use through Directorate of Animal Husbandry and Veterinary Services, Government of Tamil Nadu by TRPVB, TANUVAS.

- Recombinant PPRV truncated nucleoprotein antigen production for use in ELISA method. This technology was commercialized to M/s. Indian Immunologicals, Hyderabad
- Recombinant Leptospira LipL41 antigen production for use in diagnosis of leptospirosis. This technology was commercialized to M/s. Indian Immunologicals, Hyderabad
- Immunology Teaching kits was commercialized to M/s. Medox Biotech, Chennai
- Leptospira Latex Agglutination kit was commercialized to M/s. Fort Pharma, Chennai

e. Patents Granted

Name of the invention	Year	Patent Number
A test strip for quantitative detection of antibodies to PPRV	04.10.2010	243290
Nano-biomarker coupled Newcastle disease vaccine (NDV)	22.10.2020	349908
A novel method to diagnose small ruminants with potential resistance to bluetongue	11.12.2020	353468
An *in-vitro* molecular method for identifying gender in emu	22.10.2020	349823
Chicken Anaemia Virus (CAV)Antibody Detection Kit	22.09.2020	347388
ABT mini-encapsulator	24.09.2020	347623

f. Salient Achievements

- Peste des petits ruminant's virus (PPRV) antigen detection kit was developed based on flow-through technology using mono specific sera against recombinant nucleoprotein.
- Whole genome sequencing information has been generated for pathogens affecting cattle, poultry, dogs and cats which includes *Mycobacterium avium* subsp *paratuberculosis*, New Castle Disease Virus, Infectious Bronchitis Virus, Infectious Bursal Disease Virus, Canine and feline parvo virus.
- CDV-Check-Canine distemper virus (CDV) antibody detection kit based on indirect ELISA using recombinant truncated cross reactive PPRV nucleoprotein.
- Lateral flow antigen detection kit for classical swine fever virus
- First report of feline parvovirus infection in cats in India
- Development of multiplex PCR kit for detection of avian oncogenic viruses
- Chikungunya diagnosis by reverse transcription polymerase chain reaction
- Nanoparticles biomarker coupled Newcastle disease virus vaccine
- Development of heat killed and recombinant fusion protein vaccine for *Mycobacterium avium* subsp *paratuberculosis*
- A Nanotechnology laboratory with capabilities for nanoscale measurements and Raman spectral mapping of biological and nanoparticles has been established under the NADP funding.
- A cost effective mini encapsulator equipment was developed for encapsulation of probiotic bacteria for laboratory scale production.

III. EXTENSION

a. Details of Self financing schemes implemented at Dept of ABT

S.No	Name of the Self financing schemes	Date of Start	No of Beneficiaries
1.	Human Resource Development Unit (i) HRD Level I (ii) HRD Level II (iii) HRD Level III	29.09.2005	 246 317 467
2.	Training on (i) *In vitro* fertilization (IVF) (ii) Intra cytoplasmic sperm injection (ICSI)	06.09.2013	 105 32
3.	Biotechnological Services Unit	26.10.2012	867

b. Training/ Workshop Conducted

1. ASCAD training was conducted for field veterinarians on **"Recombinant Antigen based Diagnostic assay development"** during the year 2016-17.
2. ICAR-BSMA workshop was conducted on **"Restructuring of PG curriculum and syllabi in Basic Veterinary Subjects"** during the year 2018-19.
3. National cell culture workshop on **"Recent Trends in Cell Culture Techniques"** during the year 2019-20.

NABL Accreditation

The Rabies Diagnostic Laboratory of Department of Animal Biotechnology is an **ISO/IEC 17025:2017 accredited laboratory** in the field of Biological testing offering Rabies diagnostic services for antigen and antibody testing.


National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

RABIES DIAGNOSTIC LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

BLOCK II, III FLOOR, DEPARTMENT OF ANIMAL BIOTECHNOLOGY, MADRAS VETERINARY COLLEGE, TANUVAS, CHENNAI, TAMIL NADU, INDIA

in the field of

TESTING

Certificate Number: TC-7829

Issue Date: 13/09/2018 Valid Until: 10/09/2020*

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

Name of Legal Identity : Tamil Nadu Veterinary and Animal Sciences University

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY

FACULTY OF BASIC SCIENCES

Department of Animal Biotechnology

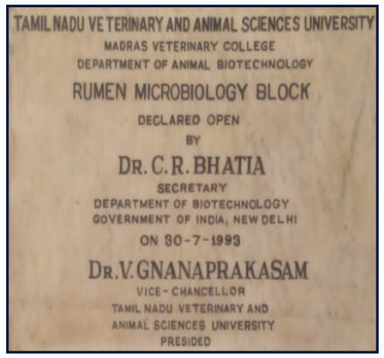
Madras Veterinary College
Chennai - 07

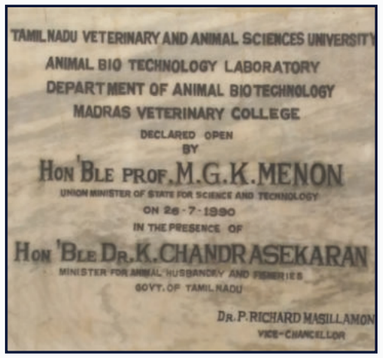
GENESIS OF THE DEPARTMENT

The Department of Animal Biotechnology (ABT) was started through the pioneering efforts of visionary staffs in the year 1989, the same year when TANUVAS was also formed. Ten years into its existence in 1999, the Indian Council of Agricultural Research (ICAR) recognized the department as a **"Centre of Excellence in Veterinary Biotechnology and Immunology"**. It is the first Animal Biotechnology Department in this country that was awarded the **ISO 2001:9000** certification for Quality Management Systems through the British Standards Institute, UK. The Department was also awarded the **"Niche Area Scheme of Excellence in Avian Biotechnology"** in 2012 to conduct research on **"Improved and expanded vaccines and Immunological understanding of avian viruses"** by ICAR.

The Department of Animal Biotechnology is housed in two blocks of three floors each with 'state of art' facilities to carry out research in various facets of biotechnology. The Central Embryo Biotechnology laboratory is located at the University campus in Madhavaram. The mandate of this department is :

- To provide education and training in all spheres of Biotechnology
- To carry out research in various areas of Biotechnology to ultimately improve animal health, production and productivity
- To disseminate the research technologies developed, to veterinarians, research scientists, students, entrepreneurs and commercial establishments.





I. EDUCATION

The Dept of ABT offers the following PG courses

- M.V.Sc & Ph.D in Animal Biotechnology from 1993
- M.Sc & Ph.D in Biotechnology from 2016
- M.Phil., in Biotechnology from 2004
- PG Diploma in Advanced Reproductive Biotechnology in Animal Models (PGDARB) from 2014

- A total of 24 students have completed their M.V.Sc or Ph.D in Animal Biotechnology and 6 students have completed M.Sc or Ph.D in Biotechnology since 2015
- Currently, a total of 10 students are pursuing their Ph.D either in Animal Biotechnology or Biotechnology.

II. RESEARCH

a. Externally funded projects implemented in the department, currently

S.No	Project title	Year of sanction	Budget (Rs in Lakhs)
1	NADP project on "Augmenting reproductive and production potential through adoption of assisted reproductive techniques using sexed semen in dairy cattle".	2019	75.71
2.	DST-FIST Project on "Animal Health, Food safety and Production"	2020	300

b. Selected external funded research projects completed (2015-2021)

S.No	Title of the project	Funding Agency	Budget (Rs in Lakhs)
1.	Improved and expanded vaccines and Immunological Understanding of avian viruses	ICAR, New Delhi	250.91
2.	Establishing National Hub for Healthcare Instrumentation Development	DST, New Delhi	70.82
3.	Cytokine orchestration using nanoparticles or microRNA - potential for directing immune responses	DBT, New Delhi	41.99
4.	TATA-Innovation fellowship scheme	DBT, New Delhi	22.20
5.	Trilateral research partnership initiative for capacity building and student exchange in influenza virus research	UKIERI	£50,000
6.	Development of novel molecular diagnostics and improved vaccine for Duck Plague virus	DBT, New Delhi	29.17
7.	Nanotechnology facility to augment farm animal production and health	NADP, New Delhi	120.00
8.	Bioplastic production by using slaughter house waste	Govt. of Tamil Nadu	37.36
9.	A novel protection system for delivery of immunomodulatory probiotic bacteria in chicken	DBT, New Delhi	40.33
10.	Validation of molecular diagnostics and vaccine for Classical Swine Fever	DBT, New Delhi	34.96
11.	Hybrid Magnetic Nanoparticle Aptamer Bio Sensor for on-Farm Early Pregnancy Diagnosis in cattle	DST, Nanomission New Delhi	43.35
12.	Selective isolation of sex specific spermatozoa in bovines using novel biomarkers identified through an integrated proteomic and Genomic approach	DBT, New Delhi	91.33
13.	Developing portable instrumentation for the existing technologies available at TANUVAS for detection of post-partum disease conditions in bovines	DST, New Delhi	21.80

c. Salient publications (2015-2021)

- Rapid determination of hydrogen peroxide produced by *Lactobacillus* using enzyme coupled rhodamine isocyanide/calcium phosphate nanoparticles (2015). *Biosensors and Bioelectronics* (IF-2.59)
- Natural influence of season on follicular, luteal, and endocrinological turnover in Indian crossbred cows (2015). *Theriogenology* (IF-2.136)
- Synthesis and characterization of silver nanoparticles using *Azadirchta indica* extract and their anti-fungal activity against *Malassezia species* (2016). *Journal of Nano Research* (IF- 2.18)
- Co-Expression of sialic acid receptors compatible with avian and human influenza virus binding in emus *Dromaius novaehollandiae* (2017). *Virology* (IF-3.11)
- An immunochromatographic lateral flow assay for rapid on the farm detection of classical swine fever virus (2017). *Archives of Virology* (IF-2.16)
- Microbial diversity and community composition of caecal microbiota in commercial and indigenous Indian chickens determined using 16s rDNA amplicon sequencing (2018). *Microbiome* (IF-9.13)
- Detection of Infectious bursal disease virus (IBDV) antibodies using chimeric plant virus – like particles (2019). *Veterinary Microbiology* (IF-2.88)
- QX-like infectious bronchitis virus reported in India (2020). *Veterinary Record* (IF-2.05)
- RNAseq reveals the contribution of interferon stimulated genes to the increased host defense and decreased PPR viral replication in cattle (2020). *Viruses* (IF-3.8)
- Emergence of novel Porcine circovirus 2 genotypes in Southern India (2021). *Transboundary and Emerging Diseases* (IF-5.005)

d. Technologies commercialized

- LeptoMultiEp - IgM based enzyme linked immunosorbent assay for serodiagnosis of Leptospirosis using novel recombinant multiepitopic antigen technology was commercialized to M/s.Genomix Biotech, Hyderabad.
- EndoMetB PB - A probiotic consortium developed for use as a bovine uterine supplement in mild and moderate bovine endometritis. This technology was validated at TRPVB and commercialized to M/s. Genomix Biotech, Hyderabad.
- ABT-CHOICE - A Nanoparticle based antibiotic selection kit for Mastitis. The technology was commercialized to M/s. Genomix Biotech, Hyderabad.
- Emu Sexing Kit-A PCR method for differentiation of gender in emus. This technology was commercialized to VR3 Emu Farms and Hatcheries, Pondicherry
- TANUCHEK -A field based test kit for quantification of somatic cell counts in milk for early detection of mastitis were supplied for field