वार्षिक प्रतिवेदन
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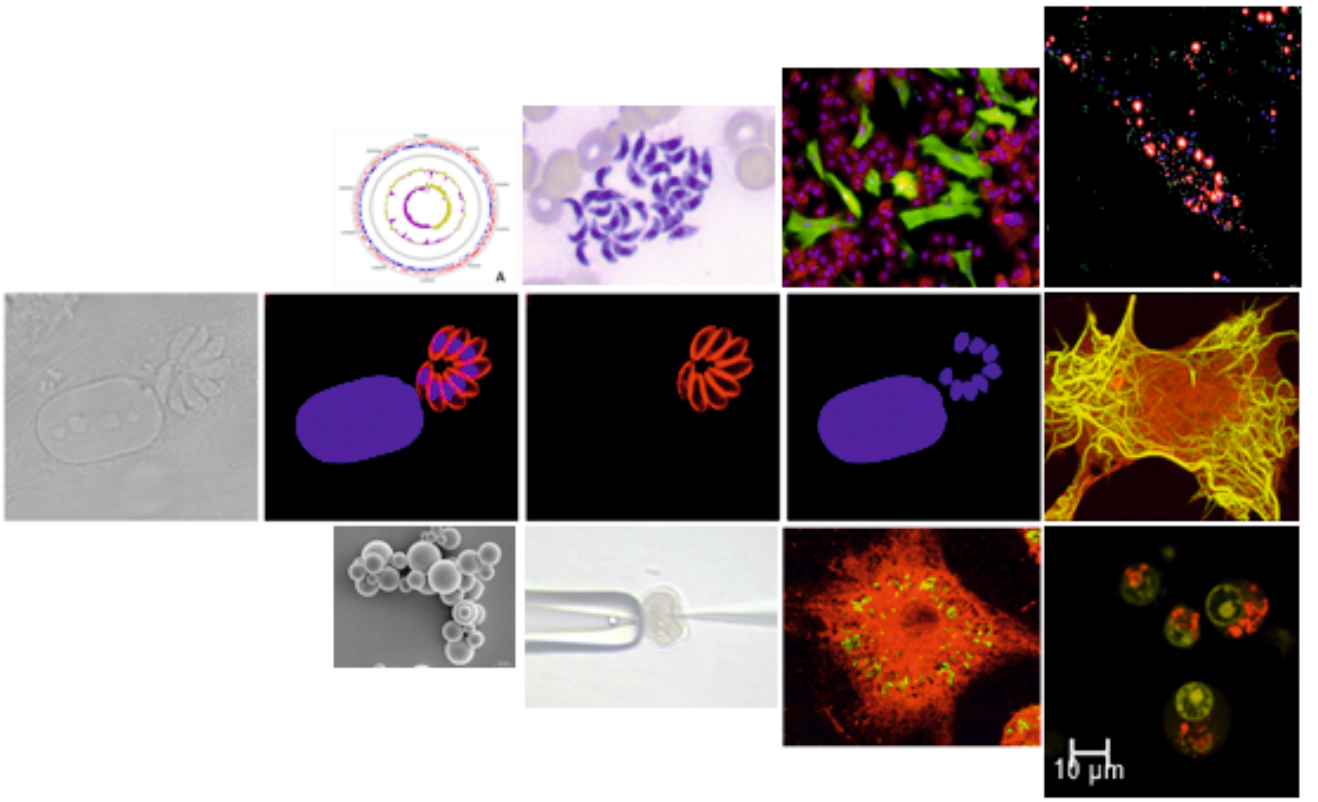
Annual Report
2017-18



राष्ट्रीय पशु जैवप्रौद्योगिकी संस्थान

National Institute of Animal Biotechnology

(An autonomous institute of the Department of Biotechnology)

NIAB

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National Institute of Animal Biotechnology

(An autonomous Institute of the Department of Biotechnology, Ministry of Science & Technology, Govt. of India)

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Hyderabad, Telangana, India PIN: 500 032
Email:admin@niab.org.in // Web: www.niab.org.in

MISSION

Development of sustainable and globally competitive livestock based economy through innovative science & technology development and entrepreneurship promotion.

VISION

To demonstrate excellence in science; develop technology and solutions in animal biotechnology leading to eventual commercialization.

OBJECTIVES

1. To undertake directed, basic and applied research towards technology and product innovation. Characterization of breeds and selective breeding to enhance productivity; develop technologies for multiplication of elite genotypes. Development of transgenic animals for producing molecules of pharmaceutical value. Enrichment of crop residues into high value products. Development of new generation vaccines, diagnostics and drugs.

2. To develop human resource across the value chain, primarily for translational research, industrial R&D; facilitate introduction of short term advanced training, new courses like MSc/MVSc-PhD and Ph.D. degree with a focus on interdisciplinary science, innovation and the science of manufacturing.

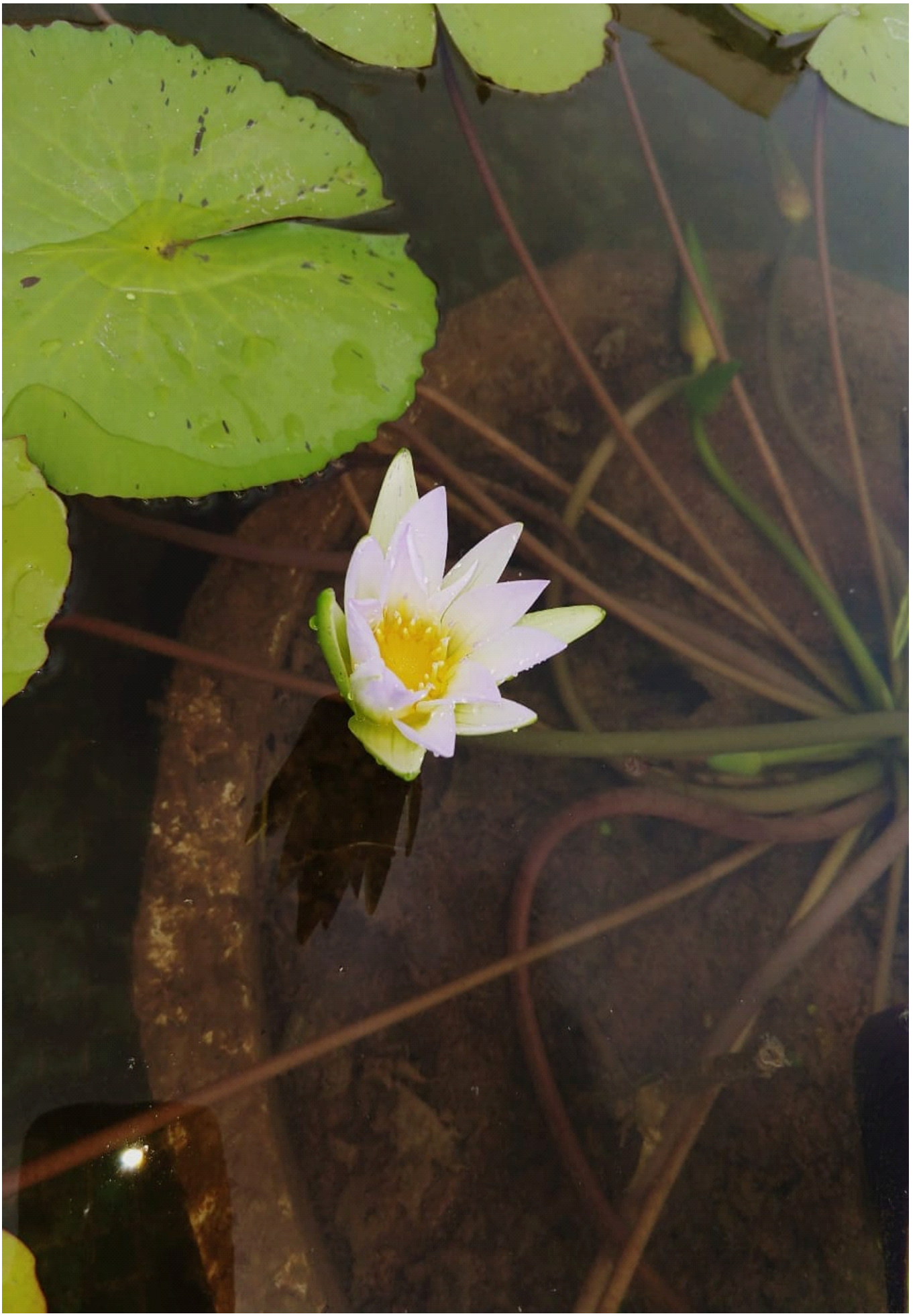
3. To contribute to national policy formulation related to animal biotechnology, animal bio-safety issues and ethical issues.

4. To promote intellectual property protection, business development, technology transfer, and academia-industry partnerships.

5. To develop collaborative programmes with national and international partners with focus on translational research and product development

6. To provide incubation facilities for entrepreneurs /startup companies.

7. To create (i) extramural centers with emphasis on product innovation and translational research (ii) 'not for profit' companies; and (iii) facilitate the creation of 'for profit' companies



From the Desk of Director

From the Desk of the Director

I have great pleasure in presenting the 2017-2018 Annual Report of the National Institute of Animal Biotechnology (NIAB), an autonomous Institute under administrative control of the Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India. The Institute became operational in 2014 from rented premises at Miyapur, Hyderabad, with state of the art facilities for research activities.

NIAB aims to harness novel and emerging biotechnologies and take up research in the cutting edge areas for improving animal health and productivity. The Institute's focus of research is on Animal Genetics and Genomics, Transgenic Technology, Reproductive Biotechnology, Animal Diseases, Bioinformatics and Nutrition Enrichment. The institute also emphasizes on basic research which would lead to the development of novel vaccines, diagnostics and improved therapeutic molecules for farm animals.

During the period of 2017-18, several new faculty were recruited along with other technical and support staff. Recently joined scientists have undertaken following scientific problems.

- Generation of costly therapeutic proteins in the milk of goat and cow to make them affordable for masses.
- Developing effective sensors to detect hidden estrus.
- Controlled release of hormones using nano fibres to overcome infertility in cattle and buffalo.
- Studies to extend fertility status of female livestock.
- Development of Vaccine adjuvants : The research on development of adjuvants for veterinary applications is lagging in India. Our work is focused on development of novel veterinary adjuvants or to improve the existing one. New adjuvants are being explored for enhancing effects of existing vaccines.
- Host - pathogen interaction studies for Bovine tuberculosis.
- Development of micronutrients with proper delivery vehicles to overcome nutritional deficits in Livestock

The ongoing research projects in the area of infectious diseases include those on brucellosis, leptospirosis, staphylococcosis, Newcastle disease, babesiosis, theileriosis and toxoplasmosis. Host-pathogen interactions, virulence mechanisms, and molecular pathogenesis are being studied with the objective of technology and product development for efficient diagnostic tools and novel vaccines. During the reporting period, NIAB has also initiated studies of cattle genomics using state of the art next generation sequencing. This will allow to determine the purity of indigenous breeds and will aid in its conservation.

In Industry collborations, NIAB signed MoU with Chemveda Life Sciences Pvt. Ltd. for a DST funded project entitled “Development of peptide-based anti-inflammatory drug for septicaemia”.

Academic programmes of the institute include “Research Scholar Programme” where NIAB has MoU with Manipal University and the University of Hyderabad for PhD registrations of the Research

Scholars. NIAB has also partnered with the Pirbright Institute and Roslin Institute (both in the UK) in the Newton Fund PhD programme, with students being jointly mentored by faculty from all the partner institutions. Institute has also partnered with Regional Centre of Biotechnology (RCB) for PhD registrations.

During this year, NIAB had co-organized International Conference on Molecular Signalling (ICMS-2018) with University of Hyderabad. Also, a National Symposium on thrust areas of relevance to livestock research was organised at NIAB, Hyderabad during March 2018.

NIAB executed the assigned responsibility to display work from all the Autonomous Institutes of DBT in the DBT stall at India International Science Festival 2017 held at Chennai.

NIAB is reaching out to farmers to understand their problems, in an effort to solve at least some of them through biotechnological applications, under an outreach programme named " MILAN" (Meeting of India Livestock-farmers and Agriculturists with NIAB scientists). These MILAN meetings have been Conducted at Pantha Nivas, Sambalpur (Orissa), and at Allahabad (UP). In future MILAN programme will be undertaken in various parts of the country including 7 states of the north east, Jharkhand, Bihar, Maharashtra etc. In MILAN, one-day workshop helps to understand field level regional problems of farmers , and to acquaint them with available technologies of their benefit. This is anticipated to create an opportunity, in association with experts from Animal Husbandry Departments, University academicians, and local veterinarians as well as dairy organizations, to understand local, region specific problems. This will help to devise strategies to resolve them through working together on a common platform. The event is planned to cover several interactive sessions on different aspects of animal production of interest to NIAB, viz. animal health, breed conservation, trait improvement, reproduction, infertility, climatic adaptability, nutrition, infectious and parasitic diseases, vaccines and diagnostics. The interaction also serves as a platform to appraise the farmers about the ways through which modern science can help in bringing in rapid advancements in livestock production even in local breeds.

The Institute is actively involved in school / college teaching under the "Bridge programme", where the aim is to generate excitement towards science in young minds. Lectures and practicals are conducted in various higher secondary schools. In addition, school and college students frequently visit NIAB so as to have exposure of research scenario in biotechnology.

As far as construction of permanent campus is concerned, significant progress is achieved and Institute has applied for occupancy certificate from GHMC. I am hopeful that Institute will shift to its permanent campus very soon.

I sincerely acknowledge the support,encouragement and advice received from the distinguished members of the NIAB Society, Governing Body, Scientific Advisory Committee, Finance Committee and Building Committee, as well as the support of the Department of Biotechnology, in furthering the activities of NIAB. The immense support received from local institutions such as CDFD, CCMB, University of Hyderabad, TS Veterinary University and various departments of Telangana State is greatly appreciated.

I also acknowledge the contributions of highly dedicated scientific, technical, administrative and other regular and outsourced staff of NIAB for their untiring efforts in meeting the challenges with limited resources. I sincerely hope and wish for continued support and encouragement from all in the years to come so that we may strive to achieve excellence in all our endeavours.

Dr Subeer S Majumdar

Research Reports

A. Reproduction & Transgenic animal

Livestock Genomics for Cattle Improvement and Transgenic Farmed Animals

Subeer S. Majumdar

Research Group
Scientist B
Satya Pal Arya

PhD students
Neelam Topno
Abhishek Das
Goutam Ulgekar

Project Fellows/RA/Trainee
Nilanjana Ganguli
Venkateswaran Ganeshan
Bharatesha (Since March 2018)
Rajendra Medda (Since March 2018)
Anindita Ghosal (Since Jan 2018)

Collaborators

S. Khadse	BIAF, Pune
Nirmalya Ganguli	NIAB, Hyderabad
Kadirvel Govindsamy	ICAR Centre for NEH Region, Shillong
John Hicky	Roslin Institute, UK

Conservation of indigenous cattle breed and determination of purity of breed. Transgenesis in farm animals for producing therapeutic protein in milk and avenues for generating more female calves through manipulation of spermatogenesis.

Objective

Genotyping through development of HD SNP chip based on NGS data obtained from indigenous cattle breed for determination of purity of breed and conservation of germ pool of native breed. To develop easier methods for farm animal transgenesis and non-transgenic animal bioreactor. To use these technologies for increase milk yield and production of therapeutic protein in milk. To generate males, favouring fertilization with X bearing sperm, to produce more female offspring.

Genomic Selection for conservation of indigenous cattle breeds and enhancing milk yield

We are aiming to generate genomic data of all the indigenous cattle breeds for conservation of Indian breeds by making a chip which will identify individuals with high purity. We have collected samples from pure individuals of five milch breeds, namely, Gir, Kankrej, Tharparkar, Sahiwal and Red Sindhi. The DNA is isolated and NGS (30X) will be performed from 20 animals of each breed. One animal from each breed will be used for 100X analysis. This sequence data shall be analyzed to decipher the genetic architecture of breeds and identify genomic signatures of all existing indigenous breeds. We have collected more than 170 blood samples from 5 milch breeds (Gir, Sahiwal, Red sindhi, Kankrej and Tharparkar) which was prioritized in our project and will be subjected for whole genome sequencing. These samples have been

collected from different parts of the India. Maximum number (60) of samples has been collected for kankrej from different districts of Gujrat. Out of these samples, 13 are male and 47 are female. On the other hand, 60 samples have been collected for Gir breeds of which 41 have been from organized farm and 19 has been from fields. 56 of 60 total collected samples were female. We collected 4 blood samples from male and 20 from female animals or Red Sindhi breed which describe the diversity existing in the kalsi farms at Dehradun. There were 26 samples collected for Sahiwal breeds from GADVASU farm at Kaljharani, Bhatinda and 2 samples from farmers of Fazilka district. We are also collecting 50 samples each from all 40 breeds of indigenous cattle for genotyping using chip developed from 5 milch breeds. HD chip would be used for identifying pure line of a breed or evaluating the level of crossbreeding in an individual. Thus the first phase of the project would result in conservation of the genetic makeup of all existing breeds which would help to retrieve the genetic diversity and have relatively pure individual from each breed for future breeding programs.

Production of Therapeutic Protein in Milk

This work is being done in collaboration with Dr. N. Ganguli of NIAB. We are trying to standardise easy testicular transgenesis in farm animals. In this direction we have initiated the work of testicular transgenesis in goat by transfecting the goat germ cells through electroporation (Figure. 1).

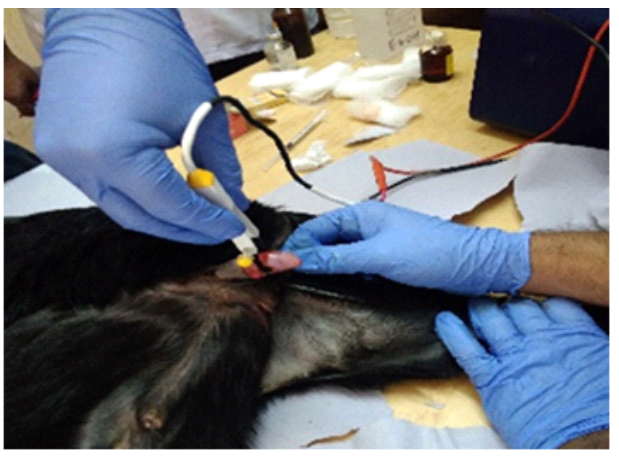


Fig.1*. Showing the procedure of testicular electro-poration in goat.*

In the purview of the difficulties in transfecting maximum number of germ cells in the testis of large animal which eventually result in poor number of transgene bearing sperm in the ejaculate, we are designing and validating the transgene construct which will help in sorting out of transgene bearing sperm. We have initiated the annotation and isolation of different milk protein gene promoter from the genome of Indian river buffalo and cloning of cDNA of cattle LH & FSH and human Bone morphogenic protein 2 (BMP2). We have also initiated the method of generation of virosome from Sendai virus and chitosan for direct perfusion in to mammary gland for transfecting mammary epithelial cells without generating a transgenic animal, thereby avoiding the risk of GMO.

To generate males, producing only X bearing sperm

This work is being done in collaboration with Dr Satyapal Arya of NIAB. With the increasing population of the country, demand of milk is likely to reach 180 million tonnes by 2022 and 330 million tonnes by 2050. To keep pace with increasing demand it is imperative to increase the number of female cattle. This problem can be potentially solved if we could produce sexed semen. Although some developed countries are producing sexed semen using Fluorescence activated cell sorter (FACS) but this method is very costly and suffers from inherent flaws resulting in low conception rate. In India, most of the cattle are owned by small hold farmers who cannot afford these costly FACS based sexed semen dosages. So there is a need to develop new methods to produce sexed semen. This project is focusing on use of multipronged molecular biology based approach to manipulate spermatogenesis for producing sexed semen naturally from a male animal. For this purpose, we are employing various strategies to kill or slow down Y chromosome containing sperm, so that resultant semen produced have only X chromosome bearing sperm. Such male may produce predominantly female offspring after natural mating. In this project, we have already cloned Apoptosis Inducing Factor (AIF) and Nuclear

Apoptosis Inducing Factor (NAIF) genes for inducing cell death in Y chromosome containing sperm and designed shRNA for a sperm motility gene MLL5 for slowing down the Y sperm. These methods for producing sexed semen is intended for meeting the projected demand of milk in the country and also help in preventing unnecessary generation of males which are usually unproductive to farmers.

Publications / patents

Shukla M, Ganguli N, Sen Sharma S, **Majumdar SS**. Sertoli cell specific decline in NOR-1 leads to germ cell apoptosis and reduced fertility. **J Cell Biochem**. 2018;119(8):6514-6526.

Sen Sharma S, **Majumdar SS**. Transcriptional co-activator YAP regulates cAMPsignaling in Sertoli cells. **Mol Cell Endocrinol**. 2017;450:64-73.

Mandal K, Bader SL, Kumar P, Malakar D, Campbell DS, Pradhan BS, Sarkar RK,Wadhwa N, Sensharma S, Jain V, Moritz RL, **Majumdar SS**. An integrated transcriptomics-guided genome-wide promoter analysis and next-generationproteomics approach to mine factor(s) regulating cellular differentiation. **DNA Res**. 2017;24(2):143-157.

Basu S, Arya SP, Usmani A, Pradhan BS, Sarkar RK, Ganguli N, Shukla M, Mandal K, Singh S, Sarda K, **Majumdar SS**. Defective Wnt3 expression by testicular Sertolicells compromise male fertility. **Cell Tissue Res**. 2018;371(2):351-363.

From left to right: Amit pal, Gowtham Ulgekar, Nirmalya Ganguly, Satyapal Arya, Nilanjana Ganguli, Venkateswaran Ganeshan, Abhishek Das, Bharathesha, Subeer S. Majumdar, Neelam Topno, Anindita Ghosal

Reproductive Biology, Gametogenesis, Oocyte atresia, DNA damage response and repair pathways

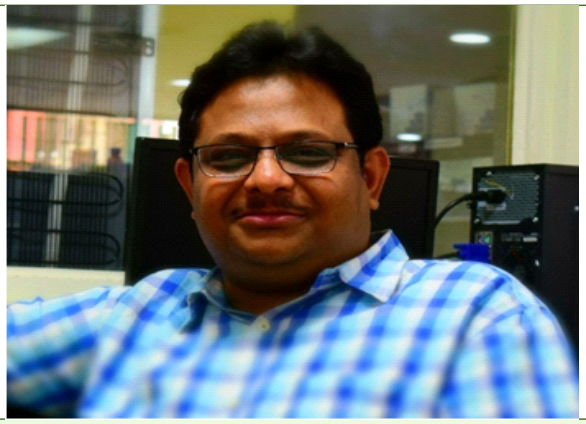
H.B.D. Prasada Rao

Education and training

Prasad did his M.Sc. (2003) from Andhra University, Vishakhapatnam, and Ph.D. (2011) from Osaka University, Japan. Then he worked as a postdoctoral fellow (2012-2016) at University of California Davis, U.S.A., under the Howard Hughes Medical Institute Investigator Neil Hunter. Later he continued as a post-doctoral research associate (2016-2017) at the same university. He Joined NIAB on 22nd January 2018.

Research experience and Interests

Prasad's research experience spans molecular genetics and reproductive biology, particularly regulation of gametogenesis in males and females by post-translational modifications such as phosphorylation, SUMOylation, ubiquitination, and proteolysis to produce haploid gametes. His interests are in understanding errors in gametogenesis which lead to infertility, pregnancy miscarriages, and congenital diseases. The focus of his research at NIAB are to understand (a) the quality control pathways in oocyte and spermatocyte development to extend livestock fertility,(b)molecular mechanisms of meiotic processes, such as homologous recombination and synapses in livestock to increase the fecundity and to prevent birth defects,(c) causes and treatments of ovarian disorders in livestock, and (d) genome instability and DNA repair pathways.



Biopharming using farmed animals and avenues for obtaining elite sperm

Nirmalya Ganguli

Research Group

Project Fellows/RA/Trainee
Anandita Ghosal (Since Jan 2018)
Amit Pal (Since Jan 2018)
Venkateswaran Ganeshan

Collaborators

Subeer Majumdar	NIAB, Hyderabad
Pankaj Suman	NIAB, Hyderabad
Syed Faisal	NIAB, Hyderabad
Neelesh Sharma	SKUAST, Jammu
K. Govindasamy	ICAR Centre for NEH Region, Shilong

Theme of research of my laboratory is establishing new easier techniques for generation of transgenic farm animals or animals with targeted somatic genomic modification of mammary epithelial cells by developing new methods for direct transfection of mammary gland for using them as bioreactor for generation of biotherapeutics and nutraceuticals. Germ cell/Stem Cell transplantation studies to explore avenues for production of sperm with elite characteristics. Generation of transgenic mice to develop mice model of farm animal diseases as well as a system to study functional genomics of farm animals.

Objectives

To establish new easier techniques for making transgenic farm animals. To develop new methods for direct transfection of mammary gland. To use these technologies for generating animal bioreactor expressing biotherapeutics in their milk for increasing affordability. To establish germ cell/stem cell transplantation in farm animals to increase production of elite bull sperm. Generation of transgenic mice to develop mice model of farm animal diseases as well as to study farm animal functional genomics.

Production of Therapeutic Protein in Milk

With increasing knowledge about functions of genes/gene products (proteins), relation of their deficiencies with causation of a particular abnormal condition of the body is getting divulged. For their replenishment, we need to produce these proteins in bulk amount as a therapeutic agent(biotherapeutics), so that this knowledge is translated into therapy and diseases remediation. In the present scenario, production of Biopharmaceuticals at cheaper cost is the need of the world. We are working towards expressing valuable biotherapeutics in milk. We are trying to standardise easy testicular transgenesis in farm animals for generating animal bioreactor expressing biotherapeutics in milk. In this direction we have initiated the work of testicular transgenesis in goat by transfecting the goat germ cells through electroporation. In the purview of the difficulties in

transfecting maximum number of germ cells in the testis of large animal which eventually result in poor number of transgene bearing sperm in the ejaculate, we are designing and validating the transgene construct which will help in sorting out of transgene bearing sperms. We have fused the EGFP with signal peptide and transmembrane domain of the sperm surface protein Basigin (BSG). Such fusion protein **(Fig.1)** will help in anchoring EGFP in the surface of the sperm tail membrane, facilitating the sorting out of such sperm from the ejaculate. These positive sperm may then be used for assisted reproductive technique for generation of transgenic pups. We have initiated the annotation and isolation of different milk protein gene promoter from the genome of indian river buffalo along with cloning of cDNA of human Bone morphogenic protein 2 (BMP2), cattle LH and FSH. We have also initiated the method of generation of virosome from Sendai virus and chitosan for direct transfection of mammary epithelial cells by perfusion in to mammary gland to achieve the same objective without generating a transgenic animal thereby avoiding the risk of GMO.

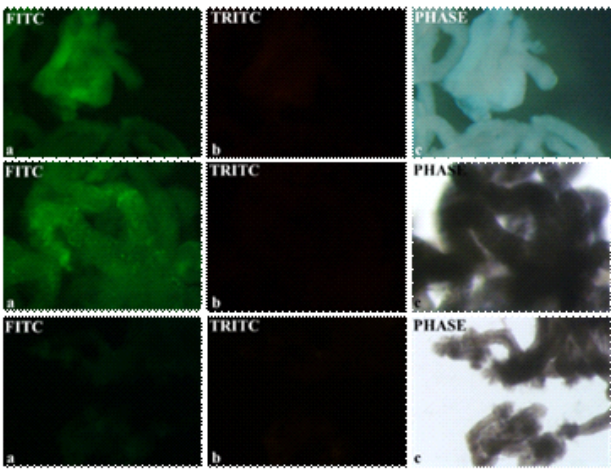


Fig.1. *Observation of in vivo EGFP expression in tubule cultured from testis electroporated with construct carrying BSG-EGFP fusion peptide under control of CMV promoter and testis from wild type mice.* ***Upper*** *and* ***Middle*** *panel show the tubules from Electroporated testis.* ***Lower*** *panel show tubules form wild type testis.*

Evacuation of Testis and Germ Cell Transplantation in Farm Animals

Male reproductive ability in mammalian species depends upon the production of sperm through the process of spermatogenesis. Spermatogonial stem cells (SSC) are the male germ line stem cells which stand to be the foundation of spermatogenesis. SSC are present on the basal membrane of the seminiferous tubules in the testis and surrounded by Sertoli cells. In 1994, it was first demonstrated that isolation and transplantation of SSC into an evacuated (endogenous germ cell depleted) testis help in restoration of successful spermatogenesis from the transplanted SSC, generating sperm with donor derived characteristics.We are establishing the culture of germ cells form goat along with easy method of evacuation of testis from germ cells in large animals without nonspecific cytotoxic effect. There is method available for evacuation of testis but this often creates immune susceptibility in animal leading to deaths sometimes therefore generate restriction for using in farm animals. Development of a safe method for germ cell depletion in farm animals is of urgent need to extrapolate germ cell transplantation in farm animals with full potential. We wish to establish an easy method of germ cell depletion in testis. Once successful we will attempt for establishing germ cell transplantation in farm animals.

Genetic Basis of Udder Gland Development

The mammary gland is a dynamic organ that undergoes dramatic physiological adaptations during the life cycle specifically at the time of pregnancy to lactation. The mammary gland and the genetic control of lactation (specifically milk production) has evolved as a vital part of the mammalian development. Milk provides an essential source of nutrients to newborn mammals, as well as immune factors. Humans have long exploited the production of milk by domestic/farmed ruminants for the manufacture of dairy products, making milk an important part of human nutrition. The mammary gland also bears the capacity of being transformed

to bioreactor facilitating the production of nutraceuticals and biotherapeutics in large quantity. The mammary gland displays a high level of developmental plasticity by undergoing repeated cycles of growth, differentiation, and regression, coordinated by the reproductive state. The ability to manipulate lactational output (specifically milk production) is an area of increasing interest. Knowledge of the biological pathways and mechanisms that govern mammary gland development and lactation is commercially important. We aim to decipher the biological pathways and mechanisms that govern mammary gland development and lactation which is commercially important. We wish to decode the roles of various genes and regulatory RNAs (miRNA, long non coding RNA) involve in mammary gland development and lactional output. Using various softwares available, we have establishd the pipeline for analysing the data obtained from RNA seq. We have used RNA seq data obtained from total RNA of mammary gland of goat at three different time point, Virgine, Lactating and Dryoff, available in GEO database.

This pipeline will help us to analyse our own data once obtained from RNA seq to choose the right target molecule. We will acquire the information from farm animals and validate them in the mice models to find key molecule which may play a role in mammary gland development or maintaining milk volume or expression of various milk components (proteins, fats etc.).

Publications / patents

Shukla M, **Ganguli N**, Sen Sharma S, Majumdar SS. Sertoli cell specific decline in NOR-1 leads to germ cell apoptosis and reduced fertility. **J Cell Biochem.** 2018; 119(8):6514-6526.

Basu S, Arya SP, Usmani A, Pradhan BS, Sarkar RK, **Ganguli N**, Shukla M, Mandal K, Singh S, Sarda K, Majumdar SS. Defective Wnt3 expression by testicular Sertoli cells compromise male fertility. **Cell Tissue Res**. 2018; 371(2):351-363.

From left to right: Anindita Ghosal, Nirmalya Ganguly, Amit pal, Venkateswaran Ganeshan

Point-of-care diagnostics to improve reproductive efficiency and health of livestock

Pankaj Suman

Research Group

PhD Students

Pankaj Kumar (Since August 2017)

Project Fellows/RA/Trainee

Aswitha Balaji (Since Dec 2017)

Komal Birader (Since March 2018)

Collaborators

Abhinav Shrestha	Dhiti Life Sciences Pvt Ltd Delhi
Pranjal Chandra	IIT Guwahati
Amit Goyal	IFS College Moga
Nirmalya Ganguli	NIAB, Hyderabad

Indian livestock sector is largely unorganised which is facing the problem of poor reproductive efficiency and lack of quality feed. Silent heat in buffalo and lack of affordable diagnostics for early pregnancy diagnosis are two issues amongst others that severely affect the management of livestock through elongation of generation interval. In rural areas, feeding of animals is largely dependent on dry roughages due to unavailability of green fodder and unaffordability of farmers to feed concentrate feeds. So, to address these issues we have initiated research work to establish our core strength to develop aptamer based colorimetric sensors to make it affordable and thermo-stable. In addition, we are in process of starting the program to manipulate the ruminal microbes that can help in enhancing the efficiency of ruminal digestion of fibrous feeds. Additionally, to improve the animal health and protect them from accidental death due to snake bite we are also working on to develop aptamer/antibody based point of care biosensor for detection of snake venom is the envenomed individual.

Point-of-care diagnostic for the oestrous detection /pregnancy diagnosis in cattle and buffalo

There are several hormonal fluctuations in the 21 days of oestrous cycle but, progesterone (P4) level goes down beyond its normal range during the oestrous phase. So, that can be used as a biomarker for oestrus detection. There are reports that have confirmed that absence of P4 in the blood/milk during oestrous phase correlates well with the time of insemination/breeding in buffalo. Further, non-return to oestrus with an elevated level of P4 post-insemination has also been considered as a mark of successful pregnancy; except the cases of persistent corpus luteum. Different kind of P4 detection methods like chromatographic and immunoassays have also been developed but, the improvement in sensitivity of detection was at the cost of its field applicability and affordability; rendering them unsuitable for use by Indian dairy farmers. Aptamers have shown promises as it can maintain the affinity for the ligands like antibodies but, remarkably improve the thermo-stability as well as reduce the

cost of production. In the beginning, two aptamers have been selected to be specific for P4. Using gold nanoparticle, a label free detection method has been optimised to sense the presence of progesterone in the standard buffers. It is based on the basic principle that in the presence of P4, aptamers adsorbed on gold nanoparticle surface will selectively bind to P4; leaving behind the gold nanoparticle (Red) to form an aggregate (Blue) in solution phase. With this colorimetric assay, we could visibly detect up to 100 ng/ml concentration of P4 in buffer. It also holds the limitation that in the presence of milk/serum we could not detect the progesterone even at a higher concentration than 100 ng/ml. It could be due to interference of the other milk/serum components and change in pH of the buffer. So, to overcome the limitations of previous methodology, we have conjugated the aptamers with the gold nanoparticle and that is being used to develop a lateral flow based assay.

Biosensor for detection of snake venom from envenomed individuals

Snake bite has been included in the neglected tropical disease as death due to this is common in regions having thick vegetation, especially during the rainy season. WHO reports that about half of deaths worldwide due to snake bites are reported from India. This is mainly due to a large number of snakes in this part of the world. But data on number of animal death is not available. We have initiated the identification and expression of recombinant venom protein for development of rapid diagnostics. Proteomic analysis of snake venom (cobra and krait) led to identification of two predominant and species specific venom proteins. Through bioinformatic analysis, specific regions in these two proteins that is not present in any other animal species have been selected to make fusion construct. Fusion constructs of 192bp (NN7) and 146bp (BC1) have been cloned after codon optimization in pET-28a (+) expression vector. Transformed *E.coli* cells were induced by 1 mM IPTG for 3 hours and expressed protein was purified using Ni-NTA affinity chromatography (Fig 1). We are in the process of purification of another fusion protein. The purified fusion protein will be used for the generation of monoclonal antibody and selection of aptamers.

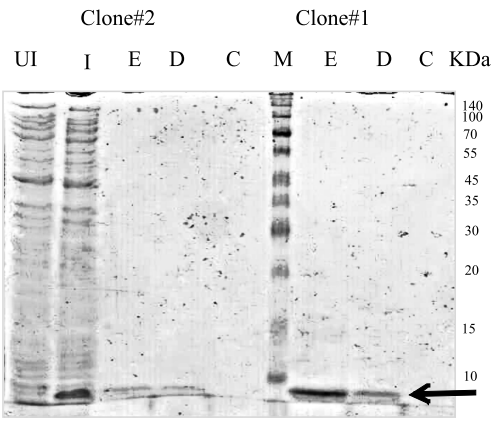


Fig.1. *SDS-PAGE profile of the fusion protein (NN7; 6 kDa, marked with arrow) after expression and purification from transformed E. coli cells. UI: uninduced; I: induced; C, D and E: Protein fractions collected under different buffers; M: molecular wt. marker*

Publications / patents

Godbole G*, **Suman P***, Malik A*, Galvankar M, Joshi N, Fazleabas A, Gupta SK, ModiD. Decrease in Expression of HOXA10 in the Decidua After Embryo ImplantationPromotes Trophoblast Invasion. **Endocrinology**. 2017;158(8):2618-2633. (* Equal first author)

From left to right: Aswitha Balaji, Pankaj Kumar, Pankaj Suman and Komal Biradar

Genetic improvement of farm animals and sexed semen

Satyapal Arya

I am working with Dr. Subeer S Majumdar on various projects. The theme of research is based on deciphering the genetic basis of economically important traits in farm animals and production of sexed semen. Presently, we are focusing on using genomic strategies to determine the purity of indigenous cattle and attempting to develop alternative methods to produce sexed semen.

Genomics for conservation of indigenous breeds

This project is using a genomics based approach for identification of pure animals and estimation of genetic mixing of graded cattle. For achieving the objectives of this, we are planning to use cutting edge genomics methods such as NGS and Array based genotyping. In this project we are planning to sequence five indigenous cattle namely Gir, Sahiwal, Tharparkar, Red Sindhi and Kankrej. Sequencing data generated will be used to extract SNPs and develop a HD chip. This HD chip will be used to genotype all the 40 registered indigenous cattle breeds. Genetic makeup and SNPs of all the breeds shall be revealed by genotyping representative individuals from each breed. We will use latest method to identify genomic signature of each breed and develop a genetic tool and database for evaluating the level of genetic mixing in an individual. HD chip together with developed machine learning tool will help further to identify pure line of a breed or evaluate the level of crossbreeding in an individual.

In this project we have collected large number of samples from different breeds namely Gir, Sahiwal, Red Sindhi and Kankrej and Tharparkar. These samples have been collected from different states across India. Sample collection of other indigenous breeds is in process. Collected blood samples have been processed for isolation of high quality DNA for next generation sequencing.

Alternative methods to produce sexed semen

With the increasing population of the country, demand of milk is likely to reach 180 million tonnes by 2022 and 330 million tonnes by 2050. To keep pace with increasing demand it's imperative to increase the number of female cattle. This problem can be potentially solved if we could produce sexed semen. Although some developed countries are producing sexed semen using Fluorescence activated cell sorter (FACS) but this method is very costly and suffers from inherent flaws resulting in low conception rate. In India, most of the cattle are owned by small hold farmers who cannot afford these costly FACS based sexed semen dosages. So there is a need to develop new methods to produce sexed semen. This project is focusing on use of multipronged molecular biology based approach to manipulate spermatogenesis for producing sexed semen naturally from a male animal. For this

purpose, we are employing various strategies to kill or slow down Y chromosome containing sperm, so that resultant semen produced have only X chromosome bearing sperm. So such male may produce predominantly female offspring after natural mating. In this project, we have already cloned Apoptosis Inducing Factor (AIF) and Nuclear Apoptosis Inducing Factor (NAIF) genes for inducing cell death in Y chromosome containing sperm. If successful in laboratory animals (mice), we may proceed for working in cattle.

Publications / patents

Basu S, **Arya SP**, Usmani A, Pradhan BS, Sarkar RK, Ganguli N, Shukla M, Mandal K, Singh S, Sarda K, Majumdar SS. Defective Wnt3 expression by testicular Sertoli cells compromise male fertility. **Cell Tissue Res**. 2018; 371(2):351-363.

Research Reports

B. Infectious Diseases

Microbes – genomics, pathobiology, detection and intervention

Nagendra R. Hegde

Research Group

Project Fellows/RA/Trainee
Madhavi Annamanedi (since October 2017)
Charanpreet Kaur (since December 2017)
K. Pavan Asrit (since October 2017)

Collaborators

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P. Aravindh Babu	TANUVAS, Chennai

Our group works on the broad area of microbial pathobiology, including genomic characterization, interactions with the host, virulence determinants and their function, methods of treatment and prevention, and diagnostic methodologies. Currently, we are engaged in (a) understanding the clonality and lineage of bovine mastitis-associated staphylococci, (b) developing serological assays for the detection of subclinical pathogens of laboratory animals, mainly mice and rats, and (c) initiating studies to unravel the biology, and to design interventions, for herpes mammillitis and pseudo-lumpy skin disease.

Molecular epidemiology and genomics of bovine mastitis-associated *Staphylococci*

Mastitis is an important disease of milch animals. Staphylococci are the major cause of subclinical and chronic mastitis. Antibiotics are used to treat mastitis, but many times without rationale, whereas very few vaccines are available and are poorly effective. For development of better therapeutic and preventive options, understanding the virulence determinants and lineages of the organisms are important. In collaboration with KVAFSU, we had earlier collected ~1000 isolates of mastitis-associated staphylococci. We are now further characterizing *S. aureus*, *S. epidermidis* and *S. chromogenes*. Molecular characterization of 83 *S. aureus* isolates revealed that (a) 60% and 20.4% of the isolates were positive for *coa*, and *mecA* genes (type V SCCmec), respectively, (b) one and seven isolates carried the *tsst* and *hlg* genes, respectively, (d) none were positive for *pvl* or *hlg* genes, and (c) 56 isolates belonged to 8 Spa types (see Table), of which, t17680 is a newly identified type. Multi-locus sequence typing of the isolates is on-going, and representative isolates belonging to unique clusters will be subjected to whole genome sequencing. The project will also contribute to building a repository of characterized mastitis-associated bacteria.

Development of diagnostics for health monitoring of laboratory animals

Mice and rats are widely used in research, as well as for pre-clinical and regulatory toxicology studies.

Spa type	No. of isolates
t021	2
t657	1
t1201	4
t1965	7
t3092	3
t4522	14
t17680	9

Subclinical infection of these animals can compromise the outcome of experiments, but health monitoring is rarely performed in India. In collaboration with IISc, we had earlier carried out proof-of-concept studies in developing ELISA-based assays to detect infection with 6 different viruses and two different bacteria. We are now engaged in producing recombinant antigens and developing ELISA based on these antigens as well as using predicted antigenic peptides, while our collaborators are working on standardizing and validating whole antigen-based ELISA. We have performed (a) antigenicity analyses for several proteins and obtained three synthetic peptides each from two different proteins of four different viruses, and (b) expression studies for some of the proteins in prokaryotic system (see Fig.1).

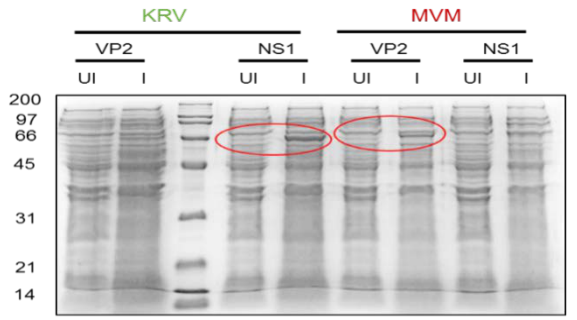

Fig.1. Expression of VP2 and NS1 proteins of Kilham Rat Virus (KRV) and MVM (Minute Virus of Mice): pRsetB plasmid containing the genes was transformed into Rosetta2 cells and the proteins were expressed by auto-induction at 30°C. Uninduced (UI) and induced (I) cultures were subjected to SDS-PAGE and Coomassie staining.

These will be used in further development of ELISA. The project is expected to contribute to the development of an indigenous kit for monitoring the subclinical infection status of laboratory mice and rats.

Study of bovine herpesvirus 2

Herpesviruses cause life-long infections. Although disease manifestations are mild, stress can exacerbate clinical outcome. Among the bovine herpes viruses (BHV), BHV-2, which causes mammillitis and pseudo-lumpy skin disease, is not well studied. However, the external lesions are worrisome to the farmer, and milk production is reduced. We have initiated a project to study BHV-2 incidence, biology, disease pathogenesis, and development of antivirals. We are currently in the process of elucidating the complete genome of BHV-2 from a clinical sample.

Publications / patents

Prabhu KN, Isloor S, Veeresh BH, Rathnamma D, Sharada R, Das LJ, Satyanaraya ML, **Hegde NR**, Rahman SA (2018). Application and comparative evaluation of fluorescent antibody, immunohisto-chemistry and reverse transcription polymerase chain reaction tests for the detection of rabies virus antigen or nucleic acid in brain samples of animals suspected of rabies in India. ***Veterinary Sciences.*** *5*(1):E24.

Hegde NR, Gauthami S, Sampath Kumar HM, Bayry J (2018). The use of databases, data mining, and immunoinformatics in vaccinology: where are we? ***Expert Opinion in Drug Discovery.*** 13(2):117-130.

From left to right: Jasmeen, Priya Gupta, Charanpreet Kaur, Nagendra R. Hegde, K Pavan Asrit, Madhavi Annamanedi

Understanding the Virulence Mechanisms of the Zoonotic Pathogen, Brucella and Development of Novel Vaccines and Diagnostic Assays for Animal and Human Brucellosis

Girish K Radhakrishnan

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Swapna Namani (Since Sept 2015)

Collaborators

Satya Parida Pirbright Institute, UK

Brucellosis is a world-wide zoonotic disease that accounts for huge loss to the livestock sector and poses a serious threat to public health. In India, brucellosis in livestock and its impact on public health causes an annual loss of US $ 3.4 billion (Rs. 22,800 crore). There is no human vaccine available for brucellosis, and the available animal vaccines have many disadvantages. Minimal information is available on the basis of Brucella host specificity and the virulence factors that enable Brucella to survive and replicate in the host. Overall objectives of my research projects are (i) To develop novel vaccines and diagnostic assays for animal and human brucellosis; (ii) To understand the mechanisms by which Brucella modulate the host immune responses; (iii) To characterize the host factors that support the invasion and intracellular multiplication of Brucella.

Identification and characterization of immunodominant antigens of Brucella

Early diagnosis of brucellosis in livestock is very crucial for taking effective control measures that will help to reduce the incidence of human brucellosis. The existing sero-diagnostic assays suffer from poor sensitivity, specificity and no DIVA capability. We developed a prototype Lateral Flow Assay-based on an immunogenic protein antigen (BM-5) of Brucella and its validation is in progress. Our preliminary studies indicate that BM-5-based brucellosis diagnosis assay has the DIVA capability.

To understand the mechanisms by which *Brucella* effector protein, TcpB suppresses host innate immune responses

TcpB is one of the virulence proteins, which is secreted by Brucella to suppress host innate and adaptive immune responses. TcpB attenuates innate immune signalling mediated by Toll-like receptor (TLR) 2 and 4 but its mechanism of action remains obscure. We identified interaction of TcpB with the microtubule tip binding protein, CLIP170. Subsequently, we found that CLIP170 induced the ubiquitination and degradation of the TLR2/4 adaptor protein, TIRAP that resulted suppression of TLR2/4 signalling in macrophages and mice.

Inflammasomes are essential components of innate immunity, which is the first line of defence against invading microorganisms. Noncanonical inflammasome activation is mediated by caspase-4/11, which recognizes intracellular LPS and promotes pyroptosis and secretion of proinflammatory cytokines. We showed that TcpB induced ubiquitination and degradation of the inflammatory caspases 1, 4, and 11. Furthermore, in both mouse and human macrophages, TcpB attenuated LPS-induced noncanonical inflammasome activation and suppressed pyroptosis and secretion of IL-1α and β induced by intracellular LPS delivery.

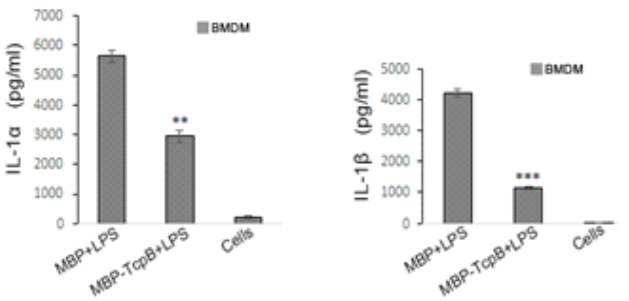

Fig.1. *TcpB attenuates secretion of IL-1α and IL-1β cytokines induced by intracellular delivery of LPS*

To characterize the host factors that supports the invasion and intracellular multiplication of Brucella

Identifying and characterizing virulence mechanisms of a pathogen are crucial for developing efficient therapeutic and preventive strategies for infectious diseases. Compared to other bacterial pathogens relatively little is known about the factors contributing to persistence of Brucella in the host and multiplication within phagocytic cells.

We performed a high throughput siRNA screening that identified essential host genes that support intracellular replication of *Brucella* in macrophages. Detailed characterization of these host factors is in progress.

Molecular characterization of V and C genes of PPRV

Peste des petits ruminant (PPR) is a highly contagious viral disease of small ruminants, which is caused by PPRV. PPRV induces host immune suppression during the acute infection, favoring viral pathogenesis and secondary infections. Studies have established that V and C proteins of Morbilliviruses interfere with different steps in the IFN-I transduction pathway. We amplified and sequenced V and C genes of various PPRV isolates. We are analyzing the role of these genes in modulation of host immune responses to understand the mechanism of PPRV- induced immune suppression.

Publications/Patents

Jakka P, Bhargavi B, Namani S, Murugan S, Splitter G, **Radhakrishnan G**. Cytoplasmic Linker Protein CLIP170 Negatively Regulates TLR4 Signaling by Targeting the TLR Adaptor Protein TIRAP. **J Immunol.** 2018;200(2):704-714.

Jakka P, Namani S, Murugan S, Rai N, **Radhakrishnan G**. The Brucella effectorprotein TcpB induces degradation of inflammatory caspases and thereby subverts non-canonical inflammasome activation in macrophages. **J Biol Chem**. 2017;292(50):20613-20627.

From left to right: Varadendra Mazumdar, Prachita Nandini, Binita Roy Nandi,Sushree Rekha Mallik, Padmaja Jakka, Swapna Namani

Fight against Leptospirosis and Development of novel Vaccine Adjuvants and Delivery systems

Syed M. Faisal

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Mohd Akif	University of Hyderabad
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Our research is focussed in broadly two areas. First is in development of vaccine for Leptospirosis which is zoonotic and emerging infectious disease in India. It is of significant importance as India has a fast growing livestock sector and is becoming self-sufficient in production of animal products. Current vaccines provide limited protection and are unable to prevent the shedding of bacteria in urine. Another area of our research is in development of novel vaccine adjuvants or vaccine delivery systems especially for Livestock. Current vaccine used in livestock against most dreadful diseases like brucellosis and Foot and Mouth Disease provide short term immunity and limited protection mainly due to unavailability of potent adjuvants. Hence, we envisage to develop potent adjuvants for vaccines used in Livestock.

Understanding the host response and molecular pathogenesis of Leptospira infection

Little is understood about *Leptospira* pathogenesis and host responses which has hampered the development of new intervention strategies. It is now becoming evident that *Leptospira* evades the host innate immune response through Toll like receptors (TLRs) by exploiting multiple mechanisms such as limiting the expression or antigenic variation of its membrane proteins, their access to antibodies and modifying its LPS. Hence it is important to understand host response against *Leptospira* infection in order to develop effective vaccines. We

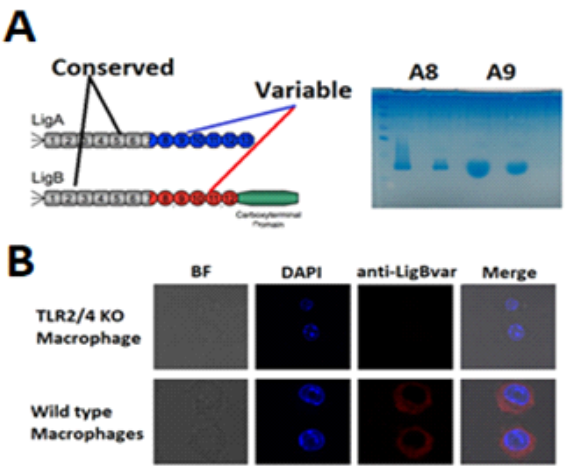


Fig.1. *(A) Purification of domains of Lig proteins. (B) Interaction of variable region of LigB with TLR2 and TLR4 receptors of mouse macrophages.*

are screening various surface proteins for their ability to activate TLR2 and TLR4. We earlier identified 21kd *Leptospira* surface adhesin (Lsa21) as strong activator innate response via signalling through TLR2/4 (data published in *Scientific Reports*, 2016). In continuation of this work we found that *Leptospira* immunoglobulin like proteins (Lig A and Lig B) are able to bind to TLR2 and TLR4 and induce production of pro-inflammatory cytokines. In order to fine map the region/domain involved in binding with TLRs we are cloning and expressing individual domains (Fig.1). Testing TLR activity of these domains is in progress. This project will contribute in identification of novel virulence factor/vaccine candidates.

Understanding the role of *Leptospira* LPS in evasion from host innate immune response

LPS is the major component of the outer membrane and plays an essential role in pathogenesis, colonization and dissemination of *Leptospira*. It is also one of the target antigen for diagnosis and potential candidate for vaccine development. It has been shown that *Leptospira* modifies its LPS (increasing the content of O antigen) to escape the immune response, a strategy similar to what is used by *Francisella tularensis,* a facultative intracellular Gram-negative pathogen. Hence, it is important to understand the role of *Leptospira* LPS in immune evasion in order to devise better strategy to control the zoonosis. We have successfully isolated the LPS from non-pathogenic strain *Leptospira biflexa* and tested its ability to activate mouse macrophages for production of pro-inflammtory cytokines (Fig. 2). Comparison of LPS from different pathogenic serovars prevalent in India is in progress. This project will contribute in development of LPS based conjugate vaccines.

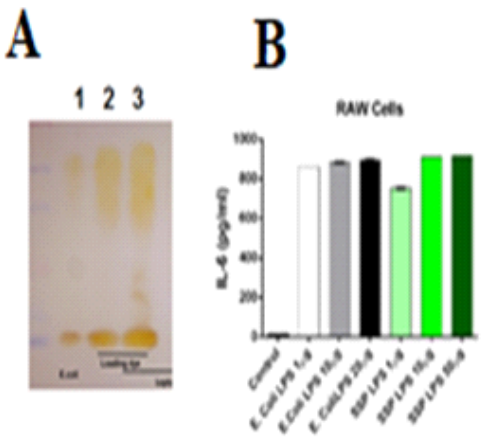


Fig.2. *(A) LPS extracted from E.coli (1) and Leptospira (2 and 3). (B) Production of IL-6 by mouse macrophages upon stimulation with Leptospira LPS.*

Creating Leptospira mutants: In perspective of identifying novel virulence factor and vaccine candidates

We are trying to create random mutants of *Leptospira* by introducing plasmid carrying transposon. There has not been much progress in this approach. We are experiencing difficulties in creating random mutant and trying to troubleshoot the problem. As alternative approach we are creating targeted mutants by using CRISPR/Cas9. We have constructed plasmid having *Leptospira* origin of replication and FlgB promoter. We have cloned EGFP gene and checking the expression in *Leptospira.* We will replace EGFP with Cas9 gene and then introduce this plasmid along with guide RNA to create specific mutants. The project will contribute in development of live attenuated vaccine for Leptospirosis.

Evaluation of various adjuvants and delivery systems for veterinary applications

Our research effort is also focused on development of vaccine adjuvants delivery systems for veterinary applications. In this direction we have tested a novel adjuvant AS007 and compared its efficacy with Alum, Freunds adjuvant and Montanide ISA720 in mouse model.

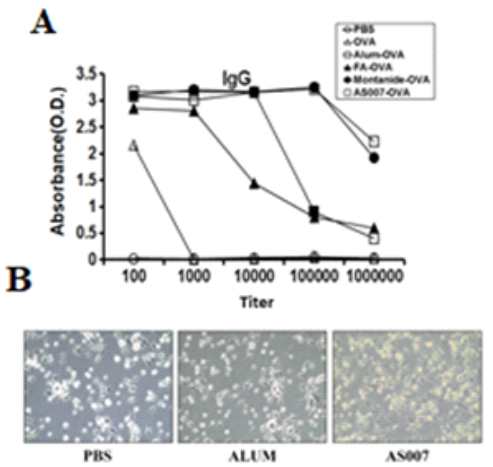


Fig.3. *(A) Antibody response against OVA in different adjuvants. (B) Maturation of mouse bone marrow derived dendritic cells in presence of different adjuvants.*

As007 induced higher antibody and cellular responses than alum and freunds adjuvant (Fig. 3A).

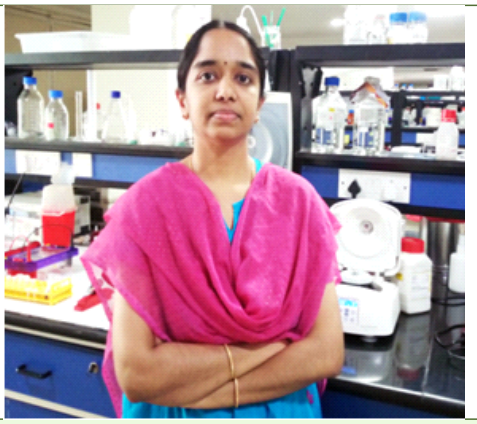
As007 also induced earlier maturation of bone marrow derived dendritic cells (Fig. 3B). Preparation and testing of other adjuvants like liposomes, microparticles, nanoparticles and herbal adjuvant is in progress. This project will contribute in development of adjuvant for veterinary applications.

Publications / patents

Bulugonda RK, Kumar KA, Gangappa D, Beeda H, Philip GH, Muralidhara Rao D, **Faisal SM**. Mangiferin from Pueraria tuberosa reduces inflammation via inactivation of NLRP3 inflammasome. **Sci Rep**. 2017;7:42683.

Baig MS, Liu D, Muthu K, Roy A, Saqib U, Naim A, **Faisal SM**, Srivastava M,Saluja R. Heterotrimeric complex of p38 MAPK, PKCδ, and TIRAP is required for AP1mediated inflammatory response. **Int Immunopharmacol**. 2017;48:211-218.

From left to right: Amit Kumar Nagwani, Ajay kumar, Syed M. Faisal, Vivek Phani Varma, Mohmmed Kadivella



Host Pathogen Interaction Studies on Animal and Avian Viruses

Madhuri Subbiah

Research Group

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Sunny Deval	(Since Mar 2017)

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Gowtham Vasudevan	TANUVAS, Chennai, TN
Elango	Gandhigram Rural Institute, TN

Newcastle disease is an economically important poultry disease across the globe caused by Newcastle disease virus (NDV). It is a highly contagious, respiratory, neurological and/or enteric disease in chickens. In India, NDV is endemic and episodes of outbreaks despite strict vaccinations are common. The virulence determining factors in NDV are not explicit. Our lab is focused on molecular characterization of non-structural viral proteins of NDV to determine their role in pathogenesis, molecular epidemiology of circulating virulent NDV strains and antiviral screening. The knowledge gained will be helpful in combating NDV which is otherwise a constant and a serious threat to poultry industry.

Understanding the role of non-structural viral protein (W) of NDV in viral life cycle

NDV expresses two non-structural proteins, V and W, by co-transcriptional (mRNA) editing of P gene. They are not packaged in the virion but are expressed only when the virus is actively replicating in the host cell. We analyzed the effect of overexpression of W protein on replication and transcription of NDV strain Komarov. Our data suggests that W protein does not play a significant role in the viral replication.

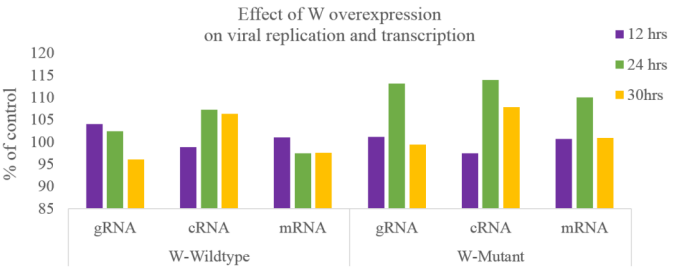

Fig.1. *Vero cells over expressing W protein (wild type and mutant) were infected with NDV strain Komarov. The viral genomic RNA, antigenomic RNA and mRNA were quantified by QPCR at different time points post infection.*

Antiviral activities of synthetic compounds against Newcastle disease virus

In collaboration with chemist, Prof. Elango from

Gandhigram Rural University, we are screening chemically synthesized compounds for antiviral activity against Newcastle disease virus by plaque reduction assay with aim to identify potent antiviral drug candidates.

Molecular epidemiology of Newcastle disease virus

We characterized seven ND viruses isolated (PDDSL-1 to-7) from vaccinated commercial poultry farms during severe disease outbreaks in Tamil Nadu, India. All the seven isolates were categorized as virulent by mean death time in embryonated chicken eggs. Their sequences carried the virulence signature of multi-basic amino acid residues in their fusion protein cleavage site (GenBank IDs: MF362982 to Mf362988). NDV strains are classified into two classes, I and II. The class II strains are further categorised into eighteen genotypes. NDV strains are designated into subgenotypes within genotypes based on their inter-population evolutionary distances. Genotype XIII viruses are currently prevalent in India. Till date four subgenotypes of genotype XIII viruses have been identified. Sub-genotype XIIIa is spread in Europe, Asia, Africa and the Middle East, sub-genotype XIIIb viruses have been documented in Asia, XIIIc viruses were isolated from eastern and north-eastern India and XIIId in Iran. Isolates PDDSL-1,-2 and -6 were closely related to certain XIIIb strains which was evident from the evolutionary distance and phylogenetic tree while isolates PDDSL-3,-4,-5 and -7 showed greater divergence from all the four subgenotypes of genotype XIII compelling their classification as a separate new subgenotype, XIIIe. The genetic divergence between the circulating virulent strains and the vaccine strains (genotype II) could possibly explain the disease outbreak in vaccinated flocks. Our data signifies the need to implement routine epidemiological surveillance and to revisit the current vaccination program.

Table 1. *Estimates of evolutionary divergence between subgenotypes of genotype XIII viruses.*

Subgenotypes of Genotype XIII	XIIIa	XIIIb	XIIIc	XIIId	XIIIe
XIIIa		0.016	0.021	0.013	0.023
XIIIb	0.104		0.022	0.010	0.013
XIIIc	0.137	0.153		0.021	0.026
XIIId	0.074	0.056	0.132		0.016
XIIIe	**0.135**	**0.076**	**0.159**	**0.082**	

Publications/Patents

Balaraman S, Saraswathy PV, **Subbiah M**, Elango KP. Synthesis and antiviral activity of sulfonohydrazide and 1,3,4-oxadiazole derivatives of 6,6-dimethyl-9-oxo-4,5,6,7,8,9-hexahydropyrazolo[5,1-b] quinazoline. **J Chem Res**. 2017; 41 (4), 221-224.

Balaraman S, Saraswathy PV, **Subbiah M**, Elango KP. Synthesis and antiviral activity of 4-(7,7-dimethyl-4-[4-{N-aroyl/benzyl}1- piperazinyl]-5,6,7,8-tetrahydroquinazolin-2-yl)morpholine derivatives. **Arkivoc 2017**; part iv: 353-364.

Balaraman S, Naveen G, **Subbiah M**, Elango KP. Synthesis and antiviral study of 4-(7,7-dimethyl-4-(piperazin-1-yl)- 5,6,7,8-tetrahydroquinazolin-2-yl) morpholine derivatives. **Med Chem Res**. 2018; 27(2): 512-519.

From left to right: Sunny Deval, B. Nagaraj Nayak, Madhuri Subbiah,Lakshmana Rao Pachineella, Devasmitha Dutta

Host pathogen interaction studies on animal parasites

Anand Srivastava

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Lab Technician
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Swasti Raychaudhuri	CCMB, Hyderabad
Rajkumara Erappa	IIT Hyderabad

My research group works on Ticks and Tick Borne diseases (TTBDs) that are responsible for the high economic losses, especially in developing countries like India. Our research interest is to understand the molecular interactions involved in host-parasite-vector cross talk. We utilise the tools of molecular biology, imaging, *in vitro* parasite culture techniques etc., for understanding the basic metabolic pathway to identify potential targets for the development of vaccine(s) and diagnostics especially for theileriosis. Currently we are working on the following projects: a) Curcumin as a therapeutic molecule for theileriosis, b) Immuno-informatics analysis to identify novel vaccine candidate and generation of multi-epitope based vaccine candidate against *Theileria annulata*, c) Elucidation of mechanism(s) of transformation of host cells by *Theileria annulata.*

Curcumin as a therapeutic molecule for theileriosis
Previously we showed that curcumin induces apoptosis and autophagy in the *Theileria* infected lymphocytes. Comparative transcriptomics of treated and non-treated cells further confirmed our observation.

Immuno-informatics analysis to identify novel vaccine candidate and generation of multi-epitope based vaccine candidate against *Theileria annulata*
Here, we used an immuno-informatics driven genome-wide screening strategy to identify vaccine targets containing important and effective dominant immunogens against *Theileria*. The proteome of *T. annulata* was screened for proteins with probability of plasma membrane localization or GPI anchor. The non-homologous proteins to host (bovine) were selected and their antigenicity was analyzed. A total

of nineteen linear epitopes in twelve proteins which are exposed in the extracellular space and have potential to induce protective antibodies were obtained. Additionally, CTL epitopes, peptides with 9-mer core sequence, were also identified, modelled and docked with bovine MHC-I structures. The CTL epitopes showing high binding energy with the bovine MHC-I were further engineered to form a multi-epitope vaccine candidate against *Theileria* (figure 2). The docking studies and molecular dynamics studies with multi-epitope vaccine candidate and modelled bovine TLR-4 showed strong binding energy which suggests that the complex is stable and multi-epitope vaccine candidate can be a potentially good candidate for vaccine development.

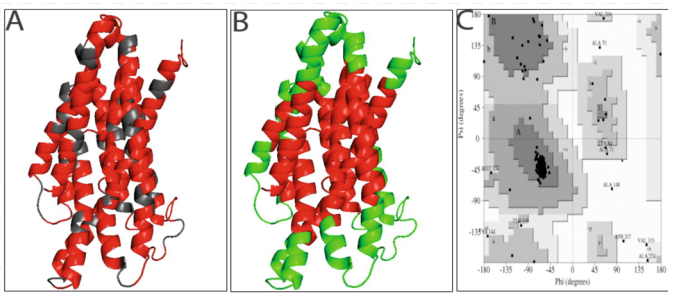

Fig.1. *Model of multi-epitope vaccine candidate: A. Multi-epitope vaccine candidate in red and linker in black, B. Predicted B-cell epitopes in multi-epitope vaccine candidate is shown in green, C. Ramachandran plot of multi-epitope vaccine candidate.*

Elucidation of mechanism(s) of transformation of host cells by *Theileria annulata*

Yeast two hybrid cDNA library of *T. annulata* infected Bovine lymphocytes was constructed. Further, bait plasmid (pGBKT7-TA04375) containing Ta-Prohibitin was prepared and its expression was analysed using anti-myc antibodies. Auto-activation and toxicity detection of TA04375 (bait) in yeast cells were also analysed. The cDNA library and bait were used for yeast two-hybrid screening. Six of these 30 colonies grew on QDO/X/A, indicating that they are likely to be positive hits (Figure 2). The validation of these interactions is in process.

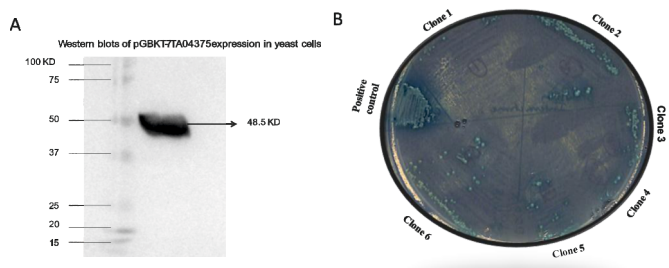

Fig.2. *A) Bait plasmid construction, western blot analysis of bait protein by c-myc antibodies, B) Screening of putative positive colonies in yeast two hybrid.*

From left to right: M. V. Shalu, Nagaraju Goud, Amit Sahu, Anand Srivastava, Vijay Macha, Prasanna Babu Araveti, Prajna Parimita Kar

Study of Virulence Mechanism and Host Pathogenesis during Intracellular Pathogens infections

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Vasundhra Bhandari	NIAB, Hyderabad
Anand Kumar	NTR College, Gannavaram, AP

Our Laboratory's research interest is focused on understanding mechanisms of pathogenesis behind major diseases using functional genomics and proteomics approaches. The main aims are to understand the genetic basis of variation in the host's response to pathogens and study the host pathogen interaction. Identifying the genes involved in immune response/host parasite interaction/disease resistance could lead to development of tools/strategies to reduce and control disease in livestock.

Identification of genetic and antigenic variations in Haemoprotozoan parasites causing Livestock Infections

Haemoprotozoan parasites like *Theileria, Anaplasma and Babesia* have a major impact on the health and productivity of the livestock especially crossbreed cattle. The current treatment and diagnostic techniques used for the parasite control have drawbacks and needs to be addressed for effective control of these parasites. The population diversity is one such issue which should be studied urgently; it will aid in understanding the population genetics of the parasite and can help in making strategies for parasite control.

In the current year, we have studied the population diversity of the *Theileria annulata* parasite using Microsatellite analysis for the samples collected from the disease endemic regions. The microsatellite analysis using the 10 microsatellite primers (5 micro and 5 mini Satellite markers) showed presence of heterogeneous population of the *T. annulata* parasite when compared to the current vaccine strain used in the field in India. Further studies are going on to calculate the degree of diversity and genetic differentiation between the parasites strains. The work is also going on to raise antibodies against the *T. annulata* recombinant proteins which will be used for making lateral flow based kit for antigen detection in the field.

Study of Host Parasite interactions to identify genes/proteins involved in disease pathogenesis during *T. annulata* infection

Bovine Theileriosis caused by *T. annulata* is a major parasite disease in cross breed animals. We have established Theileria infected bovine lymphocyte cell lines in our lab from the blood samples of infected animals. The current projects in our lab are focused on to identify the loci associated with the Theileriosis and virulence related genes for understanding the disease pathogenesis. For identification of the loci associated with the disease last year we have reported to identify 181 and 369 samples respectively into disease susceptible and tolerant groups using PCR and microscopy test. In this year we have designed and standardised a real-time PCR assay based on absolute quantification method for determining host to parasite ratio and parasitaemia in the 550 blood samples from suspected theileriosis cases. We determined the host-parasite ratios and parasitaemia (Fig.1) in the clinical samples which allowed us to screen our population for disease susceptibility and tolerant. We are next planning to do genotyping experiments using the two groups for identification of the loci. Further functional genomics studies are underway using the clinical cell lines to identify the host parasite genes involved in disease pathogenesis.

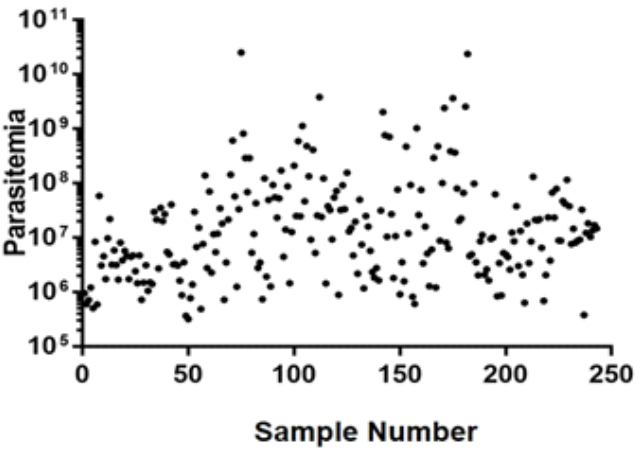


Fig.1. *Estimate of Parasitaemia in the clinical samples. Scatter plot representing the parasitaemia (T. annulata/ml of blood) in blood samples of clinical cases. Parasite load in blood samples of T. annulata infected cattle's were determined by absolute quantification based Real-time PCR.*

Identification of *S. aureus* Genes involved in disease pathogenesis during bovine mastitis in diary animals

The project is aimed at characterizing the bovine mastitis causing variable phenotypic strains of *S. aureus* in India specifically from Telangana, AP and TN states using genomic tools. The findings from the project will help in understanding of disease pathogenesis and therefore can be of great help to the livestock industry. Till now we have characterized total 81 strains of S. aureus isolated from the bovine mastitis suspected animals on the basis of biochemical and molecular tests. The strains were further subjected to SPA, MLST and AGR typing to understand the lineage of the strains. The virulenceprofiling and biofilm formation of all the strains was done to identify the virulent strains of the pathogen. The studies are underway to characterize and identify the determinants of the variable phenotypes of the strains.

Publications/Patents

Chakraborty S, Roy S, Mistry HU, Murthy S, George N, Bhandari V, **Sharma P**. Potential Sabotage of Host Cell Physiology by Apicomplexan Parasites for Their Survival Benefits. **Front Immunol**. 2017;8:1261.

Mahato S, Mistry HU, Chakraborty S, **Sharma P**, Saravanan R, Bhandari V. Identification of Variable Traits among the Methicillin Resistant and Sensitive Coagulase Negative Staphylococci in Milk Samples from Mastitic Cows in India. **Front Microbiol.** 2017;8:1446.

From left to right: Umarani Brahma, Shwetha Noori, Sonti Roy, Debabrata dandasena, Paresh Sharma

Role of CDK-related kinases (Crks) in transcription regulation in *Toxoplasma gondii*

Abhijit S. Deshmukh

Research Group

PhD Students
Ashok Kolagani
Poonam Kashyap

Project Fellows/RA/Trainee
Rajkumar Gurupwar

Collaborators

Arun Kumar Kota	University of Hyderabad
Pallabi Mitra	Hyderabad

Our laboratory is working towards understanding the unique cell cycle and transcription of *Toxoplasma gondii*, a parasite of medical and veterinary importance. Currently, we are examining the role of CDK-related kinases (Crks) in transcript maturation of T. gondii using wide array of approaches, including protein biochemistry, cell biology and genetics. The ongoing research would open up a relevant area for scrutiny in the parasite whereby Crks could be explored as possible targets to intervene parasite progression.

Role of *Toxoplasma gondii* CDK-related kinase 9 (TgCrk9) in transcription elongation

T. gondii, is an obligate intracellular protozoan parasite that infects most species of warm blooded animals, including human and can cause the disease Toxoplasmosis. The survival and propagation of the parasite greatly depends on changes of gene expression and their tight regulation during different life cycle stages indicating important role of transcription.

CDK-cyclin complexes have emerged as master regulators of major biological processes such as transcription, RNA processing and translation. Data mining has revealed limited repertoires of CDK-related kinases (Crks) and cyclins in Toxoplasma. Only ten Crks and seven atypical cyclins are encoded by the parasite. The lack of full repertoire of regulators indicates significant changes in the molecular machineries of the parasite. In eukaryotes, regulation of transcriptional elongation is carried out by Cdk9 in presence of cyclin regulatory partner cyclin T. While a Cdk9 homolog (TgCrk9) could be identified in *Toxoplasma*, an absence of a canonical cyclin T, posed an interesting question with respect to the mechanism of action of this Cdk homolog. Therefore, in this study we characterize TgCrk9, a prospective transcriptional kinase, and its potential cyclin partner with possible involvement in RNA polymerase II (RNAPII) mediated transcription elongation.

We show that TgCrk9 drives transcription elongation by RNAPII through phosphorylation of Rpb1-CTD at a conserved serine residue. We demonstrate that TgCrk9 is an active kinase and identify its regulatory

cyclin partner. Among all the potential cyclins tested (TgCycH, TgCycL and TgcycY), only TgCycL could combine with TgCrk9 and activate its kinase function (Fig. 1A-C). Interaction between TgCrk9 and TgCycL could be verified both in vitro and in vivo. The activated TgCrk9 was able to phosphorylate CTD of TgRpb1 (Fig. 1D). The CTD kinase activity of TgCrk9, mediated through a conserved serine 2 in the heptapeptide repeat of TgRpb1 was found to be inhibited by specific inhibitors, DRB and flavopiridol. This inhibition was observed at submicromolar (DRB) and subnanomolar (flavopiridol) concentrations that were considerably lower than the dosage required for inhibiting the mammalian counterpart. The chemical inactivation of TgCrk9 in the parasite leads to abrogation of RNAPII mediated transcription resulting in overall reduction in pre-mRNA. TgCrk9 inhibition on the whole affected the T. gondii progression with little or no effect on the host viability. Two threonines in T-loop of TgCrk9 appeared to be important for its activation. The activation of TgCrk9 could be achieved through either of the intact threonine residue displaying redundancy as well as functional flexibility (Fig. 1D). Cyclin independent activation of TgCrk9 by a TgCrk7 based CAK was observed. TgCAK action on TgCrk9 was possibly mediated through the T-loop threonines.

In summary, RNAPII dynamics in the parasite appears to be by and large conserved, however, our data has pointed out several peculiarities which possibly confer a certain level of flexibility and convenience to the parasite in leading a multistage, multifaceted complex life cycle spanning different host environments. Our study helps elucidate the significance of Cdk-cyclin signaling in RNAPII mediated transcription in this special class of eukaryotic parasite.

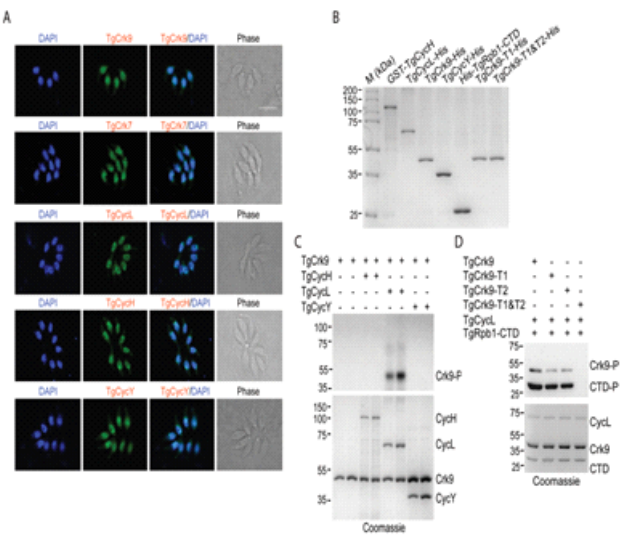


Fig.1. TgCrk9, an active parasite kinase (A) IFA images in tachyzoite stage show predominant nuclear localization of TgCrks (Crk9, Crk7) and TgCyclins (CycL, CycH and CycY). (B) Coomassie gel showing purified recombinant GST-TgCycH, TgCycL-His, TgCrk9-His, TgCycY-His, His-TgRpb1-CTD, TgCrk9-T1 (T250A), and TgCrk9-T1&T2 (T250A & T257A) used in the kinase assays. (C)TgCrk9 was autophosphorylated only in the presence of TgCycL suggesting TgCrk9 activation. TgCycH or TgCycY failed to activate TgCrk9. For each protein, effect of increasing concentration was tested. (D) Activated single point mutant of TgCrk9 displayed CTD kinase activity whereas double point mutant failed to do so, suggesting phosphorylation of at least one of the threonines in T-loop of TgCrk9 are required for its kinase activity.

Publication/Patents

Deshmukh AS, Mitra P, Kolagani A, Gurupwar R (2018) Cdk-related kinase 9 regulates RNA polymerase II mediated transcription in Toxoplasma gondii. ***BBA-Gene Regulatory Mechanisms.*** 2018.02.004 (in press).

From left to right: Kalyani Aswale, Poonam Kashyap, Abhijit S. Deshmukh, Rajkumar Gurupwar, Ashok Kolagani

Tuberculosis and other zoonotic diseases of livestock: Molecular pathogenesis, diagnosis and vaccines

Bappaditya Dey

Education and training

After graduating in Veterinary Sciences (B.V.Sc & A.H., 2002) from West Bengal University of Animal & Fishery Sciences, Kolkata Dr. Dey completed his masters in Animal Genetics and Breeding (MVSc, 2004) from CCS-Haryana Agricultural University, Hissar and subsequently, obtained his doctoral degree in Biochemistry (Ph.D, 2010) from University of Delhi, New Delhi. He continued his training in the same institute initially as a research associate and later as a Scientist-C until he moved to USA as a Post-doctoral Fellow at the Centre for Tuberculosis Research, Johns Hopkins University, Baltimore (Feb. 2011-May. 2016). Subsequently, he worked as a Senior Research Scientist at the National Emerging Infectious Disease Laboratories (NEIDL), Boston University, Boston, USA (till Apr. 2017). Dr. Dey joined NIAB on 4th December, 2017.

Research experience

Dr. Dey's experience spans various aspects of research in Tuberculosis (TB) including, molecular basis of TB pathogenesis: host-pathogen interaction, immunology of TB and vaccine development and animal models of TB, TB latency and reactivation. He developed several genetically engineered recombinant vaccines, some of which imparted heightened protection among the experimental TB vaccines studied till date.

His research on bacterial cyclic-di-nucleotide (CDN) second messengers signallinghas led to the elucidation of novel network of Cytoplasmic Surveillance Pathway (CSP) activation that promise to stimulate considerable future research into the consequences of signal transduction interference by intracellular bacterial pathogens and also into novel therapies that may target this newly characterized virulence mechanism.

Research interest at NIAB

1. Identification of immuno-genetic biomarkers of susceptibility and resistance to Bovine Tuberculosis in indigenous and crossbred cattle, which will led to the development of user friendly molecular diagnostic kit and vaccine against bovine TB with potential of reducing incidences of TB in cattle and zoonotic TB in human.

2. Development of a common point of care inexpensive easy to use molecular diagnostic platform for animal diseases using CRISPR-CAS technology.

3. Development of engineered probiotic based inexpensive live recombinant vaccines and therapies for infectious and nutritional diseases of animal.

Surveillance OF Antibiotic Susceptibility & Mechanism Of Antimicrobial Resistance

Vasundhra Bhandari, DST Inspire Faculty

Research Group

Project fellows/RA/Trainee
Sundarapu Naga Appalaraju (June 2017 to March 2018)

I am working on the global problem of Antimicrobial resistance (AMR) using One Health Approach. The main research interests are i) surveillance of antibiotic susceptibility in natural populations of pathogenic bacteria, ii) in-depth investigation on the underlying AMR mechanisms in the animal and human origin strains, iii) to understand the role of membrane genes in vancomycin resistance, and iv) to design pen side diagnostic tool.

To investigate the resistance mechanism of Oxacillin susceptible mecA positive *Staphylococcus aureus* (OS-MRSA): a new type of MRSA.

In our antibiotic susceptibility profiling we have identified isolates, which were mecA (oxacillin resistance determinant) positive and susceptible to oxacillin (MICs 0.25 µg/mL to1 µg/mL) and are referred as OS-MRSA isolates. We found these OS-MRSA isolates in both human and animal S. aureus infections.

Till date, very few studies have been done to understand the underlying mechanism of OS-MRSA strains.

Therefore, studies were undertaken to understand their mechanism. The Staphylococcal cassette chromosome (SCC) contains the mec operon located upstream regulating transcription of the mecA gene. The expression of the *mecA* gene is also regulated by b-lactamase (bla) system which is similar to the mec system. These regulatory system (MecI/MecR1 or BlaI/BlaR1) sense the presence of the drug oxacillin resulting in activation and increased expression of the mecA gene. In our OS-MRSA isolates (SA1 to SA4, n=4), induction with lower concentration of oxacillin, resulted in their conversion to MRSA phenotype and showed up to 1000 fold increase in their MIC (Fig 1A). There was also an increased expression of the mecA gene in the induced cultures (Fig 1B). Further, we have also investigated the role of *bla* gene regulatory components {BlaI (repressor) and BlaR1 (inducer)} in the OS-MRSA phenotype. We found increased expression of *BlaR1* and decreased expression of *BlaI* in 3 out of 4 isolates over a period of 4 days of oxacillin induction (Fig.2). However, in SA3 isolate, we found contrasting expression profiles indicating different resistance mechanism operative in the clinical isolates. Further, in-depth studies with help of functional genomics studies for better understanding the OS-MRSA mechanism will be performed.

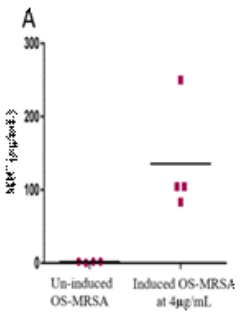


Fig.1.A. *Increase in oxacillin MIC after drug induction determined using micro-broth dilution assay*

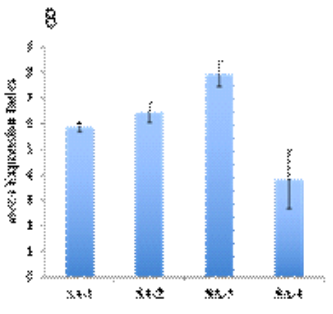


Fig.1B. *Increased expression of the mecA gene after oxacillin induction determined by real-time PCR*

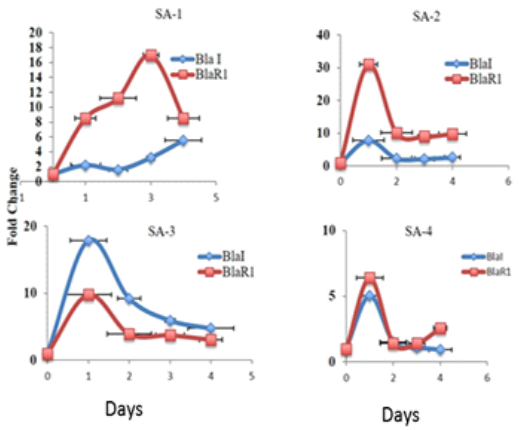


Fig.2. *mRNA expression profiling of BlaI and BlaR1 genes in the OS-MRSA isolates (n=4) during continuous passaging in presence of oxacillin (0.5 µg/ml to 4 µg/ml) for 5 days*

Characterization of vancomycin resistant *Staphylococcus aureus.*

Vancomycin is considered last treatment option for MRSA infections. Vancomycin resistant *S. aureus* (VRSA) have been reported across the globe. Major studies on VRSA strains have showed thick cell wall as a characteristic feature. Therefore, our aim is to understand the phenotypic changes due to emergence of vancomycin resistance and their molecular mechanism especially role of membrane biogenesis enzymes (transglycosylases and transpeptidases) in resistance.

Our vancomycin screening did not revealed any VRSA strains (vancomycin MIC>8µg/ml), however, borderline sensitive isolates (RVS) with MIC of ≤2µg/ml was found). We observed a thick cell wall of RVS strain as compared to sensitive strain. Therefore,We are now targeting the membrane transglycosylases involved in peptidoglycan biosynthesis to see their effect on vancomycin resistant. Four transglycosylases have been found in *S. aureus* isolate, we are planning to compare the gene expression of those transglycosylases in sensitive and RVS isolate. Vancomycin susceptibility profiling will be continued in order to identify clinical isolate of VRSA.

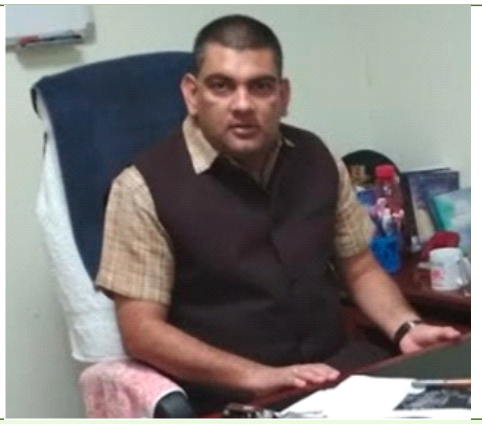
Publication/Patents

Mahato S, Mistry HU, Chakraborty S, Sharma P, Saravanan R, **Bhandari V.** Identification of Variable Traits among the Methicillin Resistant and Sensitive Coagulase Negative Staphylococci in Milk Samples from Mastitic Cows in India. **Front Microbiol.** 2017; 8:1446.

Chakraborty S, Roy S, Mistry HU, Murthy S, George N, **Bhandari V*** and Sharma P*(senior authors). Potential Sabotage of Host Cell Physiology by Apicomplexan Parasites for Their Survival Benefits. **Front. Immunol.** 2017: 8:1261.

Research Reports

C. Bioinformatics & Genomics



Bioinformatics, Genomics, Protein structure and sequences

Shailesh Sharma

Collaborators

J P Pandey	Central Tasar Research and Training Institute, Ranchi
B. Senthilkumaran	University of Hyderabad

Our team's research experience span bioinformatics and structural biology, including application of data mining, application of bioinformatics tools, computational biology, and structure-activity relationships. Present work includes (a) investigations into structural, functional and dynamic properties of proteins. (b) genome annotation, protein structure, target identification, and molecular dynamics simulations.

Tropical tasar silkworm, Antheraea mylitta is widespread and distributed in various geographical areas of India as 'Ecoraces'. The cocoons of this insect have very high content of silk which is known to be the largest among all the other known non-mulberry silk producing insects. Tasar silk industry provides livelihood to poor tribal women population of India by means of employment.

Unravel the molecular mechanism behind the voltinism, fecundity, disease susceptibility, cocoon quality and quantity is essential to increase the production of tasar silk. Since Daba ecorace of A. mylitta is often exploited for commercial tasar silk production, the present project funded by DBT has been proposed to sequence the complete genome and annotate the genes responsible for different qualitative and quantitative traits of Daba-ecorace. The whole genome sequence would be used as a reference sequence to analyse the genetic variation between the ecoraces. In addition, annotated genes information from the transcript sequence would be used to study the gene expression pattern and for induction and regulation of genes related to qualitative and quantitative characters to enhance the productivity of tasar silk.

Analysing sequence data for marker discovery and comparative genomics

Sarwar Azam

Collaborators

Subeer S. Majumdar	NIAB, Hyderabad
S. Dayananada	University of Hyderabad
Satya pal Arya	NIAB, Hyderabad
Syed Faisal	NIAB, Hyderabad
Paresh Sharma	NIAB, Hyderabad

The research includes analysing sequence data for genome annotation, gene expression, identifying single nucleotide morphism (SNPs), comparative genomics, phylogenomics and other evolutionary analysis. Lab has also been interested in developing easy to use bioinformatics tools and pipeline to facilitate genomic studies.

Genomics for conservation of indigenous cattle breeds and for enhancing milk yield

In this project, we plan to use cutting edge technologies such as Next Generation Sequencing (NGS), array based genotyping etc. to decipher genetic makeup which would help in breed conservation and implementing Genomic Selection (GS) to increase the milk yield. We will develop a SNP chip, a database and a machine learning tool. SNP chip together with machine learning tool, will help in identifying pure line of a breed or evaluate the level of crossbreeding in an individual. The project encompassing genomics for the conservation of indigenous breeds. Genomic data can be used for trait improvement such as milk yield.

More than 170 blood samples from 4 milch breeds (Gir, Sahiwal, Red Sindhi and Kankrej) were collected from different parts of the country and will be subjected for whole genome sequencing. Blood samples from other breeds of indigenous cattle will be collected to generate sequencing data for idenfication of breed signature.

Exploring Leptospira genomes for phylogenetic analysis and vaccine candidate selection

With advent of next generation sequencing technology, large number of leptospira genomes have been sequenced and deposited in public domain. At the time of starting the analysis, we downloaded 477 genome sequences from PATRIC database. These 477 genomes have been submitted from 41 countries. Maximum number of sequenced genome has been isolated from Brazil, followed by China and USA.

After initial data pre-processing and curation, 69 genomes were removed from further analysis. This genome represented as outliers may be due to sequencing bias, incomplete genome assembly or annotation. Finally, curated set of 409 genome represented 12 species of *Leptospira* were considered for further study. Most of the genome sequences (185) belong to *Leptospira interrogans*

excluding 92 unidentified strains which are largely belong to *L. interrogans*. In fact, *L. interrogans* data include 27 serogroup of which 97 genomes belong to *L. interogans* copenhageni.

Further, we analysed Leptospira species for core genome analysis. Largest core genome was of *L. pyrogenes* species consisting 4318 genes. The core genomes were further analysed for secretory proteins and outer membrane proteins. Selection of immunogenic protein for vaccine candidate is underway.

Characterization of Organophosphates (OP) compound degrading bacteria *Sphingobium fuliginis*

Orgnaophosphsate (OP) compounds are highly persistent and toxic nature. are causing bio-magnification, effect toxically on different forms of life. Sphingobium fuliginis is one of the OP degrading bacteria, has been sequenced to characterize its genomic structure and its plasmids sequences. Last year, we reported that the bacteria have been sequenced using SMPRT technology and assembled with Canu assembler. The two chromosomes of S. fuliginis harbour 5100 protein coding genes, 9 rRNA and 55 tRNA genes. Different genomic structure and its arrangement have been summarized in figure 1. We further analysed the genome for COG pathways and phylogenetic analysis with different species of Sphingobium. Further analysis to mine genes involved in OP compound and other aromatic compound degradation are underway.

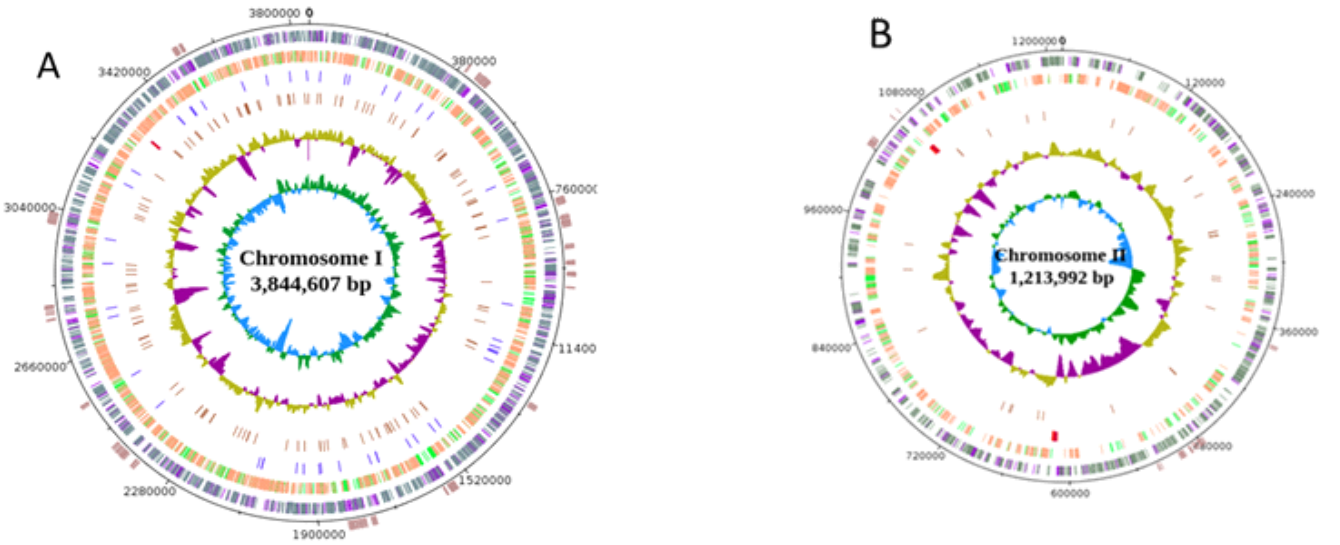


Fig.1. *Circular maps of S. fuliginis genome: (A&B) Circles 1 and 2 (from exterior to interior) represent CDS on forward (slate grey for annotated, violet for hypothetical) and reverse strands (orange annotated, green-hypothetical); circles 3 and 4 show RNA genes (blue for tRNA, red for rRNA); and VNTRS (Sienna). The GC content (olive for positive and purple for negative) and GC skew (green for positive and red for negative) are shown in 5 and 6. The brown blocks shown above circle 1 represent genomic islands.*

It is mainly present in pesticide and insecticide which

Publications

1. Sen Sharma S, **Majumdar SS**. Transcriptional co-activator YAP regulates cAMP signaling in Sertoli cells. **Mol Cell Endocrinol**. 2017; 450:64-73.

2. Mandal K, Bader SL, Kumar P, Malakar D, Campbell DS, Pradhan BS, Sarkar RK, Wadhwa N, Sensharma S, Jain V, Moritz RL, **Majumdar SS**. An integrated transcriptomics-guided genome-wide promoter analysis and next-generation proteomics approach to mine factor(s) regulating cellular differentiation. **DNA Res**. 2017; 24(2):143-157.

3. Godbole G*, **Suman P***, Malik A*, Galvankar M, Joshi N, Fazleabas A, Gupta SK, Modi D. Decrease in Expression of HOXA10 in the Decidua After Embryo Implantation Promotes Trophoblast Invasion. **Endocrinology**. 2017;158(8):2618-2633. (* Equal first author)

4. Jakka P, Namani S, Murugan S, Rai N, **Radhakrishnan G**. The Brucella effector protein TcpB induces degradation of inflammatory caspases and thereby subverts non-canonical inflammasome activation in macrophages. **J Biol Chem.** 2017;292(50):20613-20627.

5. Bulugonda RK, Kumar KA, Gangappa D, Beeda H, Philip GH, Muralidhara Rao D, **Faisal SM**. Mangiferin from Pueraria tuberosa reduces inflammation via inactivation of NLRP3 inflammasome. **Sci Rep.** 2017;7:42683.

6. Baig MS, Liu D, Muthu K, Roy A, Saqib U, Naim A, **Faisal SM**, Srivastava M, Saluja R. Heterotrimeric complex of p38 MAPK, PKCδ, and TIRAP is required for AP1 mediated inflammatory response. **Int Immunopharmacol**. 2017;48:211-218.

7. Balaraman S, Saraswathy PV, **Subbiah M**, Elango KP. Synthesis and antiviral activity of sulfonohydrazide and 1,3,4-oxadiazole derivatives of 6,6-dimethyl-9-oxo-4,5,6,7,8,9-hexahydropyrazolo[5,1-b] quinazoline. **J Chem Res**. 2017; 41 (4), 221-224.

8. Chakraborty S, Roy S, Mistry HU, Murthy S, George N, Bhandari V, **Sharma P**. Potential Sabotage of Host Cell Physiology by Apicomplexan Parasites for Their Survival Benefits. **Front Immunol**. 2017; 8:1261.

9. Mahato S, Mistry HU, Chakraborty S, **Sharma P,** Saravanan R, Bhandari V. Identification of Variable Traits among the Methicillin Resistant and Sensitive Coagulase Negative Staphylococci in Milk Samples from Mastitic Cows in India. **Front Microbiol**. 2017;8:1446.

10. Balaraman S, Saraswathy PV, **Subbiah M**, Elango KP. Synthesis and antiviral activity of 4-(7,7-dimethyl-4-[4-{N-aroyl/benzyl}1- piperazinyl]-5,6,7,8-tetrahydroquinazolin-2-yl)morpholine derivatives. **Arkivoc** 2017; part iv: 353-364.

11. Shukla M, Ganguli N, Sen Sharma S, **Majumdar SS**. Sertoli cell specific decline in NOR-1 leads to germ cell apoptosis and reduced fertility. **J Cell Biochem**. 2018; 119(8):6514-6526.

12. Basu S, Arya SP, Usmani A, Pradhan BS, Sarkar RK, Ganguli N, Shukla M, Mandal K, Singh S, Sarda K, **Majumdar SS**. Defective Wnt3 expression by testicular Sertoli cells compromise male fertility. **Cell Tissue Res**. 2018; 371(2):351-363.

13. Prabhu KN, Isloor S, Veeresh BH, Rathnamma D, Sharada R, Das LJ, Satyanarayana ML, **Hegde NR**, Rahman SA. Application and Comparative Evaluation of Fluorescent Antibody, Immunohistochemistry and Reverse Transcription Polymerase Chain Reaction Tests for the Detection of Rabies Virus Antigen or Nucleic Acid in Brain Samples of Animals Suspected of Rabies in India. Vet Sci. 2018;5(1). pii: E24.

14. **Hegde NR**, Gauthami S, Sampath Kumar HM, Bayry J. The use of databases, data mining and immunoinformatics in vaccinology: where are we? **Expert Opin Drug Discov**. 2018;13(2):117-130.

15. Jakka P, Bhargavi B, Namani S, Murugan S, Splitter G, **Radhakrishnan G**. Cytoplasmic Linker Protein CLIP170 Negatively Regulates TLR4 Signaling by Targeting the TLR Adaptor Protein TIRAP. **J Immunol**. 2018;200(2):704-714.

16. Balaraman S, Naveen G, **Subbiah M**, Elango KP. Synthesis and antiviral study of 4-(7,7-dimethyl-4-(piperazin-1-yl)- 5,6,7,8-tetrahydroquinazolin-2-yl) morpholine derivatives. **Med Chem Res**. 2018; 27(2): 512-519.

17. **Deshmukh AS**, Mitra P, Kolagani A, Gurupwar R. Cdk-related kinase 9 regulates RNA polymerase II mediated transcription in Toxoplasma gondii. **Biochim Biophys Acta Gene Regul Mech**. 2018; 1861(6):572-585.


MoU's

MEMORANDUM OF UNDERSTANDING

The details of MoU signed during the period from April 1,2017 - March 31, 2018 by NIAB are given below:

SL. NO.	MOU WITH	DATE OF SIGNING
01.	DST and Chemveda Life Sciences, Hyderabad	18.05.2017

MoU signed between NIAB & DST and Chemveda Life Sciences, Hyderabad

DISTINGUISHED VISITORS AND LECTURES

SL. NO.	Visitor	Title of Lecture	DATE
01	**Dr. Bappaditya Dey** National Emerging Infectious Diseases Laboratory, Dept. of Medicine, Boston University School of Medicine, USA	Tuberculosis in Humans and Animals: are we a threat to each other	25.04.2017
02	**Dr. Karel A. Schat** Professor Emeritus Department of Microbiology and Immunology College of Veterinary Medicine, Cornell University, USA	Circo-, cyclo-, and anelloviruses: a confusing complex. Lessons from chicken anemia virus	30.05.2017
03	**Dr. CG Joshi** Professor (Animal Biotechnology), College of Veterinary Science, Anand Agricultural University, Anand, Gujarat	Rumen Metagenomics	27.06.2017
04	**Prof. John Hickey** Chair of Animal Breeding, The Roslin Institute, University of Edinburgh, UK	Next Generation Animal Breeding	1.8.2017
05	**Dr. Vishvanath Nene** Program Director for Vaccine Biosciences, ILRI, Kenya	Focusing bovine antibody and cell mediated immune responses to vaccine antigens	6.10.2017
06	**Dr. RK Singh** Director, Indian Veterinary Research Institute (IVRI), Bareiley	Evolution of Veterinary Biologicals in India	4.11.2017
07	**Dr. Daniela Ceccarelli** National Reference Laboratory for Antibiotic Resistance in Animals, Wageningen Bioveterinary Research, Netherlands	Wageningen Bioveterinary Research: Antibiotic Resistance, Zoonoses and Much More	21.11.2017
08	**Prof. ML Madan** Former DDG, ICAR & Former VC, Deendayal Upadhaya University of Veterinary Science, Mathura	Challences in Animal Biotechnology-Concepts and Programs	10.01.2018

SL. NO.	Visitor	Title of Lecture	DATE
09	**Prof. Gerald P. Schatten** Director, Pittsburg Development Center, USA	Frontiers in stem cell and regeneration: 21st century implications" at NIAB, Hyderabad.	30.01.2018
10	**Dr. Ravinder Anand-Ivell** Associate professor, Department of Endocrinology and reproductive Physiology, University of Nottingham, UK	The emerging role of Neohormones in livestock animals	21.02.2018
11	**Prof. Suresh S. Honnappagol** Animal Husbandry Commissioner, GoI	Initiatives under Rashtriya Gokul Mission (RGM) And National Mission for Bovine Productivity (NMBP)	03.03.2018

Distinguished Visitors and lectures

Distinguished lecture by Dr. Samuel Oyola & Dr. Vishvanath Nene from ILRI on October 6, 2017.

Distinguished lecture by Dr. RK Singh, Director IVRI, on November 4, 2017.

Distinguished lecture by Dr. Daniela Ceccarelli from Wageningen BR, Netherlands on November 21, 2017

India International Science Festival 2017

Mr. Shashikant Gawai, Technical Officer, NIAB attended the India International Science Festival 2017 held at Chennai on behalf of NIAB, Hyderabad, and displayed posters from all the Autonomous Institutes of DBT in the DBT stall. With Hon'ble Minister of Science and Technology, Dr. Harsh Vardhan and with Dr. Renu Swaroop, from DBT.

International Conference on Molecular Signalling (ICMS-2018)

6th International Conference on Molecular Signalling (ICMS 2018) was jointly organised by University of Hyderabad and National Institute of Animal Biotechnology (NIAB) from February 8-10, 2018.

Symposium on Thrust areas of relevance to livestock research at NIAB, held on March 27-28, 2018. Director NIAB with Dr. R K Singh, Director, IVRI and Dr. C.G. Joshi, Anand Agriculture University, Delivering a talk.

NIAB Outreach Activities

Meeting of Indian Livestock-farmers and Agriculturists and NIAB scientists (MILAN)

To direct the research activities in "need-oriented" manner so as to address the requirement of livestock farmers, NIAB has launched outreach programme named as **MILAN** (Meeting of Indian livestock-farmers and Agriculturist with NIAB scientists). The aim of the MILAN is to reach out to farmers in the field and list out the priorities in terms of product and technology development which will be of their direct benefit and need. Field veterinarians are also involved in this interaction to get first hand information so that NIAB can attempt to address the necessities for promoting animal health and production at village level, specially to help marginal farmer.

Under this programme, two interactive workshops were held at Sambalpur (Orissa) and Allahabad in 2017-18.More meetings under MILAN are planned in various parts of the country in next year.

MILAN at Sambalpur, Odisha on February 5, 2018

Salient features of the meeting :

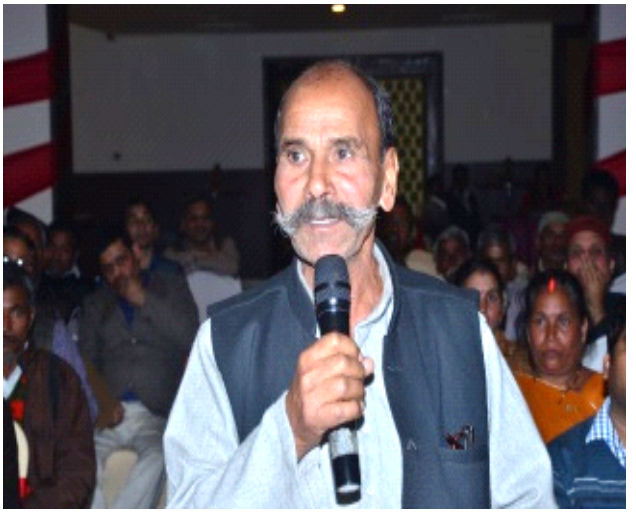
Attended by 45 farmers from Lipinda, Gosala, Hatibari and Padiabahal area and 20 veterinarians and University students.

Discussions were initiated by Dr. Suresh B. Gokhale (NIAB), Dr. P. K. Ray (Director CCBF, Chiplima), Dr. Naveen Mishra (Chief District Veterinary officer, Sambalpur), Dr. Pankaj Suman (NIAB), Mr. Sarwar Azam (NIAB) and Dr. Manoj Srivastava (BAIF).

Farmers raised the questions about their problems associated with infertility, feed insufficiency and quality, maintaining the productivity of farm animals in changing climatic conditions, conservation of indigenous breed of animals, availability of vaccines and diagnostics etc.

MILAN at Allahabad, Uttar Pradesh on February 13, 2018






Attended by 47 farmers from Pratapgarh, Amethi, Bithalpur, Dandupur, Saraisultani, Rajapur, Malakchaturi, Tilwar, Saidabad areas, 9 field veterinary officers and 12 veterinary students.

Discussions were initiated by Dr. Suresh B. Gokhale (NIAB), Dr. Sadik Ali (Addl. Director, Animal Husbandry), Dr. Vinod Verma (Allahabad University) and Dr. Badrinarayan (Director, G.B Pant Institute of Social Science), Dr. Pankaj Suman (NIAB), Mr. Sarwar Azam (NIAB) and Dr. Ravi Jadhav (BAIF) .

Farmers raised the questions about their problems associated with reduction in milk yield, repeat breeding, uterine infection, anestrous, mineral deficiency, artificial insemination, infertility, feed insufficiency and quality, maintaining the productivity of farm animals in changing climatic conditions, suitability of local breed for better milk production, availability of vaccines and diagnostics.

Bridge Programme

Bridge programme was initiated in order to connect, NIAB scientists with national educational needs of schools and colleges. The aim is to generate excitement towards science in young minds. Lectures and practicals are conducted in various higher secondary schools. In addition, school and college students frequently visit NIAB so as to have a exposure of research scenario in biotechnology.

NIAB faculty delivering lectures at different schools

Bridge Programme

Students visit to NIAB, Hyderabad from different colleges under bridge programme

IMPLEMENTATION OF THE RIGHT TO INFORMATION (RTI) ACT, 2005

Appellate Authority : Dr Girish K Radhakrishnan
Central Public Information Officer : Mr. Harjit Singh
Details about the RTI applications and appeals received in NIAB

As received under RTI Act 2005	Opening Balance as on 01.04.2017	Received during the year 2017-18			Disposed of during the year 2017-18				
		Received directly	Received as transfer from other Public Authorities [u/s 6(3) of Act]	Total	Decisions where applications accepted/ appeals upheld	Decisions where applications /appeals rejected	Transferred to other Public Authorities [u/s 6(3) of Act]	Total	Closing Balance as on 31-03-2018
Applications	0	12	08	20	20	0	0	20	0
Appeals	0	01	Not applicable	01	01	0	Not applicable	01	0

IMPORTANT EVENTS

SL. NO.	Event	DATE
01	MoU signed between NIAB & DST-Chemveda	18-05-2017
02	Technical Help and Education Programme for Flow Cytometry was organized at NIAB	15-05-2017 to 16-05-2017
03	First CAG audit was held from 18.05 to 07.06.2017 in the NIAB	18-05-2017 to 07-06-2017
04	3rd Complaint Committee Meeting for prevention and prohibition of Sexual Harassment of Women at Workplace at NIAB, Hyderabad	22-05-2017
05	NIAB's IBSC meeting at NIAB, Hyderabad	09-06-2017
06	Meeting of Building Committee of NIAB	14-07-2017
07	Meeting of Governing Body and finance Committee of NIAB	25-07-2017
08	Meeting of Scientific Advisory Committee of NIAB	31-07-2017
09	Visit of Dr. H Rahman to NIAB to discuss about the NIAB project	22-08-2017
10	Visit of Drs. Suresh Gokhale and Jayant khadse from BAIF,Pune to NIAB to discuss about the NIAB project on Livestock Genomics	04-09-2017
11	Dr. Vishvanath Nene, Program Director for Vaccine Biosciences, and Dr. Samuel Oyola from Immunogeneticist,ILRI, Kenya, visited NIAB	06-10-2017
12	A team of scientists from Telangana State – Veterinary Biologicals Research Institute (TS-VBRI), headed by Dr. Krishnamohan, Deputy Director – VBRI, visited NIAB on October 10, 2017 for an interaction with NIAB scientists	10-10-2017
13	Mr. Shashikanth, Technical Officer, NIAB attended the India International Science Festival 2017 held at Chennai on behalf of NIAB, Hyderabad, and displayed posters from the Autonomous Institutes of DBT in the DBT stall	13-10-2017 to 16-10-2017
14	Mr. Prabir Mitra, HOD, NIC-DBT, visited NIAB on October 24, 2017 to initiate digital activities and review the infrastructure requirements at NIAB main campus as per the Government of India guidelines and gave a lecture at NIAB auditorium	24-10-2017
15	Integrity Pledge was undertaken by NIAB staff and students in the NIAB Auditorium as a part of Vigilance Awareness Week observed from October 30 to November 4, 2017.	30-10-2017

SL. NO.	Event	DATE
16	Mr. CH Srinivasa Rao, Former Controller of Administration,NGRI, and Former Dy. Secretary, CSIR, delivered a lecture on vigilance in the NIAB Auditorium as a part of Vigilance Awareness Week observed from October 30 to November 4, 2017	02-11-2017
17	Mr. Amitabh Mishra, Senior Manager (Biotechnology), National Research Development Corporation (NRDC), New Delhi, visited NIAB, and interacted with the staff and faculty on the role of NRDC in the development of products and patent applications	06-12-2017
18	Annual General Meeting of NIAB	11-12-2017
19	Organization of meeting of the farmers, field veterinarians and experts with NIAB scientists (MILAN-2017-18) at Sambalpur, Orissa	05-02-2018
20	Prof Tony M. Plant, Emeritus professor, Department of Obstetrics, Gynecology and Reproductive Sciences, University of Pittsburgh, Pennsylvania, USA interacted with students at NIAB, Hyderabad	07-02-2018
21	Co-organization of the International conference on Molecular Signalling (ICMS) with University of Hyderabad, Hyderabad at School of Life Sciences Hyderabad	08-02-2018 to 10-02-2018
22	Organization of meeting of the farmers, field veterinarians and experts with NIAB scientists (MILAN-2017-18) at Allahabad, Uttar Pradesh	13-02-2018
23	4th Complaint Committee meeting for Prevention and Prohibition of Sexual Harassment of Women at Workplace and lecture by Smt. Sreelekha, Legal Expert at NIAB, Hyderabad	22-02-2018
24	NIAB Scientists participated in BioAsia-2018	22-02-2018 to 24-02-2018
25	Students from different schools visited NIAB to participate in the National Science Day celebrations (painting and quiz held at NIAB)	28-02-2018
26	National Symposium on thrust areas of relevance to livestock research was held at NIAB, Hyderabad	27-03-2018 & 28-03-2018

ORGANISATIONAL STRUCTURE OF NIAB

NIAB SOCIETY

Dr. Harsh Vardhan Hon'ble Minister of S & T and Earth Sciences	President
Prof. K Vijay Raghavan Secretary, DBT, New Delhi	Member
Shri C P Goyal Joint Secretary, DBT, New Delhi	Member
Ms. Gargi Kaul **JS & Financial Advisor,** DBT, New Delhi	Member
Dr. A K Rawat Director, DBT, New Delhi	Member
Dr. Trilochan Mohapatra Secretary, DARE, New Delhi	Member
Prof. Suresh S Honnappagol Commissioner, AH, New Delhi	Member
Prof. Appa Rao Podile Vice Chancellor,UOH, Hyderabad	Member
Dr. V A Srinivasan Advisor, NDDB, Hyderabad	Member
Dr. S K Bandyopadhyay Member, ASRB, New Delhi	Member
Dr. Shahid Jameel Welcome Trust, Hyderabad	Member
Dr. R N K Bamezai JNU, New Delhi	Member
Dr. A K Srivastava NDRI, Karnal	Member
Dr. KT Sampath, Ex-Director, NIANP, Bengaluru	Member

Dr. (Ms) Anuradha Acharya Oscimum Bio Solutions, Hyderabad	Member
Dr. Suresh Poosala BMS Preclinical R&D, Bengaluru	Member
Dr. Nagendra R Hegde Scientist-G, NIAB, Hyderabad	Member
Dr. Subeer S. Majumdar Director, NIAB, Hyderabad	Member Secretary

NIAB GOVERNING BODY

Prof. K Vijay Raghavan Secretary, DBT, New Delhi	Chairman
Shri C P Goyal Joint Secretary, DBT, New Delhi	Member
Ms. Gargi Kaul **Joint Secretary & Financial Advisor,** DBT, New Delhi	Member
Dr. A K Rawat Director, DBT, New Delhi	Member
Dr. Trilochan Mohapatra Secretary, DARE, New Delhi	Member
Prof. Suresh S Honnappagol Commissioner, AH, New Delhi	Member
Prof. Appa Rao Podile Vice Chancellor, UOH, Hyderabad	Member
Dr. V A Srinivasan Advisor, NDDB, Hyderabad	Member
Dr. SK Bandyopadhyay Member, ASRB, New Delhi	Member

Dr. Shahid Jameel Welcome Trust, Hyderabad	Member
Dr. R N K Bamezai JNU, New Delhi	Member
Dr. A K Srivastava NDRI, Karnal	Member
Dr. K T Sampath, Ex-Director, NIANP, Bengaluru	Member
Dr. (Ms) Anuradha Acharya Oscimum Bio Solutions, Hyderabad	Member
Dr. Suresh Poosala BMS Preclinical R&D, Bengaluru	Member
Dr. Nagendra R Hegde Scientist-G, NIAB, Hyderabad	Member
Dr. Subeer S Majumdar Director, NIAB, Hyderabad	Member Secretary

NIAB SCIENTIFIC ADVISORY COMMITTEE (SAC)

Dr. Lalji Singh Ex-Director, CCMB & Ex- VC, BHU	Chairman
Dr. A K Rawat Director DBT, New Delhi	Member
Deputy Director General (Animal Science) Division of Animal Science, ICAR, New Delhi	Member
Prof. John Hickey Roslin Institute, U.K	Member
Prof. Ramaswamy S C-CAMP, Bengaluru	Member
Dr. S N Singh Biovet, Bengaluru	Member

Prof. R Medhamurthy IISC, Bengaluru	Member
Mr Deepak Kapur Indovax, Gurgaon	Member
Prof. G Dhinakar Raj TANUVAS, Chennai	Member
Dr. B P Mishra IVRI, Izatnagar	Member
Dr. Subeer S Majumdar Director, NIAB, Hyderabad	Member Secretary

NIAB FINANCE COMMITTEE (FC)

Prof. K Vijay Raghavan Secretary, DBT, New Delhi	Chairman
Ms. Gargi Kaul **Joint Secretary& Financial Advisor,** DBT, New Delhi	Member
Dr. A K Rawat Director, DBT, New Delhi	Member
Dr. J Gowrishankar CDFD, Hyderabad	Member
Dr. Durgadas P Kasbekar CDFD, Hyderabad	Member
Prof. Appa Rao Podile Vice Chancellor, UOH, Hyderabad	Member
Dr. A K Srivastava NDRI, Karnal	Member
Dr. (Ms) Anuradha Acharya Oscimum Bio Solutions, Hyderabad	Member
Dr. Subeer S Majumdar Director, NIAB, Hyderabad	Member Secretary

NIAB BUILDING COMMITTEE (BC)

Dr. J Gowrishankar Former Director, CDFD, Hyderabad	Chairman
Dr. A K Rawat Director, DBT, New Delhi	Member
Shri Roshan Lal Dy Secretary, DBT, New Delhi	Member
Shri B L N Reddy Superintending Engineer, HMDA, Hyderabad	Member
Dr. G Sundararajan Director, International Advanced Research Centre for Powder Metallurgy and New Materials(ARCI), Hyderabad	Member
Dr. Subeer S Majumdar Director, NIAB, Hyderabad	Member
Shri S Ayub Basha Staff Scientist-V, UoH, Hyderabad	Member
Shri Harjit Singh Senior Manager, (Admin & Finance) NIAB, Hyderabad	Member Convenor

COMPLAINTS COMMITTEE FOR THE PREVENTION AND PROHIBITION OF SEXUAL HARASSMENT

The following internal complaints committee has been constituted for the prevention and prohibition of sexual harassment in accordance with Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act 2013:

Dr. Madhuri Subbiah, Scientist	-	Chairperson
Smt. M Sreelekha, Legal Expert	-	Member
Shri. Harjit Singh, Senior Manager (Admin & Fin.)	-	Member
Shri. Santosh Mhadeshwar, Manager S&P	-	Member
Ms. S V Dilna, Technical Officer	-	Member
Ms. Krishna Priya, PA to Director	-	Member Secretary

NIAB Staff

Scientific Staff

S.No	NAME	DESIGNATION
1	Dr. Subeer S. Majumdar	Director
2	Dr. Nagendra R. Hegde	Scientist-G
3	Dr. Girish K Radhakrishnan	Scientist-E
4	Dr. Bappaditya Dey	Scientist-E
5	Dr. H.B.D Prasada Rao	Scientist-E
6	Dr. Madhuri Subbiah	Scientist-D
7	Dr. Anand Srivastava	Scientist-D
8	Dr. Paresh Sharma	Scientist-D
9	Dr. Shailesh Sharma	Scientist-D
10	Dr. Syed Mohd Faisal	Scientist-D
11	Dr. Abhijit S Deshmukh	Scientist-C
12	Dr. Nirmalya Ganguli	Scientist-C
13	Dr. Pankaj Suman	Scientist-C
14	Mr. Sarwar Azam	Scientist-C
15	Dr. Satyapal Arya	Scientist-B
16	Dr. Vasundhra Bhandari	DST Inspire Faculty
17	Mr. Nagarjuna. V	Scientist-B (on contractual basis)

Technical Staff

S.No	NAME	DESIGNATION
1	G. Rama Devi	Technical Officer
2	Shashikant Dasharath Gawai	Technical Officer
3	A. Hari Krishna	Technical Officer
4	P. Praveen Kumar	Technical Officer
5	Dilna S.V.	Technical Officer
6	Kapil Kumar	Technical Officer

Administrative and Support Staff

S.No	NAME	DESIGNATION
1	Harjit Singh	Senior Manager (Admin & Finance)
2	I. Jagadeesh	Manager (Office & Finance)
3	Santosh Namdeo Mhadeshwar	Manager (Stores & Purchase)
4	V. Ramesh Babu	Service & Maintenance Engineer
5	PSGS Pavan Kumar	Asst Manager (Office & Estate)
6	Prem Kumar Kukumalla	Security Officer
7	K. Krishna Priya	PA to Director
8	Bookya Rajendra Prasad	Librarian
9	Dr. Jayant Pundalik Rao Hole	Veterinarian, Animal House I/C

Administrative and Support Staff

S.No	NAME	DESIGNATION
1	B.J.Acharyulu	Consultant


PHOTO GALLERY

Scientific Advisory Committee Meeting

Independence Day celebrations

Lecture on Yoga Day by Dr. Satya Pal Arya on June 21, 2017 at NIAB, Hyderabad

Vigilance Awareness week on October 30, 2017 at NIAB, Hyderabad

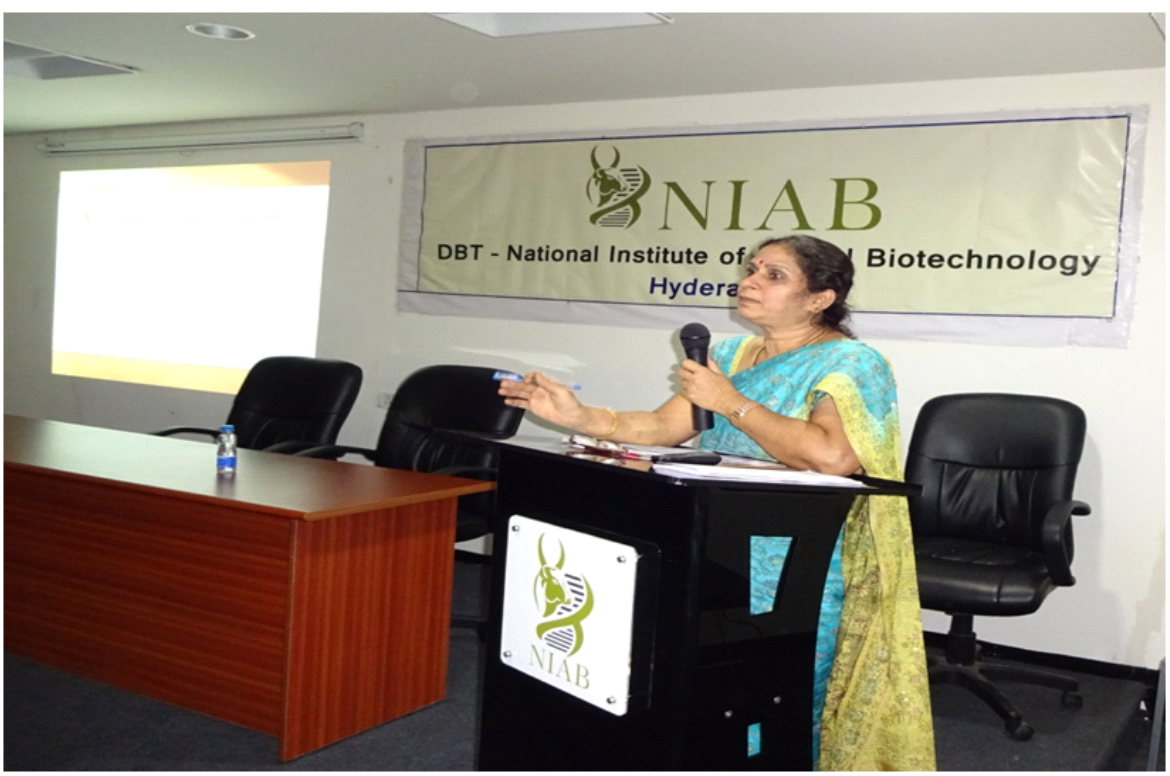
Hindi Pakhwada

Winners of different competitions during Hindi Pakhwara-2017

Lecture by Dr. K. Srivally from Town Official Language Implementation Committee (TOLIC) Hyderabad as part of Hindi Meeting held on March 9, 2018 at NIAB, Hyderabad.

NIAB Internal Complaints Committee

4th Complaints Committee (CC) meeting for Prevention and Prohibition of Sexual Harassment of Women at Workplace held on February 22, 2018 at NIAB, Hyderabad



Lecture by Smt. M. Sreelekha, Advocate on February 22, 2018 as a part of 4th CC meeting for Prevention and Prohibition of Sexual Harassment of Women at Workplace

Audited Statement Of Accounts 2017- 18

AUDITOR'S REPORT

30th May 2018

The Director
National Institute of Animal Biotechnology
D.No. 1-121/1, 4th & 5th Floors, Axis Clinicals Building
Miyapur, Hyderabad – 500 049

We have audited the attached Balance Sheet of **NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY**, Hyderabad, as at 31st March 2018 and also the Income & Expenditure Account for the year ended on that date annexed there to. These financial statements are the responsibility of the organization management. Our responsibility is to express an opinion on these financial statements based on our audit.

We report that:

1. We have obtained all the information and explanations, which are to the best of our knowledge and belief, were necessary for the purpose of our audit.
2. In our opinion, the organization has kept proper books of account as required by law so far, as appears from our examination of those books.
3. The Balance sheet and Income & Expenditure account dealt with by this report is in agreement with the books of accounts.
4. The Institute has maintained accounts on Accrual basis.
5. In our opinion and to the best of our information and according to the explanations given to us, the said Balance sheet and the Income & Expenditure account read together with the notes thereon gives the required information in the manner so required and give a true and fair view.
   a) In so far as it relates to the Balance sheet as at 31st March 2018 and
   b) In so far as it relates to the Income & Expenditure account excess of expenditure over income for the year ended on 31st March 2018.

For B.Purushottam & Co.
CHARTERED ACCOUNTANTS
Reg.No. 002808S

(Ch.Satyanarayana)
Partner M.No.019092

Place : Hyderabad
Date : 30/05/2018

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY, HYDERABAD

BALANCE SHEET AS ON 31st MAR 2018

(Amount - Rs)

Particulars	Schedule	Current Year	Previous Year
CORPUS/CAPITAL FUND AND LIABILITIES			
Corpus / Capital Fund	1	1,46,41,55,784.85	81,98,11,531.00
Reserves and Surplus	2	2,09,93,774.67	2,50,62,633.51
Earmarked / Endowment funds	3	12,85,80,108.65	1,02,28,085.00
Secured Loans & Borrowings	4	-	-
Unsecured Loans & Borrowings	5	-	-
Deferred Credit Liabilities	6	-	-
Current Liabilities and Provisions	7	40,43,554.00	26,45,073.00
TOTAL		**1,61,77,73,222.17**	**85,77,47,322.51**
ASSETS			
Fixed Assets	8	1,40,39,78,133.03	81,73,84,125.00
Investments- From Earmarked / Endowment Funds	9	12,85,80,108.65	-
Investments - Others	10	34,19,891.35	-
Current Assets, Loans, Advances etc.	11	8,17,95,089.14	4,03,63,197.51
Miscellaneous Expenditure		-	-
TOTAL		**1,61,77,73,222.17**	**85,77,47,322.51**
Significant Accounting Policies	24		
Contingent Liabilities and Notes on Accounts	25		

For B.Purushottam & Co.
CHARTERED ACCOUNTANTS
Reg.No. 002808S

Director	**(Ch.Satyanarayana)**	**Sr. Manager (Admin & Finance)**	**Manager (Office & Finance)**
NIAB	**Partner M.No.019092**	**NIAB**	**NIAB**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
Income and Expenditure Statement for the year ended on 31st MARCH 2018

(Amount - Rs.)

Particulars	Schedule	Current Year		Previous Year	
INCOME					
Income from Sales/Services	12		53,850.00		-
Grants/Subsides	13		10,00,00,000.00		8,28,00,000.00
Fees/Subscriptions	14		-		-
Income from Investments	15		-		-
Income from Royalty, Publications etc.	16		-		-
Interest Earned	17		54,74,755.00		16,10,602.62
Other Income	18		16,87,779.00		6,99,230.00
Increase/(decrease) in stock of Finished goods and works-in-progress	19		-		-
TOTAL (A)			**10,72,16,384.00**		**8,51,09,832.62**
EXPENDITURE					
Establishment Expenses	20		3,41,41,818.00		2,07,77,403.00
Administrative Expenses etc.	21		7,58,75,214.84		5,81,74,156.32
Expenditure on Grants, Subsidies etc.	22		-		-
Interest	23		-		-
Depreciation (Net Total at the year-end - corresponding to Schedule 8)		1,64,81,564.00		1,72,14,614.00	
Less: Transferred to Grants-in-Aid		1,64,81,564.00	-	1,72,14,614.00	-
Provision For Salaries and other Expenses (Annexure-J)			12,68,210.00		2,64,798.00
TOTAL (B)			**11,12,85,242.84**		**7,92,16,357.32**
Balance being excess of Expenditure over Income (A-B)			**-40,68,858.84**		**58,93,475.30**
Transfer to Special Reserve (Specify each)					
Transfer to/from General Reserve					
Balance being SURPLUS/(DEFICIT) carried to CORPUS/CAPITAL FUND					
Significant Accounting Policies	24				
Contingent Liabilities and Notes on Accounts	25				

For B.Purushottam & Co.
CHARTERED ACCOUNTANTS
Reg.No. 002808S

Director	(Ch.Satyanarayana)	Sr. Manager (Admin & Finance)	Manager (Office & Finance)
NIAB	Partner M.No.019092	NIAB	NIAB

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2018

(Amount - Rs.)

Receipts	Current Year	Previous Year	Payments	Current Year	Previous Year
1.Opening Balances					
a) Cash in hand	-	-	1. Expenses		
b) Bank Balances			a) Establishment Expenses (corresponding to Schedule 20)	3,41,41,818.00	2,07,77,403.00
i) In current accounts	-	-	b) Administrative Expenses (corresponding to Schedule 21)	7,58,75,214.84	5,81,74,156.32
ii) In deposit accounts	-	-		-	-
iii) Savings accounts	1,75,66,320.40	1,68,58,926.21	2. Payments made against funds for various projects		
			(Name of the fund or project should be shown along with		
2. Grants Received			the particulars of payments made for each project)		
a) From Government of India	75,50,00,000.00	35,28,00,000.00	Projects (Annexure F)	2,86,77,884.35	1,68,75,657.00
b) From State government	-	-			
c) From other sources (details)	-	-	3. Investments and deposits made		
(Grants for capital & revenue			a) Out of Earmarked/Endowment funds	-	-
exp. To be shown separately)			b) Out of Own Funds (Investments-Others)	-	-
			c) Investments	65,39,72,400.00	12,25,00,000.00
d) Projects (Annexure - C)	14,70,29,908.00	2,11,69,508.00			
			4. Expenditure on Fixed Assets & Capital Work-in-Progress		
3. Income on Investments from	-	-	a) Purchases of Fixed Assets	-	
a) Earmarked/Endow. Funds	-	-	Books & Journals		10,618.00
b) Own Funds (Oth. Investment)			Equipment -Lab/Office/Furniture	2,06,24,649.18	10,36,751.00
c) Investments Encashed	52,19,72,400.00	12,25,00,000.00	b) Expenditure on Capital Work-in-Progress:	57,66,25,105.00	26,90,22,720.00
4. Interest Received			5. Refund of surplus money/Loans		-
a) On Bank deposits	54,74,755.00	11,95,442.00	a) To the Government of India	-	-
b) Loans, Advances etc.	-	-	b) To the State Government	-	-
c) on savings accounts	-	4,09,578.00	c) To other providers of funds	-	
d) Interest on LC	-	5,582.62			
			6. Finance Charges (Interest)	-	-
5. Other Income(Specify)					
a) Analysis Charges	53,850.00	-	7. Other Payments (Specify)		
			Advances (Annexure-D)	8,06,07,808.18	2,64,72,328.11
6. Amount Borrowed	-	-	I-Remittances (Annexure-E)	58,88,885.00	46,57,194.00
			CPF A/c / GPF A/c	6,90,000.00	3,50,000.00
7. Any Other Receipts(Give Details)			New Pension Scheme	19,40,074.00	10,84,878.00
I-Remittances (Annexure-A)	58,88,885.00	46,57,194.00			
CPF-SUB, Arrears and adv. Refund/GPF	6,90,000.00	3,50,000.00	8. Closing Balances		
Sundry Receipts	8,57,279.00	5,31,730.00	a) Cash in hand	-	-
Application Fee	1,54,500.00	1,21,500.00	b) Bank Balances		
Sale OF Tender Forms	6,60,500.00	46,000.00	I) In current accounts	-	-
License Fee	15,500.00	-	ii) In deposit accounts	-	-
NPS	19,40,074.00	10,84,878.00	iii) Savings accounts	24,85,736.14	1,75,66,320.40
Advance/Refunds/Recovery/Ad(Annexure-B)	2,42,25,603.29	1,67,97,687.00			
TOTAL	**1,48,15,29,574.69**	**53,85,28,025.83**	**TOTAL**	**1,48,15,29,574.69**	**53,85,28,025.83**

Director
NIAB

(Ch.Satyanarayana)
Partner M.No.019092

For B.Purushottam & Co.
CHARTERED ACCOUNTANTS
Reg.No. 002808S

Sr. Manager (Admin & Finance)
NIAB

Manager (Office & Finance)
NIAB

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 1 - CORPUS/CAPITAL FUND :				
Balance as at the beginning of the year		81,98,11,531.00		56,67,16,104.00
Add : Contribution towards Corpus/Capital Fund				
NIAB Core - Plan (Non-Recurring)	65,50,00,000.00		27,00,00,000.00	
Capitalised portion of Capital Expenditure of projects	58,25,817.85		3,10,041.00	
Others	-	66,08,25,817.85	-	27,03,10,041.00
Less : Lump Sum Depreciation				
Less : Depreciation For the Year 2017-2018	1,64,81,564.00	1,64,81,564.00	1,72,14,614.00	1,72,14,614.00
Add : Balance of net income/(Expenditure) transferred from the Income and Expenditure Account				
BALANCE AS AT THE YEAR - END		**1,46,41,55,784.85**		**81,98,11,531.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 2 -RESERVES AND SURPLUS :				
1.Capital Reserve :				
As per last Account	-		-	
Addition during the year	-		-	
Less : Deductions during the year	-	-	-	-
2.Revaluation Reserve :				
As per last Account	-		-	
Addition during the year	-		-	
Less : Deductions during the year	-	-	-	-
3.Special Reserves :				
As per last Account	-		-	
Addition during the year	-		-	
Less : Deductions during the year	-	-	-	-
4.General Reserve :				
As per last Account	2,50,62,633.51		1,91,69,158.21	
Addition during the year	-40,68,858.84		58,93,475.30	
Less : Deductions during the year	-	2,09,93,774.67	-	2,50,62,633.51
Total		**2,09,93,774.67**		**2,50,62,633.51**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 3				
- EARMARKED/ENDOWMENT FUNDS :				
(Refer Annexures)				
(a) Opening balance of the Funds		1,02,28,085.00		59,34,234.00
(b) Additions to the Funds :				
i. Donations /grants	14,54,14,541.00		2,11,69,508.00	
ii. Income from investments made on account of funds	16,15,367.00		-	
iii. Other additions	-	14,70,29,908.00	-	2,11,69,508.00
TOTAL (a+b)		**15,72,57,993.00**		**2,71,03,742.00**
(c) Utilisation/Expenditure towards objective of funds				
(i) Capital Expenditure (Refer Annexures I & II)				
- Fixed Assets	58,25,817.85		3,10,041.00	
- Others	-	58,25,817.85	-	3,10,041.00
- Total				
(ii) Revenue Expenditure (Refer Annexures I & II)				
- Salaries, Wages and allowances etc.	-		-	
- Rent	-		-	
- Other Expenses	2,28,52,066.50	2,28,52,066.50	1,65,65,616.00	1,65,65,616.00
Total				
TOTAL (c)		**2,86,77,884.35**		**1,68,75,657.00**
NET BALANCE AS AT THE YEAR-END [(a + b)-c]		**12,85,80,108.65**		**1,02,28,085.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 4 - SECURED LOANS AND BORROWINGS :				
1. Central Government		-		-
2. State Government (Specify)		-		-
3. Financial Institutions				
a) Term Loans	-		-	
b) Interest accrued and due	-	-	-	-
4. Banks :				
a) Terms Loans	-		-	
- Interest accrued and due	-		-	
b) Other Loans	-		-	
- Interest accrued and due	-	-	-	-
5. Other Institutions and Agencies		-		-
6. Debentures and Bonds		-		-
7. Others (Specify)		-		-
TOTAL		-		-
Note: Amount due within one year				

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 5				
- UNSECURED LOANS AND BORROWINGS:				
1. Central Government		-		-
2. State Government (Specify)		-		-
3. Financial Institutions		-		-
4. Banks :				
a) Terms Loans	-		-	
b) Other Loans	-	-	-	-
5. Other Institutions and Agencies		-		-
6. Debentures and Bonds		-		-
7. Fixed Deposits		-		-
8. Others (Specify)		-		-
TOTAL		-		-
Note: Amount due within one year				

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 6 - DEFFERED CREDIT LIABILITIES :				
a) Acceptances secured by hypothecation of capital equipment and other assets		-		-
b) Others		-		-
TOTAL		-		-
Note: Amount due within one year				

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 7				
- CURRENT LIABILITIES AND PROVISIONS :				
A. CURRENT LIABILITIES				
1. Acceptances	-		-	
2. Sundry Creditors	-		-	
3. Advances Received	12,990.00		22,086.00	
4. Interest accrued but not due	-		-	
5. Statutory Liabilities	-	12,990.00	-	22,086.00
6. Other current Liabilities				
NIAB.CP Fund A/C	-		-	
EMD	25,000.00		-	
Security Deposit	1,47,367.00	1,72,367.00	33,000.00	33,000.00
TOTAL (A)		**1,85,357.00**		**55,086.00**
B. PROVISIONS				
1. For Taxation				
2. Gratuity				
3. Superannuation/Pension				
4. Accumulated Leave Encashment				
5. Trade Warranties/Claims				
6. Others (Specify) (Annexure-G)	38,58,197.00	38,58,197.00	25,89,987.00	25,89,987.00
TOTAL (B)		**38,58,197.00**		**25,89,987.00**
TOTAL (A+B)		**40,43,554.00**		**26,45,073.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

SCHEDULE 8 - FIXED ASSTES :	GROSS BLOCK				DEPRECIATION				NET BLOCK	
Particulars	Cost/valuation As at beginning of theyear	Addition during the year	Deductions during the year	Cost/valuation at the year end	As at the beginning of the year	On additions during the year	On Deductions during the year	Total up to the year end	As at the Currer year end	As at the Previous year end
A. FIXED ASSETS:										
1. LAND:										
a) Freehold ***	1.00	-	-	1.00	-	-	-	-	1.00	1.00
b) Leasehold	-	-	-	-	-	-	-	-	-	-
2. BUILDINGS										
a) On Freehold Land	-	-	-	-	-	-	-	-	-	-
b) On Leasehold Land	-	-	-	-	-	-	-	-	-	-
c) Ownership Flats/Premises	-	-	-	-	-	-	-	-	-	-
d) Superstructures on Land not belongs to the entity	-	-	-	-	-	-	-	-	-	-
3. PLANT MACHINERY&EQUIPMENT	15,71,94,207.00	1,60,61,066.74	-	17,32,55,273.74	6,54,15,529.00	1,51,80,732.00	-	8,05,96,261.00	9,26,59,012.74	9,17,78,678.00
4. VEHICLES	22,40,610.00	15,02,216.29	-	37,42,826.29	12,54,886.00	3,26,962.00	-	15,81,848.00	21,60,978.29	9,85,724.00
5. FURNITURE, FIXTURES	3,96,377.00	32,71,367.00	-	36,67,744.00	1,22,980.00	1,90,908.00	-	3,13,888.00	33,53,856.00	2,73,397.00
6. OFFICE EQUIPMENT	34,23,715.00	14,64,382.00	-	48,88,097.00	14,89,851.00	3,99,909.00	-	18,89,760.00	29,98,337.00	19,33,864.00
7. COMPUTER/PERIPHERALS	22,03,905.00	-	-	22,03,905.00	19,53,172.00	1,50,440.00	-	21,03,612.00	1,00,293.00	2,50,733.00
8. ELECTRIC INSTALLATIONS				-	-	-	-	-	-	-
9. LIBRARY BOOKS	6,10,603.00	12,795.00	-	6,23,398.00	6,10,603.00	12,795.00	-	6,23,398.00	-	-
10. TUBEWELLS & WATER SUPPLY	-				-	-	-	-		
11. OTHER FIXED ASSETS	7,37,373.00	11,38,640.00	-	18,76,013.00	4,27,421.00	2,19,818.00	-	6,47,239.00	12,28,774.00	3,09,952.00
TOTAL	**16,68,06,791.00**	**2,34,50,467.03**	**-**	**19,02,57,258.03**	**7,12,74,442.00**	**1,64,81,564.00**	**-**	**8,77,56,006.00**	**10,25,01,252.03**	**9,55,32,349.00**
B. CAPITAL WORK-IN-PROGRESS	**72,18,51,776.00**	**57,96,25,105.00**	**-**	**1,30,14,76,881.00**	**-**	**-**	**-**	**-**	**1,30,14,76,881.00**	**72,18,51,776.00**
TOTAL	**88,86,58,567.00**	**60,30,75,572.03**	**-**	**1,49,17,34,139.03**	**7,12,74,442.00**	**1,64,81,564.00**	**-**	**8,77,56,006.00**	**1,40,39,78,133.03**	**81,73,84,125.00**
*** LAND OF 100 ACRES ALLOTTED BY GOVT. OF AP. WORTH OF RS. 306.822 CRORES TO NIAB AT FREE OF COST VIDE G.O.MS.NO. 566, DT. 13/09/2012 AT SY NO. 37, GOPANAPALLY VILLAGE, SERILINGAMPALLY VILLAGE, R R DIST. ***										
Assets bifurcation by funding :										
Core grant	88,73,96,595.00	59,72,49,754.18	-	1,48,46,46,349.18	7,11,11,982.00	1,59,62,740.00	-	8,70,74,722.00	1,39,75,71,627.18	81,62,84,613.00
Extra mural projects	12,61,972.00	58,25,817.85	-	70,87,789.85	1,62,460.00	5,18,824.00	-	6,81,284.00	64,06,505.85	10,99,512.00
TOTAL	**88,86,58,567.00**	**60,30,75,572.03**	**-**	**1,49,17,34,139.03**	**7,12,74,442.00**	**1,64,81,564.00**	**-**	**8,77,56,006.00**	**1,40,39,78,133.03**	**81,73,84,125.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 9 - INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS :		
1. In Government Securities	-	-
2. Other approved securities	-	-
3. Shares	-	-
4. Debentures and Bonds	-	-
5. Subsidiaries and Joint Ventures	-	-
6. Others (to be specified) - STDRs	12,85,80,108.65	-
TOTAL	**12,85,80,108.65**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 10 - INVESTMENTS - OTHERS :		
1. In Government Securities	-	-
2. Other approved securities	-	-
3. Shares	-	-
4. Debentures and Bonds	-	-
5. Subsidiaries and Joint Ventures	-	-
6. Others (to be specified) - STDRs	34,19,891.35	-
TOTAL	**34,19,891.35**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year		Previous Year	
SCHEDULE 11 - CURRENT ASSETS, LOANS, ADVANCES ETC.				
A. CURRENT ASSETS				
1. Inventories				
a) Stores and Spares	-		-	
b) Loose Tools	-		-	
c) Stock-in-trade				
Finished Goods	-		-	
Work-in-progress	-		-	
Raw Materials	-	-	-	-
2. Sundry Debtors:				
a) Debts Outstanding for a period exceeding six months	-		-	
b) Others-Life Membership Fees	-	-	-	-
3. Cash balances in hand (including cheques/drafts and imprest)		-		-
4. Bank Balances:				
a) With Scheduled Banks:				
-On Current Accounts	-		-	-
-On Deposit Accounts (includes margin money)	-		-	-
-On Savings Accounts	24,85,736.14	24,85,736.14	1,75,66,320.40	1,75,66,320.40
b) With non-Schedules Banks:				
-On Current Accounts	-		-	
-On Deposit Accounts	-		-	
-On Savings Accounts	-	-	-	-
5. Post Office-Savings Accounts		-		
TOTAL (A)		**24,85,736.14**		**1,75,66,320.40**
B. LOANS, ADVANCES AND OTHER ASSETS				
1. Loans:				
a) Staff	-			
b) Other Entities engaged in activities/objectives similar to that of the Entity	-	-	-	-
2. Advances and other amounts recoverable in cash or in kind or for value to be received				
a) On Capital Account (Annexure-H)	5,84,79,565.00		7,18,034.11	
b) Prepayments - Deposits (Annexure-I)	2,08,29,788.00			
c) Others	-	7,93,09,353.00	2,20,78,843.00	2,27,96,877.11
3. Income Accrued:				
a) On Investments from Earmarked/Endowments Funds	-		-	
b) On Investments - Others	-		-	
c) On Loans and Advances	-		-	
d) Others	-	-	-	-
4. Claims Receivable		-		-
TOTAL (B)		**7,93,09,353.00**		**2,27,96,877.11**
TOTAL (A+B)		**8,17,95,089.14**		**4,03,63,197.51**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 12 - INCOME FROM SALES/SERVICES :		
1) Income from sales		
a) Sale of Finished Goods	-	-
b) Sale of Raw Material	-	-
c) Sale of Scraps	-	-
2) Income from Services		
a) Labour and Processing Charges	-	-
b) Professional/Consultancy Services (Analysis Charges)	53,850.00	-
c) Agency Commission and Brokerage	-	-
d) Maintenance Services (Equipment/Property)	-	-
e) Others (Specify)	-	-
TOTAL	**53,850.00**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 13 - GRANTS/SUBSIDIES : (Irrevocable Grants & Subsides Received)		
1) Central Government (DBT Plan Grant-in-Aid)	10,00,00,000.00	8,28,00,000.00
2) State Government(s)	-	-
3) Government Agencies	-	-
4) Institutions/Welfare Bodies	-	-
5) International Organisations	-	-
6) Others (Specify)	-	-
Total	**10,00,00,000.00**	**8,28,00,000.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 14 - FEES/SUBSCRIPTIONS :		
1) Entrance Fees	-	-
2) Annual Fees/Subscriptions	-	-
3) Seminar/Program Fees	-	-
4) Consultancy Fees	-	-
5) Others (Specify)	-	-
Total	**-**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Investments from Earmarked Fund		Investments - Others	
SCHEDULE 15 - INCOME FROM INVESTMENTS :	**Current Year**	**Previous Year**	**Current Year**	**Previous Year**
(Income on Invest. from Earmarked/Endowment Funds transferred to Funds)				
1) Interest:				
a) On Govt. Securities	-		-	-
b) Other Bonds/Debentures	-	-	-	-
2) Dividends:				
a) On Shares		-		-
b) On Mutual Fund Securities		-		-
3) Rents		-		-
4) Others (Specify) STDRs		-		-
Total		**-**		**-**
TRANSFERRED TO EARMARKED/ENDOWMENT FUNDS				

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 16 - INCOME FROM ROYALTY, PUBLICATION ETC. :		
1) Income from Royalty	-	-
2) Income from Publications	-	-
3) Others (Specify)	-	-
TOTAL	**-**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 17 - INTEREST EARNED :		
1) On Term Deposits		
a) With Schedule Banks	-	-
b) With Non-Scheduled Banks	54,74,755.00	12,01,024.62
c) With Institutions	-	-
d) Others	-	-
	-	-
2) On Saving Accounts		
a) With Scheduled Banks	-	4,09,578.00
b) With Non-Scheduled Banks	-	-
c) Post Office Savings Accounts	-	-
d) Others	-	-
	-	-
3) On Loans	-	-
a) Employees/Staff	-	-
b) Others	-	-
	-	-
4) Interest on Debtors and Other Receivables		
TOTAL	**54,74,755.00**	**16,10,602.62**
Note :- Tax deducted at source to be indicated		

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 18 - OTHER INCOME :		
1) Profit on Sale/disposal of Assets:		
a) Owned assets	-	-
b) Assets acquired out of grants, or received free of cost	-	-
2) Export Incentives realized	-	-
3) Fees for Miscellaneous Services	-	-
4) Miscellaneous Receipts	5,47,650.00	5,26,500.00
5) Other Receipts	-	-
Sundry Receipts	3,09,629.00	5,230.00
Application Fee	1,54,500.00	1,21,500.00
Sales Of Tender Forms	6,60,500.00	46,000.00
Licence Fee	15,500.00	-
Interest On Computer Advance, Conveyance	-	-
Advance And HBA	-	-
Leave Salary-Pension Contribution	-	-
Provident Fund Salvage	-	-
Free. Gifts-Donations	-	-
TOTAL	**16,87,779.00**	**6,99,230.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCSCHEDULE 19 - INCREASE/(DECREASE)		
IN STOCK OF FINISHED GOODS & WORK IN PROGRESS :		
a) Closing stock		
-Finished Goods	-	-
-Work-in-progress	-	-
Total (a)	-	-
b) Less: Opening stock		
-Finished Goods	-	-
-Work-in-progress	-	-
Total (b)	**-**	**-**
NET INCREASE/(DECREASE) [a-b]	**-**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 20 - ESTABLISHMENT EXPENSES :		
a) Salaries and Wages	2,16,64,074.00	90,43,554.00
b) Allowances and Bonus	94,97,561.00	1,01,14,536.00
c) Contribution to Provident Fund	3,71,500.00	58,646.00
d) Contribution to Other Fund (NPS)	19,23,431.00	10,84,878.00
e) Staff Welfare Expenses - Medical charges	5,71,292.00	4,75,789.00
f) Expenses on Employees Retirement and Terminal Benefits	1,13,960.00	-
g) Others (specify) - Staff leased House	-	-
TOTAL	**3,41,41,818.00**	**2,07,77,403.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 21 - OTHER ADMINISTRATIVE EXPENSES :		
a) Purchases	2,09,07,971.00	1,44,20,904.00
b) Electricity and power	65,09,360.00	67,92,922.00
c) Water charges	3,96,161.00	1,28,028.00
d) Insurance	46,859.00	34,453.00
e) Repairs and maintenance	7,52,534.00	4,14,001.00
f) Rent, Rates and Taxes	2,72,81,672.00	2,49,74,160.00
g) Vehicles Running and Maintenance	3,41,039.00	2,36,116.00
h) Postage, Telephone and Communication Charges	3,08,326.00	2,33,210.00
i) Printing and Stationary	11,39,967.00	4,63,365.00
j) Travelling and Conveyance Expenses	23,71,247.50	13,86,189.00
k) Expenses on Seminar/Workshops	7,46,035.00	47,932.00
l) Subscription Expenses	-	28,229.00
m) Expenses on Fees	-	-
n) Auditors Remuneration	34,500.00	34,500.00
o) Hospitality Expenses	2,42,835.20	1,72,046.00
p) Professional Charges	-	-
q) Advertisement and Publicity	5,80,543.86	1,88,071.00
r) Bank Charges	10,274.28	356.32
s) Security & Cleaning Contract Charges	1,05,02,407.00	61,59,776.00
t) Training Course /Symposia	70,650.00	7,500.00
u) Other Contingencies	18,11,112.00	2,47,867.00
v) Liveries & Blankets	-	-
w) Other Research Expenses	18,20,971.00	22,00,871.00
x)Office Books	750.00	3,660.00
TOTAL	**7,58,75,214.84**	**5,81,74,156.32**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 22 - EXPENDITURE ON GRANTS, SUBSIDIES ETC.		
a) Grants given to Institutions/Organisations	-	-
b) Subsidies given to Institutions/Organisations	-	-
TOTAL	**-**	**-**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
SCHEDULES FORMING PART OF INCOME & EXPENDITURE AS AT 31st MAR 2018

(Amount - Rs.)

Particulars	Current Year	Previous Year
SCHEDULE 23 - INTEREST :		
a) On Fixed Loans	-	-
b) On Other Loans (including Bank Charges)	-	-
c) Others	-	-
TOTAL	-	-

Schedule 24: Significant Accounting Policies &
Schedule 25: Contingent Liabilities & Notes on Account for the period ended 31/03/2018

1. **Method of Accounting:**

   a. The accounting system adopted by the organization is on "Accrual basis".

   b. The organization has been allocated grant-in-aid under the "Non-recurring" & "Recurring" heads in 3 categories grant-in-aidfor Capital Assets, grant-in-aid General, grant-in-aid Salaries.

2. **Revenue recognition:**

   Income comprises of Grant-in-Aid, Internal Resources through services and User charges and interest from short term deposits. Income accounted on the basis of the Cash/DD/Cheques/Cr notes received.

3. **Fixed Assets:**

   a. Fixed assets are stated at cost. Cost includes freight, duties, and taxes etc.,

   b. Depreciation: Based on the recommendation of the Finance Committee and approval of the Governing Body of the Institute, Depreciation Account on Fixed Assets has been prepared at the rate prevailing to the concerned Fixed Assets as specified in the Income Tax Act, 1961 on Written Down Value Method of Depreciation. This has been set off against the Grant in Aid (Non Recurring) in the concerned account.

   c. Capital work in progress has been entered to the extent of the last running account bills paid.

   d. Realization on sale of obsolete/surplus fixed assets which is not required for the purpose of research activities are adjusted against capital cost.

4. **Inventories:**

   All purchases of chemicals, glassware and other consumables have been charged to consumption at the time of purchase.

5. **Foreign Currency transactions:**

   Foreign Currency transactions are recognized in the books at the exchange rates prevailing on the actual date of transaction.

6. **Investments:**

   Investments in STDR's are stated at book values.

7. **Terminal benefits of employees:**

   Terminal benefits (Leave encashment & Gratuity etc.)of the employees of the institute are met from the grants allocated by Department of Biotechnology, as and when the payments become due.

8. The previous year balances have been regrouped/rearranged, wherever necessary.

For B.Purushottam & Co.
CHARTERED ACCOUNTANTS
Reg.No. 002808S

Director	Sr. Manager (Admin & Finance)	Manager (Office & Finance)	(Ch.Satyanarayana)
NIAB	NIAB	NIAB	Partner M.No.019092

Place : Hyderabad
Date : 30/05/2018

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
HYDERABAD

CLARIFICATION ON NOTES ON ACCOUNTS: 2017-18

- **Notes on Accounts 1 to 2 & 4 to 8:** Method of Accounting / Revenue recognition / Fixed Asset/ Inventories / Foreign Currency transactions / Investments:
  These are all only informatory items.

- **Notes on Accounts 3:** Fixed Assets:
  Depreciation has been calculated on Written Down Value method and at the rates prevailing to the concerned Fixed Asset as specified on the Income Tax Act, 1961 and set off against the Grant-in-aid (non-recurring). The details of the Depreciation on Fixed Assets are at Schedule – 8 is an integral part of the financial statements.

Harjit Singh
Senior Manager (Admin &Finance)

I Jagadeesh
Manager (Office & Finance)

Place: Hyderabad
Date: 30/05/2018

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
Details of Closing balances of various Earmarked / Endowement Funds (Refer Sch-3)
For the Year Ended 31 MAR 2018

Annexure-I (Amount - Rs.)

Previous year	Proj No	Particulars	Current Year
-	FS 013 (MVS)	SERB - Post Doctoral Fellowship	77,139.00
1,69,120.00	FS003(PJ)	DST - INSPIRE Fellowship	1,95,000.00
1,01,205.00	FS004	DBT-JRF Programme	1,01,205.00
33,583.00	FS005(NAT)	DBT JRF	33,583.00
-2,40,080.00	FS006(PN)	CSIR JRF	-
-	FS-007(PB)	Junior Research Fellow (RSP)	-18,417.00
-2,42,177.00	FS-009(NN)	CSIR-UGC Fellowship	-
32,500.00	FS-011(SR)	DBT-JRF Fellowship	32,500.00
-	FS014(MPU)	SERB - NPDF	3,96,000.00
-	FS015(NG)	ICMR SENIOR RESEARCH FELLOW	4,21,612.00
-	FS016(DD)	DBT JRF	32,499.00
-	FS017(AD)	DBT JRF	32,605.00
-	FS018(PPK)	DST INSPIRE Fellowship	1,06,167.00
-4,44,030.00	SP001	NMMP - Model Nursery - to meet the requirement of quality plating material for cultivation, and to maintain clonal / seed orchids	-
13,73,983.00	SP002	Characterization of Cell Cycle regulators associated with DNA replication machinery in Toxoplasma Gondii - DST INSPIRE Faculty	6,56,675.50
82,847.00	SP003	Understanding the host response and molecular pathogenesis of Leptospira interrogans infection - Ramalingaswamy Fellowship	9,79,784.00
-2,50,783.00	SP004	Evaluation of Anti-inflammatory Natural Compounds for Therapeutic use in Mastitis of Dairy Animals - NMPB	-2,66,516.00
4,13,448.00	SP005	Role of gamma delta T cells in inflammation - DST Women Scientist Scheme	-62,034.00
3,27,174.00	SP007(PS)	Identification of disease related markers for the diagnosis of Subclinical Mastitis	26,497.00
10,07,270.00	SP008(GKR)	Understanding the immune mechanism of host disease and development of marker vaccines and DIVA test for Peste des Petits ruminants	12,16,925.00
-3,78,229.00	SP009(SV)	Effect of Kisspeptin on endocrine profile and follicular dynamics in buffaloes	-4,35,559.00
81,671.00	SP010(MS)	Collaborative work for genotyping of Newcastle Disease Virus Strains - Biological and Molecular Characterization	-
1,26,475.00	SP011(PS)	Genome-wide association study for identification of novel loci associated with resistance to Theileriosis in India	43,33,639.00
1,38,756.00	SP012(MS)	Elucidation of the role of nonstructural (W) protein of Avian Paramyxoviruses	2,75,496.00
1,18,958.00	SP013(GKR)	To develop novel therapeutics for brucellosis: Identification and characterization of host factors supporting Brucella replication	1,14,817.00
3,88,107.00	SP014(PS)	Identification of Virulence factors associated with Theileria annulata infection in Indian Cattle	11,017.00
12,08,148.00	SP015(MS)	A Study to Understand the genetic variations among the field isolates of porcine circo viruses from piggery farms in Mizoram with ultimate aim to engineer an effective recombinant chimeric DIVA Vaccine	9,53,097.00
1,96,064.00	SP016 (VB)	DST INSPIRE FACULTY-Charterization of transglycosylases associated with cell wall biogenesis in Vancomycin resistant Staphylococcus aureus	82,706.00
6,97,000.00	SP017 (AS)	Elucidation of mechanism(s) of transformation of host cells by Theileria annulata	3,41,576.00

Previous year	Proj No	Particulars	Current Year
21,09,075.00	SP018 (SM)	Towards establishing an efficient animal-based production of thrapeutic Protein in Milk of farmed animals using various modes of gene delivery	9,46,845.00
31,78,000.00	SP019	Development of peptide based anti-inflammatory drug for septicemia	5,54,522.15
-	SP020(AS)	Evaluation of medicinal plant extracts for anti-tick activity and identification of active compounds	2,32,683.00
-	SP022 (NRH)	Development, testing and evaluation of whole and recombinant antigen-based ELISA for monitoring the health of laboratory animals Phase -II	11,72,313.00
-	SP023 (NRH)	Molecular epidemiology and genomics of mastitis-associated staphylococci	9,99,484.00
-	SP024(SSM)	Genomics for conservation of indigenous cattle breeds and for enhancing milk yield, Phase -I	10,48,25,041.00
-	SP025 (SF)	Random and Targeted mutagenesis of zoonotic pathogen Leptospira interrogans: In perspective of vaccine development	29,06,318.00
-	SP026 (SS)	Integrated Biotechnological Approach towards Improvement of Quality and Productivity of Tropical Tasar Silk	20,40,420.00
-	SP027(PS)	Aptamer based lateral flow device for the detection of heat or estrous in buffalo	24,10,141.00
-	SP028(BD)	The Ramanujan Fellowship	3,41,565.00
-	SP029(GKR)	To understand the role of Cytoplasmic linker protien-170 in the down-regulation of TLR4 signaling	25,12,763.00
1,02,28,085.00		**TOTAL**	**12,85,80,108.65**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
Details of Fixed Assets Fund (Capitalised Portion of Project Grants)
For the Year Ended 31 MAR 2018

Annexure-II (Amount - Rs.)

Previous year	Proj No	Particulars	Current Year
-	FS 013 (MVS)	SERB - Post Doctoral Fellowship	11,760.00
2,19,815.00	SP002	Characterization of Cell Cycle regulators associated with DNA replication machinery in Toxoplasma Gondii - DST INSPIRE Faculty	2,98,198.00
47,226.00	SP003	Understanding the host response and molecular pathogenesis of Leptospira interrogans infection - Ramalingaswamy Fellowship	-
-	SP015(MS)	A Study to Understand the genetic variations among the field isolates of porcine circo viruses from piggery farms in Mizoram with ultimate aim to engineer an effective recombinant chimeric DIVA Vaccine	3,32,795.00
43,000.00	SP016 (VB)	DST INSPIRE FACULTY-Charterization of transglycosylases associated with cell wall biogenesis in Vancomycin resistant Staphylococcus aureus	1,99,477.00
-	SP017 (AS)	Elucidation of mechanism(s) of transformation of host cells by Theileria annulata	6,29,610.00
-	SP019	Development of peptide based anti-inflammatory drug for septicemia	40,26,808.85
-	SP020(AS)	Evaluation of medicinal plant extracts for anti-tick activity and identification of active compounds	3,27,169.00
3,10,041.00		**TOTAL**	**58,25,817.85**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: A Forming part of Receipts and Payment a/c (Amount - Rs.)

Previous Year	Particulars	Current Year
	I-Remittances	
2,800.00	GSLI	4,050.00
14,92,747.00	Income Tax	27,36,100.00
4,025.00	Others (I-Remittances)	20,575.00
57,000.00	Professional Tax	78,700.00
7,45,100.00	Service Tax	3,40,630.00
23,55,522.00	TDS	27,08,830.00
46,57,194.00	**TOTAL**	**58,88,885.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: B Forming part of Receipts and Payment a/c

(Amount - Rs.)

Previous Year	Particulars	Current Year
	Advance refunds/recovery/Adjustments.	
2,10,959.00	LTC [Advance]	4,28,042.00
47,395.00	TA India & Abroad [Advance]	41,259.00
98,000.00	Transport maintenance [Advance]	24,000.00
50,000.00	Printing & Stationery [Advance]	3,45,037.00
34,453.00	Insurance [Advance]	31,362.00
27,000.00	Others [Contingencies Advance]	99,850.00
-	Others [Maintenance Advance]	9,022.00
27,83,975.00	Chemicals [Advance]	64,45,427.00
26,78,524.00	Consumables, glassware and Spares [Advance]	59,29,519.00
2,77,814.00	Others [Including Animal House Advance]	94,062.00
-	Scientific Workshops Symposiums Seminars [Advance]	90,000.00
-	Other Research Expenses [Advance]	20,000.00
7,94,653.00	Equipment [Advance]	3,46,522.00
-	Vehicles [Advance]	13,28,048.29
-	Office Equipment [Advance]	12,38,485.00
-	Furniture [Advance]	15,38,521.00
94,05,679.00	General Deposits And Advances	5,54,411.00
-	EMD	25,000.00
30,000.00	Security Deposit	1,25,864.00
85,635.00	Revolving Advance	59,581.00
-	GDA [Others]	49,27,191.00
2,73,600.00	Prepaid Expenses	5,24,400.00
1,67,97,687.00	**TOTAL**	**2,42,25,603.29**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018
Annexure: C Forming part of Receipts and Payment a/c

(Amount - Rs.)

Previous Year	Particulars	Current Year
	Projects-Receipts	
-	FS 013 (MVS)	9,60,000.00
3,85,887.00	FS003(PJ)	4,10,000.00
4,20,000.00	FS004	-
4,20,000.00	FS005(NAT)	4,20,000.00
-	FS006(PN)	3,12,580.00
-	FS-007(PB)	4,10,000.00
-	FS-009(NN)	3,14,677.00
2,85,645.00	FS-011(SR)	4,20,000.00
2,50,914.00	FS-012(MPSM)	-
-	FS014(MPU)	7,20,000.00
-	FS015(NG)	8,44,186.00
-	FS016(DD)	3,60,160.00
-	FS017(AD)	3,18,500.00
-	FS018(PPK)	3,93,500.00
-	FS019(PK)	12,822.00
17,57,623.00	SP002	35,317.00
15,28,000.00	SP003	15,55,271.00
10,13,000.00	SP004	-
18,00,000.00	SP005	-
10,23,539.00	SP007(PS)	5,501.00
14,10,505.00	SP008(GKR)	8,90,971.00
9,00,000.00	SP010(MS)	-
-	SP011(PS)	49,69,093.00
-	SP012(MS)	8,45,127.00
-	SP013(GKR)	14,45,923.00
12,30,000.00	SP014(PS)	3,133.00
14,00,000.00	SP015(MS)	7,21,829.00
11,07,320.00	SP016 (VB)	14,98,268.00
8,47,000.00	SP017 (AS)	19,96,189.00
21,09,075.00	SP018 (SM)	70,117.00
32,81,000.00	SP019	26,79,096.00
-	SP020(AS)	16,43,142.00
-	SP021 (UK)	16,53,000.00
-	SP022 (NRH)	19,64,307.00
-	SP023 (NRH)	18,96,826.00
-	SP024(SSM)	10,67,63,440.00
-	SP025 (SF)	30,96,963.00
-	SP026 (SS)	20,60,420.00
-	SP027(PS)	24,25,222.00
-	SP028(BD)	4,01,565.00
-	SP029(GKR)	25,12,763.00
2,11,69,508.00	**TOTAL**	**14,70,29,908.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: D Forming part of Receipts and Payment a/c

(Amount - Rs.)

Previous Year	Particulars	Current Year
	Advances	
2,79,494.00	LTC [Advance]	3,50,254.00
47,395.00	TA India & Abroad [Advance]	41,259.00
-	Telephone [Advance]	1,92,753.00
36,000.00	Rent [Advance]	9,74,380.00
53,000.00	Transport maintenance [Advance]	24,000.00
3,18,037.00	Printing & Stationery [Advance]	1,17,338.00
34,453.00	Insurance [Advance]	31,362.00
1,26,850.00	Others [Contingencies Advance]	5,11,244.00
-	Others [Maintenance Advance]	3,89,275.00
50,58,769.00	Chemicals [Advance]	77,52,045.00
52,11,542.00	Consumables, glassware and Spares [Advance]	46,73,606.00
-	Software [Advance]	2,33,100.00
94,062.00	Others [Including Animal House Advance]	-
-	Scientific Workshops Symposiums Seminars [Advance]	90,000.00
-	Other Research Expenses [Advance]	23,79,500.00
-	Works and Services [Advance]	1,19,19,587.00
12,600.00	Equipment [Advance]	3,17,33,968.00
7,05,434.11	Vehicles [Advance]	41,74,676.18
-	Office Equipment [Advance]	77,57,275.00
-	Furniture [Advance]	66,27,601.00
86,18,164.00	General Deposits And Advances	5,63,507.00
77,102.00	Security Deposit	11,497.00
85,635.00	Revolving Advance	59,581.00
49,27,191.00	GDA [Others]	-
7,86,600.00	Prepaid Expenses	-
2,64,72,328.11	**TOTAL**	**8,06,07,808.18**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: E Forming part of Receipts and Payment a/c

(Amount - Rs.)

Previous Year	Particulars	Current Year
	I-Remittances	
2,800.00	GSLI	4,050.00
14,92,747.00	Income Tax	27,36,100.00
4,025.00	Others (I-Remittances)	20,575.00
57,000.00	Professional Tax	78,700.00
7,45,100.00	Service Tax	3,40,630.00
23,55,522.00	TDS	27,08,830.00
46,57,194.00	**TOTAL**	**58,88,885.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018
Annexure: F Forming part of Receipts and Payment a/c

(Amount - Rs.)

Previous Year	Particulars	Current Year
	Projects - Expenditure	
-	FS 013 (MVS)	8,82,861.00
2,43,043.00	FS002	-
4,23,380.00	FS003(PJ)	3,84,120.00
3,51,349.00	FS004	-
3,86,417.00	FS005(NAT)	4,20,000.00
2,40,080.00	FS006(PN)	72,500.00
-	FS-007(PB)	4,28,417.00
2,42,177.00	FS-009(NN)	72,500.00
2,53,145.00	FS-011(SR)	4,20,000.00
2,50,914.00	FS-012(MPSM)	-
-	FS014(MPU)	3,24,000.00
-	FS015(NG)	4,22,574.00
-	FS016(DD)	3,27,661.00
-	FS017(AD)	2,85,895.00
-	FS018(PPK)	2,87,333.00
-	FS019(PK)	12,822.00
-	SP001	-4,44,030.00
15,76,747.00	SP002	7,52,624.50
15,11,411.00	SP003	6,58,334.00
7,95,374.00	SP004	15,733.00
9,01,020.00	SP005	4,75,482.00
1,00,566.00	SP006 (VB)	-
10,36,031.00	SP007(PS)	3,06,178.00
8,59,488.00	SP008(GKR)	6,81,316.00
7,38,679.00	SP009(SV)	57,330.00
10,31,719.00	SP010(MS)	81,671.00
12,60,325.00	SP011(PS)	7,61,929.00
10,07,949.00	SP012(MS)	7,08,387.00
14,67,842.00	SP013(GKR)	14,50,064.00
8,41,893.00	SP014(PS)	3,80,223.00
1,91,852.00	SP015(MS)	9,76,880.00
9,11,256.00	SP016 (VB)	16,11,626.00
1,50,000.00	SP017 (AS)	23,51,613.00
-	SP018 (SM)	12,32,347.00
1,03,000.00	SP019	53,02,573.85
-	SP020(AS)	14,10,459.00
-	SP021 (UK)	16,53,000.00
-	SP022 (NRH)	7,91,994.00
-	SP023 (NRH)	8,97,342.00
-	SP024(SSM)	19,38,399.00
-	SP025 (SF)	1,90,645.00
-	SP026 (SS)	20,000.00
-	SP027(PS)	15,081.00
-	SP028(BD)	60,000.00
1,68,75,657.00	**TOTAL**	**2,86,77,884.35**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: G Forming part of Balance sheet

(Amount - Rs.)

Previous Year	Particulars	Current Year
18,99,964.00	March Salaries	30,97,381.00
34,500.00	Audit Fee	34,500.00
5,37,132.00	Electricity Charges	4,50,855.00
14,279.00	Water Charges	49,169.00
12,519.00	Telephone Charges	12,868.00
9,545.00	Website maintenance Charges	-
1,236.00	Photo Copier maintenance Charges	4,285.00
80,812.00	NPS Employer Contribution	2,09,139.00
25,89,987.00	**TOTAL**	**38,58,197.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: H Forming part of Balance sheet

(Amount - Rs.)

Previous Year	Particulars	Current Year
	LOANS AND ADVANCES	
12,600.00	Equipment [Advance]	3,14,00,046.00
-	Furniture [Advance]	50,89,080.00
-	Office Equipment [Advance]	65,18,790.00
7,05,434.11	Vehicles [Advance]	35,52,062.00
-	Works and Services [Advance]	1,19,19,587.00
7,18,034.11	**TOTAL**	**5,84,79,565.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: I Forming part of Balance sheet

(Amount - Rs.)

Previous Year	Particulars	Current Year
	PREPAYMENTS / DEPOSITS	
50,58,769.00	Chemicals [Advance]	63,65,387.00
50,35,577.00	Consumables, glassware and Spares [Advance]	37,79,664.00
1,08,84,360.00	GDA [Others]	59,57,169.00
77,788.00	LTC [Advance]	-
-	Other Research Expenses [Advance]	23,59,500.00
99,850.00	Others [Contingencies Advance]	5,11,244.00
94,062.00	Others [Including Animal House Advance]	-
-	Others [Maintenance Advance]	3,80,253.00
5,24,400.00	Prepaid Expenses	-
2,68,037.00	Printing & Stationery [Advance]	40,338.00
36,000.00	Rent [Advance]	10,10,380.00
-	Software [Advance]	2,33,100.00
-	Telephone [Advance]	1,92,753.00
2,20,78,843.00	**TOTAL**	**2,08,29,788.00**

NATIONAL INSTITUTE OF ANIMAL BIOTECHNOLOGY
For the Year Ended 31st MAR 2018

Annexure: J Forming part of Income and Expenditure statement

(Amount - Rs.)

Previous Year	Particulars	Current Year
	PROVISIONS FOR SALARIES AND OTHER EXPENSES	
	Addition during the year :	
18,99,964.00	Salaries for March	30,97,381.00
80,812.00	NPS (Employer contribution)	2,09,139.00
34,500.00	Audit Fee	34,500.00
5,37,132.00	Electricity	4,50,855.00
14,279.00	Water charges	49,169.00
12,519.00	Telephone Charges	12,868.00
9,545.00	Website maintenance charges	-
1,236.00	Photo copier maintenance charges	4,285.00
25,89,987.00	**Sub total**	**38,58,197.00**
23,25,189.00	Less :Adjustments during the year (Refer Annexure-G)	25,89,987.00
2,64,798.00	**TOTAL**	**12,68,210.00**

NIAB
Hyderabad
FS002-DBT - Research Associate
P.I:Dr. Dileep Kumar
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
2,43,043.00	Opening Balance	0			0
0	Grant In Aid	0	1,97,600.00	Salaries - Manpower	0
0	Other Receipts	0	39,255.00	Consumables	0
0		0	6,188.00	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
2,43,043.00		**0.00**	**2,43,043.00**		**0.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
2,43,043.00		**0.00**	**2,43,043.00**		**0.00**

NIAB
Hyderabad
FS003(PJ)-DST - INSPIRE Fellowship
P.I:Dr. Padmaja Jakka, DBT JRF
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
2,06,613.00	Opening Balance	1,69,120.00			0
3,85,887.00	Grant In Aid	4,10,000.00	3,90,000.00	Salaries - Manpower	3,57,500.00
0	Other Receipts	0	21,800.00	Consumables	0
0		0	7,981.00	Contingencies	26,620.00
0		0	3,599.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
5,92,500.00		**5,79,120.00**	**4,23,380.00**		**3,84,120.00**
0	Excess of Expenditure over Income	**0**	**1,69,120.00**	Closing Balance	**1,95,000.00**
5,92,500.00		**5,79,120.00**	**5,92,500.00**		**5,79,120.00**

NIAB
Hyderabad
FS004-DBT-JRF Programme
P.I:Dr. Hiral Mistry, DBT JRF
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
32,554.00	Opening Balance	1,01,205.00			0
4,20,000.00	Grant In Aid	0	3,47,750.00	Salaries - Manpower	0
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	0
0		0	3,599.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
4,52,554.00		**1,01,205.00**	**3,51,349.00**		**0.00**
0	Excess of Expenditure over Income	**0**	**1,01,205.00**	Closing Balance	**1,01,205.00**
4,52,554.00		**1,01,205.00**	**4,52,554.00**		**1,01,205.00**

NIAB
Hyderabad
FS005(NAT)-DBT JRF
P.I: Neelam A Topno
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	33,583.00			0
4,20,000.00	Grant In Aid	4,20,000.00	3,56,417.00	Salaries - Manpower	3,90,000.00
0	Other Receipts	0	0	Consumables	0
0		0	30,000.00	Contingencies	30,000.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
4,20,000.00		**4,53,583.00**	**3,86,417.00**		**4,20,000.00**
0	Excess of Expenditure over Income	**0**	**33,583.00**	Closing Balance	**33,583.00**
4,20,000.00		**4,53,583.00**	**4,20,000.00**		**4,53,583.00**

NIAB
Hyderabad
FS006(PN)-CSIR JRF
P.I: PRACHITA NANDINI
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0	0.00	Opening Balance	2,40,080.00
0	Grant In Aid	3,12,580.00	2,40,080.00	Salaries - Manpower	32,500.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	40,000.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0		**3,12,580.00**	**2,40,080.00**		**3,12,580.00**
2,40,080.00	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
2,40,080.00		**3,12,580.00**	**2,40,080.00**		**3,12,580.00**

NIAB
Hyderabad
FS-007(PB)-Junior Research Fellow (RSP)
P.I: Mr. Araveti Prasanna Babu
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	4,10,000.00	0	Salaries - Manpower	4,08,417.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	20,000.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**4,10,000.00**	**0.00**		**4,28,417.00**
0	Excess of Expenditure over Income	**18,417.00**	**0**	Closing Balance	**0**
0.00		**4,28,417.00**	**0.00**		**4,28,417.00**

NIAB
Hyderabad
FS-009(NN)-CSIR-UGC Fellowship
P.I: Mr. B. Nagaraj Nayak
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0.00	Opening Balance	0.00			2,42,177.00
0	Grant In Aid	3,14,677.00	2,42,177.00	Salaries - Manpower	32,500.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	40,000.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0		**3,14,677.00**	**2,42,177.00**		**3,14,677.00**
2,42,177.00	Excess of Expenditure over Income	**0.00**	**0.00**	Closing Balance	**0.00**
2,42,177.00		**3,14,677.00**	**2,42,177.00**		**3,14,677.00**

NIAB
Hyderabad
FS-011(SR)-DBT-JRF Fellowship
P.I: Mr. Sonti Roy
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	32,500.00			0
2,85,645.00	Grant In Aid	4,20,000.00	2,32,742.00	Salaries - Manpower	3,90,000.00
0	Other Receipts	0	0	Consumables	0
0		0	20,403.00	Contingencies	30,000.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
2,85,645.00		**4,52,500.00**	**2,53,145.00**		**4,20,000.00**
0	Excess of Expenditure over Income	**0**	**32,500.00**	Closing Balance	**32,500.00**
2,85,645.00		**4,52,500.00**	**2,85,645.00**		**4,52,500.00**

NIAB
Hyderabad
FS-012(MPSM)-DST-ISRF Research Trainee
P.I: Dr. Manjula P.S. Magamage
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
2,50,914.00	Grant In Aid	0	2,20,914.00	Salaries - Manpower	0
0	Other Receipts	0	22,201.00	Consumables	0
0		0	7,799.00	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
2,50,914.00		**0.00**	**2,50,914.00**		**0.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
2,50,914.00		**0.00**	**2,50,914.00**		**0.00**

NIAB
Hyderabad
FS 013 (MVS)-SERB - Post Doctoral Fellowship
P.I: Dr. Muthu Varunan Shalu
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	9,60,000.00	0	Salaries - Manpower	5,86,667.00
0	Other Receipts	0	0	Consumables	1,18,284.00
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	1,00,000.00
0		0	0	Equipment	77,910.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**9,60,000.00**	**0.00**		**8,82,861.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**77,139.00**
0.00		**9,60,000.00**	**0.00**		**9,60,000.00**

NIAB
Hyderabad
FS014(MPU)-SERB - NPDF
P.I: MEENAL P ULLEWAR
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0.00			0.00
0	Grant In Aid	7,20,000.00	0	Salaries - Manpower	2,24,000.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	1,00,000.00
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**7,20,000.00**	**0.00**		**3,24,000.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**3,96,000.00**
0.00		**7,20,000.00**	0.00		**7,20,000.00**

NIAB
Hyderabad
FS015(NG)-ICMR SENIOR RESEARCH FELLOW
P.I: Ms. Nilanjana Ganguli
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	8,44,186.00	0	Salaries - Manpower	4,08,894.00
0	Other Receipts	0	0	Consumables	13,680.00
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**8,44,186.00**	**0.00**		**4,22,574.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**4,21,612.00**
0.00		**8,44,186.00**	**0.00**		**8,44,186.00**

NIAB
Hyderabad
FS016(DD)-DBT JRF
P.I: Mr Debabrata Dandasena
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	3,60,160.00	0	Salaries - Manpower	3,01,935.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	25,726.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**3,60,160.00**	**0.00**		**3,27,661.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**32,499.00**
0.00		**3,60,160.00**	**0.00**		**3,60,160.00**

NIAB
Hyderabad
FS017(AD)-DBT JRF
P.I: Mr Abhishek Das
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	3,18,500.00	0	Salaries - Manpower	2,63,145.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	22,750.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**3,18,500.00**	**0.00**		**2,85,895.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**32,605.00**
0.00		**3,18,500.00**	**0.00**		**3,18,500.00**

NIAB
Hyderabad
FS018(PPK)-DST INSPIRE Fellowship
P.I: Ms Prajna Parimita Kar
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	3,93,500.00	0	Salaries - Manpower	2,83,833.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	3,500.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**3,93,500.00**	**0.00**		**2,87,333.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**1,06,167.00**
0.00		**3,93,500.00**	**0.00**		**3,93,500.00**

NIAB
Hyderabad
FS019(PK)-CSIR Project
P.I: Pankaj Kumar
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	12,822.00	0	Salaries - Manpower	0
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	12,822.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**12,822.00**	**0.00**		**12,822.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
0.00		**12,822.00**	**0.00**		**12,822.00**

NIAB
Hyderabad
SP001-NMMP - Model Nursery - to meet the requirement of quality plating material for cultivation, and to maintain clonal / seed orchids
P.I: Prof. P Reddanna
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0	4,44,030.00	Opening Balance	4,44,030.00
0	Grant In Aid	0	0	Salaries - Manpower	0
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	-4,44,030.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**0.00**	**4,44,030.00**		**0.00**
4,44,030.00	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
4,44,030.00		**0.00**	**4,44,030.00**		**0.00**

NIAB
Hyderabad
SP002-Characterization of Cell Cycle regulators associated with DNA replication machinery in Toxoplasma Gondii - DST INSPIRE Faculty
P.I: Dr. Abhijit S Deshmukh
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
11,93,107.00	Opening Balance	13,73,983.00			0
17,57,623.00	Grant In Aid	0	9,43,925.00	Salaries - Manpower	62,400.00
0	Other Receipts	35,317.00	3,37,980.00	Consumables	3,80,346.50
0		0	376.00	Contingencies	11,680.00
0		0	4,651.00	Travel	0
0		0	70,000.00	Overheads	0
0		0	2,19,815.00	Equipment	2,98,198.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
29,50,730.00		**14,09,300.00**	**15,76,747.00**		**7,52,624.50**
0	Excess of Expenditure over Income	**0**	**13,73,983.00**	Closing Balance	**6,56,675.50**
29,50,730.00		**14,09,300.00**	**29,50,730.00**		**14,09,300.00**

NIAB
Hyderabad
SP003-Understanding the host response and molecular pathogenesis of Leptospira interrogans infection - Ramalingaswamy Fellowship
P.I: Dr. Syed Faisal
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
66,258.00	Opening Balance	82,847.00			0
15,28,000.00	Grant In Aid	15,19,000.00	11,96,112.00	Salaries - Manpower	4,62,680.00
0	Other Receipts	36,271.00	2,42,051.00	Consumables	2,956.00
0		0	13,516.00	Contingencies	26,087.00
0		0	12,506.00	Travel	1,66,611.00
0		0	0	Overheads	0
0		0	47,226.00	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
15,94,258.00		**16,38,118.00**	**15,11,411.00**		**6,58,334.00**
0	Excess of Expenditure over Income	**0**	**82,847.00**	Closing Balance	**9,79,784.00**
15,94,258.00		**16,38,118.00**	**15,94,258.00**		**16,38,118.00**

NIAB
HYDERABAD
SP004-Evaluation of Anti-inflammatory Natural Compounds for Therapeutic use in Mastitis of Dairy Animals - NMPB
P.I: Prof P Reddanna & Dr. Paresh Sharma
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0	4,68,409.00	Opening Balance	2,50,783.00
10,13,000.00	Grant In Aid	0	4,38,830.00	Salaries - Manpower	15,733.00
0	Other Receipts	0	2,83,044.00	Consumables	0
0		0	5,000.000	Contingencies	0
0		0	0	Travel	0
0		0	68,500.00	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
10,13,000.00		**0**	**12,63,783.00**		**2,66,516.00**
2,50,783.00	Excess of Expenditure over Income	**2,66,516.00**	**0**	Closing Balance	**0**
12,63,783.00		**2,66,516.00**	**12,63,783.00**		**2,66,516.00**

NIAB
Hyderabad
SP005-Role of gamma delta T cells in inflammation - DST Women Scientist Scheme
P.I:Dr. Aparna Rachamallu
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	4,13,448.00	4,85,532.00		0
18,00,000.00	Grant In Aid	0	6,60,000.00	Salaries - Manpower	1,10,000.00
0	Other Receipts	0	1,36,020.00	Consumables	3,65,482.00
0		0	5,000.00	Contingencies	0
0		0	0	Travel	0
0		0	1,00,000.00	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
18,00,000.00		**4,13,448.00**	**13,86,552.00**		**4,75,482.00**
0	Excess of Expenditure over Income	**62,034.00**	**4,13,448.00**	Closing Balance	**0.00**
18,00,000.00		**4,75,482.00**	**18,00,000.00**		**4,75,482.00**

NIAB
Hyderabad
SP006 (VB)-Characterization of vancomycin resistant Staphylococcus aureus strains - SERB Young Scientist Scheme
P.I: Dr. Vasundhra Bhandari
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
1,00,566.00	Opening Balance	0	0		0
0	Grant In Aid	0	0	Salaries - Manpower	0
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	1,00,566.00	Transfer of Funds	0
1,00,566.00		**0.00**	**1,00,566.00**		**0.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
1,00,566.00		**0.00**	**1,00,566.00**		**0.00**

NIAB
Hyderabad
SP007(PS)-Identification of disease related markers for the diagnosis of Subclinical Mastitis
P.I: Dr. Paresh Sharma
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
3,39,666.00	Opening Balance	3,27,174.00			0
10,23,539.00	Grant In Aid	0	1,87,893.00	Salaries - Manpower	2,65,980.00
0	Other Receipts	5,501.00	8,04,696.00	Consumables	40,198.00
0		0	34,642.00	Contingencies	0
0		0	8,800.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
13,63,205.00		**3,32,675.00**	**10,36,031.00**		**3,06,178.00**
0	Excess of Expenditure over Income	**0**	**3,27,174.00**	Closing Balance	**26,497.00**
13,63,205.00		**3,32,675.00**	**13,63,205.00**		**3,32,675.00**

NIAB
Hyderabad
SP008(GKR)-Understanding the immune mechanism of host disease and development of marker vaccines and DIVA test for Peste des Petits ruminants
P.I: Dr.Girish K Radhakrishnan
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
4,56,253.00	Opening Balance	10,07,270.00			0
14,10,505.00	Grant In Aid	8,60,493.00	3,53,717.00	Salaries - Manpower	3,19,918.00
0	Other Receipts	30,478.00	3,77,675.00	Consumables	3,46,315.00
0		0	8,341.00	Contingencies	962.00
0		0	1,19,755.00	Travel	14,121.00
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
18,66,758.00		**18,98,241.00**	**8,59,488.00**		**6,81,316.00**
0	Excess of Expenditure over Income	**0**	**10,07,270.00**	Closing Balance	**12,16,925.00**
18,66,758.00		**18,98,241.00**	**18,66,758.00**		**18,98,241.00**

NIAB
Hyderabad
SP009(SV)-Effect of Kisspeptin on endocrine profile and follicular dynamics in buffaloes
P.I: Dr. Satya Velmurugan
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
3,60,450.00	Opening Balance	0		Opening Balance	3,78,229.00
0	Grant In Aid	0	3,96,500.00	Salaries - Manpower	57,330.00
0	Other Receipts	0	2,83,854.00	Consumables	0
0		0	34,048.00	Contingencies	0
0		0	24,277.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
3,60,450.00		**0**	**7,38,679.00**		**4,35,559.00**
3,78,229.00	Excess of Expenditure over Income	**4,35,559.00**	**0**	Closing Balance	**0**
7,38,679.00		**4,35,559.00**	**7,38,679.00**		**4,35,559.00**

NIAB
Hyderabad
SP010(MS)-Collaborative work for genotyping of Newcastle Disease Virus Strains - Biological and Molecular Characterization
P.I: Dr. Madhuri Subbiah
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
2,13,390.00	Opening Balance	81,671.00			0
9,00,000.00	Grant In Aid	0	1,45,718.00	Salaries - Manpower	8,840.00
0	Other Receipts	0	8,36,962.00	Consumables	72,831.00
0		0	36,690.00	Contingencies	0
0		0	12,349.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
11,13,390.00		**81,671.00**	**10,31,719.00**		**81,671.00**
0	Excess of Expenditure over Income	**0**	**81,671.00**	Closing Balance	**0**
11,13,390.00		**81,671.00**	**11,13,390.00**		**81,671.00**

NIAB
Hyderabad
SP011(PS)-Genome-wide association study for identification of novel loci associated with resistance to Theileriosis in India
P.I: Dr. Paresh Sharma
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
13,86,800.00	Opening Balance	1,26,475.00			0
0	Grant In Aid	48,57,600.00	3,27,683.00	Salaries - Manpower	4,35,587.00
0	Other Receipts	1,11,493.00	8,98,616.00	Consumables	2,34,037.00
0		0	0	Contingencies	60,411.00
0		0	34,026.00	Travel	31,894.00
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
13,86,800.00		**50,95,568.00**	**12,60,325.00**		**7,61,929.00**
0	Excess of Expenditure over Income	**0**	**1,26,475.00**	Closing Balance	**43,33,639.00**
13,86,800.00		**50,95,568.00**	**13,86,800.00**		**50,95,568.00**

NIAB
Hyderabad
SP012(MS)-Elucidation of the role of nonstructural (W) protein of Avian Paramyxoviruses
P.I: Dr.Madhuri Subbiah
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
11,46,705.00	Opening Balance	1,38,756.00			0
0	Grant In Aid	8,32,130.00	1,92,920.00	Salaries - Manpower	2,06,873.00
0	Other Receipts	12,997.00	7,78,491.00	Consumables	4,90,489.00
0		0	21,152.00	Contingencies	11,025.00
0		0	15,386.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
11,46,705.00		**9,83,883.00**	**10,07,949.00**		**7,08,387.00**
0	Excess of Expenditure over Income	**0**	**1,38,756.00**	Closing Balance	**2,75,496.00**
11,46,705.00		**9,83,883.00**	**11,46,705.00**		**9,83,883.00**

NIAB
Hyderabad
SP013(GKR)-To develop novel therapeutics for brucellosis: Identification and characterization of host factors supporting Brucella replication
P.I: Dr. Girish K Radhakrishnan
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
15,86,800.00	Opening Balance	1,18,958.00			0
0	Grant In Aid	14,23,575.00	2,99,419.00	Salaries - Manpower	3,88,917.00
0	Other Receipts	22,348.00	11,24,267.00	Consumables	10,60,917.00
0		0	0	Contingencies	230.00
0		0	44,156.00	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
15,86,800.00		**15,64,881.00**	**14,67,842.00**		**14,50,064.00**
0	Excess of Expenditure over Income	**0**	**1,18,958.00**	Closing Balance	**1,14,817.00**
15,86,800.00		**15,64,881.00**	**15,86,800.00**		**15,64,881.00**

NIAB
Hyderabad
SP014(PS)-Identification of Virulence factors associated with Theileria annulata infection in Indian Cattle
P.I: Dr. Paresh Sharma
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	3,88,107.00			0
12,30,000.00	Grant In Aid	0	1,83,083.00	Salaries - Manpower	2,22,084.00
0	Other Receipts	3,133.00	6,48,710.00	Consumables	1,50,616.00
0		0	10,100.00	Contingencies	7,523.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
12,30,000.00		**3,91,240.00**	**8,41,893.00**		**3,80,223.00**
0	Excess of Expenditure over Income	**0**	**3,88,107.00**	Closing Balance	**11,017.00**
12,30,000.00		**3,91,240.00**	**12,30,000.00**		**3,91,240.00**

NIAB
Hyderabad
SP015(MS)-A Study to Understand the genetic variations among the field isolates of porcine circo viruses from piggery farms in Mizoram, with ultimate aim to engineer an effective recombinant chimeric DIVA vaccine
P.I: Dr. Madhuri Subbiah
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	12,08,148.00			0
14,00,000.00	Grant In Aid	6,97,000.00	31,619.00	Salaries - Manpower	1,65,360.00
0	Other Receipts	24,829.00	77,438.00	Consumables	5,51,228.00
0		0	12,795.00	Contingencies	3,782.00
0		0	0	Travel	6,510.00
0		0	0	Overheads	0
0		0	70,000.00	Equipment	2,50,000.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
14,00,000.00		**19,29,977.00**	**1,91,852.00**		**9,76,880.00**
0	Excess of Expenditure over Income	**0**	**12,08,148.00**	Closing Balance	**9,53,097.00**
14,00,000.00		**19,29,977.00**	**14,00,000.00**		**19,29,977.00**

NIAB
Hyderabad
SP016 (VB)-DST INSPIRE FACULTY-Charterization of transglycosylases associated with cell wall biogenesis in Vancomycin resistant Staphylococcus aureus
P.I: DR VASUNDHRA BHANDARI
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	1,96,064.00			0
11,07,320.00	Grant In Aid	14,95,616.00	2,40,000.00	Salaries - Manpower	11,21,230.00
0	Other Receipts	2,652.00	4,88,666.00	Consumables	1,38,664.00
0		0	0	Contingencies	93,820.00
0		0	0	Travel	23,025.00
0		0	35,000.00	Overheads	35,000.00
0		0	1,47,590.00	Equipment	1,99,887.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
11,07,320.00		**16,94,332.00**	**9,11,256.00**		**16,11,626.00**
0	Excess of Expenditure over Income	**0**	**1,96,064.00**	Closing Balance	**82,706.00**
11,07,320.00		**16,94,332.00**	**11,07,320.00**		**16,94,332.00**

NIAB
Hyderabad
SP017 (AS)-Elucidation of mechanism(s) of transformation of host cells by Theileria annulata
P.I: Dr. Anand Srivastava
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	6,97,000.00			0
8,47,000.00	Grant In Aid	19,50,000.00	0	Salaries - Manpower	3,77,520.00
0	Other Receipts	46,189.00	0	Consumables	13,01,852.00
0		0	0	Contingencies	333.00
0		0	0	Travel	42,298.00
0		0	1,50,000.00	Overheads	0
0		0	0	Equipment	6,29,610.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
8,47,000.00		**26,93,189.00**	**1,50,000.00**		**23,51,613.00**
0	Excess of Expenditure over Income	**0**	**6,97,000.00**	Closing Balance	**3,41,576.00**
8,47,000.00		**26,93,189.00**	**8,47,000.00**		**26,93,189.00**

NIAB
Hyderabad
SP018 (SM)-Towards establishing an efficient animal-based production of thrapeutic Protein in Milk of farmed animals using various modes of gene delivery
P.I: Dr. Subeer S Majumdar
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0.00	Opening Balance	21,09,075.00			0
21,09,075.00	Grant In Aid	0	0	Salaries - Manpower	2,05,920.00
0	Other Receipts	70,117.00	0	Consumables	7,97,610.00
0		0	0	Contingencies	18,638.00
0		0	0	Travel	75,509.00
0		0	0	Overheads	0
0		0	0	Equipment	1,34,670.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
21,09,075.00		**21,79,192.00**	**0.00**		**12,32,347.00**
0.00	Excess of Expenditure over Income	**0**	**21,09,075.00**	Closing Balance	**9,46,845.00**
21,09,075.00		**21,79,192.00**	**21,09,075.00**		**21,79,192.00**

NIAB
Hyderabad
SP019-Development of peptide based anti-inflammatory drug for septicemia
P.I: Dr. Girish K Radhakrishnan
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	31,78,000.00			0
32,81,000.00	Grant In Aid	25,23,250.00	0	Salaries - Manpower	1,02,440.00
0	Other Receipts	1,55,846.00	0	Consumables	6,62,362.00
0		0	0	Contingencies	16,963.00
0		0	0	Travel	0
0		0	1,03,000.00	Overheads	44,000.00
0		0	0	Equipment	44,76,808.85
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
32,81,000.00		**58,57,096.00**	**1,03,000.00**		**53,02,573.85**
0	Excess of Expenditure over Income	**0**	**31,78,000.00**	Closing Balance	**5,54,522.15**
32,81,000.00		**58,57,096.00**	**32,81,000.00**		**58,57,096.00**

NIAB
Hyderabad
SP020(AS)-Evaluation of medicinal plant extracts for anti-tick activity and identification of active compounds
P.I: Dr. Anand Srivastava
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	16,00,000.00	0	Salaries - Manpower	2,64,159.00
0	Other Receipts	43,142.00	0	Consumables	3,53,655.00
0		0	0	Contingencies	2,01,000.00
0		0	0	Travel	20,076.00
0		0	0	Overheads	1,39,400.00
0		0	0	Equipment	4,32,169.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**16,43,142.00**	**0.00**		**14,10,459.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**2,32,683.00**
0.00		**16,43,142.00**	**0.00**		**16,43,142.00**

NIAB
Hyderabad
SP021 (UK)-Rescue of recombinant bluetongue virus using a novel approach employing plasmid based system and host to understand the viral evasion of host immunity
P.I: Dr. K Usha
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	16,53,000.00	0	Salaries - Manpower	68,333.00
0	Other Receipts	0	0	Consumables	0
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	15,84,667.00
0.00		**16,53,000.00**	**0.00**		**16,53,000.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**0**
0.00		**16,53,000.00**	**0.00**		**16,53,000.00**

NIAB
Hyderabad
SP022 (NRH)-Development, testing and evaluation of whole and recombinant antigen-based ELISA for monitoring the health of laboratory animals Phase -II
P.I: Dr. N R Hegde
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	19,36,050.00	0	Salaries - Manpower	2,07,000.00
0	Other Receipts	28,257.00	0	Consumables	5,35,744.00
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	49,250.00
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**19,64,307.00**	**0.00**		**7,91,994.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**11,72,313.00**
0.00		**19,64,307.00**	**0.00**		**19,64,307.00**

NIAB
Hyderabad
SP023 (NRH)-Molecular epidemiology and genomics of mastitis-associated staphylococci
P.I: Dr. N R Hegde
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	18,66,600.00	0	Salaries - Manpower	2,26,200.00
0	Other Receipts	30,226.00	0	Consumables	6,60,090.00
0		0	0	Contingencies	0
0		0	0	Travel	11,052.00
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**18,96,826.00**	**0.00**		**8,97,342.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**9,99,484.00**
0.00		**18,96,826.00**	**0.00**		**18,96,826.00**

NIAB
Hyderabad
SP024(SSM)-Genomics for conservation of indigenous cattle breeds and for enhancing milk yield, Phase -I
P.I: Dr Subeer S Majumdar
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	10,58,63,200.00	0	Salaries - Manpower	0
0	Other Receipts	9,00,240.00	0	Consumables	5,11,412.00
0		0	0	Contingencies	1,75,067.00
0		0	0	Travel	2,65,970.00
0		0	0	Overheads	0
0		0	0	Equipment	9,85,950.00
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**10,67,63,440.00**	**0.00**		**19,38,399.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**10,48,25,041.00**
0.00		**10,67,63,440.00**	**0.00**		**10,67,63,440.00**

NIAB
Hyderabad
SP025 (SF)-Random and Targeted mutagenesis of zoonotic pathogen Leptospira interrogans: In perspective of vaccine development"
P.I: Dr Syed Mohd Faisal
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	30,71,000.00	0	Salaries - Manpower	0
0	Other Receipts	25,963.00	0	Consumables	1,84,645.00
0		0	0	Contingencies	6,000.00
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**30,96,963.00**	0		**1,90,645.00**
0	Excess of Expenditure over Income	**0**	**0.00**	Closing Balance	**29,06,318.00**
0.00		**30,96,963.00**	0		**30,96,963.00**

NIAB
Hyderabad
SP026 (SS)-Integrated Biotechnological Approach towards Improvement of Quality and Productivity of Tropical Tasar Silk
P.I: Dr Shailesh Sharma
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	20,43,000.00	0	Salaries - Manpower	0
0	Other Receipts	17,420.00	0	Consumables	0
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	20,000.00
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**20,60,420.00**	**0.00**		**20,000.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**20,40,420.00**
0.00		**20,60,420.00**	**0.00**		**20,60,420.00**

NIAB
Hyderabad
SP027(PS)-Aptamer based lateral flow device for the detection of heat or estrous in buffalo
P.I: Dr. Pankaj Suman
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	24,14,802.00	0	Salaries - Manpower	0
0	Other Receipts	10,420.00	0	Consumables	15,081.00
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**24,25,222.00**	0		**15,081.00**
0	Excess of Expenditure over Income	**0**	**0.00**	Closing Balance	**24,10,141.00**
0.00		**24,25,222.00**	0		**24,25,222.00**

NIAB
Hyderabad
SP028(BD)-The Ramanujan Fellowship
P.I: Dr. Bappaditya Dey, Sci-E
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	4,00,000.00	0	Salaries - Manpower	0
0	Other Receipts	1,565.00	0	Consumables	0
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	60,000.00
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**4,01,565.00**	**0.00**		**60,000.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**3,41,565.00**
0.00		**4,01,565.00**	**0.00**		**4,01,565.00**

NIAB
Hyderabad
SP029(GKR)-To understand the role of Cytoplasmic linker protien-170 in the down-regulation of TLR4 signaling
P.I: Dr.Girish K Radhakrishnan, Scintist-E
Receipts and Payments Account from 01/04/2017 to 31/03/2018

Previous Year Amount Rs.	Receipts	Current Year Amount Rs.	Previous Year Amount Rs.	Payments	Current Year Amount Rs.
0	Opening Balance	0			0
0	Grant In Aid	25,11,800.00	0	Salaries - Manpower	0
0	Other Receipts	963.00	0	Consumables	0
0		0	0	Contingencies	0
0		0	0	Travel	0
0		0	0	Overheads	0
0		0	0	Equipment	0
0		0	0	Books	0
0		0	0	AMC	0
0		0	0	Others	0
0		0	0	Transfer of Funds	0
0.00		**25,12,763.00**	**0.00**		**0.00**
0	Excess of Expenditure over Income	**0**	**0**	Closing Balance	**25,12,763.00**
0.00		**25,12,763.00**	**0.00**		**25,12,763.00**

मानव कल्याण के लिए पशु स्वास्थ्य

Animal Health for Human Welfare

MILAN with Farmers

Allahabad, Uttar Pradesh

Sambalpur, Odisha

National Institute of Animal Biotechnology

(An autonomous institute of the Department of Biotechnology,
Ministry of Science & Technology, Govt. Of India)

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