, ascites etc. Collaborations will be established with an industry partner for upscaling and commercialization.

- **Development of a rapid diagnostic kit for Chikungunya;**

  Principal Investigator Dr. Pratima Ray

  Chikungunya (CHIKV) has recently seen a re-emergence in India infecting over 1.38 million populations in 2006 with unexpectedly high morbidity. However, the epidemiology and disease burden remain largely undetermined partially due to lack of an appropriate diagnostic test other than RT-PCR/Real-time. A simple, rapid and affordable point of care diagnostic test for early detection of chikungunya antigen in the serum/plasma of the patients is required. Dr. Pratima Ray and her team have started work on this diagnostic kit. Large scale tissue-culture production of chikungunya virus is currently in progress which will be used for raising polyclonal/monoclonal antibodies. Tissue-culture grown virus will also be used to extract RNA for cloning E1/E2 genes in to expression vector and recombinant antigen will be then used to develop recombinant/monoclonal antibodies. A parallel approach will also be taken to analyze the CHIKV infected culture supernatant by Western blotting / Mass spectrometry that may provide clue to identify potential target for chikungunya diagnosis. A total of about 3000 blood sample were collected at different days of fever onset (day1-30) from patients suspected with chikungunya infection and admitted at one of the study centers (All India Institute of Medical Sciences, Delhi, Karnataka Institute of Medical sciences, Karnataka and Sawai Man Singh Medical College, Rajasthan) as the part of a ongoing study funded by Department of Biotechnology. About two third of these sample have been already tested for chikungunya IgM by ELISA and Chikv RNA by RT-PCR and Real-Time PCR and about 300 of them were chikunguya positive by one of three tests. These samples will help to assess chikungunya test that is under development as compare to the tests that are available in the market

- **Develop a cheap, and ideally less invasive test for self home blood glucose monitoring;**

  Principal Investigator Dr. Nikhil Tandon

  In diabetes, a key recurring cost especially in patients on insulin therapy is that of self home blood glucose monitoring. Cost to the patient for a single strip ranges from Rs. 21-32, which even if a single daily test is advocated, adds up to between Rs. 600 - 900 per month. Most patients on insulin ideally require at least 3 tests a day, which are never done due to financial reasons. A key area therefore would be to develop a cheap, and ideally less invasive test for self home blood glucose monitoring. The other key laboratory based diagnostic which is required on a 3 monthly basis for patients with diabetes is glycosylated hemoglobin (HbA1c). This test is significantly under-used in clinical practice because of the expense. The chronic disease component of the in vitro diagnostics centre would also explore the possibility of a cheaper, point of care test for measuring HbA1c. Microalbuminuria, which is an assessment of microscopic amounts of protein loss through the kidney predicts future progression of overt kidney disease and is also associated with cardiovascular outcomes in people with diabetes. This test is also not universally available and is significantly under used for managing diabetics. An attempt should be made to design a cheap test for assessing microalbuminuria which can be made universally available. Finally, diagnosis of acute coronary syndrome is often dependent on measuring troponin T and troponin I – tests which have no local manufacturers. An attempt to design point of care tests for trop T and trop I for use in emergency rooms would be a goal of the centre. Additional diagnostics required for chronic disease care would be decided after due consultation with end users.

International collaborations

A letter of intent was signed between the Department of Biotechnology, GOI and University of Turku (UT), Finland to establish a program of cooperation between the UT and the National Biodesign Alliance for collaborating in research, innovation, higher education, training and capacity building in the area of diagnostics related to human health. A formal MoU is being developed between the National Biodesign Alliance and UT under the DBT Indo-Finnish program. This program will also allow sandwich Ph.D. program between the Alliance and UT. As part of this collaboration five overseas fellowship awards will be anchored by the Alliance and will be recruited shortly.

CLINICAL DEVELOPMENT SERVICE AGENCY

Clinical Development Service Agency Mission:

- Develop a cadre of investigators of global standard in regulatory product evaluations through a comprehensive & sustained training program.
- Create support system for biotech product evaluation for products developed in India or licensed to India & being developed by public institutions or companies.
- Training in Clinical trials for regulatory submissions, Preclinical research for early clinical development and Conduct of clinical trials.

Centers of Excellence for Training and Regulatory Trials

There is an acute shortage of institutions and agencies conducting phase III clinical trials in India for public health diseases and even those that exist do not have the capacity to conduct clinical trials at globally accepted levels. CDSA's efforts, therefore, are to identify and support institutions that focus on early and late phases of clinical trials and are willing to improve its infrastructure, leadership, skilled personnel and a governance model.

CDSA proposes to establish a network of institutions by supporting good existing centres and upgrade them as centres of excellence (COE) for training and regulatory trials as affiliates of CDSA. It will enter into collaborative agreements with at least five premier institutions in the first year to convert them into centres of excellence to tap the huge potential of the clinical trials market. CDSA will provide a core grant to these institutions to develop human resource and infrastructure.

The COE are expected to:

- Provide training to principal investigators and support team staff
- Provide network for evaluation and diffusion of Indian products of public interest or created by SMEs in India
- Make their expertise and facilities accessible to Indian companies
- Participate in governance of CDSA in a distributed model

Selection criteria have been developed to choose the centres who respond to a 'Call for Proposals' advertisement in the press and on the website. A selection committee headed by Dr. V.M. Katoch, DG-ICMR, will select institutions that meet these criteria.

Clinical Trials Training Program with iOWH

For the clinical trials program, an MOU was signed with the Institute for One World health (iOWH) to set up the processes, tools, and systems to train a cadre of clinical researchers across the country.

The clinical trials program consisted of executing several activities prior to effective implementation, viz., mapping of premier clinical research institutions, determining training needs based upon best practices and gaps, developing curriculum and training modalities, etc.

During July and August 2010, the two consultants visited several key clinical research institutions (NICED-Kolkata, SAS-Delhi, AIIMS-Delhi, KEM-Mumbai, KEM-Pune, CMC-Vellore, NIMS-Hyderabad) as part of the institutional mapping process and also to elicit views of the opinion leaders on how the training program should be structured. To seek a clear consensus, a 2-day meeting was organized by CDSA in collaboration with iOWH with representatives of the research institutions along with other special invitees to brainstorm the issues involved. The meeting was held in Delhi from September 14 to 15 and was attended by 35 national and international delegates. The meeting generated intense discussion and several ideas to pursue the program and as to how CDSA can contribute to enhancing quality, scalability and sustainability of the clinical trials. Three keys decisions were taken: (i) Clinical trial training program in collaboration with iOWH should move forward in synergy with Centres of Excellence (ii) CDSA will ensure that five regional centers of excellence are identified across India and that partnerships are established to enable capacity building (iii) the centers of excellence be in a state of readiness to undertake two clinical trial projects by September 2011.

An Expert Committee comprising of Dr. Nita Bhandari, Dr. Shinjini Bhatnagar, Dr. Shoibal Mukherjee, Dr. Mouli Natchu, Dr. C. S. Pramesh, and Dr. Rajat Goyal was constituted to make recommendations on the curriculum and modalities of the training program. Subsequently, iOWH will organize a 2-day meeting in July '11 to take the program further to train trainers with an international faculty.

Post-graduate Training Program in Drug Discovery and Translational Medicine

A teaching program was envisaged as a tripartite collaboration among academia, industry and CDSA to enhance preclinical research capacity in drug discovery and translational medicine. The program would be suitable for graduates in pure sciences, pharmacy and medicine to prepare them for undertaking advanced research and development of clinical products. Bristol Myers Squibb had initially expressed interest to be party to this program but have recently declined to pursue it further.

Severe acute malnutrition in children (SAM)

An alliance has been formed among Departments of Health Research (DHR) and Biotechnology (DBT), and Ministry of Health and Family Welfare of the Government of India to support research to generate evidence for development of practical and scalable regimens to medically rehabilitate children suffering from Severe Acute Malnutrition (SAM) without serious complications at home/community level and/or at peripheral inpatient facilities.

The Steering Committee of the program will be chaired by Dr. M.K. Bhan and a Technical Advisory Group (TAG) headed by Dr. H.P.S. Sachdeva will select expert members based upon their experience in the field of pediatric nutrition. CDSA will serve as the secretariat for SAM program and implement decisions of the Steering Committee and Technical Advisory Group.

Governing Body Meeting

The first meeting of the founder members of the Society and of the Governing Body of CDSA took place at the BIRAP office on November 12, 2010 under the chairmanship of Dr. M.K. Bhan, Secretary DBT.

FUNDED PROJECTS

- **Evaluation of novel adjuvants for mucosal priming following cutaneous delivery of vaccines;**

  Principal Investigators: Dr. Uma Chandra Mouli Natchu (PBC, THSTI), Dr. Anna George (NII)

  Poor responses to vaccines have hampered efforts towards control and eradication of infectious diseases like poliomyelitis, rotavirus diarrhea, typhoid and tuberculosis in India and have been a major setback for public health programs. Apart from morbidity and mortality from the disease, the loss of credibility arising from poor effectiveness further affects vaccine coverage rates. As more and more vaccines are being added, discovery and evaluation of novel adjuvants that can improve vaccine responses will be critical to their success. In this project, evaluation is made on the ability of novel safe adjuvants like Vitamin D to enhance the quality and duration of systemic immune responses to antigens including the Inactivated Polio Virus (IPV) vaccine and its ability to generate priming at mucosal sites to cutaneously delivered vaccines.

- **Vitamin D supplementation to improve immune responses to vaccines administered in early infancy - The NutriVac-D Trial;**

  Principal Investigator: Dr. Uma Chandra Mouli Natchu.

  Co-Investigators: Dr. Nitya Wadhwa, Dr. Shinjini Bhatnagar, Dr. Vineeta Bal, Dr. Satyajit Rath, Dr. Sudhanshu Vrati.

  This project aims to assess the impact of vitamin D supplementation on immune responses to vaccines in Indian infants. Vitamin D deficiency has broad consequences on the immune system and is hypothesized to affect a number of normal processes in antigen presentation and the innate immune system that could have a bearing on immune responses to antigens. Also, the deficiency is highly prevalent ($\approx$80%) at birth and early in life when most vaccines are delivered. A number of events, like the ability of murine dendritic cells (DCs) to migrate from skin sites of vaccination to mucosal lymphoid organs and migration of human CD8+ T cells to inflamed skin sites have been shown to be calcitriol (vitamin D) dependent.

- **Development of a rapid diagnostic test for diagnosis of celiac disease (CD)**

  Principal Investigator: Dr. Shinjini Bhatnagar (PBC, THSTI), Dr. Navin Khanna (ICGEB)

  Co-Investigators: Dr. Nitya Wadhwa, Dr. U.C. Mouli Natchu, Dr. Savita Saini (AIIMS).

  Several cases of Celiac disease (CD) in India remain undiagnosed because of poor access to specialized expensive diagnostic tests. There is an urgent need to develop simple, inexpensive in-house point of care (POC) diagnostic tests that have high diagnostic accuracy for CD but are simple to perform and are easily accessible. These tests can be used effectively as a first step non-invasive CD screening method in both people with symptoms suggestive of CD and in high risk groups such as first degree family members or those with other autoimmune diseases. They would be valuable in large population studies for determining the true incidence and prevalence of the disease in the country. A multicentre study, funded by DBT, has been initiated to develop a rapid diagnostic test for diagnosis of celiac disease (CD).

- **Toward the characterization of multipleP-loop GTPases in mycobacteria.**

  Principal Investigator: Dr. Nisheeth Agarwal

  Co-Investigator: Dr. Ramandeep Singh

  Tuberculosis (TB) is a deadly disease of humans causing a serious impact on global health. TB is caused by acid-fast bacilli, Mycobacterium tuberculosis, which has infected one third of world's population. Globally there were 9.4 million cases of TB and 1.3 million deaths reported in year 2008, out of which 2 million cases were reported alone from India. Co-infection of TB patients with HIV and emergence of drug resistant strains of M. tuberculosis have further worsen the situation and warrant further studies to develop new chemotherapeutic agents against this lethal infectious organism. One of the several ways to develop an effective antimicrobial agent is by targeting components of essential metabolic pathways.

  GTPase superfamily of proteins is universally present in all forms of life, regulating essential cellular pathways

such as protein synthesis, cell cycling & differentiation and hormone signaling. A survey of genome sequences of different mycobacterial species reveals the presence of conserved P-loop GTPases namely Era, Obg, EngA, HflX and YchF which have not been characterized and their role has remained obscure in these organisms. Amino acid sequence alignment of P-loop GTPases from pathogenic and nonpathogenic mycobacterial species reveals nearly identical active site G-domains suggesting conserved occurrence of this superfamily of proteins across the different mycobacterial species. However, there are marked differences in the active site residues between the mycobacterial proteins and those from other bacterial systems such as E. coli, which obliterate a complete overlap in their functions.

Based on the conserved occurrence of P-loop GTPases in different mycobacterial species, we hypothesize their involvement in essential metabolic pathways. We would like to investigate the role of multiple P-loop GTPases in the biology of mycobacteria to explore this class of proteins as novel drug targets. We will address this question by employing the following strategies:

1) Cloning, expression and purification of P-loop GTPases of pathogenic and non-pathogenic mycobacteria and their biochemical characterization.
2) Deletion/downregulation of P-loop GTPases from Mycobacterium smegmatis, a surrogate host of the pathogen M. tuberculosis, and the effect of deletion on mycobacterial physiology.
3) Overexpression of P-loop GTPases in M. smegmatis and its effect on mycobacterial gene expression.
4) Whole genome screening to identify interacting partners of mycobacterial GTPases.

This proposal is aimed at characterizing the role of an essential family of proteins in pathogen M. tuberculosis that is causing a huge socio-economic burden globally as well as in India. Thorough analyses of these unexplored molecules will not only facilitate understanding their role in pathogen but will also help achieving our goals of shortening the prolonged chemotherapy for TB, and eliminating drug resistant TB cases by exploiting some of them as potential drug targets.

- **"Investigating the role of MazF toxins in Pathogenesis and Persistence of M. Tuberculosis"**

  Principal Investigator: Dr. Ramandeep Singh

  Co-Investigator: Dr. Nisheeth Agarwal

  Bacterial drug-tolerance is reported to result from lower metabolic requirements for processes that characterize actively growing cells such as transcription, translation, replication and cell wall synthesis. An attractive hypothesis for the origin of these persisters is that they arise from stochastic over expression of endogenous regulators of macromolecular synthesis in a subset of cells. The best studied of these systems are the "toxin-antitoxin" (TA) modules found within many prokaryotic genomes. These modules are generally expressed from a bicistronic operon wherein the upstream gene encodes an unstable antitoxin and the downstream gene encodes a stable toxin. The antitoxins neutralize their cognate toxins by forming tight protein-protein complexes that abrogate toxicity of toxins if both modules are present in equal concentration. Bioinformatic analysis revealed that genome of M.tuberculosis H37Rv encodes 38 potential toxins (9 MazF, 3 RelE, 1 HigB, 2 ParE and 23 VapC homologs), of which 34 are operonic with a potential antitoxin gene. Several of these TA modules have been bio-chemically characterized. In contrast, the related obligate intracellular parasite M. leprae appears to have lost all functional toxin genes due to the unchanging nature of the niche M. leprae occupies in the human host.

  RelE and MazF are RNA ribonucleases that lead to bacteriostasis by cleaving of the coding region of mRNAs at the ribosomal A-site, resulting in ribosomal stalling on the truncated message. Over expression of transfer-messenger RNA (tmRNA) releases stalled ribosomes from the transcript and tags the truncated peptides for proteolytic degradation. The expression of these RNA toxins of TA modules is upregulated under various stress conditions such as amino acid starvation lead to rapid depletion of antitoxins, thereby leading to growth arrest by RNA toxins. Our preliminary results show that out of seven putative MazF toxins of M. tuberculosis, over expression of toxins, Rv1102c, Rv1991c and Rv2801c inhibited bacterial growth. This project is therefore aimed at:

(i) Identifying the stress conditions in which these MazF toxins are upregulated.

(ii) Role of MazF toxins (Rv1102c, Rv1991c and Rv2801c) in survival of M. tuberculosis in stress conditions/ drug induced persistence.

(iii) Role of MazF toxins (Rv1102c, Rv1991c and Rv2801c) in virulence of M. tuberculosis using guinea pig model of pulmonary tuberculosis.

- **Role of tyrosine kinases in the life-cycle of Japanese encephalitis virus and dengue virus**

Principal Investigator: Dr. Guruprasad R. Medigeshi

Co-Investigator:

We are investigating the role of tyrosine kinases (TK) at various stages of the life-cycle of mosquito-borne flaviviruses using Japanese encephalitis virus (JEV) and Dengue virus (DENV) as models. We are employing the following strategies:

1) Screening of tyrosine kinase specific siRNA library to identify TKs that are essential for viral survival and propagation.
2) Characterize the exact role of TKs identified above using in vitro assays for viral entry, replication, assembly and egress.
3) Generating mutant viruses that lack the ability to modulate/interact with TK signaling pathways and test for pathogenesis in vivo using existing animal models.

The aim of this proposal is to understand the role of TKs in the life-cycle of JEV and DENV that are of great public health concern in India. Identification of TKs that are essential for flavivirus pathogenesis will not only provide a better understanding of the host-pathogen interactions but will also enable us to devise better strategies to combat these viruses that are a huge social burden in developing countries.

Establishing antiviral discovery platform for dengue virus

The aim of this proposal is to identify potent antivirals for dengue and related flaviviruses which are pathogens of global concern. We are in the process of generating recombinant dengue viral proteins with particular focus on dengue viral protease (non-structural protein (NS) 2b/3) and polymerase (NS5). The objective is to establish in vitro assay platforms for screening natural and synthetic compounds for antiviral activity. We are employing the following strategies:

1) To clone and express dengue virus 2 NS2b/3 and NS5 in both prokaryotic and eukaryotic systems, to purify the recombinant protein and generate antibodies.
2) Use recombinant protein for identifying interacting partners and also to establish protease and polymerase assays
3) Use in vitro assay platform to screen for inhibitors of protease and polymerase activities
4) Characterize the inhibitors for mechanism of action and for in vivo protection in relevant animal models

- **Cross sectional study of cord blood immune markers in term appropriate for gestational age (AGA) and small for gestational age (SGA) neonates.**

Principal Investigators: Drs. Satyajit Rath & Vineeta Bal from NII;Drs. Nitya Wadhwa & Shinjini Bhatnagar from PBC; Prof. V. K. Paul from AIIMS

Co-Investigators: Drs. Uma Chandra Mouli Natchu & Deepak Rathore from PBC; Drs. Neerja Bhatla, Ramesh Agarwal & Manju Saxena from AIIMS

The primary objective is immunological characterization of cord blood and blood in early infancy, in full-term appropriate- and small-for-gestational age neonates, to examine the status of immune system maturation in a situation of intrauterine growth retardation, and to evaluate other potential modifiers of the immune system maturation and development.

Progress till now: The standard operation procedures, case recording forms and the data forms were prepared. The ethical clearance from the ethical committees of PBC and THSTI were obtained. Collection of cord blood was standardized and the research staff was trained to collect clinical data and the cord blood. The laboratory assays were standardized. In preliminary analyses where cord blood was compared with healthy adult volunteer blood with respect to various categories of immune cells such as T cells (T helper, T cytotoxic cells, T regulatory cells, gamma delta T cells, natural killer T cells, naïve, effector and central memory subsets of T cells), B (naïve, memory and B1) cells, macrophages, dendritic cells and NK cells, peculiarities were observed in cord blood population cells, such as monocytes, which have not been reported so far.

TRAINING AND EDUCATION

THSTI has developed several training and education programs for the purpose of human resource development. These are listed below.

- **Short term training for the graduate students**

  THSTI receives a large number of applications for undertaking 6-12 month project training for young students working towards their graduate degree programs. Depending upon the availability of resources such students are accommodated to work at THSTI for 6-12 months duration under the mentorship of its faculty members. Following students received training at THSTI.

Sh. Pranshu Sahgal	B.Tech. (Biotechnology)	VIT University, Vellore
Ms. Deepa Nair	M.Tech. (Biotechnology)	Amity University, Noida
Ms. Sakshi Bhardwaj	B.Tech. (Biotechnology)	Ambala College of Engg.
Ms. Pooja Rohilla	M.Sc. (Biotechnology)	Kurukshetra University
Sh. A.Bhardwaj	B.Tech. (Genetic Engg.)	SRM University, Chennai
Ms. Vibha Pathak	M.Sc. (Biotechnology)	HNB Garhwal University

- **Training of Doctoral students**

  THSTI has begun to accept Junior Research Fellows (JRF) of the DBT, CSIR, ICMR and UGC to undertake research work leading to the PhD degree. Selection for these positions is through an all-India advertisement. Only those who have qualified the JRF exam of DBT, CSIR, ICMR and UGC are eligible. Final selection is based on the interview of the eligible candidates. These students work under the mentorship of THSTI faculty. THSTI have the following PhD students:

Ms. Preeti Thakur	DBT JRF
Ms. Bhavya Khullar	CSIR JRF
Ms. Minu Nain	CSIR JRF
Sh. Manish Sharma	UGC JRF
Sh. Saurabh Gayali	CSIR JRF
Sh. Nishant Sharma	UGC JRF

- **Post-doctoral training**

  THSTI has created 'Vaccine Research Innovation (VRI) Awards' under VIDRC and 'Innovation Awards' under Centre for Biodesign for young investigators having brilliant research accomplishments with a monthly stipend of Rs 40,000/- . This is a career oriented scheme to identify and mentor outstanding young scientists with innovative ideas and desirous of pursuing research in areas related to vaccine and infectious diseases. The young scientists below the age of 35 years are considered for this award. Selected awardees work under the mentorship of THSTI faculty. The award is analogous to the 'Innovative Young Biotechnologist Award' of the Department of Biotechnology and the 'Young Investigator Award' of the Regional Centre for Biotechnology (RCB). Candidates having PhD degree with excellent academic record and high impact publications/patents are considered for the award. Duration of the award is three years extendable for another two years based on rigorous review of performance. The awardees under this category are Dr. Tanvi Agarwal ,VRI Awardee under VIDRC and Ms. Sagarika Haldar, Innovation Awardee under CBD.

PUBLICATIONS & PATENTS

- **Publications:**

  Wadhwa N, U.C.M Natchu, Sommerfelt H, Strand TA, Kapoor V, Saini S, Kainth UPS, Bhatnagar S (2011) Oral rehydration solution containing zinc does not reduce during or stool volume of acute diarrhea in hospitalized children: A randomized controlled study. J Pediatr Gastroenterol Nutr 53:161-167.

  Vashist S, Bhullar D, Vrati S (2010) La Protein Can Simultaneously Bind to Both 3'- and 5'-Noncoding Regions of Japanese Encephalitis Virus Genome. DNA Cell Biol. (in press).

  Appaiahgari MB, Vrati S (2010) IMOJEV®: a Yellow fever virus-based novel Japanese encephalitis vaccine. Expert Rev Vaccines. 9:1371-84.

  Anantpadma M, Stein DA, Vrati S (2010) Inhibition of Japanese encephalitis virus replication in cultured cells and mice by a peptide-conjugated morpholino oligomer. J Antimicrob Chemother. 65:953-61.

- **Patent filed:**

  Application No. 1133/DEL/2011; Title: A method and device for detection of anti-transglutaminase antibodies.

INFRASTRUCTURE DEVELOPMENT

- **Interim Laboratories**

  THSTI has leased three facilities in Udyog Vihar one for PBC & VIDRC, one for CDSA & CBD and one for the HIV Vaccine Programme. The VIDRC and PBC facility is fully equipped and functional. The other facilities are in the process of being developed and both of them will be functional shortly.

- **Faridabad Campus**

  Engineers India Limited has awarded a Composite works tender to M/s Odeon Builders Pvt. Ltd. on 27-06-2011 for contract value of Rs. 105.14 Crores. Tendering process for elevator work is in progress.

  Building wise Progress:

  The site layout for RCB, THSTI, Primate Research building, Small Animal Facility and Library building has been completed. PCC has been completed for THSTI and Library building respectively

AUDITOR'S REPORT & AUDITED ACCOUNTS

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
BALANCE SHEET AS AT 31ST MARCH, 2011

Amount (in Rs.)

LIABILITIES	**Schedule**	**Current Year**	**Previous Year**
Corpus / Capital Fund	1	72,713,417	–
Reserves and Surplus	2	19,940,066	–
Earmarked/Endowment Funds	3	–	–
Secured Loans and Borrowings	4	–	–
Unsecured Loans and Borrowings	5	–	–
Deferred Credit Liabilities	6	–	–
Current Liabilities and Provisions	7	76,429,061	–
TOTAL		**169,082,544**	–
ASSETS			
Fixed Assets	8	14,196,580	–
Investment From Earmarked/Endowment Funds	9	–	–
Investment - Others	10	–	–
Current Assets. Loans, Advances etc.	11	154,885,964	–
Miscellaneous Expenditure		–	–
(to the extent not written off or adjusted)			
TOTAL		**169,082,544**	–
SIGNIFICANT ACCOUNTING POLICIES AND NOTES ON ACCOUNTS	24		
CONTINGENT LIABILITIES	–		

Schedules 1 to 24 form an integral parts of Accounts

As per our separate Report of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

Income	**Schedule**	**Current Year**	**Previous Year**
Income from Sales/ Services	12	–	–
Grants/Subsides	13	71,784,835	–
Fees/Subscriptions	14	–	–
Income from Investments	15	–	–
Income from Royality,Publication etc.	16	–	–
Interest Earned	17	1,163,950	–
Other Income	18	77,996	–
Increase/(Decrease) in stock of Finished goods and works in progress	19	–	–
Deferred Income-Fixed Assets		3,207,111	–
TOTAL (A)		**76,233,892**	–
EXPENDITURE			–
Establishment Expenses	20	11,950,060	–
Other Administrative Expenses etc.	21	41,136,655	–
Expenditure on Grants , Subsidies etc.	22	–	–
Interest	23	–	–
Depreciation (Net Total at the year-end-corresponding to Schedule 8)		3,207,111	–
Prior period Adjustment A/c (ANN-A)		–	–
TOTAL(B)		**56,293,826**	–
Balance being excess of Income Over Expenditure (A-B)		19,940,066	–
Transfer to special Reserve(Specify each)		–	–
Transfer to /from General Reserve		–	–
BALANCE BEING SURPLUS (DEFICIT) CARRIED TO CORPUS/CAPITAL FUND		**19,940,066**	–
SIGNIFICANT ACCOUNTING POLICIES AND NOTES ON ACCOUNTS	24		
CONTINGENT LIABILITIES	–		

Schedules 1 to 24 form an integral parts of Accounts

As per our separate Report of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

Amount (in Rs.)

RECIEPTS **Particulars**	**Current Year**	**Previous Year**
OPENING BALANCES		
A) CASH IN HAND		
B) BANK BALANCES		
GRANT RECEIVED	92,280,000.00	–
OTHER RECEIPTS		
A) FEE ON SERVICES	2,979,396.00	–
B) MISCELLANEOUS RECEIPTS	30,596.00	–
C) RECRUITMENT FEE	49,900.00	–
D) TENDER FEE	2,000.00	–
E) SECURITY DEPOSIT	47,070.00	–
F) EMD	88,000.00	–
TOTAL	**95,476,962.00**	–

As per our separate Report
of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

Amount (in Rs.)

PAYMENTS (Particulars)	**Current Year**	**Previous Year**
Lab Equipments	12,961,025	–
Computer & Peripherals	1,731,717	–
Furniture & Fixtures	567,575	–
Office Equipments	462,254	–
Manpower	5,809,822	–
Consumables	11,240,831	–
MIT Expenses	16,396,251	–
Advances		
(a)Advance to Supplier	8,000	–
(b)Advance to Employees	137,851	–
(c)Advance for Fixed Assets	288,713	–
(d)Regional Centre of Biotechnology	809,100	–
Payment to NII	20,000,000	–
Administrative Expenses:		
Advertisement Expenses	194,171	–
Bank Charges	140,365	–
Books & Periodicals	24,609	–
Car Hiring Charges	117,564	–
Carriage & Handling Charges	630,616	–
Conference Fees	15,000	–
Conveyance	6,107	–
Courier Expenses	58,340	–
Designing & Development(Website) Charges	58,105	–
Electricity Expenses	812,952	–
Gas Fill Charges(Lab Use)	2,087	–
Generator Running Expenses	547,483	–
Guest House Charges	9,092	–
Honorarium	19,200	–

Amount (in Rs.)

	Current Year	Previous Year
House Keeping Charges	216,779	–
Internet Charges	9,938	–
Local Meeting Expenses	153,193	–
Miscellaneous Expenses	69,838	–
Office Expenses	100,575	–
Operation General Maintenance	305,492	–
Printing & Stationery	380,868	–
Repair & Maintenance-Electrical	161,780	–
Repair & Maintenance-Office Equipments	285,232	–
Security Charges	168,988	–
TA/DA Expenses	281,637	–
Telephone Expenses	155,264	–
Travelling Expenses (Local)	41,036	–
Water Charges	21,555	–
CLOSING BALANCES		
In Current Account/Short Term Deposits	20,075,957	–
TOTAL	**95,476,962**	**–**

As per our separate Report of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	DR. SUDHANSHU VRATI	Dr.DINAKAR M. SALUNKE	SANJIV RAI MEHRA
(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

(Amount in Rs.)

Schedule 1-Corpus/Capital Fund :	**Current Year**		**Previous Year**	
Grant in Aid Non Recurring				
Balance as per Beginning of the year	–			
Add:- Contribution towards corpus/Capital Fund	9,008,101		–	
Add; Excess depreciation charged	–			
Less: Reduced during the year	3,207,111	**5,800,990**		–
Fixed Assets Fund				
Balance as at the begging of the year	–		–	
Add: Contribution received during the year	66,465,192			
Less: Reduced during the year	447,235		–	
Balance as the end of the year		**66,912,427**	–	–
BALANCE AS AT THE YEAR-END		**72,713,417**		–

Amount (in Rs.)

Schedule 2-Reserves And Surplus :	Current Year		Previous Year	
1. Capital Reserves :				
As per Last Account	–		–	
Addition during the year	–		–	
Less :- Deduction during the year	–	–	–	–
2. Revalution Reserve :				
As per Last Account	–		–	
Addition during the year	–		–	
Less :- Deduction during the year	–	–	–	–
3. Special Reserves :				
As per Last Account	–		–	
Addition during the year	–		–	
Less :- Deduction during the year	–	–	–	–
4. General Reserve :-				
As per Last Account	-		–	
Addition during the year	19,940,066		–	
Less :- Deduction during the year	–	19,940,066	–	–
TOTAL		**19,940,066**	–	–

As per our separate Report of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	DR. SUDHANSHU VRATI	Dr.DINAKAR M. SALUNKE	SANJIV RAI MEHRA
(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

Schedule 3-EARNMARKED/ENDOWMENT FUNDS	**Current Year**		**Previous Year**	
A) Opening Balance of the Funds	–		–	
B) Addition to the Funds	–		–	
1) Donation/grants	–		–	
2) Income from investment made on account of funds	–		–	
3) other additions(specify nature)	–		–	
TOTAL(A+B)	–		–	
C) Utilisation /Expenditure towards objective of funds				
1) Capital Expenditure	–		–	
Fixed Assets				
Other				
2) Revenue Expenditure	–		–	
Salaries, Wages and Allowance				
Rent				
Other Administrative expense				
TOTAL (C)	–		–	
NET BALANCE AS AT THE YEAR ENDED (A+B-C)	–		–	

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For Mehra & Sistani
Chartered Accountants

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(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

Schedule 4-SECURED LOANS AND BORROWINGS	**Current Year**		**Previous Year**	
1. Central Government		–		–
2. State Government(Specific)		–		–
3. Financial Institutions				
a. Term Loans	–		–	
b. Interest accrued and Due	–	–	–	–
4. Banks				
a. Terms Loans	–		–	
b. Other Loans (Specific)	–	–	–	–
5. Other Institutions and Agencies		–		–
6. Debentures and Bonds		–		–
7. Others		–		–
Total		–		–

As per our separate Report
of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

Schedule 5-UNSECURED LOANS AND BORROWINGS	**Current Year**	**Previous Year**
1. Central Government	–	–
2. State Government(Specific)	–	–
3. Financial Institutions	–	–
4. Banks		
a. Terms Loans	–	–
b. Other Loans (Specific)	–	–
5. Other Institutions and Agencies	–	–
6. Debentures and Bonds	–	–
7. Fixed Deposit	–	–
7. Others	–	–
Total	–	–

SCHEDULE 6 DEFERRED CREDIT LIABILITIES	**Current Year**	**Previous Year**
A) Acceptances secured by hypothecation of capital equipment & other assets	–	–
B) Others	–	–
Total		

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For Mehra & Sistani
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(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

Schedule 7-CURRENT LIABILITIES & PROVISIONS	**Current Year**		**Previous Year**	
A. Current Liabilities				
1. Acceptances		–		–
2. Sundry Creditors				
(a) For Goods	137,671			–
(b) For Others	6,808,569			
	-	6,946,240		
3. Advances Received				–
(a) Security Deposit from Contractors	249,350		–	
(b) Earnest Money Deposit	88,000	337,350		
4. Projects Grant/ Fellowships				
DBT	65,214,226			
5. Provisions	–			
		65,214,226	–	–
6. Interest accrued but not due on				
a) Secured Loans / borrowings	–		–	
b) Unsecured Loans / borrowings	–	–	–	–
7. Statutory Liabilities				
a) Overdue	–		–	
b) Duties and Taxes				
TDS Payable-Consultancy	19,118			
TDS Payable - Contractor	28,642			
TDS Payable- Rent	90,240			
TDS Payable-Salary	299,000	437,000		–
8.Other current Liabilities				–
Other Liabilities	3,494,245			
		3,494,245		–
TOTAL (A)		**76,429,061**		–

Amount (in Rs.)

Date: 16/09/2011	Current Year		Previous Year	
1. For Taxation		-		-
2. Gratuity		-		-
3. Superannuation/Pension		-		-
4. Accumaulated Leave Encashment		-		-
5. Trade Warranties / Claims		-		-
TOTAL (B)		-		-
TOTAL (A+B)		76,429,061		-

As per our separate Report of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	DR. SUDHANSHU VRATI	Dr.DINAKAR M. SALUNKE	SANJIV RAI MEHRA
(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE (THSTI)
DEPRECIATION SCHEDULE FORMING PART OF BALANCE SHEET AS ON 31st March 2011

SCHEDULE - FIXED ASSETS & DEPRECIATION

ASSETS	RATE	W.D.V.as on 01/04/2010	Additions/Sales			Total As on 31/03/2011	Depreciation for the year (Rs.)	W.D.V. as on 31/03/2011 (Rs)
			Upto 30/09/2010	On or After 01/10/2011 (Rs)	Sales (Rs.)			
1. Land								
(a) Free Hold		-	-	-	-	-	-	-
(b) Lease Hold		-	-	-	-	-	–	-
2. Building								
(a) On Freehold Land		-	-	-	-	-	-	-
(b) On leasehold Land		-	-	-	-	-	-	-
(c) Ownership flats/premises		-	-	-	-	-	-	-
(d) Superstructures on Land not belonging to the entity		-	-	-	-	-	-	-
3. Plant Machinery & Equipments								
(a) Lab Equipments(Core)	40%		-	12,967,529	-	12,967,529	2,593,506	10,374,023
(b) Lab Equipments(Projects)	40%	-	-	1,109,476	-	1,109,476	221,895	887,581
4. Vehicles			-	-	-	-	-	-
5. Furniture & Fixtures								
(a) Furniture and Fixtures (Core)	10%	-	-	606,339	-	606,339	30,317	576,022
(b) Furniture and Fixtures (Projects)	10%	-	-	150,558	-	150,558	7,528	143,030
6. Office Equipments								
(a) Office Equipments (Core)	15%	-		462,254	-	462,254	34,669	427,585
7. Computer / Peripherals								
(a) Computer & Peripherals (Core)	60%	-	-	1,828,731	-	1,828,731	548,619	1,280,112
(b) Computer & Peripherals (projects)	60%	-	-	726,039	-	726,039	217,812	508,227
8. Books & Scientific Journals		-	-	-	-	-	-	-
TOTAL		-	-	17,850,926	-	17,850,926	3,654,346	14,196,580
Capital Work in Progress		-	-	-	-	-	-	-
GRAND TOTAL		-	-	17,850,926	-	17,850,926	3,654,346	14,196,580

As per our separate Report of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	DR. SUDHANSHU VRATI	Dr.DINAKAR M. SALUNKE	SANJIV RAI MEHRA
(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

SCHUDULE -9 INVESTMENTS FROM EARMARKED / ENDOWNMENT FUNDS	**Current Year**	**Previous Year**
1. In Government Securities	–	–
2. Other approved Securities	–	–
3. Shares	–	–
4. Debentures and Bonds	–	–
5. Subsidiaries & Joint Ventures	–	–
6. Others(to be specified)	–	–
Total	–	–

SCHUDULE -10 INVESTMENTS --OTHER	**Current Year**	**Previous Year**
1. In Government Securities	–	–
2. Other approved Securities	–	–
3. Shares	–	–
4. Debentures and Bonds	–	–
5. Subsidiaries & Joint Ventures		
6. Others(to be specified)		
Total	–	–

As per our separate Report
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For Mehra & Sistani
Chartered Accountants

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(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

Schedule 11-CURRENT ASSETS,LOANS AND ADVANCES	**Current Year**		**Previous Year**	
A. Current Assets.				
1. Inventories				
a) Stores & Spares	–		–	
b) Loose Tools	–		–	
c) Stock-in-Trade				
Finished Goods	–		–	
Works-in-progress	–		–	
Raw Material	–	–	–	–
2. Sundry Debtors				
a) Debts outstanding for a period exceeding six months	–		–	
b) Others	–	–	–	–
3. Cash balance in hand (include cheque/draft and imprest)				–
Imprest				
Cash in hand				
4. Bank Balance				
a) with Scheduled Banks				
On Current accounts	10,495,841			
On Deposit Accounts	140,000,000		–	
On Saving Accounts	–	150,495,841	–	–
b) With non scheduled Banks				
On Current accounts	–		–	
On Deposit Accounts	–		–	
On Saving Accounts				
5. Franking Machine GPO				
6. FD-Gene Fund				
7. FD-SBI				
Total (A)		**150,495,841**	–	–

As per our separate Report
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For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2011

Amount (in Rs.)

Schedule 11-CURRENT ASSETS,LOANS AND ADVANCES ETC	**Current Year**		**Previous Year**	
B. Loans Advance & Other Assets				
1. Loans:				
a) Staff			–	
b) Other Entities engaged in activities/ objective similar to that of the Entity				
c) Other	–	–	–	–
2. Advances & other amounts recoverable in cash or in kind orfor value to be received				
a) On capital Account	–		–	
b) Prepayments				
c) Others	3,997,130			
d) Advance for Fixed Assets	288,713			
		4,285,843	–	–
3. Income Accrued				
a) On Investment from Earmarked/Endowment funds	–		–	
b) On Investment -other	–		–	
c) on Loans and advance	–		–	
d) Others	104,280	104,280	–	–
4. Claims Receivable		-		–
Total (B)		**4,390,123**		–
Total (A+B)		**154,885,964**		–

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(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

SCHEDULE 12-INCOME FROM SALES/SERVICES	Current Year	Previous year
1. Income From Sales		
a) Sale of Finished Goods	-	-
b) Sales of Raw Material	-	-
c) Sales of Scraps	-	-
2. Income From Services		
a) Labour and processing charges	-	-
b) Professional/ Consultancy Services	-	-
c) Agency Commission and Brokerage	-	-
d) Maintenance services	-	-
e) Other		-
TOTAL	-	-

SCHEDULE 13-GRANTS / SUBSIDIES	Current Year	Previous year
Central Government	71,784,835	
State Government	-	-
Government Agencies	-	-
Institutions/ Welfare bodies	-	-
International Organisations	-	-
Others	-	-
TOTAL	**71,784,835.00**	-

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For Mehra & Sistani
Chartered Accountants

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(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

SCHEDULE 14 - FEES / SUBSCRIPTIONS	Current Year	Previous Year
Entrance Fees/Application Fees		
Annual Fees/Subscription /PVJ Fees		
Seminar/Program Fees	–	–
Consultancy Fees/DUS Fees	–	–
Fees For Notice of Opposition		
Others		
TOTAL	–	–

SCHEDULE 15 - INCOME FROM INVESTMENTS	Investment from Earmarked Fund		Investment - Others	
	Current year	Previous year	Current year	Previous year
1. Interest				
a) On Govt. Securities	–	–	–	–
b) Other Bonds/Debenture	–	–	–	–
2. Dividends				
a) On shares	–	–	–	–
b) On Mutual Funds Securities	–	–	–	–
3. Rents	–	–	–	–
4. Others	–			
TOTAL	–	–	–	–
TRANSFERRED TO EARMARKED/ENDOWMENT FUNDS	–	–	–	–

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Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

SCHEDULE 16 - INCOME FROM ROYALTY, PUBLICATION ETC.	Current Year	Previous Year
Income from Royalty	–	
Income from Publication	–	
Others	–	
TOTAL	–	–

SCHEDULE 17 - INTEREST EARNED	Current Year	Previous Year
1. On Term Deposit		
With Scheduled Banks	1,163,950	
With Non -Scheduled bank		
With Institutions		
Others		
2. On Saving Accounts		
With Scheduled Banks		
With Non -Scheduled bank		
Post office savings accounts		
Others		
3. On Loan		
Employees/Staff		
Others		
4. Interest on debtors and other Receivable		
TOTAL	**1,163,950**	**-**

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Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

SCHEDULE 18- OTHER INCOME	**Current Year**	**Previous Year**
Profit on sale/disposal		
Owned assets		
Assets acquired out of grant, or received free of cost		
Export Incentives Realized		
Fees for Miscellaneous Services		
Misc. Income for Staff Car		
Sale of Old Newspaper & Periodicals	10,596	
Miscellaneous Income (Recovery of Pension from Chair Person)		
Miscellaneous Income (Others)	67,400	
TOTAL	**77,996**	-

SCHEDULE 19- INCREASE/(DECREASE) IN STOCK OF FINISHED GOODS & WORK IN PROGRESS	**Current Year**	**Previous Year**
Closing Stock		
Finished Goods	-	-
Work in Progress	-	-
Opening Stock		
Finished Goods	-	-
Work in Progress	-	-
NET INCREASE / (DECREASE)	-	-

SCHEDULE 20- ESTABLISHMENT EXPENSES	**Current Year**	**Previous Year**
Salary and Wages and allowances	11,950,060	
Contribution to Provident Fund		
Contribution to Gratuity Fund		
Staff Welfare Expenses		
TOTAL	**11,950,060**	–

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For Mehra & Sistani
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Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

SCHEDULE-21 - OTHER ADMINISTRATIVE EXPENSES ETC.	Current Year	Previous Year
Consumables	27,077,412	
Administrative Expense		
Advertisement Expenses	798,036	–
Audit Fee	33,090	–
Bank Charges	140,365	–
Books & Periodicals	90,379	–
Car Hiring Charges	1,264,922	–
Carriage & Handling Charges	742,813	–
Conference Fees	15,000	–
Conveyance	22,004	–
Courier Expense	189,725	–
Designing & Development (Website) Charges	65,105	–
Electricity Expenses	1,774,340	–
Gas Fill Charges	2,087	–
Generator Running Expense	620,823	–
Guest House Charges	27,606	–
Honorarium	19,200	–
House Keeping Charges	279,281	–
Internet Charges	10,966	–
Local Meeting Expenses	417,279	–
Miscellaneous Exp	445,457	–
Office Expense	171,214	–
Operation and General Maintenance(AMC)	328,788	–
Printing & Stationery	469,234	–
Repair and Maintenance Building	2,757,939	–
Repair & Maintenance -Electrical	1,254,179	–

Amount (in Rs.)

	Current Year	Previous Year
Repair & Maintenance - Lab Equipment	119,700	
Repair & Maintenance-Office Equipment	336,175	
Security Charges	328,587	
TA/DA Expenses	281,637	
Telephone Expense	752,402	
Traveling Expenses	259,820	
Water Charges	41,090	
	41,136,655	-

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For Mehra & Sistani
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(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE
SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR YEAR ENDED 31st MARCH, 2011

Amount (in Rs.)

SCHEDULE-22-EXPENDITURE ON GRANTS, SUBSIDIES ETC.	Current Year	Previous year
Grants given to Institutions / Org.	–	
Subsidies given to Institutions / Org		–
TOTAL	–	–

SCHEDULE-23-INTEREST	Current Year	Previous year
On Fixed Loan	–	–
On Other specific (include Bank Charge)		
Other(Specify)	–	–
TOTAL	–	–

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Chartered Accountants

C. B. YADAV	DR. SUDHANSHU VRATI	Dr.DINAKAR M. SALUNKE	SANJIV RAI MEHRA
(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

Amount (in Rs.)

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
A) CASH IN HAND				
B) BANK BALANCES				
GRANT RECEIVED	92,280,000.00		–	
OTHER RECEIPTS				
A) FEE ON SERVICES	2,979,396.00		–	
B) MISCELLANEOUS RECEIPTS	30,596.00		–	
C) RECRUITMENT FEE	49,900.00		–	
D) TENDER FEE	2,000.00		–	
E) SECURITY DEPOSIT	47,070.00		–	
F) EMD	88,000.00			
TOTAL		**95,476,962.00**		–

As per our separate Report
of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

Place: Gurgaon
Date: 16/09/2011

Amount (in Rs.)

PAYMENTS Particulars	Current Year		Previous Year	
Lab Equipments	12,961,025		–	
Computer & Peripherals	1,731,717		–	
Furniture & Fixtures	567,575		–	
Office Equipments	462,254		–	
Manpower	5,809,822		–	
Consumables	11,240,831		–	
MIT Expenses	16,396,251		–	
Advances				
(a)Advance to Supplier	8,000		–	
(b)Advance to Employees	137,851		–	
(c)Advance for Fixed Assets	288,713		–	
(d)Regional Centre of Biotechnology	809,100		–	
Payment to NII	20,000,000		–	
Administrative Expenses:				
Advertisement Expenses	194,171		–	
Bank Charges	140,365		–	
Books & Periodicals	24,609		–	
Car Hiring Charges	117,564		–	
Carriage & Handling Charges	630,616		–	
Conference Fees	15,000		–	
Conveyance	6,107		–	
Courier Expenses	58,340		–	
Designing & Development(Website) Charges	58,105		–	
Electricity Expenses	812,952		–	

Amount (in Rs.)

PAYMENTS Particulars	Current Year		Previous Year	
Gas Fill Charges(Lab Use)	2,087		–	
Generator Running Expenses	547,483		–	
Guest House Charges	9,092		–	
Honorarium	19,200		–	
House Keeping Charges	216,779		–	
Internet Charges	9,938		–	
Local Meeting Expenses	153,193		–	
Miscellaneous Expenses	69,838		–	
Office Expenses	100,575		–	
Operation General Maintenance	305,492		–	
Printing & Stationery	380,868		–	
Repair & Maintenance-Electrical	161,780		–	
Repair & Maintenance-Office Equipments	285,232		–	
Security Charges	168,988		–	
TA/DA Expenses	281,637		–	
Telephone Expenses	155,264		–	
Travelling Expenses (Local)	41,036		–	
Water Charges	21,555		–	
CLOSING BALANCES			–	
In Current Account/Short Term Deposits	20,075,957		–	
TOTAL		**95,476,962**		–

As per our separate Report
of even date attached
For Mehra & Sistani
Chartered Accountants

C. B. YADAV	DR. SUDHANSHU VRATI	Dr.DINAKAR M. SALUNKE	SANJIV RAI MEHRA
(ADMINISTRATIVE OFFICER-F&A)	(DEAN)	(EXCECUTIVE DIRECTOR)	(PARTNER)

Place: Gurgaon
Date: 16/09/2011

ANNEXURE -1

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON
DBT PROJECT
R/P Entitled "Establishment of the Pediatrics Biology Centre"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCE				
Bank Balance	–		–	
Grant-in Aid Received	20,400,000		–	
TOTAL		**20,400,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	577,516		–	
Furniture & Fixture	150,558		–	
Equipment	1,109,476		–	
Administrative Expenses	686,026		–	
Consumables	817,477		–	
Manpower	2,081,261		–	
Payment to NII	2,312,323		–	
CLOSING BALANCES				
Bank Balance	12,665,363		–	
TOTAL		**20,400,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE -2

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

DBT PROJECT

R/P Entitled "Establishment of the Vaccine and Infectious Disease Research Centre (VIDRC)"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS / **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	52,061,000			
TOTAL		**52,061,000**		–

AMOUNT-IN-RUPEES

PAYMENTS / **Particulars**	**Current Year**		**Previous Year**	
Administrative Expenses	6,862,949		–	
Consumables	3,847,353		–	
Manpower	1,956,930		–	
Payment To NII	15,930,900		–	
Society for Applied Studies	3,960,000		–	
CLOSING BALANCES				
Bank Balance	19,502,868		–	
TOTAL		**52,061,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE -3

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON
DBT PROJECT
R/P Entitled "Establishment of the Vaccine and Infectious Disease Research Centre (VIDRC)"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	40,739,000			
TOTAL		**40,739,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	–		–	
Manpower	–		–	
Administrative Expenses	–		–	
Centre Of Bio -Design (AIIMS)	3,000,000		–	
CLOSING BALANCES				
Bank Balance	37,739,000		–	
TOTAL		**40,739,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE -4

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

DBT PROJECT

R/P Entitled "Clinical Development Services Agency"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS / **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	15,771,697			
TOTAL		**15,771,697**		–

AMOUNT-IN-RUPEES

PAYMENTS / **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	148,523		–	
Equipment	–		–	
Consumables	–		–	
Furniture & Fixture	–		–	
Administrative Expenses	821,168		–	
Manpower	837,782		–	
CLOSING BALANCES				
Bank Balance	13,964,224		–	
TOTAL		**15,771,697**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE -5

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

R/P Entitled "Vitamin D supplementation to improve immune responses to vaccines administered in early infancy- The NutriVac -D Trial"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	5,411,000			
TOTAL		**5,411,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	–		–	
Manpower	–		–	
Administrative Expenses	–			
Current Assets	–			
CLOSING BALANCES				
Bank Balance	5,411,000		–	
TOTAL		**5,411,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE -6

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

DBT PROJECT : "Development of a rapid diagnostic test for diagnosis of celiac disease - Phase I-II"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	1,501,000			
TOTAL		**1,501,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripheral	148,523		–	
Equipments	–			
Furniture & Fixture			–	
Administrative Expenses	–		–	
Manpower	–		–	
Consumables	163,721		–	
CLOSING BALANCES				
Bank Balance	1,337,279		–	
TOTAL		**1,501,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 7

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

DBT PROJECT : "Evaluation of novel adjuvants for mucosal priming following cutaneous delivery of vaccine"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	930,800			
TOTAL		**930,800**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	600,000		–	
Manpower	162,000		–	
Contingency	25,000		–	
Travel	25,000		–	
CLOSING BALANCES				
Bank Balance	118,800		–	
TOTAL		**930,800**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 8

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE

DBT PROJECT : "Investigating the role of Mazf toxins in pathogenesis and persistence of Mycobacterium tuberculosis"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	983,000			
TOTAL		**983,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals			–	
Furniture & Fixture			–	
Equipment			–	
Administrative Expenses			–	
Consumables			–	
Manpower			–	
Administrative Expenses			–	
CLOSING BALANCES				
Bank Balance	983,000		–	
TOTAL		**983,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 9

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE

DBT PROJECT : "Towards the Characterisation of multiple P-loop GTOases in Mycobacteria"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	921,000			
TOTAL		**921,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	–		–	
Manpower	–		–	
Administrative Expenses	–		–	
CLOSING BALANCES				
Bank Balance	921,000		–	
TOTAL		**921,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 10

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

DBT PROJECT : "THSTI-IAVI Vaccine Programme"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	33,020,000			
TOTAL		**33,020,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	–		–	
Manpower	–		–	
Administrative Expenses	–		–	
CLOSING BALANCES				
Bank Balance	33,020,000		–	
TOTAL		**33,020,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 11

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON

DBT PROJECT

R/P Entitled "Biotechnology Industry Partnership Programme (BIPP)"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	7,500,000			
TOTAL		**7,500,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–			
Furniture & Fixture	–			
Equipment	–			
Administrative Expenses	–			
Consumables	2,570,656		–	
Manpower	289,158		–	
Travel	–		–	
CLOSING BALANCES				
Bank Balance	33,020,000		–	
TOTAL		**33,020,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 12

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON
DBT PROJECT

R/P Entitled "Metabolism in mycobacteria: role of PPK-1 and PPK-2 in stationary phase survival and virulence of M. Tuberculosis"

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	1,400,000			
TOTAL		**1,400,000**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	–		–	
Manpower	–		–	
Administrative Expenses	–		–	
Manpower	675,000		–	
Contingency	109,220		–	
CLOSING BALANCES				
Bank Balance	615,780		–	
TOTAL		**1,400,000**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

ANNEXURE - 13

TRANSLATIONAL HEALTH SCIENCE & TECHNOLOGY INSTITUTE
GURGAON
DBT PROJECT

R/P Entitled "Immune function in infancy – special focus on low birth weight and small for date infants and the role of Vitamin D deficiency".

RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2011

AMOUNT-IN-RUPEES

RECIEPTS **Particulars**	**Current Year**		**Previous Year**	
OPENING BALANCES				
Bank Balance	–		–	
Grant-In-Aid Received	–			
TOTAL		**–**		–

AMOUNT-IN-RUPEES

PAYMENTS **Particulars**	**Current Year**		**Previous Year**	
Computer & Peripherals	–		–	
Furniture & Fixture	–		–	
Equipment	–		–	
Administrative Expenses	–		–	
Consumables	–		–	
Administrative Expenses	–		–	
Manpower	377,950		–	
Contingency	120,666		–	
CLOSING BALANCES				
Bank Balance	(498,616)		–	
TOTAL		**–**		–

For Mehra & Sistani
Chartered Accountants

C. B. YADAV	**DR. SUDHANSHU VRATI**	**Dr.DINAKAR M. SALUNKE**	**SANJIV RAI MEHRA**
(ADMINISTRATIVE OFFICER-F&A)	**(DEAN)**	**(EXCECUTIVE DIRECTOR)**	**(PARTNER)**

SCIENTIFIC MEETINGS / WORKSHOPS









THSTI organizes scientific meetings and workshops as part of its continuing education program where experts in a given field are invited to give expert lectures and interact with other scientists. The Seminars held during the period upto 31st March, 2011 are given below:-

S.No	Topic of the seminar	Speaker
1	Breakthrough in PCR Technology	Dr. Muruganand, Application Manager, Eppendorf
2	CNS Tuberculosis titled "Mycobacterium tb-PknD interaction with laminin"	Dr. Sanjay Jain, Asstt. Professor at Jonhns Hopkins Centre for TB Research
3	Effectiveness & Safety of Rotavirus Vaccines in Routine use	Dr. Umesh Parashar , Centre for Disease Control & prevention Atlanta, USA
4	Prions and Virons: Mysterious Infectious Agents of Mammals	Dr. Deepak Sharma, The National Institute of Diabetes Digestive & Kidney Disease. National Institute of Health Maryland, USA
5	Investigating the virulence Determinants of Mycobacterium	Dr. Krishnamohan Atmakuri from Harvard University, Boston USA
6	LpPLA2-Its role in Human Health and structural Insight	Dr. Uttam Kumar Samanta, KIIT University, Bhubaneswar
7	Passport Across the blood -brain barrier: The GBS Way	Dr. Anirban Banerjee, San Diego State University
8	T-cadherin mediated cell signaling in Vasculature; implications in metabolic disorders	Dr. Manjunath B. Joshi
9	Contributions of Native American populations in Global control of Infectious diseases	Prof. Mathuram Santosham Johns Hopkins Unversity
10	Dissection of vulnerabilities in HIV-1 envelope modulating virus entry and neutralization: Translational possibilities	Dr. Jayanta Bhattacharya, National AIDS Research Institute (ICMR)
11	Novel widespread response elements mediate direct transrepression by agonistliganded glucocorticiod receptor	Dr. Milan Surjit from Institute of Genetics Molecular & Cellular Biology (IGBMC), France.
12	Multiple pathways of DNA double-strand break repair in mycobacterium	Dr. Krishna Murari Sinha, Institute of Molecular Medicine, New Delhi
13	The conquest of Hib Diesease-The trials and tribulations	Prof. Mathuram Santosham John Hopkins University Baltimore, USA
14	Boosting(host) cellular trafficking to fight against tuberculosis	Dr. Varadharajan Sundaramurthy, Max Planck Institute of Molecular cell Biology and Genetics Dresden , Germany
15	Life under constant challenges bladder umbrella cells	Dr. Puneet Khandelwal, University of Pittsburg school of Medicines
16	Role of Micro & IVAS and Toll-like receptors in B-Cell differentiation	Dr. Murali Gururajan, Dept. of Medicine, Cedars Los Angeles, CA

COMMITTEES OF THE INSTITUTE

➤ Society Committee

S.No	Name	Affiliation	Position
1.	Prof. G. Padmanaban	Hon. Professor, Distinguished Biotechnologist, Department of Biochemistry, Indian Institute of Science, Bangalore	President
2.	Prof. M.K. Bhan	Chairman, Governing Body, THSTI & Secretary Department of Biotechnology, Delhi	Member
3.		Joint Secretary & Financial Advisor, Ministry of Science & Technology, Delhi	Member
4.	Dr. V.M.Katoch,	Secretary (Department of Health Research) and Director General, Indian Council of Medical Research, New Delhi	Member
5.	Prof. A. Surolia	Director, National Institute of Immunology New Delhi	Member
6.	Dr. T.S. Rao	Advisor (Medical Biotechnology) Department of Biotechnology, New Delhi	Member
7.	Dr. J. Gowrisankar	Director, Centre for DNA Fingerprinting & Diagonostic, Hyderabad	Member
8.	Dr. B. Ravindran	Director, Institute of Life Sciences, Bhubaneswar	Member
9.	Dr. G. C. Mishra	Director, National Centre for Cell Sciences, Pune	Member
10.	Prof. M. Radhakrishna Pillai	Rajiv Gandhi Centre for Biotechnology, Thuruvananthapuram	Member
11.	Dr. G. B. Nair	National Institute of Cholera & Enteric Diseases, Kolkata	Member
12.	Prof. Ashok Jhunjhunwala	Indian Institute of Technology, Chennai	Member

➤ Governing Body of THSTI

S.No.	Name	Affiliation	Position
1	Dr. M.K. Bhan	Secretary, DBT	Chairman (Ex-officio)
2	Dr. V.M. Katoch	Secretary, DHR and DG, ICMR	Member (Ex-officio)
3		JS &FA, DBT	Member (Ex-officio)
4	Dr. T.S.Rao	Advisor, DBT (Nodal Officer -THSTI)	Member (Ex-officio)
5	Dr. Dinakar M. Salunke	Executive Director, RCB	Member (Ex-officio)
6	Dr. P.N. Tandon	President, NBRC, Manesar	Member
7	Dr. G. Padmanaban	IISc., Bangalore	Member
8	Dr. Subrata Sinha	Director, NBRC, Manesar	Member
9	Dr. Balram Bhargava	AIIMS, New Delhi	Member
10	Dr. K. Srinath Reddy	President, PHFI, New Delhi	Member
11	Dr. K. Vijayraghavan	Director, NCBS & inStem, Bangalore	Member
12	Dr. M.S. Ananth	ex-Director, IIT, Chennai	Member
13	Dr. T. Balaganesh	Astra Zeneca, Bangalore	Member
14	Dr. Sanjay Biswas	D/oElec. Engineering, IISc., Bangalore	Member
15	Dr. Ashutosh Sharma	IIT, Kanpur	Member
16	Dr. Shinjini Bhatnagar	Professor, PBC-THSTI	Member
17	Dr. S. Vrati	Dean, THSTI	Member (Ex-officio)
18	Dr. Dinakar M. Salunke	Executive Director, THSTI	Member Secretary (Ex-officio)

➤ Governing Body of CDSA

S.No	Name	Affiliation	Position
1.	Prof. M.K. Bhan	Chairman, Governing Body, THSTI & Secretary, Department of Biotechnology,Delhi	Chairman
2.	Dr. Dinakar M. Salunke	Executive Director,THSTI	Member
3.	Dr. G. B. Nair	National Institute of Cholera & Enteric Diseases, Kolkata	Member
4.		Joint Secretary & Financial Advisor, Ministry of Science & Technology, Delhi	Member
5.		DG, ICMR or nominee	Member
6.		DCGI or nominee	Member
7.	Dr. Balram Bhargava	All India Institute of Medical Science Delhi	Member
8.	Dr. J.P. Muliyal	CMC, Vellore	Member
9.	Dr. Y.K.Gupta	All India Institute of Medical Science Delhi	Member
10.	Dr. Rama Mukherjee	Industry	Member
11.	Dr. T.S.Rao	Advisor, Department of Biotechnology Delhi	Member
12.	Dr. Rajat Goyal	IAVI, New Delhi	Member
13.	Dr. Madhuram Santosham	JHU (International Expert)	Member
14.	Dr. Harmeet Sidhu	Programme Director, CDSA	Member Secretary

➤ Scientific Advisory Group- VIDRC

S.No	Name	Affiliation	Position
1.	Dr. Rafi Ahmed	Emory University	Chairman
2.	Prof. G. Padmanaban	Hon. Professor, Distinguished Biotechnologist, Department of Biochemistry, Indian Institute of Science, Bangalore	Member
3.	Dr. S. Das	Indian Institute of Science, Bangalore	Member
4.	Dr. Gagandeep Kang	Christian Medical College, Vellore	Member
5.	Dr. V.D. Ramanathan	Tuberculosis Research Centre, Chennai	Member
6.	Dr. Shahid Jameel	International Centre for Genetic Engineering & Biotechnology, New Delhi	Member

➤ Scientific Advisory Group- PBC

S.No	Name	Affiliation	Position
1.	Prof. Gagandeep Kang	Head, The Welcome Trust Research Laboratory, Department of Gastrointestinal Sciences, Christian Medical College, Vellore	Chairperson
2.	Prof. Partha P. Majumder	Director,National Institute of Biomedical Genomics, Kolkata	Member
3.	Prof. Halvor Sommerfelt	Professor, University of Bergen, Bergen, Norway	Member
4.	Prof. L.S. Shashidhara	Indian Institute of Science Education and Research,Pune	Member
5.	Prof. Ranjan Sen	Chief, Laboratory of Cellular and Molecular Biology, National Institute of Aging, Biomedical Research Centre,Baltimore, USA	Member

➤ Institute Management Committee

S.No.	Name	Affiliation	Position
1.	Dr. Dinakar M. Salunke	Executive Director, THSTI	Chairperson
2.	Dr. Sudhanshu Vrati	Dean, THSTI	Member
3.	Dr. Shinjini Bhatnagar	Professor, THSTI	Member
4.	Dr. Guruprasad R. Medigeshi	Asstt. Professor, THSTI	Member
5.	Dr. Satyajit Rath	Scientist, NII	Coopted Member
6.	Sh. M.V.Santo	Administrative Officer (P&A)	Coopted Member
7.	Sh. Chandrabhan Yadav	Administrative Officer (F&A)	Coopted Member

➤ Finance Committee

S.No.	Name	Affiliation	Position
1.	Dr. M.K. Bhan	Secretary, DBT and Chairman- GB, THSTI	Chairman (Ex-officio)
2.		JS &FA, DBT	Member (Ex-officio)
3.	Dr. T.S. Rao	Advisor, DBT	Member (Ex-officio)
4.	Dr. Dinakar M. Salunke	Executive Director	Member (Ex-officio)
5.	Dr. Sudhanshu Vrati	Dean, THSTI	Member (Ex-officio)
6.	Sh. Chandrabhan Yadav	Administrative Officer (F&A)	Non-Member Secretary and Convener

STAFF OF THSTI

Scientific

Sl. No.	Name	Designation
1	Dr. Sudhanshu Vrati	Professor & Dean
2	Dr. Shinjini Bhatnagar	Professor
3	Dr. Guruprasad R. Medigeshi	Assistant Professor
4	Dr. Ramandeep Singh	Assistant Professor
5	Dr. Nisheeth Agarwal	Assistant Professor
8	Dr. Manjula Kalia	Research Scientist 'D'
11	Dr. Mohan Babu Appaiahgari	Research Scientist 'C'
12	Dr. Sankar Bhattacharyya	Research Scientist 'C'
14	Dr. Nitya Wadhwa	Research Scientist 'D'
15	Dr. Shailaja Sopory	Research Scientist 'D'
16	Dr. Uma Chandra Mouli Natchu	Ramalingaswami Fellow
21	Dr. Deepak Kumar Rathore	Research Associate (P)
24	Ms. Renu	Senior Research Fellow
25	Dr. Reeta Singh	Senior Research Fellow (P)
26	Dr. Ravi Varma Ambazhagar	Senior Research Fellow (P)
28	Ms. Mamta Singh	Junior Research Fellow

Administration

Sl. No.	Name	Designation
1	Mr. M. V. Santo	Administrative Officer (P&A)
2	Mr. C.B. Yadav	Administrative Officer (F&A)
3	Mr. Mohd. Shahid	Section Officer
4	Ms. Taruna Sharma	Programmer
5	Ms. Jyoti Sinha	Management Assistant
6	Mr. Deepak Joshi	Management Assistant
7	Mr. Rajesh Kumar	Management Assistant
8	Ms. Shilpa Chopra	Data Entry Operator
9	Mr. Mukesh Juyal	Data Entry Operator
11	Mr. Dharmendra Sharma	Programmer
12	Ms. Rita Francis	Executive Secretary

Technical

Sl. No.	Name	Designation
1	Mr. Gopal Raman Agarwal	Inst. /Elect Engineer
2	Mr. Vishal Gupta	Sr. Technical Officer
3	Dr. Madhu Pareek	Technical Officer-I
4	Ms. Sonali Porey Karmakar	Technical Officer-I
5	Mr. Saqib Kidwai	Technical Officer-I
6	Mr. Imran Khan	Lab. Technician
7	Mr. T. Maheswar Rao	Lab. Technician
8	Mr. Lokesh S. Chandolia	Lab. Technician (Project)
9	Mr. Ranjeet Rai	Lab. Technician (Project)
12	Ms. Arpita Mishra	Asstt. Vaccine Technologist
13	Mr. Sharanabasava	Asstt. Vaccine Technologist
14	Mr. Uttam Kumar Saini	Technical Asstt.
15	Mr. Gaurav Singh	Technical Asstt.
16	Mr. Manoj Mahato	Technician – II
17	Mr. Shri Chand Pandeya	Technician – II

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