



HAFFKINE INSTITUTE

For Training Research and Testing

An Autonomous Institute of Govt. of Maharashtra Registered under Societies Registration Act 1860

Recognised as Scientific & Industrial Research Organisation (SIRO) by Ministry of Science & Technology Govt. of India.



ANNUAL REPORT

2023-2024

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2023-24



HAFFKINE INSTITUTE FOR TRAINING, RESEARCH & TESTING

Acharya Donde Marg, Parel, Mumbai 400 012.

www.haffkineinstitute.org

(Revamped under MahatI)

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Director's Desk



**Smt. Seema Vyas (IAS),
Director,
Haffkine Institute**

Greetings from Haffkine Institute!!

It gives me immense pleasure as a director of this prestigious institute to present to you the annual report of the institute for the year 2023-24.

Haffkine Institute is one of the oldest biomedical research institutes in the country and over the years, it has evolved as a centre for multidisciplinary research with public health at its focus. We are committed towards the serving the welfare of humans by means of ameliorating and alleviating sufferings, providing holistic measures to research, prevention, treatment and education in biomedical and allied fields of science.

Through this annual report, I would like to highlight the research, training and testing activities of the

all department of institute and also to convey the achievements made by each department in their domain.

Looking at the dedication and commitment of the staff of the institute, I am confident that the staff of the Haffkine Institute will be ready to face new challenges in the next year. Also their whole hearted participation in the Institute's research, training & testing activities will help in achieving the Institute's goal to become one of the finest research Institutes in the country and in the world. I wish Haffkine staff and students all the best for their future endeavors.

GOVERNING COUNCIL

2023 24

1	Shri. Hasan Mushrif President Hon. Minister, Medical Education Government of Maharashtra Mantralaya, Mumbai – 400 032 Email – min.mme&msa@maharashtra.gov.in Ph- 022 -82843264, 022-82843262	President
2	Hon. Minister of State, Medical Education Government of Maharashtra Mantralaya, Mumbai – 400 032	Vice – President
3	Shri. Dinesh Waghmare (IAS) Principle Secretary Medical Education & Drugs Department Government of Maharashtra Mantralaya, Mumbai – 400 032 Email – psec.mededu@maharashtra.gov.in Ph-022-22719466, 022-22719477	Member
4	Shri. Abhimanyu Kale, IAS Commissioner, Food and Drugs Administration, Bandra-Kurla Complex, Bandra (E), Mumbai – 400 051. Email - comm.fda- mah@nic.in Ph – 022- 26590548	Member
5	Dr. Dilip Mhalsekar Director, Medical Education and Research, Government of Maharashtra, St. George's Hospital Campus, Mumbai - 400001. Email - dmerps@gmail.com Ph – 022-22620735	Member
6	Dr. Atul Goel Director General of Health Services, Government of India, Room No. 444, 'A' Wing, Nirman Bhawan, New Delhi – 110108.	Member
7	Smt. Seema Vyas, IAS Director, Haffkine Institute for Training, Research and Testing, Parel, Mumbai – 400 012.	Member - Secretary

EXECUTIVE COMMITTEE		
2023-24		
1	Smt. Seema Vyas, IAS Director, Haffkine Institute for Training, Research and Testing, Parel, Mumbai – 400 012.	Chairperson
2	Mrs. Suvarna Pachpore Senior Scientific Officer and HOD, Dept. of Chemical Testing, Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member
3	Dr. Usha Padmanabhan Senior Scientific Officer and HOD, Department of Biochemistry and Cell Biology Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member
4	Dr. Anuya Rege Senior Scientific Officer and HOD, Department of Bacteriology, Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member
5	Dr. Mrunal Ghag-Sawant Scientific Officer and HOD Venomous Animal Unit, Zoonosis Dept. and Toxicology Dept. Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member
6	Dr. Sandeepan Mukherjee Scientific Officer and HOD, Department of Virology Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member
7	Dr. Ashish Asrondkar Scientific Officer and HOD, Department of Chemotherapy Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member
8	Dr. Vrushali Patil Scientific Officer and Incharge Department of Training Haffkine Institute for Training, Research and Testing, Parel, Mumbai - 400 012.	Member

Administration 2023-2024



Shri. Sharad Makane

Additional Charge as Chief
Administrative Officer
20/02/2022 - 30/06/2023



Shri. Dhirendra Ramteke

Additional Charge as
Chief Administrative Officer
01/7/2023 to Till Date

Overview

As per Memorandum of Association, the Minister, Medical Education, Government of Maharashtra is Ex-Officio president of the Governing Council and Minister of State, Medical Education is ex-officio Vice-President of the Governing Council. The Governing Council meets once/twice a year and given direction for smooth functioning and progress of the Institute. All other members of the governing council are Ex-Officio members of Government of Maharashtra like Secretary, Medical Education, Director, Medical Education Commissioner, Food and Drugs Administration and a representative from Health department, Government of India, which is considered to be a think tank of the Institute. Apart from this supreme body of the institute, Executive Committee (Administration) meets regularly to execute the decisions of Governing Council and also take decision in local issues. All the decision with financial implications is discussed in the executive committee. The said decisions are then ratified by the Governing Council found fit.

Administration Department maintains personal records of all the staff members. It also maintains record of all the Scientist and Students and caters to the need of various departments for smooth functioning of the Institute. All the Correspondence received in the institute is routed through the Department. Maintenance of facilities like

digital communication is done by Admin. Liaisoning with PWD civil as well as an Electrical helps other department functioning smoothly. After ISO audit the record maintenance system has been improved.

Accounts Section which works under Administration Department also maintains all the books of accounts of the Institute in electronic format. It also maintains records of all the grants received by the Institute for various research project from ICMR, IDSP, DBT and DST, apart from grant in aid received from the Government of Maharashtra. All the accounting is done digitally by accounting software, which facilitates monitoring institute's financial position. Though the payment of salary to staff is received from Treasury office, Thane through Directorate of Ayurveda, the pay bills are prepared and record is maintained at the Institute level. Stores Section which also function under Administration Department, procures all consumables, chemical, reagents, plasticware and glassware items and distributes to all the departments as per their requirements. It also procures all the local and imported Scientific Instruments for various departments of the Institute. The Store department also ensures maintenance of Instruments. Civil and electrical maintenance of the Institute is done by P.W.D, Government of Maharashtra.

Chief Administrative Officer



Research

Research

1. Establishment of National Venom Research Centre in Haffkine Institute

Team: This is an Institutional project involving Department of Biochemistry, Department of VAU, and Department of Chemistry.

Funding Agency - DHR (Department of Health Research), New Delhi

Budget – Rs. 2, 33,64,211/-

Status – Ongoing

Abstract:

Snakebite is on the top of the neglected tropical diseases' list published by the World Health Organization (WHO). In India, annually about 3 lakhs snakebite cases are reported. Of these, 500,000 are fatal and about 1.5 lakhs snakebite victims have serious injuries leading to disabilities. In last decade reduction in efficacy of anti-snake venom (ASV), the only effective treatment for

snakebite is reported, which is predicted to be because of regional and seasonal variation in venom. Establishment of the National Venom Research Centre is initiated - 1. To meet the challenge of mortality and disability due to snakebite, 2. To understand ecology of snakes, 3. To find user-friendly and economic alternatives to ASV and 4. To explore therapeutic applications of venoms. (As submitted in 2018).

2. National One Health Programme for Prevention and Control of Zoonosis

(NOHP-PCZ)

Team: This is an Institutional project involving Department of Virology, Department of Zoonosis, Department of Biochemistry, and Department of Training.

Funding agency: National Centre for Disease Control

Budget : Rs. 24,00,000/-

Abstract:

Zoonotic Diseases have emerged as a major cause of Public Health concern over the past 2 decades of the 21st Century. A majority of these diseases – like Rabies, Leptospirosis, Brucellosis, Scrub Typhus etc. - have caused many episodic outbreaks in Urban, Semi-Urban and Rural parts of the country. Timely detection and creating awareness amongst all stakeholders i.e. the Government, the Medical, Veterinary and Animal Health and the Public in general is critical to control, prevention and management of these conditions. With this view, the National Centre for

Disease Control (NCDC) under the aegis of the MoHFW, Government of India, has identified Haffkine Institute as one of the Regional Coordinators under the National One Health Program for Prevention and Control of Zoonosis (NOHPPCZ) the flagship program of the Division of Zoonotic Disease Program (DZDP), NCDC. We are working as coordinator for the states of Maharashtra, Chhattisgarh, and Goa.

As a part of this program in 2023-2024

- An online webinar was conducted on the occasion of World Rabies Day on 27/09/2023.

- Hands-on training for Laboratory Diagnosis of Rabies was conducted for public health officers and microbiologists from the State of Maharashtra during the period from 04/10/2023-06/10/2023.
- A lecture series on Veterinarian & Zoonosis was conducted on 04/11/2023. Experts from Veterinary Sciences delivered talks at the event. The participants included various clinicians, veterinarians, and human and veterinary public health professionals.
- Talk on National Action Plan for the Elimination of Dog-Mediated Rabies was delivered on 11/12/2023 for the participants including animal caretakers, dog catchers, and veterinarians.
- Meeting for the Implementation of the Zero Rabies Program for Mumbai City under the Zero Rabies Cities Program of NCDC, GoI

was held between the Executive Health Officer and the Epidemiology Team from BMC, Mumbai on 06/10/2023.

- Meeting for the Implementation of the Zero Rabies Program for Mumbai City under the Zero Rabies Cities Program of NCDC, GoI was held between NCDC, Panvel Municipal Corporation, and Haffkine Institute for Training Research & Testing on 08/11/2023.
- In other study activities, a comparative study of rabies detection RT-PCR kits was performed. Also, in community outreach activities, Haffkine Institute worked along with Mission Rabies NGO, PATH NGO, and Prayas Social Work in Criminal Justice NGO for rabies awareness.

We plan to perform the testing and training activities under this program in the upcoming year.





Bacteriology

Bacteriology



Dr. Anuya Rege
Head of the Department

Overview

Department of Bacteriology is the oldest department of the Haffkine Institute. Since its beginning, the department has been involved in research to tackle problems of immediate concern to public health. In 1896, plague broke out in Bombay in an epidemic form. Dr. Haffkine was invited by the Government to investigate the causes of the plague epidemic and to develop a prophylactic. He started his work in one of the rooms of the Petit Laboratory of Grant Medical College and this was the beginning of the Department of Bacteriology, with the main function of producing plague vaccine. In the year 1947, the Department of Bacteriology- then known as 'Vaccine Department'-supplied 23.5 million ml of plague vaccine, the highest in the history of the Institute. Department gradually undertook the production of Cholera & T.A.B.

vaccines. The year 1963 saw the historic peak of supply of 23.5 million ml. of cholera vaccine.

Currently, it provides testing facilities for carrying out Bacteriological examination of water samples from various industrial and household sources. Besides, departmental testing activities also involve Testing of water purifying systems & Air sterilizers, antimicrobial efficacy testing of sanitizers, disinfectants, antimicrobial coated/incorporated material as well as synthetic and herbal preparations

Furthermore, department provides guidance and Research facilities to M.Sc. / Ph.D. candidates and Short Term Research Interns (STRIP students).

Department has initiated research projects on Antibacterial & Antibiofilm activities of natural products.

Dr. Anuya Rege



Department Photograph



मराठी भाषा
गौरव दिवस
२०२४

जागतिक
महिला दिन
२०२४





STRIP (Nov. 2023- Mar 2024) Student's Presentations



Dr. Rege with her
STRIP 2023 Student

STRIP 2023
Student's Presentation



Research Projects 2023-24

1. *In vitro* Evaluation of Antibacterial & Antibiofilm Potential of Alum (*Sphatika*) and its *Bhasma* (*Sphatika Bhasma*) against Clinical Isolates.

Team:

- Miss Mrudali Ambre (STRIP Student, Bacteriology Department)
- Mrs. Dipti Kolte (Co-Mentor, Bacteriology Department)
- Dr. Anuya Rege (Mentor, Bacteriology Department)

Funding Agency: Haffkine Institute

Duration: January 2023 - June 2023 (STRIP Batch- II)

Budget: STRIP Fee

Status: Completed

Abstract

In the present *in vitro* study, antimicrobial activities of Alum (*Sphatika*) and *Sphatika Bhasma* were evaluated against total 6 clinical isolates, viz., *K. aerogenes*, *K. pneumoniae*, *P. aeruginosa*, *P. mirabilis*, *P. vulgaris*, *S. flexneri* and a mixed culture, using various assays such as MIC, MBC and Agar Well Diffusion Method. Further, their effect on bacterial biofilms was also detected using crystal violet staining method. The antibiofilm activity of Alum was noted in the order of *P. mirabilis*

> *P. aeruginosa* > *P. vulgaris* > *K. pneumoniae* > *S. flexneri* > Mixed culture > *K. aerogenes*, whereas, antibiofilm activity of *Sphatika Bhasma* was noted in the order of *P. aeruginosa* > Mixed culture > *P. vulgaris* > *S. flexneri* > *K. pneumoniae* > *P. mirabilis* > *K. aerogenes*. Furthermore, AL

+ SB combination acted synergistically against the biofilms of clinical isolates. Moreover, Alum and *Sphatika Bhasma* have revealed Antimicrobial and Antibiofilm potential against mono as well as mixed cultures in present *in vitro* study.

2. *In Vitro* Assessment of Antibacterial & Antibiofilm Potential of Ascorbic Acid against Standard Strains.

Team:

- Miss Saloni Akhadkar (STRIP Student, Bacteriology Department)
- Mrs. Dipti Kolte (Co-Mentor, Bacteriology Department)
- Dr. Anuya Rege (Mentor, Bacteriology Department)

Funding Agency: Haffkine Institute

Duration: November 2023 - March 2024 (STRIP Batch- I)

Budget: STRIP Fee

Status: Completed

Abstract

In the present *in vitro* study, Ascorbic Acid was evaluated for its Antibacterial activity against 6 bacteria (standard strains) namely, *E. coli* (ATCC-25922), *S. enterica* (NCIM-5256), *S. typhi* (NCTC-786), *E. faecalis* (ATCC-29212), *MRSA* (ATCC-25923), *S. aureus* (NCTC-3750) and their 3 Mixed Cultures using MIC, MBC and Agar Well Diffusion methods. Further, their effect on bacterial biofilms was also detected using crystal violet staining method. The antibiofilm activity of Ascorbic Acid was noted in the order of Mixed Culture-III > Mixed Culture-I > *MRSA* > *S. typhi* > Mixed Culture-II > *E.*

faecalis > *E. coli* > *S. aureus* > *S. enterica*. Furthermore, Ascorbic Acid + Ciprofloxacin combination acted synergistically against the biofilms of *E. faecalis*, *MRSA* and *S. aureus* and Mixed Culture-I. Besides, In the Time Course Study with Ascorbic Acid, *S. enterica*, *S. typhi* and *MRSA* were found to be inhibited around 3hr., whereas, *E. faecalis*, *S. aureus*, Mixed Culture-II and Mixed Culture-III were inhibited around 6hr. Furthermore, *E. coli* and Mixed Culture- I were inhibited around 24hr. Thus, Ascorbic Acid exhibited broad spectrum Antibacterial as well as Antibiofilm potential by inhibiting Gram Positive as well as Gram negative bacteria and their mixed cultures.

3. Determination of Antimicrobial & Anti-Biofilm Effect of Ascorbic Acid- An *In vitro* Study.

Team:

- Miss Disha Thakur (STRIP Student, Bacteriology Department)
- Mrs. Dipti Kolte (Co-Mentor, Bacteriology Department)
- Dr. Anuya Rege (Mentor, Bacteriology Department)

Funding Agency: Haffkine Institute

Duration: November 2023 - March 2024 (STRIP Batch- I)

Budget: STRIP Fee

Status: Completed

Abstract

In the present *in vitro* study, Ascorbic Acid was evaluated for its Antimicrobial effect against 6 Clinical isolates namely, *K. aerogenes*, *K. pneumoniae*, *P. aeruginosa*, *P. mirabilis*, *P. vulgaris*, *S. flexneri* and mixture of all bacteria as well as 2 Fungi namely, *A. niger* (ATCC-16404) & *C. albicans* (ATCC-10231) and Mixture of *C. albicans* & Bacteria using MIC, MBC and Agar Well Diffusion methods. Besides, Ascorbic Acid was further evaluated for its effect on microbial biofilms using Crystal Violet staining method. The antibiofilm activity of Ascorbic Acid was noted in the order of *P. aeruginosa* > *P. mirabilis* > Mixed Culture-I > *K. pneumoniae* > *K. aerogenes* > *S. flexneri*. However, it did not show any Anti-biofilm activity against *P. vulgaris* at any concentrations tested. Ascorbic Acid also exhibited the Antibiofilm activity against *C. albicans* and Mixed culture-II

(*C. albicans* + Mixed Bacteria) at RT as well as at 37° C and the activity was found to be concentration dependent. Furthermore, combination Ascorbic Acid + Ciprofloxacin acted synergistically against the biofilms of *K. aerogenes*, *K. pneumoniae* and *S. flexneri*, whereas, combination Ascorbic Acid + Fluconazole acted synergistically against the biofilms of *C. albicans*. Likewise, combination Ascorbic Acid + Ciprofloxacin+ Fluconazole acted synergistically against the biofilms of Mixed Culture-II. Besides, the Time Course Study with Ascorbic Acid revealed inhibition of all clinical isolates and their mixture around 3 hours, whereas, it displayed inhibition of *C. albicans* and Mixed Culture-II around 48 hours and 6 hours respectively. Thus, Ascorbic Acid can be used for combating the microbial biofilms-related menaces.

4. " Biodegradation of PAHs (Naphthalene and Anthracene) by Bacteria Isolated from Oil- Contaminated Soil Sample."

Team:

- Miss Nishitta Prakash Nayak (STRIP Student, Bacteriology Department)
- Mrs. Jayashree More (Mentor, Bacteriology Department)

Funding Agency: Haffkine Institute

Duration: December 2023 - May 2024 (STRIP Batch – II)

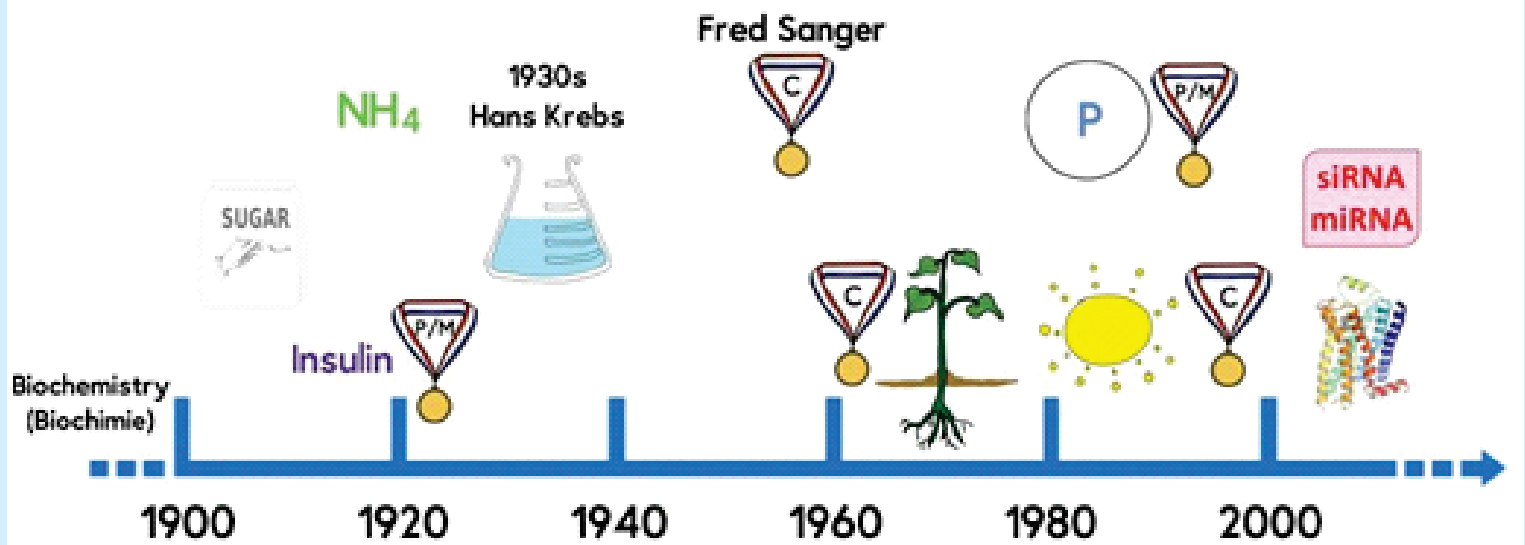
Budget: STRIP Fee

Status: On going

Abstract

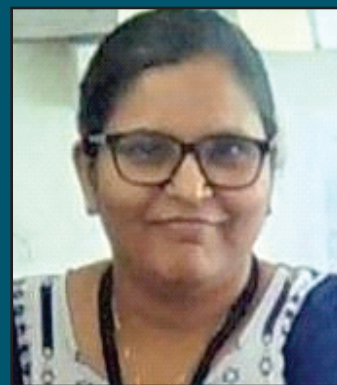
Few initial stages like Soil sample collection from various sites and isolation of Bacteria from collected soil samples are going on.

Timeline of Biochemistry



Biochemistry

Biochemistry



Dr. Usha Padmanabhan
Head of the Department

Overview

The Department of Biochemistry was established in 1923. The department is actively involved in basic and applied research, testing activities including pre-clinical cytotoxicity assays, snake venom and ASV testing, and training programs. Unique and novel testing services offered by the Department are chemical testing of honey and biochemical analysis of gall bladder and kidney stones. At present, various independent and collaborative projects focused on diseases prevalent in India are being pursued.

Understanding pathogenesis of the diseases at molecular level would aid in better management of the diseases at different levels, i.e., diagnosis, therapy and prognosis. Screening of traditional medicinal formulations and synthetic compounds for therapeutic activities using 'in vitro' and 'in vivo' techniques forms an integral part of the departmental research activities. Pharmacological studies on traditional medicines will enable their wider acceptance and will also result in finding novel applications. The department would like to focus more on clinical research with public health implications



Departmental Photograph

Research Projects 2023-24

1. To isolate various Subunits of various kinds Venom of (Indian big four) and understand antigenicity against ASVs.

Team:

- Dr. Usha Padmanabhan,
- Dr. Amruta Naik,
- Dr. Shruti Jawale
- Shivam Kesarwani

Funding Agency: Haffkine Institute, DHR (Department of Health Research) & BITP

Duration: Infinity

Budget: As per Institute guidelines

Status: ongoing

Abstract

Cobra, Russell's viper, krait and saw-scaled viper are the Indian big 4 venoms. The most common sea snake along the Indian coast, is the hook-nosed sea snake (*Hydrophis schistosus*). Then come two other species, the annulated sea snake (*H. cyanocinctus*) and Malacca sea snake (*H. caerulescens*). There is no antidote available specifically for sea snake venom.

Snake venoms are complex mixtures of enzymes and proteins of various sizes, amines, lipids, nucleosides, and carbohydrates. Venoms also contain various metal ions that are presumed to act as cofactors and include sodium, calcium, potassium, magnesium, and zinc. Polypeptide toxins (molecular weight 5-10 KDa) include cytotoxins, cardiotoxins, and postsynaptic neurotoxins (such as α -bungarotoxin and α -Cobratoxin), which bind to acetylcholine receptors at neuromuscular junctions. Viperid

venom contains 80-90% elapid venoms 25-70% enzymes (3-150 KDa) of, which damage vascular endothelium.

There are 4 manufacturers of antivenom in India. High quality snake antivenoms are the most effective treatment to prevent or reverse most of the venomous effects of snake bites. Another issue is that the amount of antivenom used for treatment also needs to be standardized since in most cases, there is a overuse of antivenom leading to unwanted sideeffects in patients.

This project aims to isolate subunits / peptides/ enzymes present in snake venom and identify which the leading antigen in snake venom and if possible standardize the dose of antivenom for neutralization of each venom type.

The project has been approved by the expert committee overseeing the NVRC project and Biosafety Committee.

2. IgG and B cells isolation from rabbits injected with cobra venom.

Team:

- Dr. Usha Padmanabhan,
- Dr. Amruta Naik,
- Mr. Sameer Patil,
- Mrs. Sanika Parka
- Mr. Pravin Shirsat.

Funding Agency: Haffkine Institute

Duration: 3 years

Budget: 20,00,000/-

Status: ongoing

Snakebite envenoming is recognized as a high-priority neglected tropical disease (NTDs) by the World Health Organization that predominantly affects rural communities living in low and middle income countries in Asia, Latin America, and Africa (Attarde et al., 2022). More than 5.8 billion people globally are at risk of snakebite envenoming, which kills between 81,000 and 138,000 people per year. In the South East Asia Region – a biodiversity hotspot for venomous snakes, and home to some of the world's most densely packed populations snakebite envenoming is a major public health problem, killing tens of thousands of people every year and causing a range of physical and mental disabilities, including blindness and amputation, and post-traumatic stress disorder (WHO, 2022). In India, out of the 60 described snake species that cause clinically significant envenomation in humans, 14 species have been noted to cause human mortalities (WHO, 2016). The centerpiece in the therapy of snakebite envenomings is the timely administration of safe and effective antivenoms, which are preparations of IgGs or IgG

fragments prepared from the plasma of horses or other animals

immunized with venoms of one snake species (monospecific antivenoms) or several species (polyspecific antivenoms) (Gutiérrez et al., 2020).

Nevertheless, existing antivenoms only available specific treatment for snakebite are produced exclusively against the 'big four' snakes: the spectacled cobra (*Naja naja*), common krait (*Bungarus caeruleus*), Russell's viper (*Daboia russeli*) and saw-scaled viper (*Echis carinatus*). Despite the availability of polyvalent antivenom, snakebite continues to be a severe burden on the rural agrarian communities in India, resulting in an annual toll greater than that of any other country (Mahapatra et al., 2011).

In many cases of snakebite envenoming, it is often difficult for clinicians treating patients to determine the species responsible for envenoming, thus making treatment with the correct antivenom more difficult, especially in regions where only monospecific antivenoms are available

(Theakston and Laing, 2014). For years, much effort has gone into developing novel diagnostics to support diagnosis of snakebite victims, especially in rural areas of the tropics. Gaining access to affordable and rapid diagnostics could potentially facilitate more favourable patient outcomes due to early and appropriate treatment (Knudsen et al., 2021). Thus,

we aimed to induce the IgG production in the In vivo model against the Indian cobra venom which will be examined for its cross reactivity with cobra venom by performing ELISA to develop a novel diagnostic kit for the detection of snakebite envenoming.

3. Estimation of Anti-diabetic Potential of Ayurvedic Metallic Formulation

Team:

- Dr. Amruta Naik.

Collaborator:

- Dr. Aditi Kulkarni,
Podar medical college, Mumbai

Funding Agency: Once the MOU signed it will be submitted to AYUSH

Duration: 3 years

Budget: 8,00,000/-

Status: To be submitted to AYUSH

Abstract

Type 2 diabetes (T2D), which is much more common, is primarily a problem of progressively impaired glucose regulation due to a combination of dysfunctional pancreatic beta cells and insulin resistance. Diabetic nephropathy is reported to be responsible for 25% of mortality in diabetes mellitus as it is a major sequel of diabetes mellitus, leading to end stage renal disease. Identification and assessment of therapeutic potential of natural compounds have been led to the discovery of innovative and economical drugs to treat several diseases, including diabetes. Suvarna Raj Vangeshwar is an Ayurvedic metallic formulation prepared using Kupipakwa

rasayana method. In clinical practice, it is used by Ayurvedic practitioners in conditions Prameh or Meha which is correlated with diabetes mellitus. In vitro cell based assay is an appropriate and inexpensive method for understanding of anti-diabetic action of compound. Various medicinal plants has been explored so far with respect to their anti-hyperglycemic activity but very less work has been done so far on the herbometalic preparations with respect to anti diabetic potential. Hence, in this proposed study the anti-hyperglycemic effect of the Suvarna Raj Vangeshwar will be monitored to understand its mode of action.

4. Effect of Snake Venom on Human Cells.

Team:

- Dr. Amruta Naik.

Collaborator:

- Dr. Usha Padmanabhan

Funding Agency: Haffkine Institute

Duration: 3 years

Budget: 7, 00,000/-

Status: Ongoing

Abstract

Snake venoms have evolved a wide diversity of peptides and proteins that induce harmful inflammatory and neurotoxic effects including severe pain and paralysis, hemotoxic effects, such as hemorrhage and coagulopathy, and cytotoxic/ myotoxic effects, such as inflammation and necrosis. Although sufficient in most cases, snakebite treatments have been challenged by the continuous high numbers of clinical illness and mortality associated with snakebites worldwide. Chronic morbidity following snakebites have been underestimated, with many victims reporting chronic symptoms in the bitten region, including complex regional pain syndrome and musculoskeletal disabilities. Available snakebite treatments face challenges associated with high incidences of adverse reactions along with poor

efficacy against local tissue effects. Therefore, there is a need of more research work directed to the development of more effective snakebite therapies which will enable to overcome severe acute and chronic effects caused by snakebites. Understanding the cellular mechanisms of how the venom act especially at the bite site will help to identify ways to prevent severe complications of the snake bites e.g. tissue destruction. Therefore, this study focus on the determination of events that underlie cellular exposure will help to identify pathways perturbed by crude venom explain some of the pathological effects observed in local envenomation. Data obtained from this study may serve as the basis for diverse translational research for the utilization of snake venom in the therapeutics.

5. MOLECULAR CHARACTERIZATION OF ENDOGENOUS INDIAN SCORPION(S) THROUGH WHOLE GENOME SEQUENCING.

Team:

- Dr. Usha Padmanabhan,
- Ms. Amalamerin George Kanjupally (Ph.D. student)

FundiAng Agency: Internal

Duration: 3-5 years

Budget: Rs. 1 lakh per year

Status: Ongoing

Abstract

Scorpions are venomous arachnid arthropods mainly inhabiting a wide range of hot and dry environments in the terrestrial ecosystem. The risk of scorpion envenomation to public health in tropical and subtropical areas of the world is life-threatening. Over 2.5 billion people are at risk for scorpion stings. Farmers, workers, and residents in rural areas are among the most vulnerable group. **Fig 1: Indian red scorpion found in the residential area.** Across the globe, there are approximately 1750 species, of which 25 are dangerous to humans. Presently, there are around 86 species found throughout India. The two commonly found species of scorpions that are found in the Indian subcontinent– the red scorpion (*Hottentotta tamulus*) and the black scorpion (*Heterometrus*). In India, commonly affected states are Maharashtra, Karnataka, Tamil Nadu, West Bengal, Madhya Pradesh, Puducherry, and Odisha. The composition of venom differs in accordance with geographical differences. In the state of Maharashtra, it is observed that the composition of *H. tamulus* venom varies depending on the region from which the sample was obtained. In India, scorpion envenomation treatments are generally symptomatic since specific anti-venoms are not available unlike the other developed countries like South Africa, Middle East, and America.



Fig 1: Indian red scorpion found in the residential area.

This study aims to understand the venom composition by utilizing the whole genome sequencing technique which will provide insights to identify venom related genes in the development of effective anti- scorpion venoms to combat the life-threatening consequences of scorpion bites, ensuring the safety of public health. The results of the study will contribute to the genomic database for scorpions by providing high- quality genome sequences. This understanding can improve treatment outcomes for scorpion stung patients by allowing researchers to target certain venom components or modify anti-scorpion venoms formulations to account for geographical variances in scorpion species.

In this study, DNA extraction from scorpions (the red scorpion and the black scorpion) will be carried out. Whole genome sequencing will be performed using Oxford Nanopore Technology (ONT). Targeted sequencing will be carried out using Sanger sequencing.



Fig 2: Indian black scorpion obtained from Venomous animal unit

6. An investigation of endogenous Indian snake(s), such as Saw-scaled viper through whole genome sequencing.

Team:

- Dr. Usha Padmanabhan,
- Ms. Priyanka Mishra (Ph.D. student)

Funding Agency: Internal

Duration: 3-5yrs

Budget: Rs. 1 lakh p.a.

Status: Ongoing

Abstract

Snakes are squamates and are ingrained in the lizard phylogeny. Approximately 3150 species of snakes are found around the world. There are more than 300 species of snakes in India, and 60 of them are considered dangerous. An estimated 81000 to 138000 snakebite deaths occur each

year worldwide. Estimated death due to snakebite in India was 1.2 million with the average of 58000 deaths per year from 2000-2019. The "Big Four" snakes of India namely Indian cobra (*Naja naja*), common krait (*Bungarus caeruleus*), Russel's viper (*Daboia russelii*), saw scaled viper (*Echis carinatus*) are responsible for the majority of India's yearly more than 46,000 snakebite deaths.

Envenomation and snakebite mortality are frequently unreported in the field of global health. Based on the mortality and amputations data, WHO added snakebite envenoming to its priority list of neglected tropical illnesses in 2017 (WHO, 2019b) and in 2019 it unveiled a strategy for the prevention and management of snakebite. The lack of sufficient quantities of significant morphological features, along with insufficient sampling and a shortage of experienced experts, have been key roadblocks to understanding snake diversity.

Using the snake moult samples provides a non-destructive substitute for the traditional way of DNA extraction from tissues, which can lead to infections and death of the snakes. Whole genome sequencing of the extracted DNA will be carried out using Oxford Nanopore Technology (ONT). By focusing on the whole genome of “Big four” snakes of India, the project aims to understand the venom related genes in species to suggest the development of more effective Anti-Snake Venom (ASV). Targeted sequencing using Sanger sequencing will help for the identification of snake species. This will ascertain the specific genetic markers which are unique or highly conserved within the species.

Morphological characterization data can be helpful for identifying the species based on morphological features for different applications such as biodiversity surveys, behavioural ecology, public awareness, education etc.

Our findings will aid in understanding the polymorphisms and mutation hotspots in the snake genome which lead to characteristic changes in the same species of snakes from different locations. This data may help for the development of region-specific ASV to help reduce the snakebite mortality cases.



Fig.1: Cobra molt (Received from Cell Biology, HITRT)



Fig.2: Saw scaled viper molt (received from Cell Biology, HITRT)

7. Effect of the Cobra Venom on active caspase-3 expression in neuronal cells.

Team:

- Dr. Amruta Naik,
- Dr. Usha Padmanabhan,
- Mr. Karthik Srinivasan,
- Ms. Vaidehee Pramod Diware. (Strip Students)

Funding Agency: DHR

Duration: 6 Months

Budget: 25,000/-

Status: Ongoing

Abstract

Snake envenomation is a significant global health concern, notably for its profound effects on human health worldwide. India experiences a notable incidence of cobra venom bites, ranking among the highest globally. India faces a significant number of snakebite cases, reporting over 1,000,000 incidents annually, which tragically lead to 58,000 deaths, including those specifically attributed to cobra. Cobra venom induces neurotoxicity primarily through the action of alpha-neurotoxins present in the venom. This neurotoxic effect is a significant contributor to the morbidity and mortality associated with cobra envenomation. Cobra venom primarily disrupts neuromuscular transmission leading to acute

neuromuscular weakness, including respiratory involvement, which is a prominent feature of snake envenomations. Cobra venom induces apoptosis leading to morphological alterations indicative of programmed cell death. The activation of the Caspase-3 pathway can be triggered by various cellular signals, including responses to cellular stress and external stimuli, ultimately leading to cell death. This insight into apoptotic pathways enhances our understanding of venom-induced cellular responses and contributes to the development of target specific interventions in snakebite management. In this study the primary focus is to assess the effect of the cobra venom on the neuronal toxicity by quantifying active caspase-3 levels through the technique of ELISA.

8. Effect of snake venom on neurotransmitter release from neuronal cells.

Team:

- Dr. Amruta Naik,
- Dr. Usha Padmanabhan,
- Mr. Karthik Srinivasan,
- Ms. Tanaya Vijay Acharya. (Strip Students)

Funding Agency: DHR

Duration: 6 Months

Budget: 25,000/-

Status: Ongoing

Abstract

Snakebites are a prevalent and concerning issue in India, significantly contributing to morbidity and mortality. The estimated number of snakebites worldwide has been put as 5.4 million, resulting in 2.5 million envenomation and 81,000–138,000 deaths, annually. It is estimated that there are over 1,000,000 snakebites in India alone causing 58,000 deaths annually and significant disability in almost four times the number. The Indian cobra (*Naja Naja*), a member of the 'Big Four' venomous snakes, is a major cause of snakebite envenoming's.

Cobra venom comprises a complex mixture of proteins, enzymes, and peptides, each playing a role in its powerful cytotoxic, neurotoxic, and

cardiotoxic properties. Cobra venom contains neurotoxins that target the nervous system by disrupting neurotransmitter function, allowing the snake to capture prey and defend itself. Cobra venom contains neurotoxins that specifically target acetylcholine (ACH), one of the important neurotransmitter in the nervous system. Acetylcholine is responsible for transmitting signals between nerve cells and muscles, controlling muscle contraction for movement, including respiration. This disruption of nerve signalling can lead to muscle paralysis and, in severe cases, respiratory and cardiac failure. In this study, sandwich-ELISA assay will be performed to determine the effects of cobra venom on the release of human acetylcholine (ACH) by in neuronal cells i.e. LN-18 after venom exposure.

9. Isolating Snake Venom Proteins Through Gel Filtration Chromatography and Subsequent Analysis

Team :

- Dr. Usha Padmanabhan,
- Amruta Naik,
- Shivam Kesarwani and
- Mugda Gulavane (Strip Students)

Funding agency: BITP & STRIP project, Haffkine Institute

Duration: 6 Month

Budget: 40,000/-

Status: Ongoing

Abstract

Snake venom is injected through the fangs of the snake, which are in the gland behind the eyes. The fangs act like hypodermic needles. Snake venom is usually a combination of different biochemicals. Snake venom can be classified into three types on the basis of the effects caused after envenomation into the bloodstream: Hemotoxic, Neurotoxic, and Cytotoxic. Hemotoxic snake venom disrupts the blood clotting system and causes continuous bleeding. This can lead to fatal bleeding, shock, and seizures. Neurotoxic snake venom targets the central nervous system. It causes paralysis, locking of the jaw, and difficulty breathing. Victims die of respiratory failure as their muscles of respiration do not work properly.

Cytotoxic snake venom affects the surrounding areas of the bite. It damages cells and tissues (necrosis). In some cases, it can lead to the amputation of the body part. Snake venom causes other symptoms such as Hypotension, Tachycardia, Vomiting, diarrhea, and Kidney failure.

Snake venom consists of low molecular weight proteins thus, there is a need to understand which of these proteins elicit maximum antigenicity, so that the effects may be neutralized. The study aims to look at low molecular weight proteins in venom and study their reactivity against commercially available antivenom through fractionation of venom through Sephadex G 25 Column chromatography.

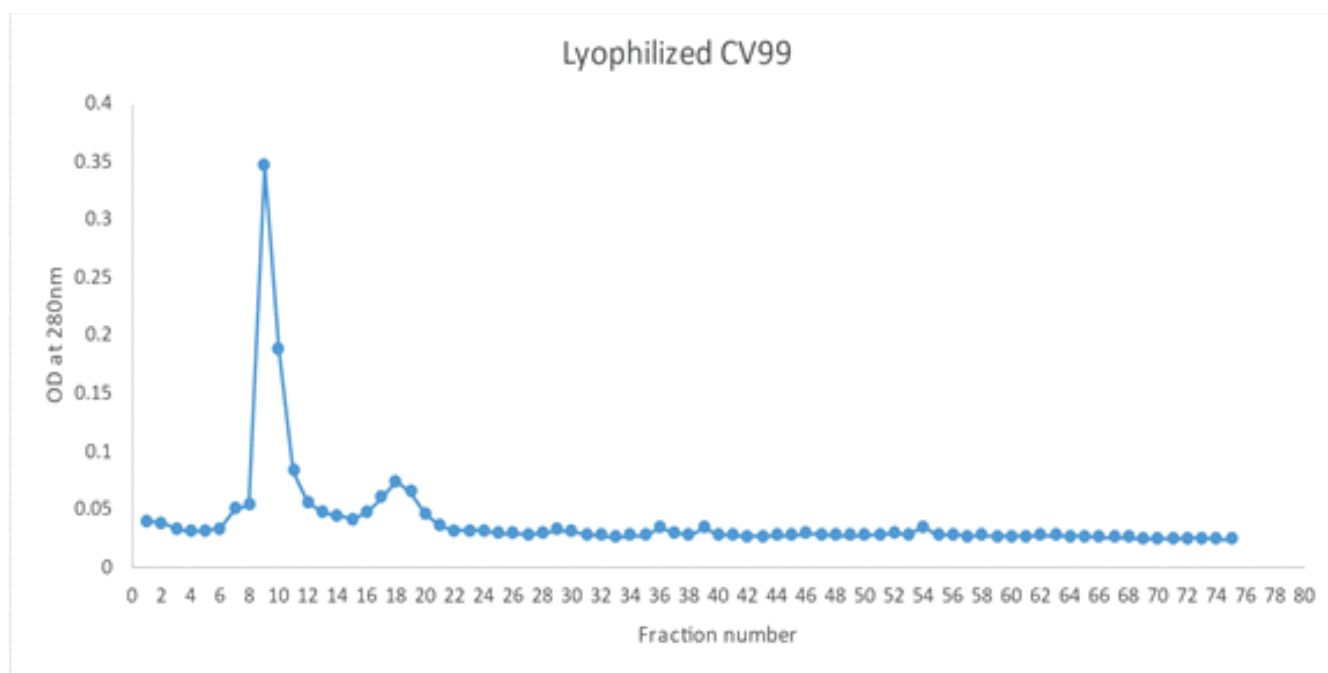


Figure 1: OD of lyophilized CV99 fractionated from Sephadex G25 50ml column

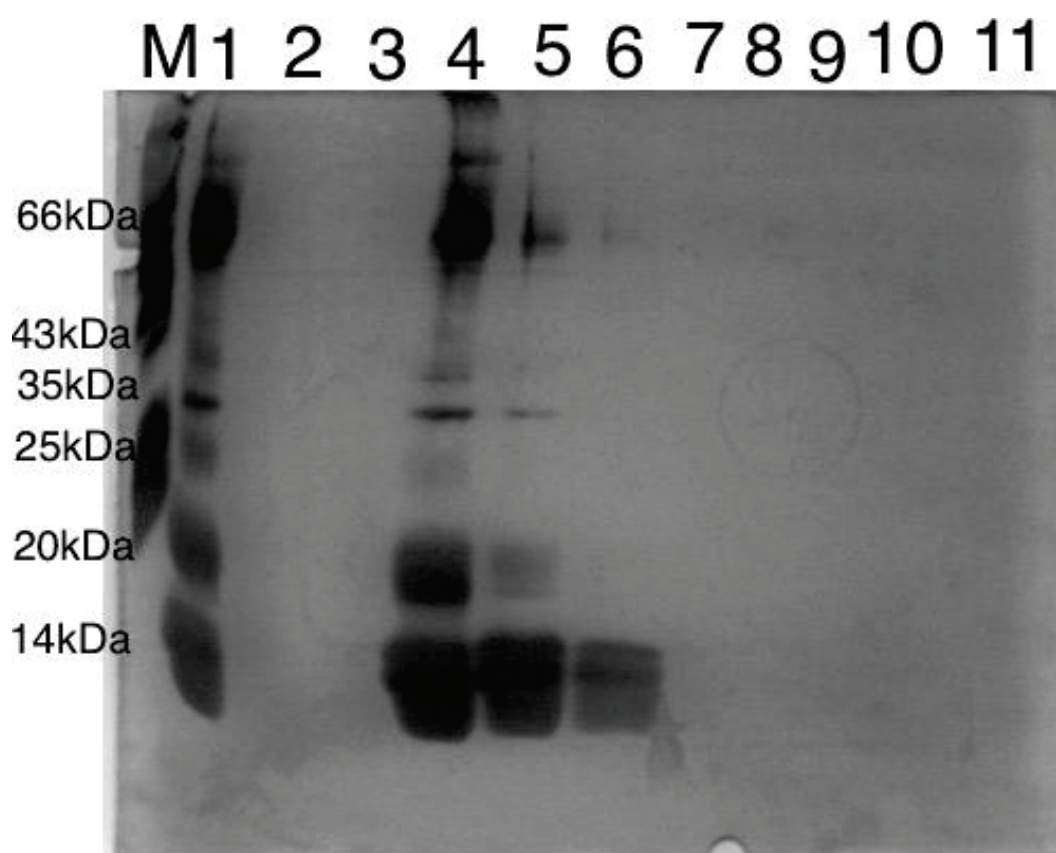


Figure 2: SDS – PAGE of selected fractions 7-11, 16-20 & positive control -CV99

10. Sequence Analysis Of The Cardiotoxin Precursor (3FTX) Gene From Indian Cobra

Team:

- Dr. Usha Padmanabhan,
- Priyanka Mishra &
- Debashish Mukherjee (Strip Students)

Funding agency: STRIP project, Haffkine Institute

Duration: 6 Month

Budget: 20,000/-

Status: Ongoing

Abstract

One of the significant cause of morbidity and mortality in India, South-East Asia and sub-Saharan Africa is venomous snakebites. Snakebite was included in the list of neglected tropical disease (NTD) in 2017. More than 300 snake species are found in India, 60 are classified as poisonous. The Big 4 species - Russell's viper (*Daboia russelii*), common Indian cobra (*Naja naja*), common krait (*Bungarus caeruleus*), and saw-scaled viper (*Echis carinatus*) - account for the majority of snakebites in India.

Snake venom is a complex mixture of peptides, proteins and other bioactive compounds. Cobra venom is neurotoxic due to the presence of three-finger toxins. The family of three-finger toxins (3FTx) is of particular interest. In this research, the 3FTx family member CTX-3 precursor gene from the Indian cobra's (*Naja naja*) genome was amplified, sequenced, and analyzed. A non-invasive source was genomic DNA that was taken from shed skin

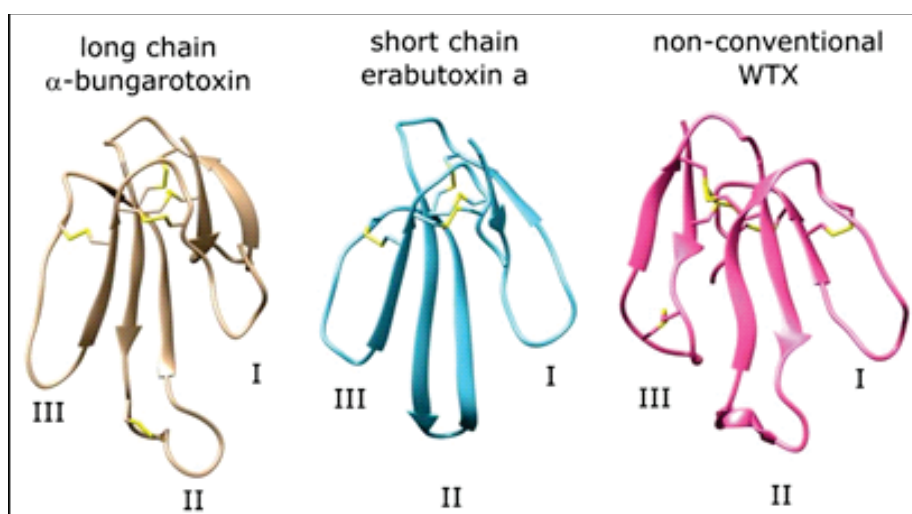
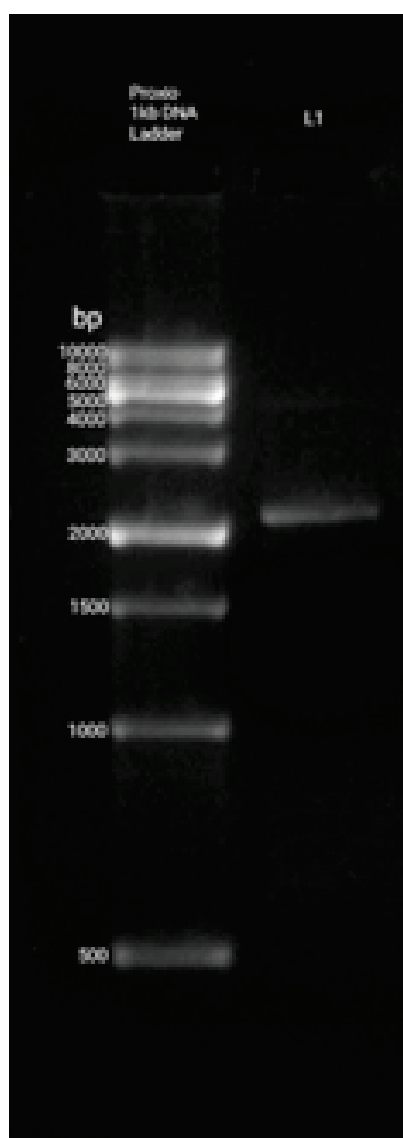


Figure: Structure of 3FTx displaying its subtypes Long chain, Short chain & Non - conventional 3FTx
 [Gulsevin, A., & Meiler, J. (2020). An Investigation of Three-Finger Toxin—nAChR Interactions through Rosetta Protein Docking. *Toxins*, 12(9), 598.]



Molecular ladder:

Proxio 1kb DNA Ladder

Lane 1:

Purified PCR product
from sample 1 set 1 +
sample 1 set 2

Volume loaded on gel:

5 μ l of purified PCR
product + 2 μ l of Gel
loading buffer

Figure – 2% Agarose gel electrophoresis of CTX 3 gene amplified by PCR.

Sanger sequencing was used to ascertain the nucleotide sequence after polymerase chain reaction (PCR) was utilized for gene amplification. Then, using computational bioinformatics methods, the identification of the CTX-3 gene would be verified, and its taxonomic and phylogenetic connections within the 3FTx family and other snake species can be determined. This research provides insights into the molecular characterization of CTX-3, contributing to the understanding of venom evolution and highlighting the potential of snake-derived toxins for future therapeutic developments.

The analyses is under process.

Keywords: 3FTx; CTX-3; *Naja naja*; Sanger sequencing

11. Molecular Characterization Of Indian Red Scorpion Based On Cytochrome C Oxidase Subunit I (COI) Gene

Team:

- Dr. Usha Padmanabhan,
- Amalamerin George &
- Juweria Sayyed (Strip Students)

Funding agency: STRIP project, Haffkine Institute

Duration: 6 Month

Budget: 20,000/-

Status: Ongoing

Abstract

Scorpionism is a major public health issue in many parts of the globe. Every year, approximately

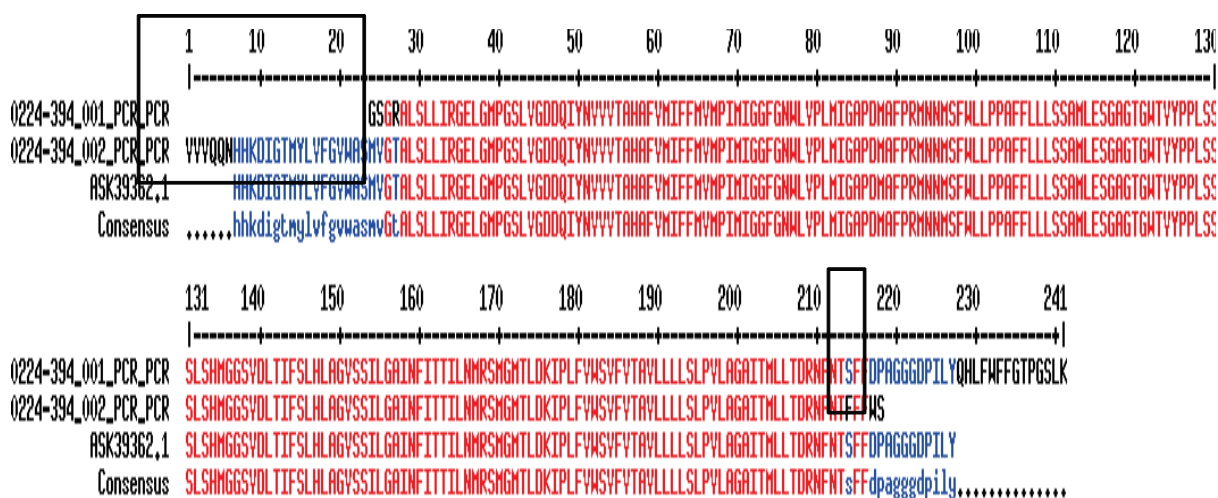
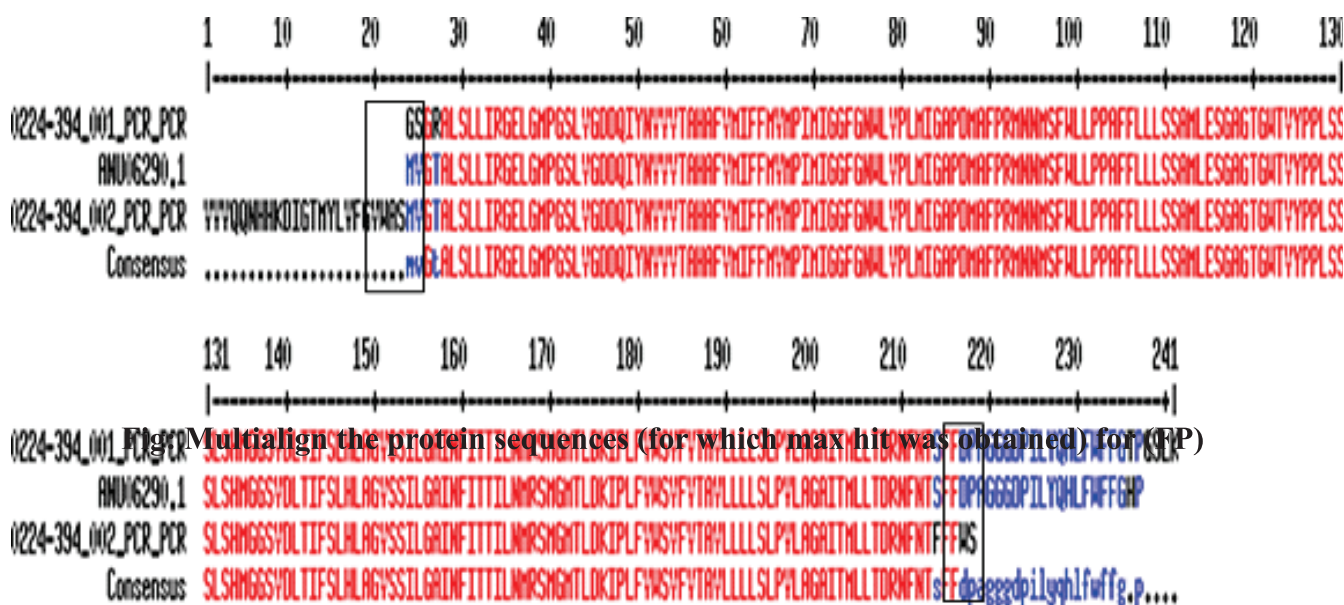
1.2 million scorpion stings occur worldwide, predominantly in tropical regions. The mortality resulting from these venomous stings presents a significant health concern.

Indian red scorpions (*Hottentotta tamulus*) are a medically significant species due to their potent venom. Scorpion venom consists of various components including water, mucosa, enzymes, amino acids, biogenic amines, neurotoxins, peptides, and proteins with potent molecular activities. Rapid and accurate species identification is crucial for effective treatment

decisions. While scorpion stings can be fatal if left untreated, the recommended treatment for scorpion envenomation is immediate administration of antivenom therapy.

This study explored the use of DNA sequencing and computational analysis for Indian red scorpion identification. DNA isolated from scorpion legs subjected to polymerase chain reaction (PCR) to amplify the cytochrome c oxidase subunit I (COI) gene. Sanger sequencing determined the amplified COI sequence.

Computational biological tools Blast, MSA, Clustal-W were used to analyze the sequence, confirming its taxonomic placement and exploring phylogenetic relationships.



Multialign the protein sequences (for which max hit was obtained) for (RP)

Results demonstrated highest match with *Hottentotta jabalpurensis* and *Hottentotta tamulus*. This study supports the combined use of DNA sequencing and computational biology for reliable Indian red scorpion identification, aiding in appropriate treatment protocols and venom research.

Keyword: *Hottentotta tamulus*, COI gene, antivenom, Sanger sequencing

12. Size Exclusion Chromatography of Snake Venom Proteins to Understand Antigenicity

Team:

- Dr. Usha Padmanabhan,
- Amruta Naik,
- Shivam Kesarwani and
- Tanvi Thakur (Strip Students)

Funding agency: BITP and STRIP project, Haffkine Institute

Duration: 6 Month

Budget: 40,000/-

Status: Ongoing

Abstract

Over the course of millions of years, animal venom has evolved to serve various functions such as capturing prey, defending against predators, and competing with rivals. Snake venom contains a diverse array of peptides and proteins that can cause significant harm, including strong inflammatory and neurotoxic effects resulting in intense pain and paralysis. Moreover, they can also induce hemotoxic effects like bleeding and blood clotting disorders, as well as cytotoxic and myotoxic effects, which contribute to tissue inflammation and necrosis. Snakebite envenomation remains a significant public health concern worldwide, often leading to severe morbidity and mortality.

The study aims to separate venom components through size exclusion chromatography to understand antigenicity so that strategies for developing special antibodies may be developed.

The venom was treated with DTT, a reducing agent to see the effects on snake venom and separated using a sephadex G 25 Column.

This work investigates the utility of Size Exclusion Chromatography (SEC) as a tool for elucidating the snake venom proteins. Through SEC analysis, venom components were separated based on their molecular size, allowing for the isolation and characterization of individual proteins and peptides.

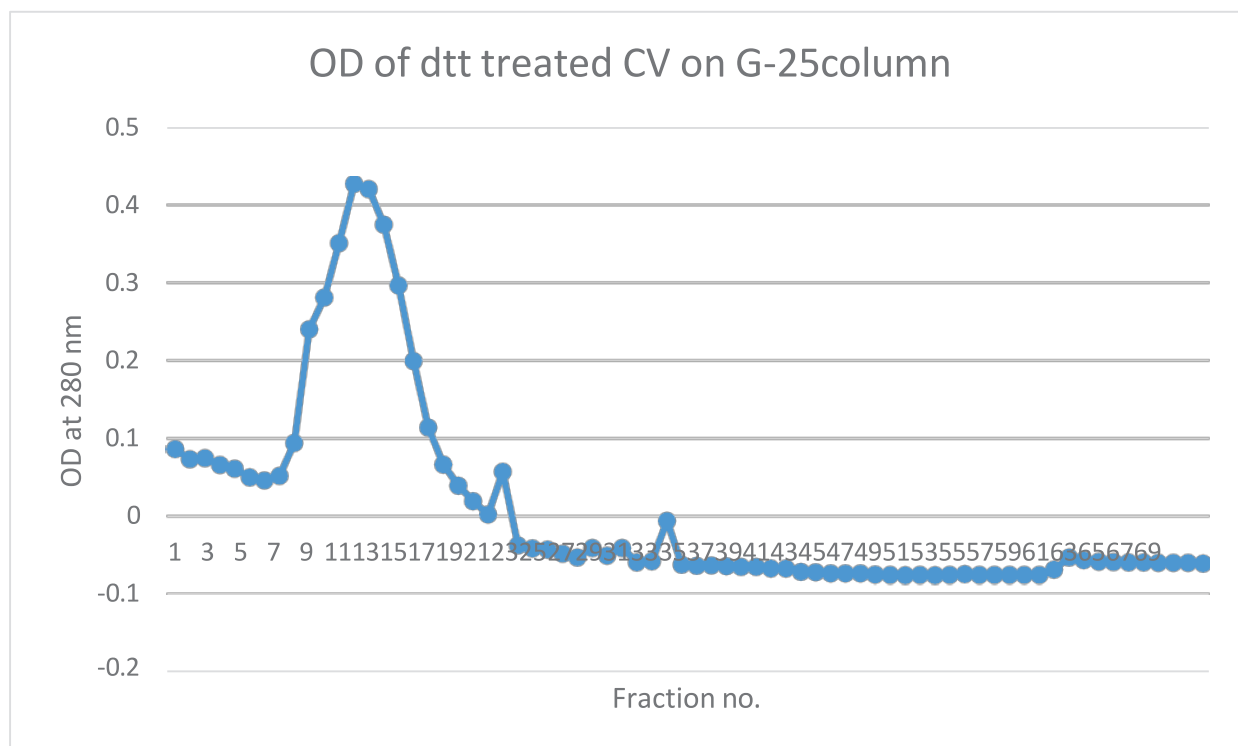


Figure 1: OD graph of DTT treated fraction 9 and 10.

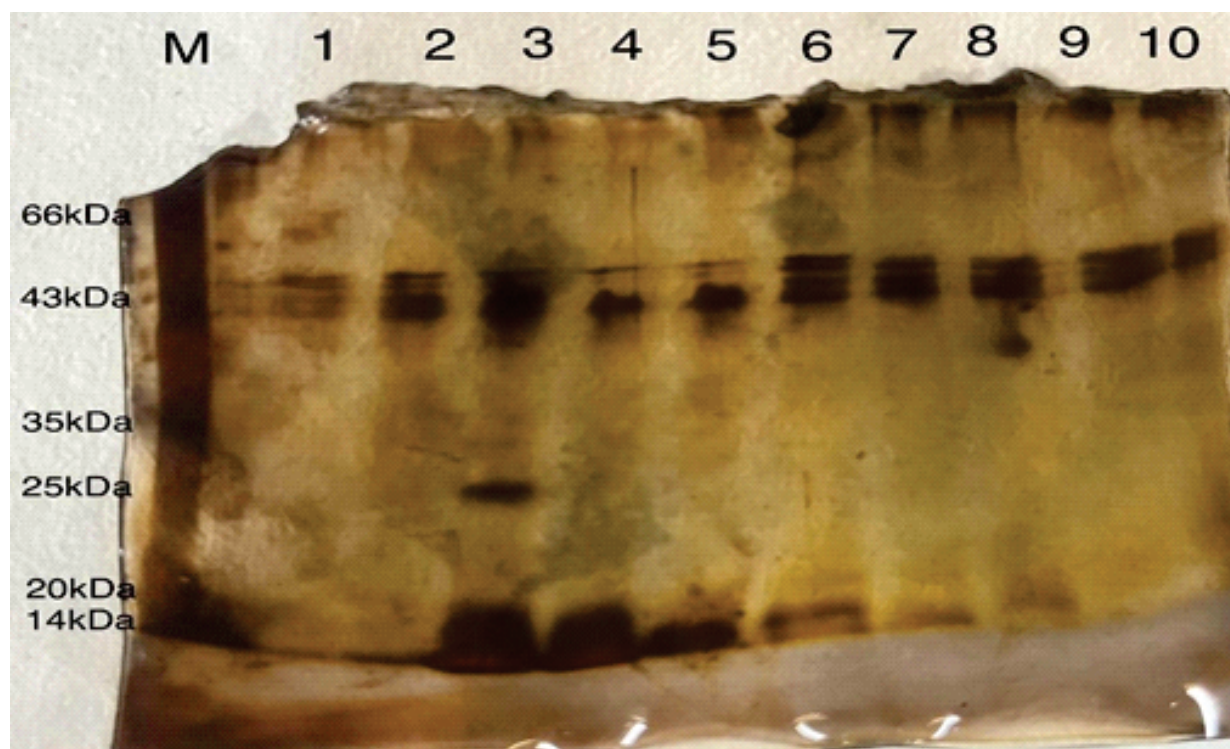
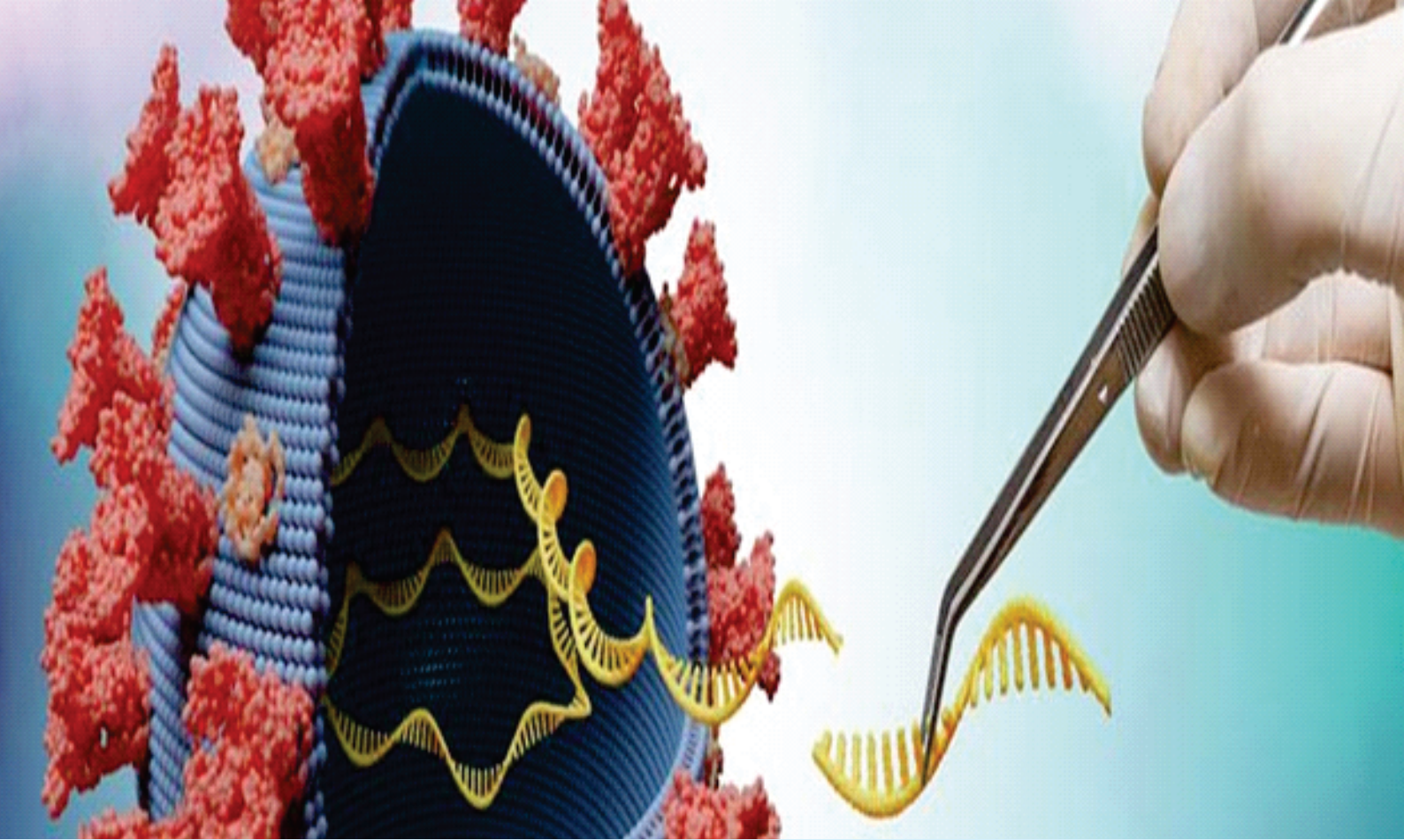
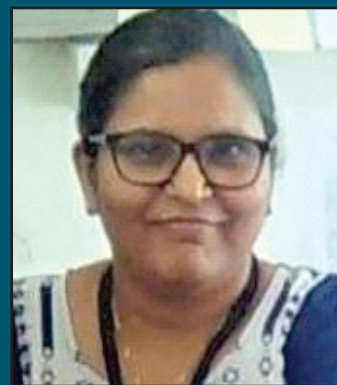


Figure 2: Silver staining of selected column fractions



Cell Biology

Cell Biology



Dr. Usha Padmanabhan
Head of the Department
From 11/01/2017-15/10/2019 and
18/12/2020- till date

Overview

This department focuses on different aspects of cell biology and is in keeping modern approaches that are used in medicine. In accordance with the Institute's mandate of Training, Research & Testing the department makes its charter.

Testing: Over the past year, the department has initiated genome sequencing as a testing program for Novel Corona virus variant identification through Nanopore sequencing and hopes to expand the scope of this technology into prognostics and personalised medicine through identification of SNPs etc. The department wishes to get into small animal transgenic studies for commercial pre-clinical testing and research.

Research: The department will study (1) Basic cellular pathogenesis of infectious diseases such as modes of entry of pathogens into cells, amplification of pathogens at the systemic level and novel etiological agents (2) Cellular signalling mechanisms in non-infectious diseases such as oncogenic transformation of normal cells through acquisition of self-renewal properties and/or mutations and their progression to cancer (3) Developmental of organisms by studying spatio temporal effects of differentiation of stem cells in development of specific tissues and modulation

of disease progression by pathogen induced alterations in stem cell differentiation programs which in turn causes changes in immunity.

Training: The department has initiated a new Training program called Advance research techniques (ART) which offers short internships for a period of 2-4 months and students are given hands-on training in techniques of protein and nucleic acid analyses, cell culture and in vivo egg development.

The department has participated in the Institutional training programs and has successfully trained 4 students (2020-21) and 10 students (2021-22) in the short term internship program, of whom 02 students have been placed and 02 have moved to get further education.

Over the past year, the department is affiliated to the University of Mumbai for M.Sc. in Applied Biology and Maharashtra University of Health Sciences in Applied Medical Biology for Ph.D. degree. Given the opportunity, the department wishes to train more students throughout the year in research methodology through short projects, as well as enroll students for M.Sc. and Ph.D. studies.

Presently there is 1 PhD student in the department.

Dr. Usha Padmanabhan

1. Determination of sequence of SARS Cov-2 variants & establishment of Internal SARSCov-2 Database for accuracy of variants of calling

Team:

- Dr. Usha Padmanabhan &
- Shashank Sarang

Funding agency: Haffkine Institute funds, CSR funds from M/S Icertis International & M/S Smith & Nephew received by Dr. Usha Padmanabhan and DPDC funds to Department of Cell biology

Duration: Continuous

Budget: Annual

Status: Ongoing

Abstract

The project was aimed at identifying new emerging variants of the Corona virus through genome sequencing and becoming part of INSACOG. The project was submitted to the IEC, Haffkine Institute under the title "Determination of sequence of SARS Cov-2 variants & establishment of Internal SARSCov-2 Database for accuracy of variants of calling". 24 samples received by department of Virology were used to standardize the sequencing. Following the standardization, sequences were published at GenBank.

Introduction

Global human health is increasingly challenged by emerging viral threats. In late December 2019, a new Beta- coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), appeared from the Chinese city of Wuhan and was later confirmed as the causative agent of a new severe form of pneumonia, coronavirus disease 2019 (COVID-19) [1]. The COVID-19 pandemic in India is a part of the worldwide pandemic of COVID-19. As of 4 May 2022, according to official figures, India has the second-highest number of confirmed cases in the world (after the United States of America) with 43,088,118 [2, 3].

SARS-CoV-2 consists of a positive-sense single-stranded RNA genome, spanning 29,903

nucleotides in length, and four structural proteins: N, S, E, and M. The N (nucleocapsid), protein encapsulates the genome, while the S (spike), E (envelope), and M (membrane) proteins comprise the surrounding lipid bilayer envelope. As shown in figure-1 [4], the genome size of SARS Cov-2 is approx.

~ 30 kb.

Over the past 2 years from 2020 several variants of SARS Cov-2 have been identified [5].

These mutations and Variants of Interest have been identified through whole genome sequencing (WGS) of the COVID-19 viral genome.

Globally, Genome sequencing of COVID-19 world is carried out by two methods: either via Illumina or through Nanopore. Among available sequencing technologies, nanopore-sequencing (Oxford Nanopore Technologies) could be an important cornerstone, as it is mobile, scalable, and Cost-effective.

Objectives

Our aim was to determine the Whole genome sequence (WGS) of SARS Cov-2 using easily deployable next-generation sequencers, the small and hand-held MinION sequencer with In-house setup using the samples from BCG Clinical Trial and standardize variant calling to become

part of the Indian nSARS- COV2 genomics Consortium (INSACOG)

Results

In our laboratory, we have standardized the Oxford Nanopore method of sequencing. In brief the method used is as follows: The RNA genome is reverse transcribed and subjected to PCR using the 'midnight' split primer sets protocol which produce tiled overlapping amplicons (1200 bp), which cover almost the entire SARS-CoV-2 genome. Each sample is then tagged with a unique barcode (in the form of a DNA sequence).

Adapters that target DNA to the nanopores are ligated. Finally the DNA is purified and loaded onto the MinION flowcells. Downstream bioinformatics analyses are performed with the help of inter-ARTIC bioinformatics pipeline as recommended by Oxford Nanopore Technologies.

The Institute has been inducted into INSACOG vide Office memorandum (OM) No. RAD-22017/28/2020-KGD-DBT-Part (6) dated 30-12-2022.

In 2023, the Institute has been certified by Public Health Department, State Govt of Maharashtra as a sequencing center for Mumbai metropolitan region vide letter dated 7th Sept 2023.

The analyses based on our sequencing results given by State nodal officer Dr. Rajesh Karyakarte are as follows:

Reprt no. 129 of MAHACOG dated 17.04.2023

Sequencing Done in Haffkine Institute, Mumbai for detecting Omicron coordinated by BJGMC, Pune File Name: MetaData_INSACOG_Batch 1				
Maharashtra: 24				
Pangolin-Lineage	Nextclade identification	Number of Samples	%	WHO
Mumbai samples: 24 (06-02-2023 to 24-03-2023)				
XBL	Recombinant	2	Low Coverage, not included for %	
XBB.1.5	23A (Omicron)	1	4.55	
XBB1.9.1	22F (Omicron)	6	27.27	
XBB.1.16		8	36.36	Omicron
XBB.2.3		7	31.82	
Total Mumbai samples: 24				
Maharashtra Samples: 24				

Report no.140 of MAHCOG dated 04.05.2023

Sequencing Done in Haffkine Institute, Mumbai for detecting Omicron coordinated by BJGMC, Pune File Name: INSACOG Covid-19 data Sorted				
Maharashtra: 96				
Pangolin-Lineage	Nextclade identification	Number of Samples	%	WHO
Mumbai samples: 96 (27-02-2023 to 22-04-2023)				
B.1.1	20B (Omicron)	1	Low Coverage, not included for %	
B.1.1.529		2		
XBB		2	2.63	
XBB.1		3	3.95	
XBB.2		3	3.95	
XBB1.9.1	22F (Omicron)	1	1.32	
XBB.1.19.1		3	3.95	
XBB.2.3		7 (9.21)	26.58	
XBB.2.3.2		14 (18.42)		
XBB.1.5	23A (Omicron)	6	7.89	
XBB.1.16	23B (Omicron)	30 (39.47)	48.68	
XBB.1.16.1		7 (9.21)		
Not Assigned	-	17	QC Failed	
Maharashtra Samples: 96				

Report no.150 of MAHCOG dated 23.06.2023

Sequencing Done in Haffkine Institute, Mumbai for detecting Omicron coordinated by BJGMC, Pune File Name: MetaData_INSACOG_HI_Batch 3				
Maharashtra: 96				
Pangolin-Lineage	Nextclade identification	Number of Samples	%	WHO
Mumbai samples: 96 (09-03-2023 to 17-05-2023)				
BA.5	22B (Omicron)	1	1.28	Omicron
XBB	22F (Omicron)	26	33.33	
XBB.1.5	23A (Omicron)	9	11.54	
XBB.1.16	23B (Omicron)	42	53.85	
Not Assigned	-	18	QC Failed	
Maharashtra Samples: 96				

Report no.173 of MAHCOG dated 06.01.2024

Sequencing Done in Haffkine Institute, Mumbai for detecting Omicron coordinated by BJGMC, Pune File Name: MetaData_INSACOG_Batch4				
Maharashtra: 67				
Pangolin-Lineage	Nextclade identification	Number of Samples	%	WHO
Mumbai samples: 52 (17-05-2023 to 28-12-2023)				
B	- (low coverage)	2	Not taken of percentage calculations	Omicron
B.1		3		
B.1.1.529		1		
B.1.1.161		1		
XBB.1.5.28	23A (Omicron)	2	4.44	
XBB.1.9.1	23D (Omicron)	1	4.44	
FL.1.5.1 (XBB.1.9.1.1.5.1)	Seen till 16-12-2023	1		
HK.3 (XBB.1.9.2.5.1.1.3)	23H (Omicron) (01-12-2023)	1	2.22	
XBB.1.16	23B (Omicron) Seen from 17-05-2023 to 22-06-2023)	1	11.11	
XBB.1.16.1		1		
XBB.1.16.2		2		
XBB.1.16.5		1		
XBB.1.41.1	22F (Omicron)	1	2.22	
XBB.2.3	23E (Omicron) Seen till 21-12-2023	1	24.44	
HH.2 (XBB.2.3.2.2)		1		
XBB.2.3.3		1		
GJ.6 (XBB.2.3.3.6)		1		
GZ.1 (XBB.2.3.4.1)		1		
GE.1 (XBB.2.3.10.1)		2		
JY.1 (XBB.2.3.19.1)		1		
JY.1.1 (XBB.2.3.19.1.1)		3		
BA.2.86	23I (Omicron) Seen from 01-12-2023 onwards. In the month of December 2023, 80.76% of variants are BA.2.86* and JN.1*	3	51.11 (Since Dec23, 80.76%)	
BA.2.86.1		1		
JN.1 (BA.2.86.1.1)		12		
JN.1.1 (BA.2.86.1.1.1)		6		
JN.4 (BA.2.86.1.4)		1		

Mumbai sub-urban samples: 7 (29-11-2023 to 26-12-2023)				
B	-	1	Not taken of percentage calculations	Omicron
B.1.1		(low coverage)		
GK.1.1 (XBB.1.5.70.1.1)	23A (Omicron)	1	20	
JN.1 (BA.2.86.1.1)	23I (Omicron)	1	80	
JN.1.1		3		
Thane samples: 7 (02-12-2023 to 28-12-2023)				
B	-	1	Not taken of percentage calculations	Omicron
	(low coverage)			
BA.5.5.1	22B (Omicron)	1	16.66	
XBB.2.3.11	23E (Omicron)	1	16.66	
BA.2.86.1	23I (Omicron)	1	66.66	
JN.1 (BA.2.86.1.1)		3		
Pangolin-Lineage	Nextclade identification	Number of Samples	%	WHO
Beed samples: 1 (21-12-2023)				
B.1	- (low coverage)	1	-	Omicron
Maharashtra Samples: 67 (Mumbai = 52, Mumbai sub-urban = 7, Thane = 7, Beed = 1)				

1. JN.1* is the most dominant variant seen in this sequencing run.

Report no.179 of MAHCOG dated 02.02.2024

Sequencing Done in Haffkine Institute, Mumbai for detecting Omicron coordinated by BJGMC, Pune File Name: MetaData_INSACOG_Batch4_Pending for metadata				
Maharashtra: 6				
Pangolin-Lineage	Nextclade identification	Number of Samples	%	WHO
Mumbai samples: 6 (02-12-2024 to 23-12-2023)				
BA.2.86.1	23I (Omicron)	1	100	Omicron
JN.1 (BA.2.86.1.1)		2		
Unassigned	-	3	Low coverage	
Maharashtra Samples: 6 (Mumbai = 6)				

1. BA.2.86* (including JN.1*) is the ONLY lineage seen in this sequencing run.

The lab has till date sequenced 283 samples

2. Assessment of Tribal population in Maharashtra's Bhandara, Gondia & Gadchiroli districts: Awareness, Treatment Access and Seroprevalence survey for Rabies.

Team

- Dr. Usha Padmanabhan (PI) &
- Mr. Pawan Kumar Todkar, S.O. Department of Virology, (Ph D student)

Funding agency: Internal

Duration: 5 Years

Budget: 1 Lakh P.A.

Status: Ongoing

Abstract

Rabies is a viral disease that affects the nervous system of mammals, including humans. The disease is caused by the Rabies virus, which is a member of the Lyssavirus genus of the family Rhabdoviridae. The virus is typically transmitted to humans through the bite of an infected animal, such as a dog, cat, or bat. Once the virus enters the body, it travels along nerve fibers to the brain, where it causes inflammation and damage to the nervous system. Without prompt treatment, rabies is almost always fatal.

In India, rabies is a significant public health concern, with an estimated 20,000 deaths reported annually, and Maharashtra state being one of the most affected regions. In Maharashtra's tribal region, particularly the eastern Vidharbha region, is one such area where rabies is a significant public health concern. The region is home to a large population of tribal communities who are at a higher risk of contracting the disease due to their proximity to animals and lack of awareness about the disease and preventive measures.

Table No:-1 District-wise Population, Scheduled Tribe Population, and Forest Area with Demarcation Information in Maharashtra, India.

District	Total Population (2011)	Scheduled Tribe Population (2011)	Forest Area (sq km)	Forest Demarcation
Bhandara	1,200,334	88,336	3,276.58	Demarcated by the Forest Survey of India
Gondia	1,322,507	214,131	3,039.31	Demarcated by the Forest Survey of India
Gadchiroli	1,072,942	448,488	8,071.36	Demarcated by the Ministry of Environment, Forest and Climate Change

Project aims to assess awareness, vaccine penetration, primary health access and sero-prevalence in these areas.

During 2022-23 Project has only been tentatively framed and permissions were in the process of being sought.

During 2023-24, this project received the permissions from the following

Sr. No.	Permission granting body /authority	Date
1	Institutional Ethics Committee, Haffkine Institute for Training, Research & testing (Chairman Dr. T.P. Lahane)	24.05.2023
2	Doctoral committee review	25.07.2023
3	Ministry of Tribal Development	04.08.2023
4	Village Panchayat, Chaudampalli	11.09.2023
5	Health Department, District council (Zilla Parishad), Gadchiroli	06.10.2023
6	Topic approval from Mumbai University	29.11.2023
7	Permission to travel to Chaudampalli for site visit from Hon. Director, HITRT	05.01.2024 08.01.2024

The field visit was conducted by Mr. Pavankumar Todkar, Ph.D. Research Fellow & Scientific Officer, Department of Virology, and Mr. Bhagyawan Pawar, Lab Assistant, Cell Biology Department.

The field visit conducted from January 5th to January 9th, 2024, aimed to assess the feasibility of implementing a Ph.D. research project "Assessment of Awareness, Treatment Access, and Sero- prevalence for Rabies in the Tribal population in Maharashtra's Gondia/Gadchiroli districts" in Choudampalli, Dist. Gadchiroli, Maharashtra State. The journey involved interactions with local authorities, healthcare facilities, and logistical considerations.

Following is the report of the site visit that outlines the key findings and observations in brief:

It takes almost 1.5 days to reach the site. Public transport availability is very less in the Gadchiroli district. This is to be taken into consideration for sample transport.

- Interaction with the police patil of Choudampalli Mr. Deva Meshram, He requested a 2-3 days notice period for preparation but assured cooperation. This makes the project locally viable Interaction with Honorable Sarpanch, Mr. Nikhil Madavi, who graciously offered space for the study at the newly constructed Gram Panchayat office. The newly constructed Gram Panchayat office includes a hall for village community activities and other rooms. Said

area is therefore sufficient to execute the project i.e. for interacting with the villagers for informed consent and for blood collection.

- Choudampalli serves as a health sub-center, 8 km from Markanda PHC and 12 km from Ashti Rural Hospital. Choudampalli health sub-center comprises two rooms (labor room and OPD). Dr. Mohini, Medical officer, was informed about the proposed Ph.D. project. The medical officer visits every Friday and whenever vaccination programs are conducted at the Choudampalli health sub-center. Normally nurses are on duty at the health sub-center. The nurses at the sub-center express readiness to collect blood samples for the project. Tests involving sickle cell anemia and hemoglobin are performed at Choudampalli health sub-center. The Choudampalli Health Sub Center needs some equipment support to make the research project feasible.

Sample transport can be through dry ice available at Rs. 100 per kg in Chandrapur or through Blue Dart shipment with cold chain maintenance costs Rs. 22,000 per sample transportation. Hence sample transport for the project needs to be arranged prior to start of the project.



Figure 1: Meeting with Village Sarpanch at Choudampalli



Figure 2: Choudampalli health sub- center



Figure 3: Meeting with nurses at Choudampalli health sub-center at OPD

3. Identification of genetic markers responsible for cardiac myocyte function during chick embryo (*Gallus gallus domesticus*) development

Team:

- Dr. Usha Padmanabhan (PI),
- Shashank Sarang &
- Shaurya Giri (STRIP Student)

Funding agency: Internal

Duration: 6 Month

Budget: 20,000/-

Status: Ongoing

Abstract

Heart failure continues to be a leading cause of death globally. The annual prevalence of heart failure (HF) is estimated to be 37.7 million. Patients with heart failure often have a 3 to 5-year survival rate, which means their prognosis is dismal than that of most cancers. Yet, heart failure - which is defined as "a complex clinical syndrome that results from any structural or functional impairment of ventricular filling or ejection of blood" - develops as a result of myocardial injury quite frequently. The advancement of cardiovascular medicine over the span of thirty years has resulted in a notable decline in the mortalities from acute cardiovascular syndromes in developed countries. However such developments display a gender bias and are less efficacious for women compared to men.

Since the current course of treatment is often not optimal, new options for care must be established. Treatments based on the molecular markers which are responsible for cardiac

myocyte function could emerge as a viable new approach to the management of existing diseases.

Several studies have described differences in basal gene expression in cardiac myocytes from both genders in adult rats, changes in gene expressions during pubertal development in pigs and other species such as zebrafish etc. Studies have also established gene expression patterns in cardiac myocytes developed in vitro from stem cells.

The objective of this study is to perform a thorough transcriptome analysis of cardiac cells derived from developing embryonic chicks during its development with the purpose of finding genetic markers/factors responsible for cardiac function.

Initially a literature survey was conducted and data of transcriptomes derived from cardiac cells from different species were analysed using venn analyses to identify common genetic signatures involved in cardiac function. The project is ongoing.

4. Monitoring the development of the Endocrine System using Chick Embro

Team:

Dr. Usha Padmanabhan (PI),
Shashank Sarang &
Afrah Nawab (STRIP Student)

Funding agency: Internal

Duration: 6 Month

Budget: 20,000/-

Status: Ongoing

Abstract

Model organisms are non-human species that are studied to understand specific biological phenomena, disease, molecular pathways, and behaviors. Despite different adult forms, these organisms share similar developmental mechanisms and structures (figure 1).

These organisms usually have metabolic/molecular aspect similar humans and are easy to handle in laboratories. Model organisms can be plants, microbes (e.g, yeast) or animals (e.g, flies, fish, worms, and rodents), each of which have a genetic makeup and all of which have been relatively widely studied. The endocrine system consists of 3 axis, the Hypothalamus -Pituitary-adrenal (HPA), Hypothalamus - Pituitary-gonadal (HPG) and Hypothalamus -Pituitary-thyroid (HPT) axis. The HPT is considered to maintain thermal homeostasis, The HPG is considered to regulate development and regulation of the reproductive organs and systems, and the HPA is considered to regulate bodily responses to stress via

glucocorticoids like cortisol or corticosterone, the main stress hormone in vertebrate.

Steroid production in mammalian embryo begins after the differentiation of gonads but in birds synthesis of estrogen begins at undifferentiated stage of gonads of chicks and thus chick model was the best to study the effects of estrogen (beta-estradiol) on gonadal development.

Between embryonic day 6.5-7.5 (HH stage 29-30) sex of chick can be determined microscopically but hormones such as estrogen is found between day 1-2. This means there is a strong role of estrogen in the determination of sex of the chick embryo. Therefore the gonads are bi-potential that could differentiate into testes and ovaries.

In birds, females are heterogametic (ZW) and males are homogametic (ZZ). DMRT1 gene expression is involved in the development of testes.

This project investigates the development of the Endocrine System using Chick Embro.

5. *Plasmodium falciparum* genomics: Standardization of target-based PCR and sequencing of genes involved in drug resistance and infectivity.

Team:

Dr. Usha Padmanabhan (PI),
Dr. Priyanka Gupta &
Ms. Sanajana Gupte (STRIP Student),
Khalid Mohammed (BITP)

Team from Zoonosis: Dr. Mrunal Ghag Sawant, Ms. Trupti Satwekar & Ms. Sheetal Shetty (MSc Student)

Funding agency: Internal

Duration: 6 Month

Budget: 40,000/-

Status: Ongoing

Abstract

Malaria is a global infectious disease that remains a leading cause of morbidity and mortality in the developing world, causing one million fatalities worldwide each year. The disease is mainly caused by *Plasmodium falciparum* that remains as dominant parasite and accounts for 50% of malaria cases.

Administration of antimalarial drugs remains the primary treatment for malaria infection. However, due to repeated drug administration, parasite strains have become resistant to almost all antimalarial drugs used hampering disease management.

The project evolved as a result of discussion with Dr. Mrunal Ghag Sawant who has observed decrease in infectivity of *Plasmodium* strains with

increase in passage number. Thus, the aim of the study initially was to develop and standardize target-based PCR and sequence genes involved in host infectivity and study accrument of mutations leading to loss in infectivity. This project was later expanded to develop, standardize target-based PCR and sequencing of genes involved in drug resistance from the *Plasmodium falciparum* genome.

In vitro culturing of *Plasmodium falciparum* in erythrocytes, isolation, and purification of Parasite DNA by three different cell permeability methods, Primer designing and analysis of drug resistance genes were established. The optimum conditions for standardization of CRT, MDR1, Atpase6 and Cytb drug resistance genes were carried out. However, standardization of Cytb gene resistance to Atovaquone was determined.

Sequencing of these genes of the organism will be carried out once all gene targets are PCR amplified successfully.

Results:

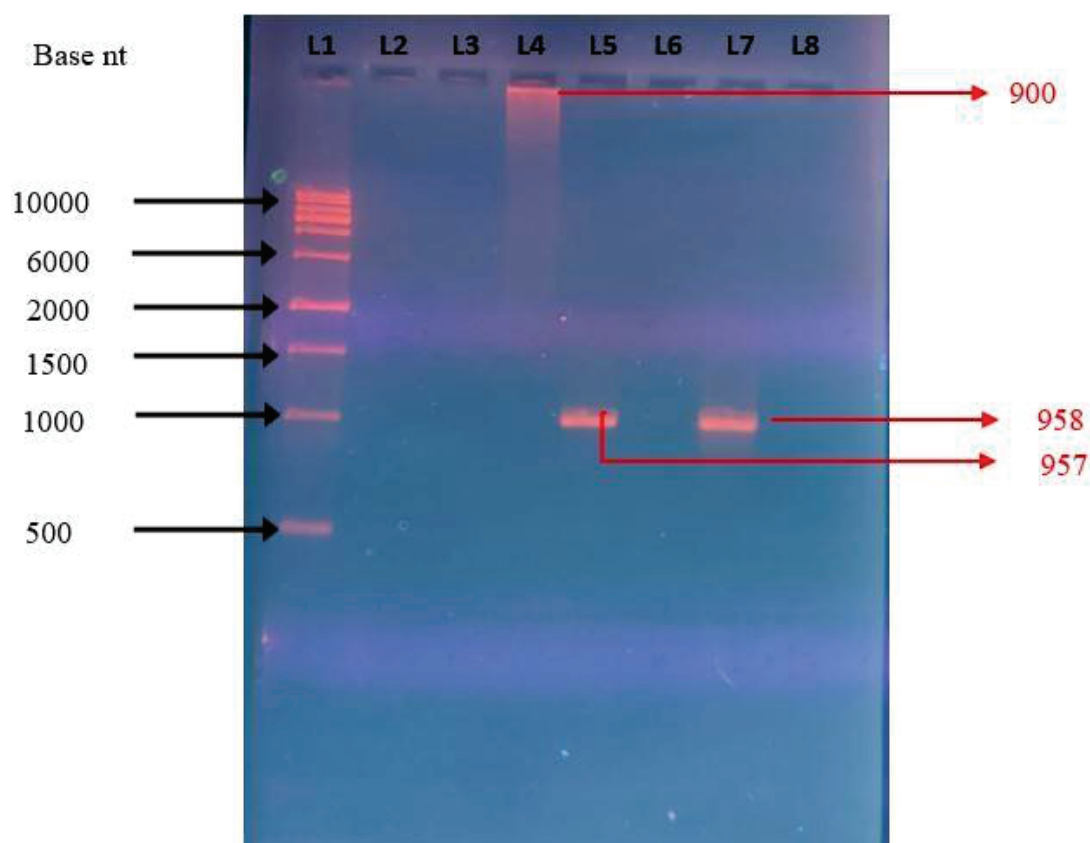
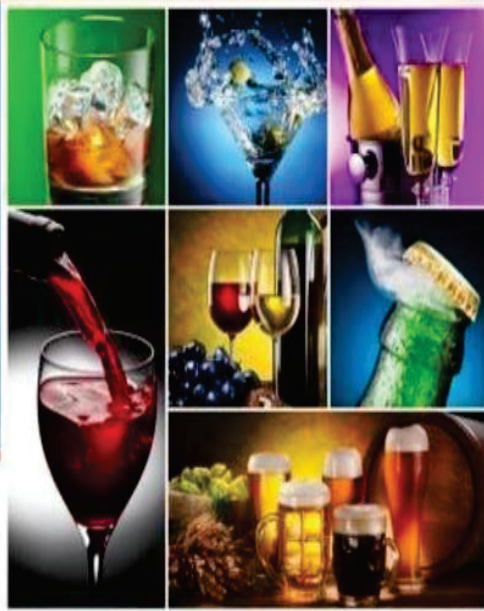


Figure 1: Agarose Gel Electrophoresis (1.2%) showing results of target-based PCR conducted for amplification of PfMDR1 and PfCytb genes of *Plasmodium falciparum*

Sequencing is expected to be carried out soon, after duplication of results.



Chemical Testing

Chemical Testing Department



Mrs. Suvarna Pachpore
Head of the Department

Overview

Chemical Testing Department is one of the older Departments in Haffkine Institute. Chemical Testing Department is majorly involved in Testing of Alcoholic Beverages received from Maharashtra State Excise Department. This includes Country Liquor from Manufacturer, Country Liquor from Retailer, Indian Made Foreign Liquor (Vodka, Rum, Whiskey, Beer etc.), Toddy and Wine.

Apart from Alcoholic Beverages, Department is also involved in Testing of Denaturants for Liquor. As we are aware that besides consumption, alcohol

has wide applications in different fields like disinfectant, cosmetic, fuel, cleaning agent etc. In this case when alcohol is used for these purposes it is denatured with few chemicals to make it unfit for consumption. These denaturants are also tested in Chemical Testing Department.

Department also extends its services to perform alcohol content testing in cosmetics and sanitizers.

Department provides training to STRIP students in the field of Nanoparticles and Phytochemistry.

Department also provides hands on training Three Training programs are conducted in department. They are as follows:

- 1) Workshop on Testing of Alcoholic Beverages (TAB) – This is a two day training program conducted in various batches every year during March to June. Rating received for this course is usually Very Good to Excellent.
- 2) Short Term Research Internship Program (STRIP) – This program provides research

platform to students for a period of few months.

- 3) National Apprentice Training Scheme (NATS) – This program provides hands-on training to apprentice on regular departmental activities for one year.

Chemical Testing Department is a Maharashtra FDA approved Department.

Mrs. Suvarna Pachpore



Departmental Photograph

Testing of Alcoholic Beverages and related Chemicals



Birth Anniversary Celebration of
Former President Hon. Dr.A.P.J.Abdul Kalam



Marathi Bhasha Day Celebration



Dr.Haffkine Day Celebration in Porch



Meri Mitti Mera Desh Celebration

Other Departmental Activities

- 1) Visit by Maharashtra State Excise Department
- 2) Departmental Presentation to Russian Scientists



Chemotherapy



Dr. Ashish L Asrondkar
Head of the Department

Overview

The Chemotherapy Department is one of the oldest department in the Haffkine Institute. The department has been engaged in research to address issues of immediate public health concern since its inception. The Department of Chemotherapy is engaged in Training, Research & Testing activities.

Chemotherapy Department mainly focused on the synthesis of heterocyclic compounds for their putative medicinal benefits. Compounds have been synthesized and characterized through Analytical Instrumentation facility available in the department. The department of Chemotherapy uses green techniques to synthesize heterocyclic compounds (i.e. microwave irradiation). Department also focused on research using *in*

silico drug designing tool. The Institute currently has a project approved by DHR, and the department forms part of the project.

The department has taken part in institutional training programs and trained students in the short-term internship programme. For MSc and PhD degrees, the department is affiliated to the University of Mumbai for the subject of Chemistry. The department has two registered guides for MSc and Ph D degree from University of Mumbai.

1. Dr. Ashish Asrondkar-Registered Guide for MSc and PhD (Chemistry)
2. Dr. Vrushali Patil- Registered Guide for MSc and PhD (Chemistry) Details of students of PhD degree in Chemotherapy Department:

Sr No.	Name of the student	Degree	Guide Name	Current status
1	Miss Harshada Sawant	PhD	Dr. Vrushali Patil	In progress

For Science graduate and postgraduate students, the department offers a variety of short-term training programs lasting one month, 45 days, three months, and six months (STRIP). The department wants to increase the number of students trained in research techniques through short projects throughout the year, as well as enroll students in MSc and PhD programs.

Department has three FDA approved chemist for Chemical and Instrumentation section. The department provides testing facility on HPLC (High Performance Liquid chromatography), GCMS (Gas chromatography Mass Spectrophotometer), and IR (Infrared Spectrophotometer) samples on commercial & academic purposes. Recently department initiated two advanced training courses on HPLC and GCMS instruments.

1. Hands on Training on HPLC (Duration-1 month)
2. Advance training on GC-MS (Duration -1 month)

The department submitted a proposal for the establishment of a NABL accredited laboratory at Haffkine Institute for Training, Research and Testing. Medical Education and Drugs Department of Maharashtra government has praised and approved the project. District planning development committee (DPDC) Mumbai division funded instruments worth Rs 2.4 crore for the establishment of NABL lab at Chemotherapy department. The work of the laboratory is nearing completion and soon the work of drug testing will be started in the department.

Dr Ashish L Asrondkar



Departmental Photograph

Departmental Projects

1. Design, development, and biological assessment of Rabies using heterocyclic derivatives.

Team:

- Guide: Dr. Vrushali Patil
- Student Name: Miss. Harshada Sawant (Ph.D. Student)

Funding Agency: Haffkine Institute

Duration: 2021- 2026

Budget: 8 lakhs

Status: In progress

Abstract

Rabies is a zoonotic disease that affects both humans and animals. It is caused by the RABV virus of the Lyssavirus genus, transmitted through the bite of infected mammals. Rabies is usually transmitted from the saliva of infected dogs. Currently, vaccination is only preventive treatment available against RABV virus. As it doesn't have any specific treatment till now, due to which the survival rate of the patient was very low. After

clinical disease is developed, the death is fatal. In the light of the above anti-rabies agents are clearly needed. Ectodomain homo-trimeric spikes is responsible for fusion of the virus with host cells, it leads to increase in the activity of the virus. The proposed study, is aimed to developed heterocyclic derivatives and plant based derivatives to inhibit interaction between the rabies and drug moiety.

2. In-silico studies of heterocyclic compounds against Filariasis

Team:

- Guide: Dr. Ashish Asrondkar
- Student: Mr. Rahul Patel (Strip Student)

Funding Agency: Haffkine Institute

Duration: November 2023 - April 2024

Budget: 25,000/-

Status: On-going

Elephantiasis, a debilitating neglected tropical disease, was investigated using in silico methods. Virtual screening and docking were performed with Schrodinger, identified promising drug candidates against, beta tubulin protein in *Brugia malayi*. Molecular dynamics simulations assessed

their stability and binding modes. Density functional theory calculations (B3LYP) provided insights into electronic interactions. This study revealed potential therapeutic agents for further development.

3. Synthesis of Peptide using solid phase peptide synthesis

Team:

- Guide name: Dr. Vrushali Patil
- Student name: Ms Sakshi Parmar,

Funding Agency: Haffkine Institute

Duration: November 2023-April 2024

Budget: Funded by Haffkine Institute

Status: On-going

Abstract

The peptide synthesis was carried out by Solid Phase Peptide Synthesis where the amino acids were covalently bound to the inert polymeric solid support and those amino acids were extended by addition of more amino acid chain leading to the formation of peptide. Amino acids used here were

Fmoc-glutamic acid, Fmoc-lysine, Fmoc-Isoleucine as protection group. Depending upon its binding affinity we decided to further proceed with the synthesis of this oligo-peptide chain using SPPS technique and the protection and deprotection of amino acid was monitored through Kaiser test.

4. “Study of Anti-oxidant assay of triazole compounds”

Team:

- Guide name: Dr. Ashish Asrondkar
- Student name: Mr Gaurav Patil

Funding Agency: Haffkine Institute

Duration: August 2023-October 2023

Budget: Funded by Haffkine Institute

Status: Completed

Abstract

By products of enzymatic processes that take place within the body are free radicals. They are Created by natural processes such phagocytosis, biosynthesis, catalysis, respiration of cells, and Biotransformation. Exogenous mechanisms (sunlight, radiation, heavy metals, bacteria, fungi, Protozoa, and viruses) can also create them. The overabundance of free radicals contributes to the pathophysiology of many diseases as well as ageing processes and oxidative stress (OS).

These include lung conditions, atherosclerosis, cancer, rheumatoid arthritis, neurological illnesses including Parkinson's and Alzheimer's, and harm to

DNA. These days, compounds having antioxidant activity are crucial because they enable organisms to maintain a balance Between the rate at which the body neutralises free radicals and the rate at which they are Produced. Synthetic antioxidants are also present in addition to natural ones (flavonoids, Carotenoids, vitamins, etc.). The antioxidant efficiency of synthesised triazole analogues was tested using the DPPH radical scavenging assay. When compared to normal ascorbic acid, the results showed that synthesized triazoles molecules exhibit strong antioxidant activity.

5. Screening of Designed Heterocyclic Ligands on PBMC Cell Lines

Team:

- Guide name: Dr. Ashish Asrondkar
- Student name: Mr Viraj Shinde (Strip Student)

Funding Agency: Haffkine Institute

Duration: August 2023-October 2023

Budget: Funded by Haffkine Institute

Status: Completed

Abstract

Human peripheral blood mononuclear cells (PBMCs) are isolated from peripheral blood and identified as any blood cell with a round nucleus (i.e. lymphocytes, monocytes, natural killer cells (NK cells) or dendritic cells). The cell fraction corresponding to red blood cells and granulocytes (neutrophils, basophils and eosinophils) is removed from whole blood by density gradient centrifugation. This study explores the impact of various heterocyclic ligands on the peripheral blood mononuclear cell (PBMC) line. The abstract highlights the screening process, emphasizing potential interactions and effects on

PBMCs. Results provide insights into the potential applications of heterocyclic ligands in cellular contexts, contributing to the understanding of their biological significance. This study explores the impact of screening heterocyclic ligands, derived from 2,4-dihydroxy benzaldehyde, benzoyl chloride, and 4-chlorobenzylaldehyde, on the PBMC cell line. The aim is to assess the potential bioactivity and cytotoxicity of these ligands, providing valuable insights into their interaction with peripheral blood mononuclear cells. The research contributes to understanding the toxicity relevance of these heterocyclic compounds in a cellular context and cellular viability.

6. Screening of Designed Heterocyclic Ligands on PBMC Cell Lines Team:

Team:

- Guide name: Dr. Ashish Asrondkar
- Student name: Mr Akash Patil (Strip Student)

Funding Agency: Haffkine Institute

Duration: August 2023-October 2023

Budget: Funded by Haffkine Institute

Status: Completed

Abstract

Human peripheral blood mononuclear cells (PBMCs) are isolated from peripheral blood and identified as any blood cell with a round nucleus (i.e. lymphocytes, monocytes, natural killer cells (NK cells) or dendritic cells). The cell fraction corresponding to red blood cells and granulocytes (neutrophils, basophils and eosinophils) is removed from whole blood by density gradient centrifugation. This study explores the impact of various heterocyclic ligands on the peripheral blood mononuclear cell (PBMC) line. The abstract highlights the screening process, emphasizing potential interactions and effects on PBMCs. Results

provide insights into the potential applications of heterocyclic ligands in cellular contexts, contributing to the understanding of their biological significance. This study explores the impact of screening heterocyclic ligands, derived from 2,4-dihydroxy benzaldehyde, benzoyl chloride, and 4-chlorobenzylaldehyde, on the PBMC cell line. The aim is to assess the potential bioactivity and cytotoxicity of these ligands, providing valuable insights into their interaction with peripheral blood mononuclear cells. The research contributes to understanding the toxicity relevance of these heterocyclic compounds in a cellular context and cellular viability.

7. Molecular Docking, DFT, Spectroscopy Analysis of Flavonol Derivatives of As Antiviral Agents of JEV.

Team:

- Guide name: Dr. Ashish Asrondkar
- Student name: Ms. Sarvesh Garude,

Funding Agency: Haffkine Institute

Duration: November 2023-January 2024

Budget: Funded by Haffkine Institute

Status: Completed

Abstract

Japanese encephalitis is a viral infection that primarily affects the central nervous system. It is transmitted to humans through the bite of infected mosquitoes, especially those found in rural and agricultural areas of Asia. The disease has a significant impact on public health, causing inflammation in the brain and often leading to severe neurological complications or even death. In this paper we report the spectroscopic characterization and reactivity studies on potential ligands using computational techniques

such as Molecular Dynamic (MD) simulations and Density Functional Theory (DFT). Comparing the three derivatives computed findings with the conventional drug's yields more insights. Molecular docking study is also performed to scrutinized ligand which having high binding affinity towards desired protein of JEV. After evaluation, the desired ligand has highest binding energy of -9.597 kJ/mole, the graph of RMSD, RMSF, Radius of gyration, SASA indicates stability of protein-ligand in the equilibrated system as compared to standard drug.

8. Molecular Docking and ADMET Properties of Glycyrrhizin Gabra against spiked glycoprotein of Covid-19

Team:

- Guide name: Dr. Vrushali Patil
- Student name: Mr. Steve Anthony (Strip Student)

Funding Agency: Haffkine Institute

Duration: December 2024-March 2024

Budget: Funded by Haffkine Institute

Status: Ongoing

Abstract

The World Health Organization (WHO) has classified the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) a pandemic, and it has been a serious public health concern since its first report. SARS-CoV-2 (2019-nCoV) initially appeared in 2019 and quickly spread throughout the world. Scientists are studying antivirals specifically designed for the treatment of COVID-19. COVID-19, which is caused by SARS-CoV-2, is difficult to treat with currently available antiviral drugs. As a result, the goal and purpose of this

study was to investigate the plants that have been linked to antiviral activity. We proposed that Glycyrrhizin, Liquiritin, Glabridin, Glycyrrhetic Acid-3-O-Glucuronide, and Isoliquiritin from the plant *Glycyrrhiza glabra* could be studied as a potential herbal candidate with anti-viral activity against SARS-CoV-2 using in silico techniques such as molecular docking and druggability studies. Promising docking results showed the potential of these herbal medicines for use in upcoming treatments of coronavirus.



Clinical Pathology

Clinical Pathology



Dr. Sandesha Pashte
Head of the Department
Additional Charge
(01/02/2023 - 31/03/2024)

Overview

Department of Clinical Pathology is one of the oldest department in the institute and was established in the year 1905 and undertook studies on communicable diseases like plague, cholera, Malta fever, typhoid, malaria, diphtheria, relapsing fever. The department has well established testing laboratory with different sections like Hematology, Serology, Microbiology and tissue culture, as per ISO 9001:2008. Department has tested antibacterial, antimycobacterial and antifungal, post

fumigation Operation theatre swabs & microwave disinfection systems.

The department comprises of Head of Department, one Scientific Officer, one Visiting Scientist (Dr. Anil Suryavanshi), one Laboratory Assistant, one Laboratory Attendant, two doctoral degree (Ph.D.). With its vision to develop into a center with complete solutions for diagnosis of diseases, a state of art laboratory, a recognized and accredited laboratory.

Dr. Sandesha Pashte



Departmental Photograph

Research Projects 2023-24

1. Identification of ligand receptor interactions across blood brain barrier in viral neuro- pathogenesis. (EXTRA-MURAL Funding)

Team:

- Dr. Shashikant Vaidya (P.I.) &
- Ms. Durga Bethala (DST-INSPIRE-SRF)

Funding Agency: Department of Science and Technology, Govt. of India

Duration: March 2017- Till date

Budget: Rs. 24, 16,069/-

Status: Thesis Submitted, Viva pending

Abstract

More than 500 million people worldwide are infected each year by any of the four-dengue virus(DENV) serotypes. Dengue serotype 2 (DENV 2) is most predominant in India and other SouthAsian countries. The clinical spectrum caused during dengue infections is wide and some patientsmay develop neurological alterations during or after the infection. Clinical evidences suggests thatblood brain barrier (BBB) may be compromised during DENV infection; however, it is not clearwhether the damage is due to the infection per se or to the inflammatory response activated by the BBB cells. Other neurotropic flaviviruses such as Japanese encephalitis virus (JEV) are alsoknown for neurological damage. JEV

uses the bloodstream to enter nerve tissue where it infectscells of the neurovascular unit. Another neurotropic virus like rabies virus (RABV) chooses theretro-grade axonal route to infect the neuronal cells. Both JEV and RABV affect the cells ofneurovascular unit in different ways resulting into BBB damage, glial activation and tissueinflammation. Our aim is to study pattern of DENV infection to BBB, compared with other neurotropic viruses like JEV and RABV using in vitro model. In our study, we observed that the BBB is dysregulated by superinfecting DENV2 activated murine macrophage(RAW264.7) on murine endothelial cells (BEnd3) rather upon direct virus infection.

2. Quantitative phosphoproteome profiling of circulating influenza virus strains in Mumbai region.

Team:

- P.I.: Dr. Shashikant Vaidya and
- Ph. D. Student: Ms. Pinky Singh

Funding Agency: Haffkine Institute

Duration: December 2017- Till date

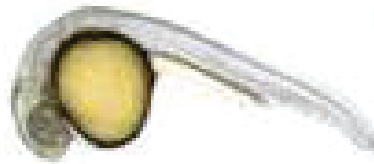
Budget: 5 lakhs

Status: Thesis Submitted, Viva pending

Abstract

Influenza viruses a major human pathogen whose genotypic diversity results in unpredictable pandemics and epidemics. Although annual influenza epidemics affect around 10% of the global population, current treatment options are limited and development of new antivirals is needed. Elucidation of host factors required during virus infection provides information not only on the signalling pathways involved but also on the identification of novel drug targets. Quantitative phosphoproteomic will help in revealing the unique phosphoproteome

dynamics that occur in the host cell within minutes of influenza virus infection. In this study, Influenza virus isolates would be subjected to PCR for amplification of gene sequences as per WHO primer pairing for quantifying relative viral load. Quantitative phosphoproteomic analysis of human lung carcinoma, epithelial cell line (A549) infected with influenza viruses will be performed at varying time intervals. Harvested cells will be subjected for TEM and flow based studies followed by iTRAQ labelling. Identification and quantitative analysis of iTRAQ-labelled phosphopeptides will be performed using LC-MS/MS.



Toxicology

Toxicology



Dr. Mrunal Ghag-Sawant
Head of Zoonosis Department

Overview

Toxicology is the study of adverse effects of chemical substances on living organisms and their environment. It is a dynamic multi-disciplinary science that required interactions between biology, chemistry, medicine, veterinary science, pharmacy and environmental biology. Over the past few years, toxicology has played a vital part in drug development. For more than 20 years, the Department of Toxicology and the Institute has been providing services for the comprehensive toxicity testing studies for registration of pharmaceuticals, agrochemicals, biocides, cosmetics, chemicals and related products. Majorly *in vivo* toxicity testing is conducted in the Dept., which is as per the regulatory requirements of the OECD, ICH, FDA, EMEA, OPPTS, BIS and/ or ISO10993.

With the increasing demand for anti-snake venom, the demand for LD50 assays during research and commercial production has increased. Every year, millions of experimental animals are used all over the world to perform LD50 assays of venom. Alternative methods to these assays are urgently needed. The Department of Toxicology is currently involved in the LC50 study of four snake venoms for validation and standardization of assays in small vertebrate animals like zebra fish is in progress.

Future Plan

- 1) To establish NABL accreditation laboratory
- 2) To establish GLP compliance testing and research laboratory
- 3) Establish in various research studies in zebra fish facility



Departmental Photograph

Research Projects 2023-24

1. Zebra Fish as an Alternative Model for Determining the Median Lethal Concentration of Cobra Venom

Team:

- **PI Investigator:** Dr. Mrunal Ghag Sawant
- **Co-Investigator:** Mrs. Swati U. Mumbarkar
- **Scientific Assistant:** Mrs. Meenal Mulkutkar
- **M.Sc. Student:** Ghatkar Madhura Pramod Purna

Funding Agency: Academic Research / Department of Toxicology

Duration: 15th January 2023 to 14th January 2026

Budget – 3,08,000/-

Status: Ongoing

Abstract

India has the highest number of deaths due to snake bites in the world with 35,000-50,000 people dying per year according to World Health Organization (WHO) direct estimates. In the present study, we will be using only Cobra venom which mainly contains a powerful post-synaptic neurotoxin and cardiotoxin. Animal models are primarily used in biomedical research to understand the cellular and molecular basis of human disease as well as to develop and test novel therapeutic approaches. The 3Rs' major objective is to change current methods of animal testing in order to minimize the use of animals in

experimentation whenever possible. This proposal is focused towards validation and standardization of assays in lower sentinel animals like zebrafish. The aim of the study is the standardization and validation of the Median Lethal Concentration and Lethal Concentration of Cobra venom range in Zebrafish. The Median Lethal Concentration using various concentrations of Cobra venom will be assessed in Zebrafish embryos in 24 well plates using 12 embryos in RF assay and 24 embryos in MLC50 per concentration of venom. The Minimum Lethal Concentration of venom will be calculated using statistical analysis.

The zebrafish embryos will be observed for clinical symptoms, morbidity and mortality, survival rate, physiological changes and pathological changes. The result are presented as mean $\pm$ SD. Statistical analysis will be evaluated by one-way ANOVA followed by Tukey test. Values with $P < 0.001$ will be considered statistically significant.



Fig 1. Coagulation of fertilized embryo (108 $\mu\text{g/ml}$)



Fig 2. Lack of somite formation (36 $\mu\text{g/ml}$)

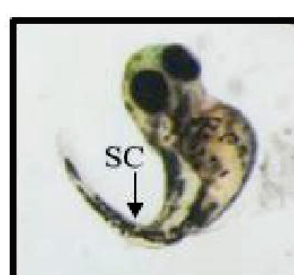


Fig 3. Spinal curvature (SC) (36 $\mu\text{g/ml}$)

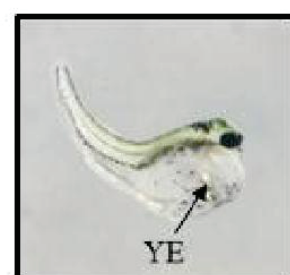


Fig 4. Yolk sac edema (YE) (12 $\mu\text{g/ml}$)



Fig 5. Non detachment of tail (12 $\mu\text{g/ml}$)

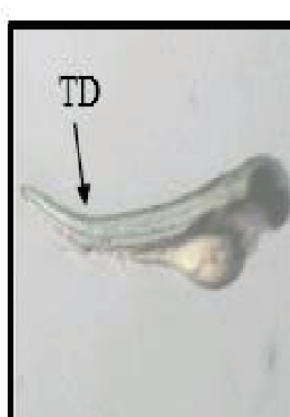


Fig 6. Tail deformity (TD) (4 $\mu\text{g/ml}$)



Fig 7. Pericardial edema (PE) (4 $\mu\text{g/ml}$)



Fig 8. Zebrafish embryo (Control)

Standardization of Range fining Assay

2. Determining genotoxic potential of Cobra Venom using *in vivo* method.

Team:

- **PI Investigator:** Dr. Mrunal Ghag Sawant
- **Co-Investigator:** Mrs. Swati U. Mumbarkar
- **Scientific Assistant:** Mrs. Meenal Mulkutkar
- **M.Sc. Student:** Ms. Shreya Thakur

Funding Agency: Academic Research/ Department of Toxicology

Duration: 15th January 2023 to 14th January 2026

Budget - XINR

Status: Ongoing

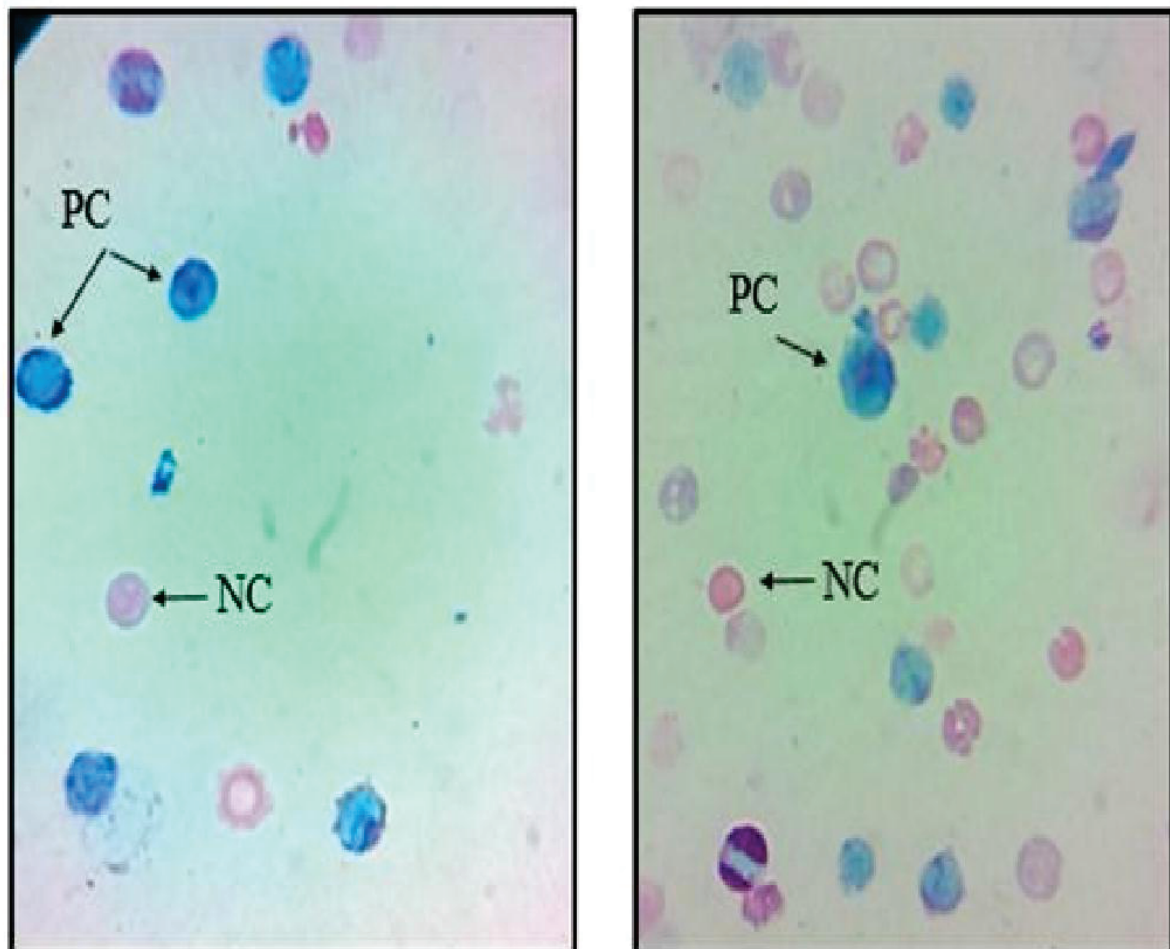
Abstract

The Indian Cobra (*Naja naja*) also known as the Spectacled Cobra, Asian Cobra or Binocellate Cobra is a member of the "Big Four" species that are responsible for most of the snakebite cases in India. Phospholipases A2 (PLA2s), Snake Venom Metalloproteinase (SVMP), Snake Venom Serine Proteases (SVSP) and Three-Finger Toxins are the main toxins in venom and are responsible for a variety of pharmacological effects in snakebite patients either singly or in combination. The Indian Cobra's venom mainly consists of a powerful post-

synaptic neurotoxin and cardiotoxin. According to case reports, snake venom is being used as a club drug as an alternative of opioid and alcohol during rave parties. Present work will focus on exploring the effects of snake venom on the genetic material/molecular level using rodents. The aim of the study is to evaluate the Genotoxicity of Sub lethal doses of Cobra venom using *in vivo* method. For Acute Toxicity Assay, Single Dose studies with successive escalations will be carried out to determine the Maximum Tolerated Dose (MTD) in rats. For Micronucleus Assay, animals will

be treated with the test substance once and samples of bone marrow and peripheral blood will be taken for slide preparation. Genotoxicity will be confirmed by the presence of micronuclei in observed slides. In Comet Assay, test substance

will be administered through subcutaneous route and liver tissue will be used for sample preparation. Slides will be scored per sample and 25 comets per slide using an image analysis software.



Standardization slide of Bone Marrow

3. Quantitative estimation of nitric oxide and glutathione in cobra venom-induced oxidative stress in zebrafish embryos

Team:

- **PI Investigator:** Dr. Mrunal Ghag Sawant
- **Co-Investigator:** Mrs. Swati U. Mumbarkar
- **Scientific Assistant:** Mrs. Meenal Mulkutkar
- **M.Sc. STRIP Student:** Ms. Rutuja Shikhare

Funding Agency: Haffkine Institute

Duration: January 2023 to June 2023

Status: Completed in June 2023.

Abstract

Zebra fish was chosen as the model organism for the study as it is a well-established vertebrate developmental model for human diseases, including hematopoietic, cardiovascular, ocular, muscular, complex brain, cancer, developmental research, and toxicology studies, owing to its peculiar characteristics during early stages of life. Snake venom consists of various toxins, which can lead to clinical effects that can be local and systemic. Snake venoms of the Elapidae family are rich in proteins that include three-finger toxins (3FTxs) and phospholipase A2s (PLA2s), which include post-synaptic neurotoxins, cardiotoxins/cytotoxins and muscarinic toxins that are responsible for potentially fatal neurotoxic effects,

local tissue damage, necrosis, and blood clots. Toxicity of Cobra venom was examined in Zebrafish embryos using different concentrations of Cobra venom which led to various physiological and anatomical changes in the Zebrafish embryos. In this study, the oxidative stress and antioxidant defence caused due to Cobra venom was studied, for which the concentration of nitric oxide, an oxidant, and the concentration of GSH, an antioxidant were measured. Griess reaction and Ellman method were used for the quantitative detection of nitric oxide and GSH respectively. The concentration of nitric oxide and GSH varied depending on concentration of venom and developmental stage of the embryo.

4. Intravenous toxicity Study of Heterocyclic quinoline compounds [N'-(4-chlorobenzylidene)-6-methoxy-2-(4-methoxyphenyl) quinoline-4-carbohydrazide : 4b] in Mice

Team:

- **PI Investigator:** Dr. Mrunal Ghag Sawant
- **Co-Investigator:** Mrs. Swati U. Mumbarkar
- **Scientific Assistant:** Mrs. Meenal Mulkutkar
- **M.Sc. Strip Student:** Mr. Tanmay Shinde

Funding Agency: Haffkine Institute

Duration: 6 months (December 2023 to May 2024)

Status: In process

Abstract

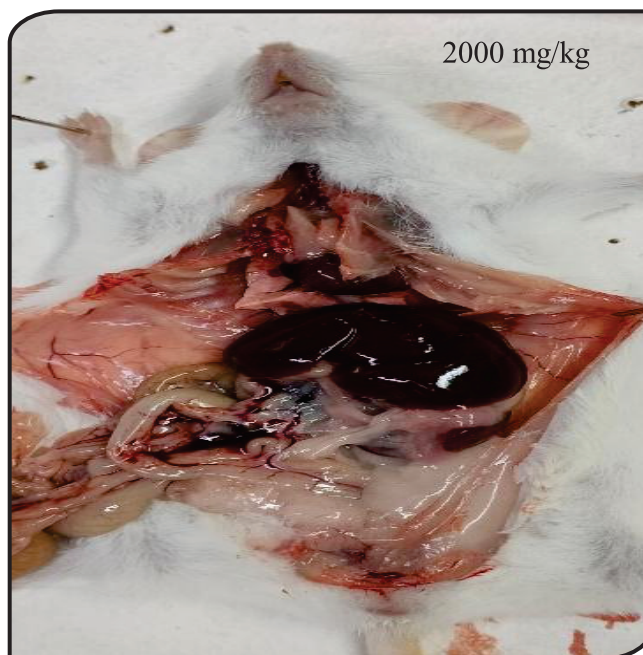
Aiming to extend pursue our fascination in the synthesis of novel quinolone derivatives with potential biological activity, we designed new quinoline derivatives that included Schiff base, pyrazole moieties. The quinoline compounds that emerged were synthesized and assessed against triple negative breast cancer cells. The in silico studies carried out using autodock software, the designed compounds shown promising results by forming Hydrogen bonding, Pi-Pi interaction and highly conversed amino acid in a target protein. The toxicity prediction by ADMET, confirmed that

the compounds were found to be less toxic than the reference drug. Further, molecular dynamics simulations were performed on compound 1 and doxorubicin against PI3K signalling pathway protein 2RD0. Analysis of conformational stability, residue flexibility, hydrogen bonding, solvent accessible surface area (SASA), and revealed comparable stability of complex to the 2rd0 protein: Protein (in native form). The majority of the compounds demonstrated anti-cancer action. Among them, quinoline heterocyclic ligands demonstrated an

excellent inhibitory ratio, which is corroborated by docking studies with the highest binding affinity and lowest docking score.

In the current study, we are using the NCE ligands to study acute intravenous toxicity in mice. Objective(s): The screening of Intravenous toxicity of Heterocyclic quinolone compound in Swiss albino mice.

Results: Based on the results of the present study, it is concluded that the N^{''}(3,5 dihydrobenzylidene)-6-methoxy-2-(4- methoxyphenyl) quinolone -4-carbohydrazide: (4a) is non-toxic by Intravenous route and is classified under GHS category4 / Unclassified.



5. Intravenous toxicity Study of Heterocyclic quinoline compounds [N'-(3,5- dihydroxybenzylidene)-6-methoxy-2- (4-methoxyphenyl) quinoline-4- carbonylhydrazide : 4a] in Mice

Team:

- **PI Investigator:** Dr. Mrunal Ghag Sawant
- **Co-Investigator:** Mrs. Swati U. Mumbarkar.
- **Scientific Assistant:** Mrs. Meenal Mulkutkar.
- **M.Sc. STRIP Student:** Miss Siddhi Nigade

Funding Agency: Haffkine Institute

Duration: 6 months (January 2024 to Jun 2024)

Status: In process

Abstract

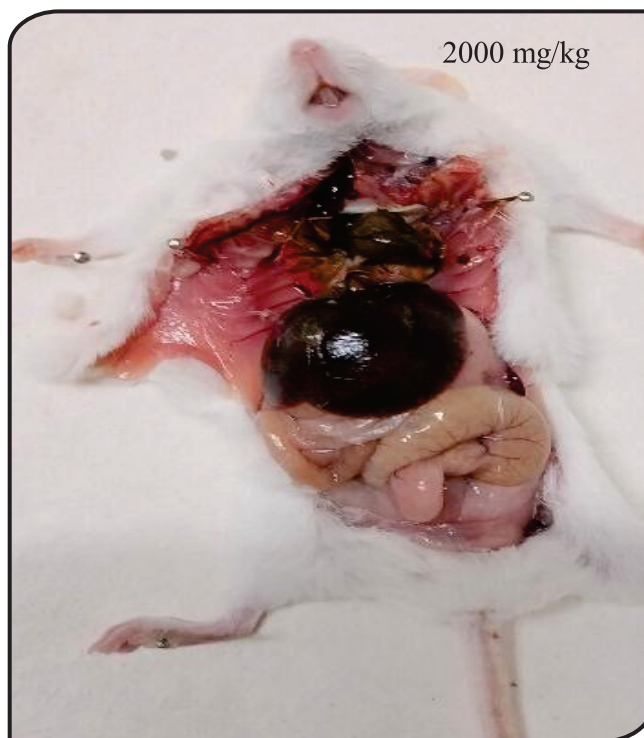
Aiming to extend pursue our fascination in the synthesis of novel quinolone derivatives with potential biological activity, we designed new quinoline derivatives that included Schiff base, pyrazole moieties. The quinoline compounds that emerged were synthesized and assessed against triple negative breast cancer cells. The in silico studies carried out using autodock software, the designed compounds shown promising results by forming Hydrogen bonding, Pi-Pi interaction and

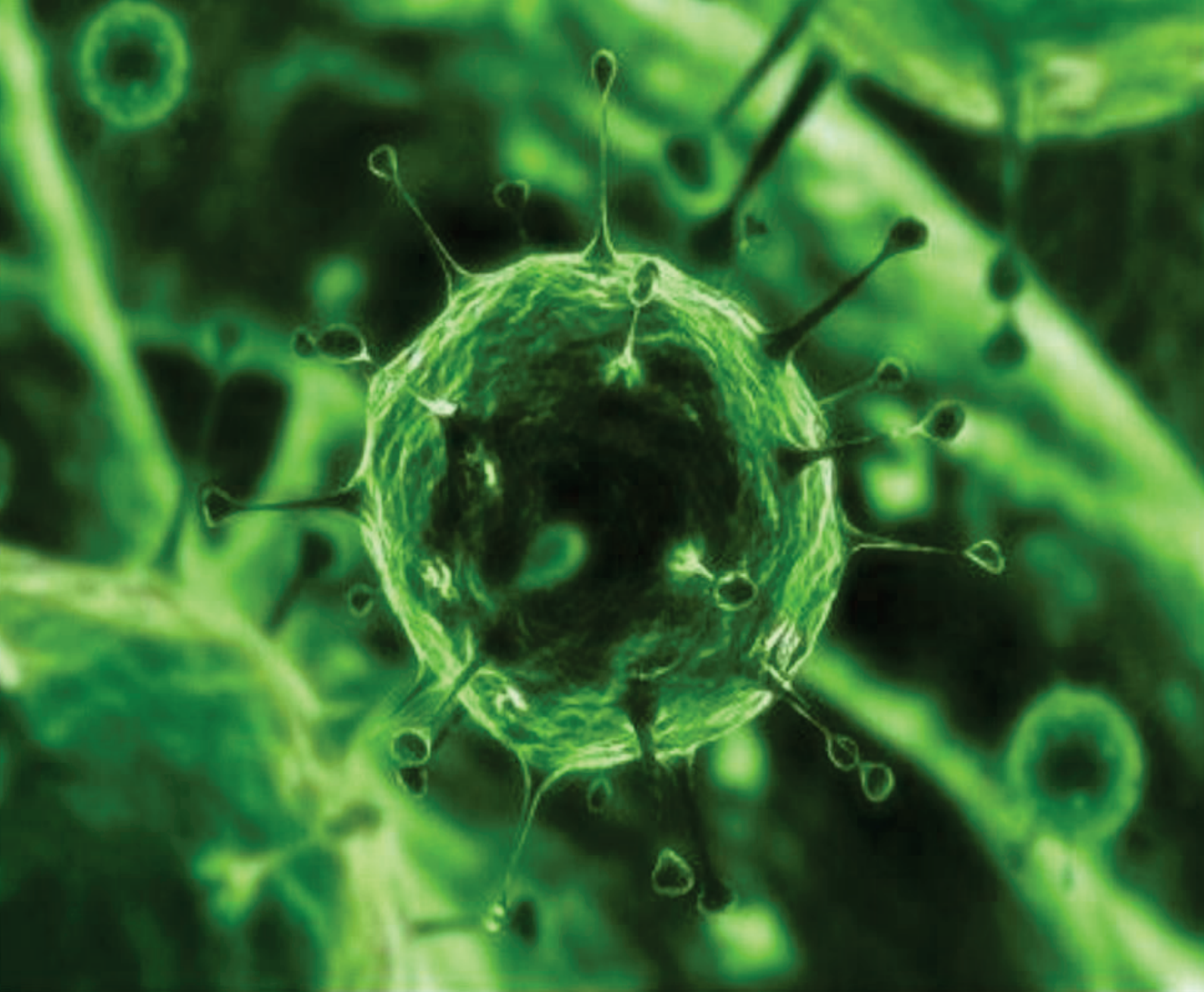
highly conversed amino acid in a target protein. The toxicity prediction by ADMET, confirmed that the compounds were found to be less toxic than the reference drug. Further, molecular dynamics simulations were performed on compound 1 and doxorubicin against PI3K signalling pathway protein 2RD0. Analysis of conformational stability, residue flexibility, hydrogen bonding, solvent accessible surface area (SASA), and revealed comparable stability of complex to the 2rd0 protein: Protein (in native form).

The majority of the compounds demonstrated anti-cancer action. Among them, quinoline heterocyclic ligands demonstrated an excellent inhibitory ratio, which is corroborated by docking studies with the highest binding affinity and lowest docking score. In the current study, we are using the NCE ligands to study acute intravenous toxicity in mice.

Objective(s): The screening of Intravenous toxicity of Heterocyclic quinolone compound in Swiss albino mice.

Results: Based on the results of the present study, it is concluded that the N" (3, 4- chlorobenzylidene)-6-methoxy-2-(4-methoxyphenyl) quinolone-4-carbohydrazide: (4b) is non- toxic by Intravenous route and is classified under GHS category4 / Unclassified.





Virology

Department of Virology 2023-2024



Dr Sandeepan Mukherjee
Head of Department
20/12/2020-30/11/2023



Mr Pavankumar Todkar
Head of Department
01/12/2023 – Till Date

Overview

The Department of Virology is one of the older departments at the Haffkine Institute, engaged for the past 95 years in understanding the epidemiology, pathophysiology, and host immune response towards various viral diseases. It is a National Influenza Centre recognized by the WHO. Currently, it is a network laboratory under the NCDC-IDSP Influenza-like Illness Surveillance.

Neurovirology, Vector-borne Virology, and Respiratory Virology are the current thrust areas of the Department. Research is undertaken to understand the virus-host relationship and its

implications for public health. Studies related to the anti-viral efficacy analyses of novel chemical entities (NCEs) of both synthetic and natural origin are conducted. These evaluations have both academic and commercial outcomes.

The Department organizes an annual Hands-on Training in Techniques in Virology and Immunology. Testing includes the diagnosis of viral infections like COVID-19, Influenza, and Rabies using classical and molecular virology. A team of three technical and five support staff facilitates the routine tasks of the Department.



Departmental Photograph

Research Projects 2023-24

1. “Laboratory surveillance of Influenza like illness and severe acute respiratory illness (ILI-SARI) in India (Extra Mural)

Team:

- Ms Seema Vyas,
- Dr Sandeepan Mukherjee (Till 30 November 2023),
- Mr. Pavankumar Todkar

Funding Agency: National Centre for Disease Control, Govt. of India, New Delhi.

Duration: NCDC 2009 Onwards

Budget: 11.20 Lakhs per year

Status: On Going

Abstract

Influenza viruses are highly contagious, causing acute respiratory illness and afflicting humans since ancient times. World Health Organization (WHO) declared first pandemic of the 21st century caused by Influenza A (H1N1) pdm 09 virus. Department of Virology at Haffkine Institute has been identified as a network laboratory for the national project on surveillance of Influenza like illness under the NCDC- IDSP. Understanding the prevalence and epidemiology of influenza virus infections will not only help in control of the disease as well as aid in the development of effective vaccines.

Under this program, we receive nasopharyngeal/throat swabs from hospitals in and around Mumbai, Thane, and Raigad region. These swabs are subjected for the extraction of viral RNA and the positivity is detected using qRT-PCR.

Objectives

1. To provide epidemiology and seasonality data of influenza virus.
2. To understand the groups at high risk of severe outcomes, including hospitalization and deaths.

Result and Conclusions

From April 2023 till March 2024, we have not received nasopharyngeal/throat swabs, for influenza testing.

2. Quality Assurance in Molecular Testing: Evaluating Manual vs. Automated RNA Extraction Techniques using RT-PCR-Based Methods.

Team:

- Krushna Tambe (STRIP Student),
- Chetan Zope, Pavankumar Todkar

Funding Agency: HITRT

Duration: 6 months

Budget: 25,000/-

Status: In Process

Abstract

This study aims to assess the quality assurance of molecular testing through the comparative evaluation of manual and automated RNA extraction techniques using RT-PCR-based methods. As part of a quality assurance exercise, we conducted a pilot study focusing on evaluating RNA extraction methods for the detection of the RnaseP gene. By comparing the

efficiency, accuracy, and reliability of manual spin column-based RNA extraction against automated magnetic bead methods, this research seeks to identify the optimal approach for RNA purification in molecular diagnostics. The findings of this study will contribute to enhancing the quality and consistency of molecular testing protocols, particularly in the context of viral RNA analysis.

3. Evaluation of synergistic anti-viral activity of oseltamivir and amantadine against Influenza H1N1 Virus.

Team:

- Santosh Ghuge (STRIP Student),
- Manjula Jadhav,
- Pavankumar Todkar

Funding Agency: Haffkine Institute

Duration: 6 Month

Budget: 25 Thousand Rupees Only

Status: On Going

Abstract

This project explores the synergistic anti-influenza activity of Oseltamivir, Amantadine, and Ribavirin, three marketed antiviral drugs commonly used in the treatment of influenza. The study investigates the combined efficacy of these drugs in inhibiting the replication of the influenza virus. Oseltamivir (75 mg), a neuraminidase inhibitor, and Amantadine (100 mg), an M2 ion channel protein inhibitor, target different stages of the viral replication cycle. Ribavirin (800 mg) is a broad-spectrum antiviral used in treatment hepatitis C, that interferes with viral RNA synthesis and mRNA

capping. The combined use of these drugs is hypothesized to enhance antiviral activity due to their different mechanisms of action. The results could have significant implications for the treatment of influenza, particularly in severe cases or those resistant to monotherapy. The influenza H1N1 virus is harvested in MDCK (Kidney cells) cells and its titer is determined using hemagglutination assay by 0.75% RBCs. The drug cytotoxicity is determined using MTT assay on A549 cellline (lung carcinoma) and the antiviral assay will be performed on A549 cellline to evaluate the hypothesis.



**Department of Zoonosis and Venomous Animal Unit
and Experimental Animal Facility**



Zoonosis and Venomous Animal Unit and Experimental Animal Facility

Zoonosis and Venomous Animal Unit and Experimental Animal Facility 2023-24



Dr. Mrunal Ghag-Sawant
Head of Zoonosis Department

Overview

Department of Zoonosis have three different units functional under the same umbrella namely Entomology unit, Venomous animal unit and Experimental animal facility. Department is committed for training, research and testing in the field of Vector and vector borne diseases, snake and snake venom and animal disease models.

History

The present Zoonosis department was started in the year 1938 as Department of Entomology under the leadership of Dr. M. Sharif, D.Sc. Ph.D. to

work mainly of entomology with plague and its transmission. Dr. P. J. Deoras, Assistant Director has succeeded after that and continued to work on plague and established venomous animal unit along with insect colonies of Public Health Importance. The history of venom/ anti-venom research and procedure for venom extraction from live venomous snakes started way back before 1920. Experimental animal facility is CPCSEA approved state of art animal facility for small laboratory rodents and functioning as centralized facility of Haffkine institute wherein various research, training and testing activities are performed.

Present state of affair

Currently department is actively engaged in Training, research and testing and besides the earlier activities new training and testing methodologies are regularly introduced with full zeal & devotion.

In research, the entomology unit is contributing to existing knowledge in Public health and Infectious zoonotic diseases with special reference to Malaria. The various projects in the department are aimed to understand- vector behavior, Vector Control, Contribution of the genetic mutations towards insecticide resistance, Diagnosis of the disease, investigating the role of trace metals in disease pathophysiology, by doing in vitro cultivation of malaria parasite, screening of various antimalarial natural compounds is carried out. , development of new and improving existing vaccines.

The venomous animal unit has license from state forest department to maintain various kinds of a venomous, non-venomous snakes and scorpions. The major research activity of venomous animal unit is on snake venoms to explore their therapeutic potential such as anti-cancer, anti-inflammatory potential. This unit is involved in screening of natural compounds to explore their repellent property against snakes in laboratory, is also engaged in research on anti-snake venom and anti-scorpion toxin which will facilitate in reduction of snake bite and scorpion bite fatality incidences and venomics of snake venom proteins. One of the major roles of the department is to provide good scientific grade lyophilized venom for anti-venom producing and other research institutes.

Experimental animal facility is involved in various core areas of animal research includes standardization and validation of various animal disease models of infectious and metabolic disease, zoonotic disease such as Rabies,

Japanese encephalitis, Anti-Inflammatory, Osteoarthritis, Anti- diabetes, wound healing etc.

In training, the department conducts various training programs on “Snakes and their Importance” for those who are working with public health authorities, paramedical, veterinary and medical institutes, colleges and schools, at state and national levels. “Mission to control mosquito menace” aimed at training and teaching the college students and other interested professionals to create public health awareness in the control of Mosquito and mosquito borne diseases.

Animal facility conducts workshop on “Principle and practices of laboratory animal care” which encompass concepts of in in vivo experiments and its applications in the field of research as well as ethical issues, welfare regulations.

In testing, the Department is a Central Insecticide Board, Ghaziabad, New Delhi approved center and is actively engaged in testing of household insecticides as per WHO guidelines, this department also provides testing facilities for identification of venom samples especially those seized by police and forest departments of India. Experimental animal facility conducts various academic animal testing activities such as the Anti-Inflammatory, Hepatotoxicity, Hyperlipidemia, Malaria, Filarial, Osteoarthritis, Atherosclerosis and Fistula in Ano etc. Apart from this department also provides rented facility for organization/ institution for their research/ breeding purpose with prior permission of Institutional IAEC committee.

Insect breeding laboratory and insecticide testing facility The present insect breeding laboratory was established in year 1938. This laboratory has state of art breeding and rearing of laboratory insects colonies of Public Health Importance.

Current insect breeding laboratory have live phase of clinically important mosquito species

such as *Aedes aegypti*, *Culex quinquefasciatus*; fly species such as *Musca domestica* among flying insects. This laboratory is also breeding and rearing crawling insects, such as *Periplaneta Americana*, *Blattella germanica* and *Blatta orientalis*.

Insect rearing is performed by trained personnel with at most biosafety, occupational safety and ethical precaution. The insectary rooms are maintained at 28°C and ~80% humidity, with a 12 hr. day and night cycle. Mosquitoes are bred in metal cages and fed with blood by using laboratory animal in order to get continues colony for testing and research purpose. All trays and buckets consisting adult insect, larvae and pupae are covered with non-chemical treated netting. If any insect escape during handling, they either be

collected by using catching device or killed by using commercially available electric racket.

Research activities Insectary provides laboratory bred sterile insects for various Bio efficacy, persistency, repellence, testing against crawling & flying insects, mosquito repellence test on human skin, as per WHO guidelines

Future Plan

- To establish well equipped Insect breeding laboratory.
- To establish GLP/NABL compliance testing and research laboratory.
- Up gradation of laboratory facility for housing and testing of squirrel, bird and termite.

Dr. Mrunal Ghag Sawant



Departmental Photograph

Venomous Animal Unit

Overview

Haffkine Institute is one of the oldest biomedical research institutes in the country. It was established in 1899 and is named after Dr. Waldemar Mordecai Haffkine, who invented the plague vaccine. Since then, the Haffkine Institute has emerged as a multi-disciplinary institute engaged in training, research, and testing of various aspects of infectious diseases.

In 1920, the Venomous Animal Unit, India's premier unit working on snakes, was established to prepare anti-venom sera against venomous

snakes and scorpions and also to study the repellency of snakes against various herbal and chemical components, behavioral changes in serpents, anti-snake and anti-scorpion venoms.

The history of venom/anti-venom research and the procedure for venom extraction from live venomous snakes originated way back before 1920 by honorable Dr. Dalal. This facility has a license from the state forest department to maintain various kinds of venomous, non-venomous snakes and scorpions in captivity for 90 days.



Photo Courtesy: Digital Library of University of South Carolina

The old snake housing facility was constructed way back in year 1960. However as per the current international norms serpentarium is upgraded to house more than 100 snakes. This advance facility have environmental parameter control systems. Snakes are hunted from permitted forest divisions and brought

to serpentarium. Then snakes undergo period of quarantine, during which complete health checkup is

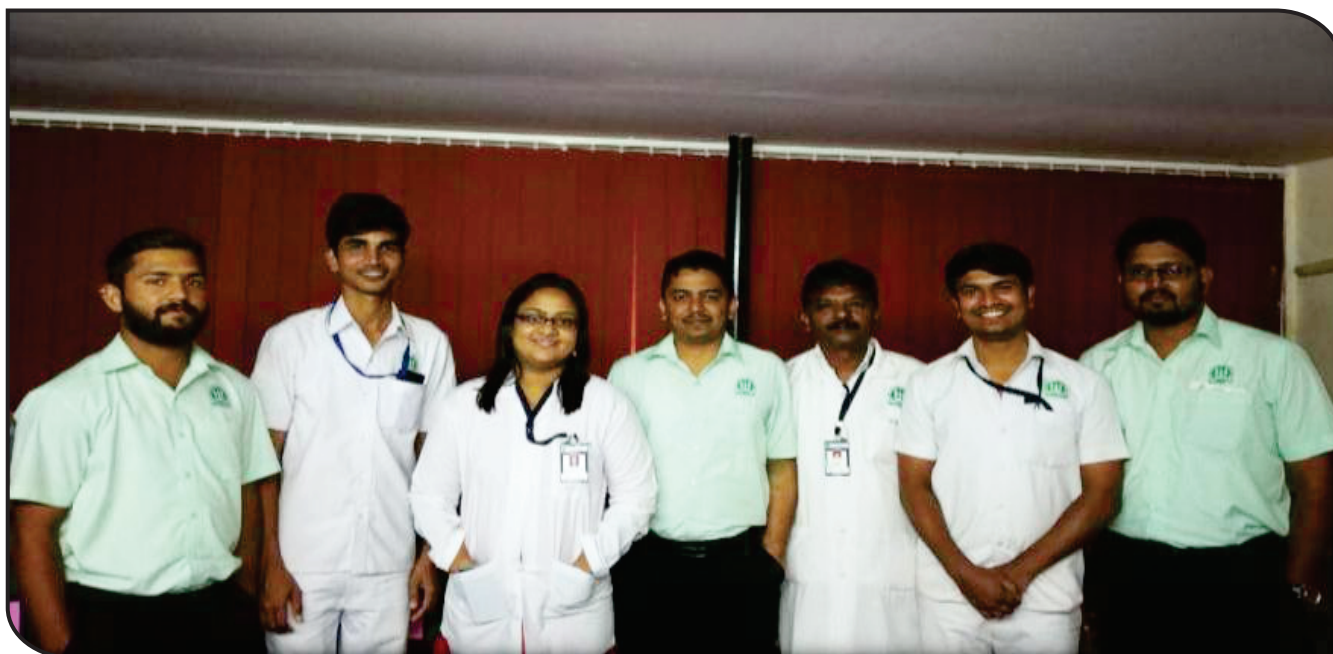
performed. Snakes are then introduced in stock for venom milking purpose. Snakes are fed with healthy laboratory bred mice or rat. Snake venom is extracted from different types of venomous snakes manually using head catch method with minimal stress to snakes. Extraction is performed

by trained personnel at regular intervals under the supervision of veterinarian and medical doctors with at most biosafety, animal safety, occupational safety and ethical precaution. This extracted venom is stored in the form of lyophilized powder until its requirement for production of anti-snake venom and for various aspects of research and education. Snakes are handed over to forest department after the holding period of 90 days to release back in natural environment.

Future Plan

- To establish western zone venom referral center
- To establish NABL compliance testing and research laboratory

Dr. Mrunal Ghag Sawant



Departmental Photograph

Experimental Animal Facility

Overview

The Experimental animal facility is available to boost the teaching, training and research facilities and to meet the growing demand for high quality laboratory animals in emergent field of Laboratory animal science. Qualified veterinarians and technical personnel are always at hand to help carry out research and keep it in accordance with the standards established by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA).

Animal care the laboratory houses rats, mice and rabbits. Each species of animals is maintained in individual rooms to avoid disease transmission and inter-species conflicts. All efforts are made to maintain the animals under controlled environmental conditions [Temperature (22-26°C), Relative Humidity (60 ± 10 %), 12 hrs alternate light and dark cycle] with 100 % fresh air exchange in animal rooms and uninterrupted power and water supply. The support staffs ensures that every part of animal care including feeding, watering, restraining, cage cleaning, record keeping and ordering of animals, feeds, bedding materials and equipment from outside sources are monitored. The animals themselves are isolated from human habitation and guarded from dust, smoke, noise, wild rodents, insects and birds-in fact anything that would disturb their habitat. A high degree of hygienic conditions

(macro- and micro- environment) around the animals are maintained as per the CPCSEA guidelines.

Animal ethics The Animal House is registered with the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Environment and Forests, Govt. of India (Reg. No) and has an established Institutional Animal Ethics Committee (IAEC) that advises the students, teachers/researchers on facilities, policies and practices concerning the care and use of animals.

Veterinary care Periodic health monitoring of the animals is carried out to ascertain the health status of the animals. Veterinary care is crucial to keep the animals content and healthy. The veterinarian keeps them under daily observation and monitors any behavioural changes or signs of illness. The veterinarian supervises their diet and sanitation and contributes to the formulation of appropriate policies and procedures for ancillary aspects of veterinary care.

Various core areas of animal research includes standardization and validation of various animal disease models of infectious and metabolic disease, zoonotic disease such as Rabies, Japanese encephalitis, Anti- Inflammatory, Osteoarthritis, Anti-diabetes, wound healing etc.

Dr. Mrunal Ghag Sawant Incharge,
Experimental Animal Facility



Departmental Photograph

Insect breeding laboratory and insecticide testing facility

Mosquito rearing facility



Mosquito rearing facility



Adult Mosquito collection for Testing



Peet – Grady Chamber for Insecticide testing



Serpentarium (Venomous animal unit)

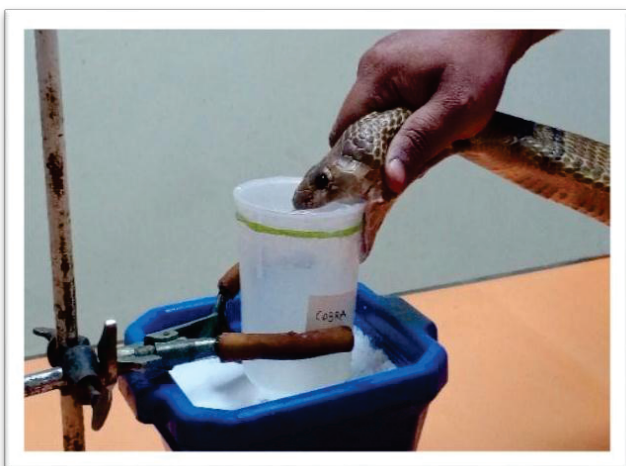
Complete view of snake housing



Provision of hideouts for snakes



Snake Venom extraction



Safety provision for handling venom in laboratory



Experimental Animal Facility

Experimental Animal Facility



Autoclaving Room



Individual Ventilated Caging System



Clean Corridor



Research Projects 2023-24

1. To Study the interplay of oxidative Stress, Tissue Damage and Immunological Effects of Viperidae Venom in Mice

Team:

- Principal Investigator and
- Ph.D. Student - Dr. Mrunaal Ghag Sawant
- Guide / Mentor - Dr. Sandeepan Mukherjee

Funding Agency: Haffkine Institute

Duration: 5 Year (Registration date: 05/05/2022)

Budget: 5 lakhs

Abstract

Snakebite envenomation is a serious medical problem in many developing tropical and subtropical countries and is categorized as a neglected tropical disease due to critical shortages in the production of antivenom. WHO reports suggest that between 81,000 and 138,000 deaths occur each year due to snake envenomation. Snakebite envenoming causes as many as 400,000 amputations and other permanent disabilities. Snakebites result in several effects to include oedema, blistering, haemorrhage, necrosis and respiratory paralysis. Antivenom is the preferred treatment for the systemic effects of snakebite envenomation, though these are often ineffective in neutralizing venom or toxin-induced local tissue damage. To effectively treat snakebites and to understand the need of species specific antivenom, it is important to determine the lethal potency and pathophysiological effects induced by specific snake venoms.

In the current study, we assessed and compared the lethality of Viperidae venoms from two venomous snakes of India that are the primary causes of severe local tissue necrosis. Such studies are the first step to understand the pathophysiology of snake envenomation and

shall be critical to identify prognostic and therapeutic markers. Snake venom was procured from the Venomous Animal Unit of Haffkine Institute. Swiss albino mice (18-20 gms) were injected with Russell's viper (*Daboia russelli*) and saw scaled viper (*Echis carinatus*) venom via intramuscular and subcutaneous route.

Data obtained showed that the intramuscular median lethal doses (LD50) for *Echis carinatus* and *Daboia russelli* venoms are 3.08 and 5.92 mg/kg mouse body weight and subcutaneous median lethal doses (LD50) for *Echis carinatus* and *Vipera russelli* venoms are 3.54 and 3.84 mg/kg mouse body weight, respectively.

This comparative assessment will help in refinement of procedures used to understand the lethality and pathophysiology of snake envenomation with respect to the clinical route of exposure. These may in turn be used to develop more effective and refined management strategies associated with snake envenomation.

2. *In vitro* and *In vivo* Activity of Phospholipase A2 enzyme against *Plasmodium sp.*

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- M.Sc. Student: Ms. Sheetal S. Shetty

Funding Agency: Haffkine Institute

Duration: 3 Year (Registration date: 17/06/2022)

Budget: 3,00,000/-

Status: Ongoing

Abstract

Malaria is a parasitic disease with vector transmission involving a diversity of parasites in different ecological environments. In 2018, the World Health Organization (WHO) reported 228 million cases of malaria, with an estimated 405,000 deaths; children under the age of 5 represent the most vulnerable group for this endemic disease. Available drugs for the treatment of malaria are also expensive, have side effects and/or there may be some drug resistance, which has encouraged the development of new drugs.

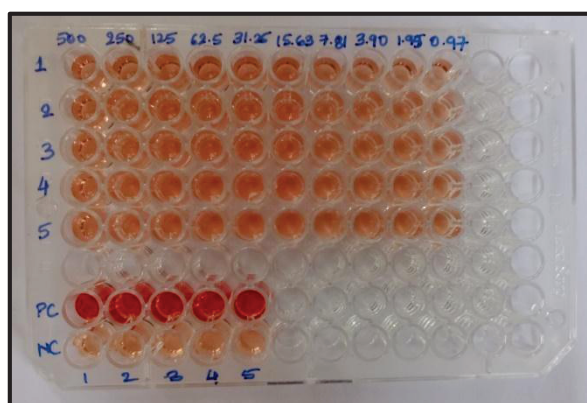
Phospholipase A2 is an enzyme that catalyses the hydrolysis in the sn-2 position of phospholipids,

triggering the release of fatty acids and lysophospholipids. PLA2s various sources have reported antitumor potential, antiviral and antiparasitic activity which makes this group of proteins promising targets of study. The aim of the study is to evaluate the *in vitro* and *in vivo* activity of Phospholipase A2 enzyme against *Plasmodium sp.*

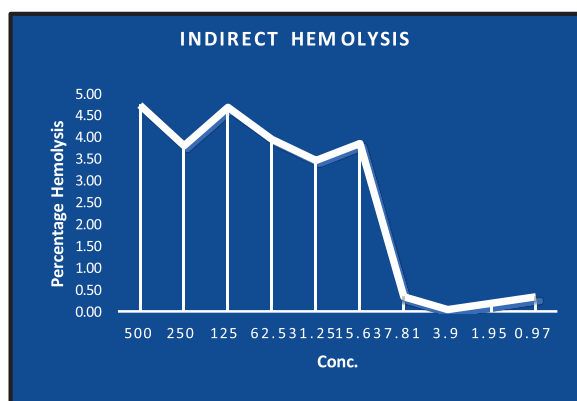
The cytotoxic activity of the enzyme in different concentrations will be tested on Peripheral Blood Mononuclear Cells (PBMC). The 50% cytotoxic dose will be calculated by linear regression. Indirect hemolysis will be evaluated following the method that uses agarose gel-erythrocytes-egg yolk along with red blood cells in suspension. The Minimum Indirect Hemolytic Dose (MIHD) will be calculated.

The *in vitro* assays will be done in a 96-well microplate with RPMI 1640 medium with *P. falciparum* cultures. The activity will be tested by SYBR Green I test and the fluorescence will be measured using spectrophotometer with an excitation of 485nm and an emission of 590nm. Enzyme concentrations showing efficacy above 60% will be assessed for their toxicity in Swiss Albino mice. The mice will be observed for any

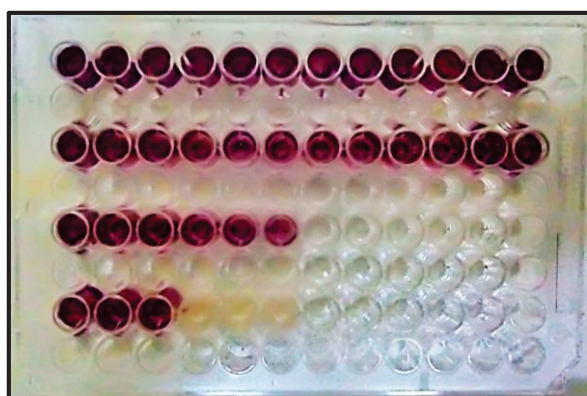
behavioral changes as per the Standard Toxicity Study Guideline, OECD. The *in vivo* antimalarial assays will be done by a four-day suppression test, followed by *in vivo* antimalarial activity. The results will be presented as mean $\pm$ S.E.M. of three replicates and experimental differences between means will be determined by analysis of variance followed by Dunnett's test for intragroup comparisons. Significance will be set up at $p < 0.05$.



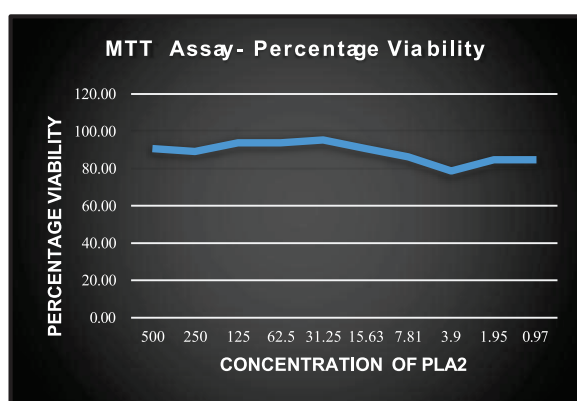
Indirect Haemolysis Assay Plate of PLA₂



Graphical Representation of Percentage Hemolysis



MTT Assay plate of PLA₂



Graphical Representation of MTT Assay

3. Mapping mosquito vectors and monitoring insecticide resistance in and around Mumbai Metropolitan Region.

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- Name of M.Sc. Student: Mr. Pradeep Jadhav

Funding Agency: Haffkine Institute

Duration: 3 Year (Registration date: 14/10/2022)

Budget: 3,00,000/-

Status: Ongoing

Abstract

Insecticide resistance is defined as heritable change in the sensitivity of a mosquito population to an insecticide, which is reflected in repeated field failure of that product to achieve the expected level of control when used according to label recommendations for that pest species.

Insecticide resistance in mosquito vectors is a growing concern and requires immediate attention because of the limited chemical arsenal available for vector control. Although insecticide resistance has been identified in some surveys, very negligible data is available about the current extent and distribution of this resistance in many parts of Mumbai metropolitan region and surrounded area, hence there is a need to

perform more comprehensive studies to understand its extent, which will ensure the most appropriate insecticides to be used for effective vector control. Such information is essential for the planning of effective vector control interventions.

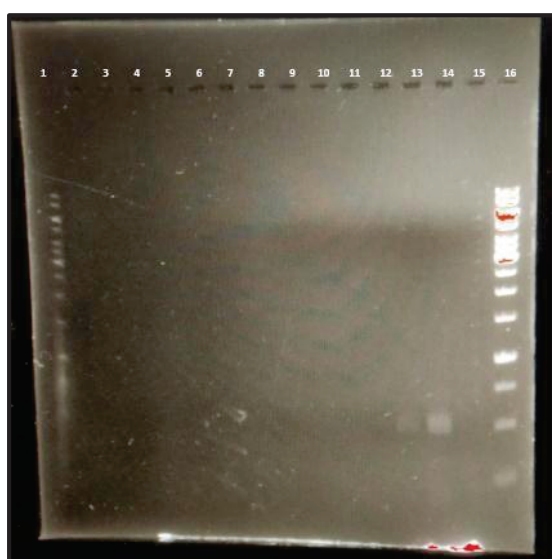
In the last decade, the emergence of resistance in populations of *mosquitoes* to common class of insecticides used in public health was reported from many parts of India.

Malaria research program use pyrethroid impregnated long lasting insecticide nets (LLINs) and indoor residual spraying (IRS) which uses different insecticides, all from the pyrethroid class. These same insecticide classes are also widely used to control agricultural pests and this can pose additional selection pressure on mosquitoes, resulted in the evolution of insecticide resistance.

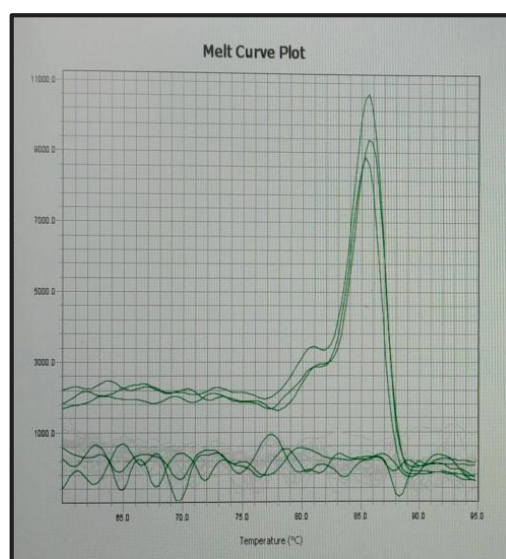
This study is designed to assess the insecticide resistance status of different species of mosquito vectors in and around Mumbai city.

The study sites will be selected after extensive survey of mosquito breeding sites. Bioassay will be performed on adults collected from the field to assess the susceptibility of insecticides as described by the standard WHO testing protocol.

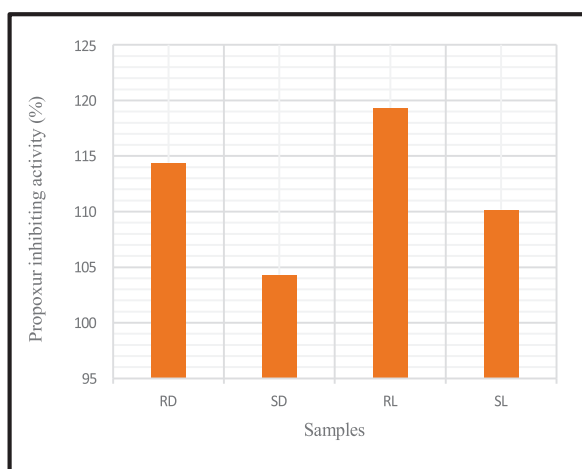
Data from insecticide susceptibility tests will be used to characterize the susceptibility levels of mosquito populations in the study sites. Molecular characterization will be done using Polymerase chain reaction (PCR) and biochemical assays (Acetyl cholinesterase assay, Esterase assay, and Monooxygenase assay) to detect resistance level and mechanism involved.



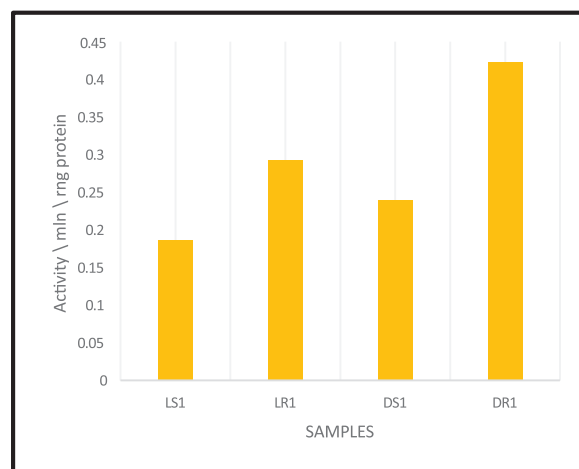
PAGE of Amplified PCR products



VGSC Gene of *Culex* PCR Amplified Plot



**Acetylcholinesterase assay
Graphical Representation of % remaining activity in propoxur**



Esterase Activity/min/mg Protein

4. Estimate lethal toxicity of saw-scaled viper through induced oxidative stress in mice.

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- Name of Strip Student: Ms. Shridevi Mankoji

Funding Agency: Haffkine Institute

Duration: 16/11/2023 - 16/03/2024

Budget : 25,000/-

Status: Ongoing

Abstract

Half of the snakebites in the entire world are from India. It is the most underreported and neglected tropical disease. Over 130,000 people die each year because of snake bites and around three times as many amputations and other permanent disabilities are caused by snakebites annually. Snake venom components known to induce oxidative stress include phospholipase A₂, metalloproteinases, three-finger toxin and L-amino acid oxidase. Swiss Albino Mice were selected as the preferred animal model for this study, taking advantage of their numerous benefits as a model organism. The *in vivo* oxidative

damage caused by the Viper venom was distinctly demonstrated by the elevated levels of oxidative stress markers. To detect the toxicity and oxidative stress of Saw Scaled Viper venom assays such as NO (Nitric oxide), GSH (Glutathione) and TBARS (Thiobarbituric acid) was performed with mice organ homogenates and their absorbance was taken. According to the results oxidative stress was mostly seen in SOI (site of injection), Kidney and Liver as compared to Heart which showed decreased oxidative stress. As per results it was seen that venom induced oxidative stress in mice. Hence, this can be used as a parameter for confirming snakebite cases in the field leading to better treatment.

5. Russell's viper Venom: Unravelling the Intricacies of Oxidative Stress and Cellular Responses

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- Name of Strip Student: Ms. Sayali Salunke

Funding Agency: Haffkine Institute

Duration: 25/10/2023 -25/01/2024

Budget : 15000/-

Status: Completed

Abstract

Envenomation resulting from a snakebite is a potentially life-threatening condition caused by the toxins present in the venom injected during the bite of a venomous snake. This study aimed to assess the oxidative stress induced in mice through the implementation of Nitric Oxide, GSH, and Lipid Peroxidation assays. Swiss Albino Mice were specifically chosen as the preferred animal model due to the various advantages they offer as a model organism. The *in vivo* oxidative damage resulting from Russell's Viper venom was clearly demonstrated by heightened levels of oxidative stress markers and antioxidant enzymes/molecules. In the NO assay, Intramuscular injection caused an elevation in oxidative stress in the liver, attributed to venom-induced damage. Subcutaneous injection

resulted in swift mortality, primarily impacting the subcutaneous region, with a relatively lesser effect on the heart for both injection routes. However, in the GSH assay, the venom displayed increased activity in the liver following both intramuscular and subcutaneous injections, with comparatively lower effects on the thigh region (intramuscular) and subcutaneous area (subcutaneous). The TBARS (Thiobarbituric Acid Reactive Substances) test was conducted to examine heightened levels of Malondialdehyde (MDA). Elevated venom concentrations correlated with increased MDA production, with intramuscular injection having a more significant impact on the kidney and a lesser effect on the heart. Conversely, subcutaneous injection had the highest effect on the subcutaneous region and the lowest on the heart in mice. These findings suggest an increase in oxidative stress levels in the test mice compared to the control mice.

6. From essence to eradication: Assessment of Larvicidal Potential of Essential oil against Mosquito larvae.

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- Co-investigator: Mrs. Trupti Satvekar
- Name of Student: Ms. Henna Mehaboob

Funding Agency: Haffkine Institute

Duration: 25/10/2023 -25/01/2024

Budget : 15000/-

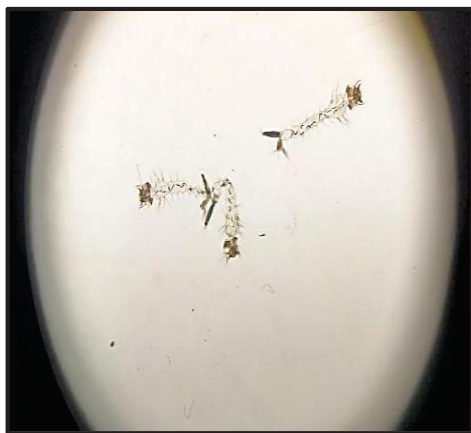
Status: Completed

Abstract

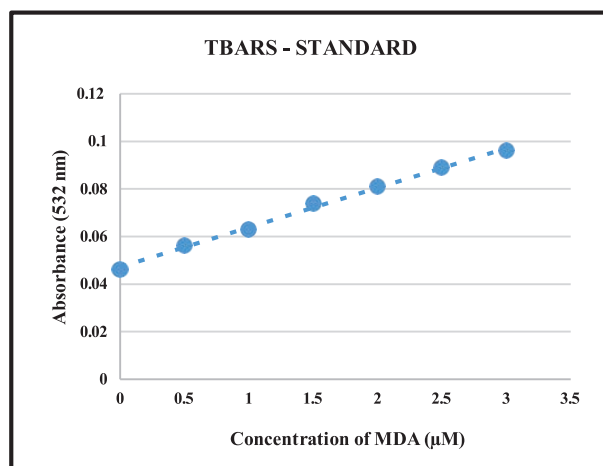
The aim of this research was to evaluate the mosquito larvicidal properties of the essential oil from different sources. The essential oils used were Neem, Peppermint, Lemongrass and Cinnamon. Larvicidal activity was investigated using early 4th instar Larvae of culex were treated with single essential oil and combination of two essential oils of various concentrations and LC50 and LC 95 was calculated.. Dead larvae were collected after 24 hour of treatment for the examination. The LC50 values for the Neem, Peppermint, Lemongrass and Cinnamon were determined to be 112.750, 68.092, 47.639, 49.053 and LC95

values were 206.324, 162.097, 90.152 and 90.528 respectively.

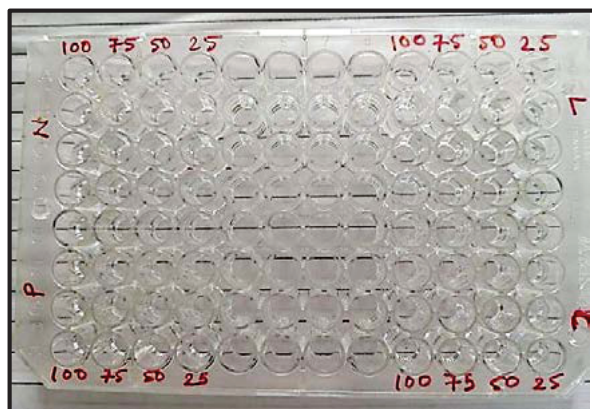
The TBAR (Thiobarbituric acid reactive substances) test was performed to check the increased levels of Malondialdehyde (MDA) After treatment with EOs, the mosquito larvae showed increased lipid peroxidation due to tested oils. It shows the MDA level increased in the larvae which was treated by cinnamon oil. The acetylcholinesterase (AChE) inhibition assay was performed for the comparison between the plant based larvicide and synthetic larvicide. These results suggest that plant extracts (essential oil) can be developed as an alternative ecofriendly larvicide.



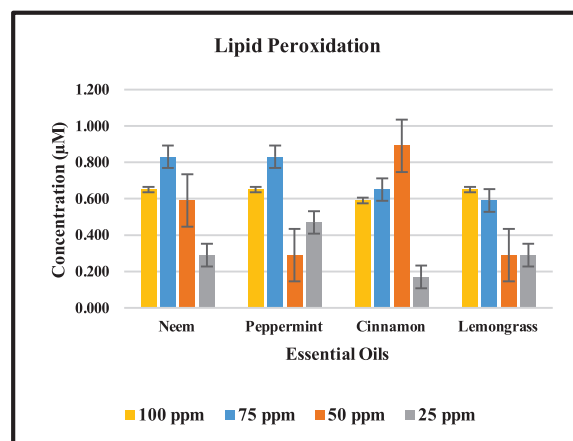
Larvae after treatment with essential oils



TBARS Standard Graph



TBARS Assay of sample (Single Essential oil)



TBARS Assay of Sample (Single Essential Oil)

6. From essence to eradication: Assessment of Larvicidal Potential of Essential oil against Mosquito larvae.

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- Co-investigator: Mrs. Trupti Satvekar
- Name of Student: Ms. Henna Mehaboob

Funding Agency: Haffkine Institute

Duration: 25/10/2023 -25/01/2024

Budget : 15000/-

Status: Completed

Abstract

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7. Identification of Insecticide resistance in mosquito vector

Team:

- Principal Investigator: Dr. Mrunal Ghag Sawant
- Co-investigator: Mr. Pradeep Jadhav
- Name of Student: Mr. Shreyas Vishwarao

Funding Agency: Haffkine Institute

Duration: 25/10/2023 -25/01/2024

Budget : 15000/-

Status: Completed

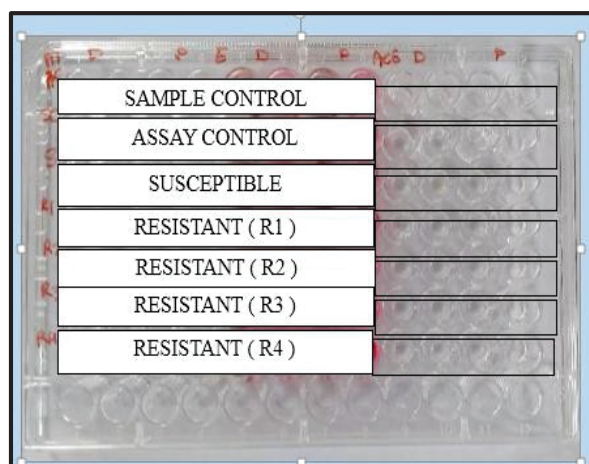
Abstract

Malaria is the most well-known mosquito-borne disease, and it is one of the main causes of mortality for people worldwide. The most important part of the global plan for controlling diseases caused by mosquitoes is vector control, of which insecticide treatment is an essential aspect. However, insecticide-resistant mosquito vectors and drug-resistant infections are mostly to blame for the recent rise in mosquito-borne disease cases. Numerous studies have demonstrated that insecticide resistance is most likely caused by a variety of complicated resistance mechanisms, including greater metabolic detoxification of insecticides and a decreased sensitivity of the target proteins or genes.

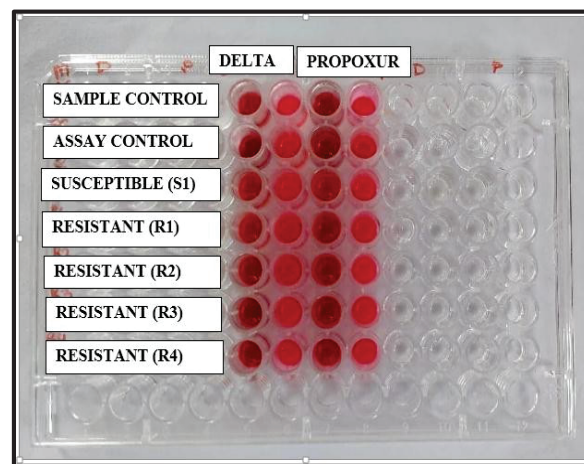
In order to control vectors for the Municipal Corporation of Mumbai and surrounding cities, it was necessary to identify and assess the effectiveness of the phenotypic and genotypic evaluation of insecticide resistance of frequently utilized insecticides. The CDC Bottle Bioassay was used in this investigation to evaluate susceptibility and resistance in different mosquito populations. Biochemical and molecular assays were then employed as backup methods. The genetic composition of a mosquito's gene may mutate with generation and seasonal changes, leading to the creation of specific gene variations in the vector. To maximize regional integrated mosquito management techniques, this vector control management strategy should be regularly observed and applied to populations that are exposed.

In this study, we employed insecticides to determine the survivability and resistance activities of adult mosquitoes. We subsequently evaluated the results using the Bottle Bioassay method, following the criteria provided by the Centers for Disease Control and Prevention (CDC). Furthermore, biochemical methods and assays can be employed to determine the resistance mechanism. Certain biochemical assays can be

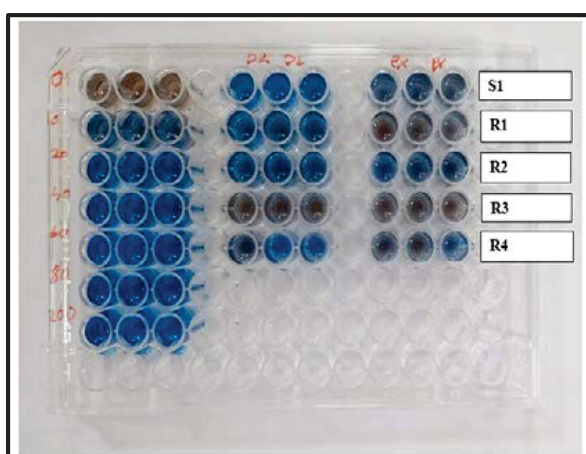
used to evaluate changes in resistance gene frequencies in field populations under various selection pressures after a population is appropriately described. It should be highlighted that not all resistance mechanisms are now covered by basic field biochemical tests. It is not possible to detect resistance entirely with biochemical assays; standard susceptibility testing must still be performed



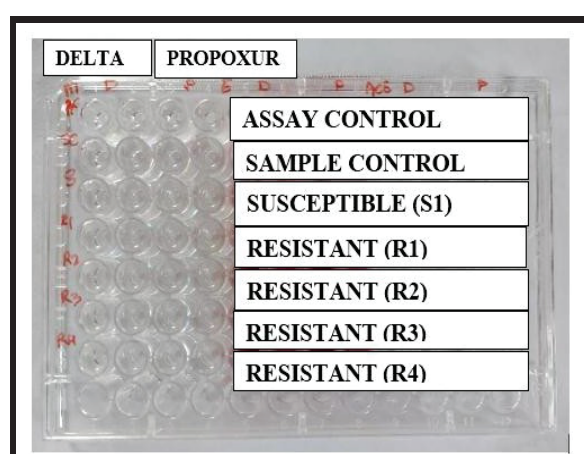
Acetylcholinesterase assay



Esterase Assay



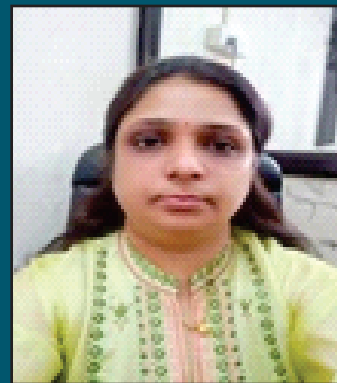
Protein Estimation



Monooxygenase Assay

Supporting Departments

Dispensary



Dr. Sandesha Pashte
Additional charge as Head of
the Department

Overview

VISION, MISSION, GOAL

- To provide comprehensive primary Health care for acute chronic illness.
- Emphasis on Preventive Health care by providing Pre-exposure prophylaxis vaccination and regular health check-ups.
- To educate the patient about future complications of their illness by counselling and creating awareness.

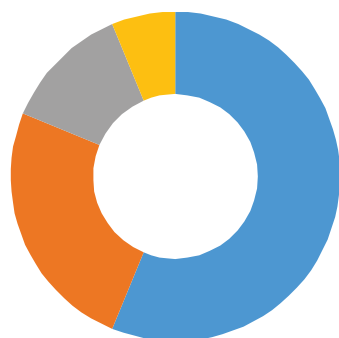
Dispensary was established to provide medical facility for Haffkine Institute employees. Medical Officers provide treatment for various diseases and immunization for Haffkine students, staff

and their relatives in dispensary. Medical reimbursement bills were accessed in dispensary.

Haffkine Institute Dispensary provides Pre exposure prophylaxis vaccination facility to its employees and students for Hepatitis-B, Rabies, Tetanus, and Influenza.

Medical officers of Dispensary provide Outpatient Department facility and monthly medication for chronic illness [like hypertension, Diabetes, dislipidemia, anemia, raised BMI, hypothyroidism, chronic joint pain etc] and acute illness [Like U.R.T.I., UTI, Gastroenteritis, gastritis, hypotension, fever, injuries etc], for staff & their family members and students.

CHRONIC ILLNESS



- HYPERTENSION
- DIABETES
- DYSLIPIDEMIA

Fig-Patient taking treatment for chronic illness at Dispensary, HITRI.

Dispensary conducts Medical Checkup for Institutes Staff and students. During medical checkup medical officers provide health assessment by evaluating Chief complaints, Vaccination history, Personal habits, BMI, waist-hip ratio, Vision check- up (Near & Distant), Pulse, and B.P. Systemic Examination. Treatment, diet counseling and life style changes are advised as per requirement. Routine follow-up for chronic illness patients is done in dispensary.

- Dispensary unit had conducted Annual Medical Check-up For Animal House Employees. and Chemical Testing department.
- Dispensary provides first aid facility and kit to all departments.

- Antenatal care is provided to pregnant employees.
- Pre-employment check-up is also done at dispensary by medical officers.
- OPD treatment and consultation facility is provided by Medical officers for HBPCCL employees whenever required.
- Medical officers provide consultation and treatment to PWD staffs and their contract workers and CNCS staff
- Medical Officers provide clinical assistance for various research projects.

- Dispensary provides medical Assistance to V.A.U. department during snake/ scorpion venom milking procedure.
- Medical Officers provide Training on topic "Snake bite and First aid" during Annual workshop conducted by V.A.U.
- Medical Officers provide Training on topic "Snake bite and First aid" during Annual workshop conducted by V.A.U.
- Dispensary unit had conducted Pre Employment Medical Check-up For Apprentice students in 2023.

Other Activities

- Dispensary Unit Staff has attended Lecture series on Human Rabies management on 27th September 2023 under The National One Health Program for Prevention & Control of Zoonosis NCDC.
- Dispensary Unit staff has Celebrated Marathi Bhasha Din in Oct 2023.
- Dispensary Unit Staff has attended Awareness Of Organ Donation presented by Dr. Pravin Shingare in 2023.
- Dispensary Unit Staff has attended lecture by Dr. T. P. Lahane in 2023
- Dispensary Unit Staff has attended Zoonosis webinar under NCDC on 24.11.2023



Departmental Photograph

Library



Mrs. Sarita Ajit Wadekar
Librarian

Overview

The aim and objective of the Haffkine Institute Library is to collect, organize, search and retrieve information in the areas of prime activities of the institute i.e. Research in Biomedical and allied sciences with a special reference to the communicable diseases.

This year library continued to provide online scientific search and retrieval facilities to the staff, researchers and students. Users mainly consisted of Scientific Staff, Research Fellows and the students enrolled for the various programmes of the institute. The library also provided reference

service by Telephone, Email, Post, Courier, etc. to the distant users who could not come to the library.

The library made available different research and scientific publications from other libraries to the scientists and students of the Haffkine Institute on the basis of Inter Library Cooperation. Similarly, publication available in our library were made available to other libraries in the current year. The library regularly imparted induction and orientation training to outside visitors and new students of the institute on library usage and how to conduct the literature search effectively.

LIBRARY COLLECTION

DESCRIPTION	TOTAL
Books	10923
Bound Volumes of Journals	27603
Theses	511

LIBRARY FACILITY



THE LIBRARY COMMITTEE

The Library Committee Members meet regularly to discuss the matters associated with the library.

Sr. No	Name of Committee Member	Designation
1	Dr. Sandeepan Mukherjee	Chairman
2	Dr. Ashish Asrondkar	Member
3	Ms. Swati Mumbarkar	Member
5	Account Officer (Haffkine Institute)	Member
6	Ms. Sarita Wadekar	Member Secretary



Departmental Photograph

BOOK EXIBITION

The Haffkine Institute Library organized a Book Exhibition to commemorate the **“Marathi Bhasha Samvardhan Pandharwada 2024 from 22th January to 25th January 2024”**.



Radiation Biology Unit 2023-2024



Dr. Anuya Rege
Senior Scientific Officer



Mr. Manoj K. Patil
Scientific Officer &
Radiological Safety Officer

Overview

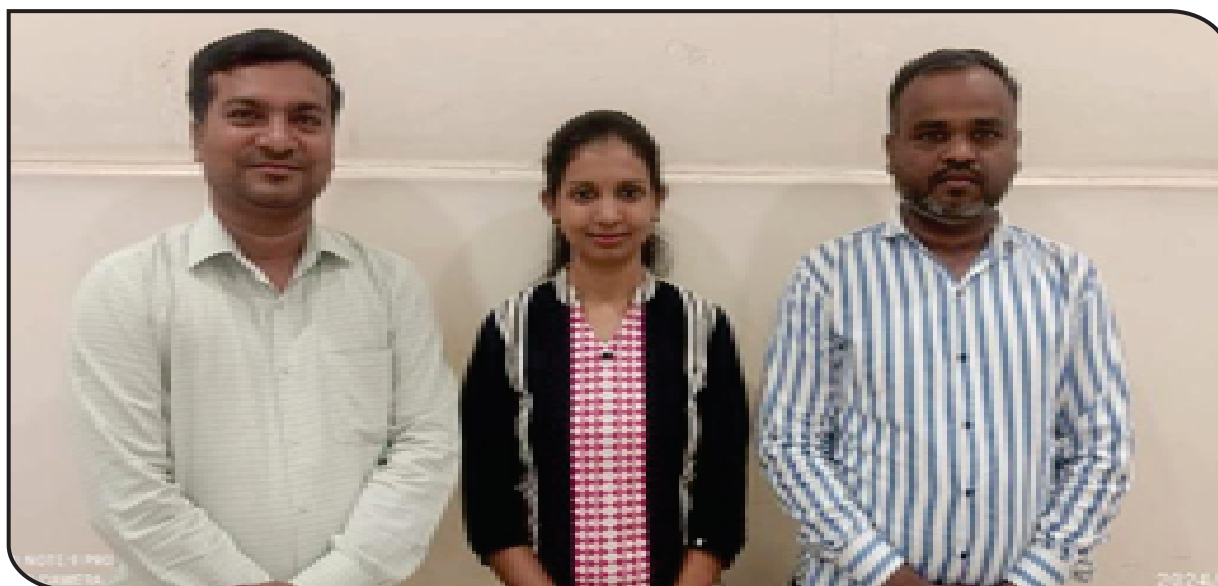
This facility was sponsored by Department of Science & Technology (DST). The main aim and objective of the Radiation Biology Unit is to provide a safe and secure laboratory for handling and storage of radio-isotopes and to conduct experiments related to radio-isotopes/radio-labelling, as per the guidelines established by the Atomic Energy Regulatory Board (AERB), Gov. of India.

Furthermore, the Radiation Biology Unit is approved as Type II laboratory for handling low energy Beta (β) emitting sources such as Tritium (H^3), Carbon (C^{14}), Phosphorous (P^{31}) and Sulphur (S^{35}). The facility can be useful for work related to

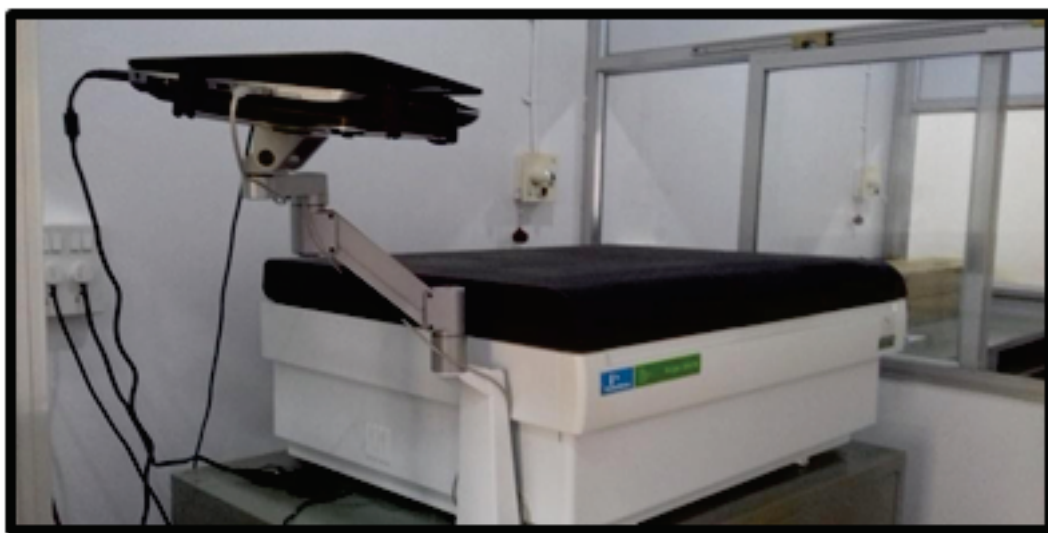
radioactive organic and bio-organic molecules, radio-labelled plant extracts etc., which can be achieved by collaborating with the Board of Radiation and Isotope Technology (BRIT), to make radio-labeled compounds.

Instruments available in the Facility:

- 1) Liquid Scintillation Counter.
- 2) Phosphor Imager.
- 3) Centrifuge.
- 4) Fume Hood.
- 5) Radiation Survey Meter.
- 6) Cryostat Microtome.



Departmental Photograph



Liquid Scintillation Counter



Phosphor Imager



Fume Hood

Training Department



Dr. Vrushali Patil
In-charge,
Department of Training

Overview

Haffkine Institute has emerged as a multi-disciplinary Institute engaged in Training, Research and Testing of various aspects of infectious diseases. The Institute serves as a premier teaching institution in the field of biomedical sciences.

Haffkine Institute has been recognized by the University of Mumbai for M.Sc. (by Research) and Ph.D. degree courses in Applied Biology, Microbiology and Chemistry. It has also been affiliated to Maharashtra University of Health Sciences (MUHS), Nashik for Ph.D. degree course in Applied Medical Biology.

Haffkine Institute also provides a research platform through Short Term Research Internship Programme (STRIP) to the students who are pursuing their master degrees under the recognized universities. Training department is

also engaged in coordination of various training programmes in different batches. Furthermore, Training department started collaborative Industrial Biotech Training Programme (IBTP) with Gujarat government & Biotech Industrial Training Programme (BITP) with Department of Science & Technology, Govt. of India.

Haffkine Institute has been approved as a SIP center to conduct Summer Internship Program (SIP) for the students pursuing degree in Health Sciences Faculty like Allopathy, Dental, Ayurveda, Homeopathy, Unani, Nursing etc. from Maharashtra University of Health Sciences, Nashik. 16 SIP students have been trained in various subjects in the year 2023 by the training department.

Training Department actively engaged in training activity under NOHPPCZ, National Centre for Disease Control (NCDC), New Delhi.

Training Department - Ph.D. Students

Sr. No.	Name of Student	Designation (M.Sc. / Ph.D.)
1	Harshada Sawant	Ph.D
2	Dr. Mrunal Ghag-Sawant	Ph.D
3	Pawankumar Todkar	Ph.D
4	Priyanka Mishra	Ph.D
5	Amalamerin George	Ph.D
6	Bhupali Kore	Ph.D

Training Department – M.Sc. Students

Sr. No.	Name of Student	Designation (M.Sc. / Ph.D.)
1	Sheetal Shetty	M.Sc.
2	Madhura Ghatkar	M.Sc.
3	Shreya Thakur	M.Sc.
4	Pradeep Jadhav	M.Sc.

Training Department – BITP Trainee

Sr. No.	Name of Trainee	Designation
1	Karthik Shrinivasan	BITP-Trainee
2	MD Danish	BITP-Trainee
3	Mohammad Khalid Bhat	BITP-Trainee
4	Shivam Kesarwani	BITP-Trainee

Training Department – NATS Trainee

Sr. No.	Name of Trainee	Designation
1	Janhavi Koregaonkar	NATS-Trainee
2	Sanjana Rampurkar	NATS-Trainee
3	Saish Chavan	NATS-Trainee
4	Divya Karepaka	NATS-Trainee
5	Akansha Yadav	NATS-Trainee
6	Amulya Ryakala	NATS-Trainee
7	Karina Pawaskar	NATS-Trainee
8	Samruddhi Jadhav	NATS-Trainee
9	Anisha Mane	NATS-Trainee
10	Gayatri More	NATS-Trainee

Training Department – IBTP Trainee (GSBTM) Gujarat State Biotechnology Mission

Sr. No.	Name of Trainee	Designation
1	Rutisha Trivedi	IBTP-Trainee
2	R. Priyanka	IBTP-Trainee
3	Pooja Chavan	IBTP-Trainee
4	Pooja Gaikwad	IBTP-Trainee
5	Rahul Sharma	IBTP-Trainee

Training Department – STRIP Students (Oct 2023 to March 2024) Batch

Sr. No.	Name of Students	Designation
1	Afrah Nawab	STRIP Student
2	Santosh Ghuge	STRIP Student
3	Debashish Mukherjee	STRIP Student
4	Juveria Sayyad	STRIP Student
5	Sakshi Parmar	STRIP Student
6	Shreya Gore	STRIP Student
7	Rahul Patel	STRIP Student
8	Shridevi Mankoji	STRIP Student
9	Saloni Akhadkar	STRIP Student
10	Disha Thakur	STRIP Student

Training Department – STRIP Students (Dec 2023 to May 2024) D.Y.PATIL Batch

Sr. No.	Name of Students	Designation
1	Tanvi Thakur	STRIP Student
2	Mukta Gulavane	STRIP Student
3	Vaidehi Diware	STRIP Student
4	Nishitta Nayak	STRIP Student
5	Tanaya Acharya	STRIP Student
6	Shourya Giri	STRIP Student
7	Gunjan Awari	STRIP Student
8	Tanmay Shinde	STRIP Student

Training Department – STRIP Students (Jan 2024 to June 2024)

Sr. No.	Name of Students	Designation
1	Siddhi Nigade	STRIP Student
2	Krushna Tambe	STRIP Student

Training Department – SIP Students 2023 (Summer Internship Programme)

Sr. No.	Name of Students	Designation
1	Gargi Patil	SIP Student
2	Utkarsha Ichake	SIP Student
3	Keyur Sabnis	SIP Student
4	Faraj Yusuf Shaikh	SIP Student
5	Sonal Sinha	SIP Student
6	Sanjyot Annadate	SIP Student
7	Dhirti Sukheja	SIP Student
8	Nahid Fatema Sayyad	SIP Student
9	Nandani Goswami	SIP Student
10	Prathamesh Sakhere	SIP Student
11	Riya Arvind Pandey	SIP Student
12	Vedant Bahiwal	SIP Student
13	Sailee Nawathe	SIP Student
14	Antara Agarwal	SIP Student
15	Aarya Chati	SIP Student
16	Siddhi Bhogaonkar	SIP Student



Museum



Mr. Pradeep Jadhav
Museum Coordinator



Mr. Nilesh Gaikwad
Museum Coordinator

Overview

The Museum in the Historic renowned mansion with Portuguese architecture is a magnificent museum which unveils Life Sciences, Microbiology and the glorious past of this Institute and the inspirational work of Dr. Waldemar Mordecai Haffkine.

It has a short Film "The World of Dr. Haffkine" made by Films Division in 1976.

It also has snake section, with original skeletons of grown up and baby snakes. A wet display of semi non-venomous and venomous snakes can be

found here, apart from replica of various crawling and flying insects like mosquitoes, flies, cockroaches and bed bugs. Some original insect collections on display have been collected way back in 1924. The shaded snake skins and instruments used for handling snakes are also displayed. A film explaining milking of snake venom and original snake venom is also available for viewing. Transparent sculptures of enlarged forms of five most significant microbes namely Human Immunodeficiency Virus (HIV), Rabies Virus, Influenza Virus, *E. coli* and Bacteriophage are on display.

Details of total participants and financials from April 2023 to March 2024

Total number of Participants	Total Revenue Generated (April 2023 to March 2024)
1159	25,950.00

List of Dignitary Guests and Institutes/Organisation visited Museum at Haffkine Institute (April 2023 - March 2024)

Sr. No	Date of Visit	Name of Visitor/Organization	No. of Participants
1	16 th April 2023	Heritage Walk - Maharashtra Tour Guide Association Guide	08
2	20 th April 2023	DMLT students and Staff - Maharashtra Institute of Paramedical Sciences	25
3	21 st April 2023	St. Lawrence International School - Kalyan	79
4	25 th April 2023	Community Medicine - G. S. Medical college	19
5	18 th May 2023	Anam Prem Organization	03
6	18 th May 2023	Dr. Girish Mahajan – Director –Himedia	03
7	30 th May 2023	PSM Department, KEM Hospital/G.S. Medical college	28
8	31 st May 2023	Vibrant Nursing college –Surat	60
9	5 th June 2023	Trainees- Virology department –HITRT	10
10	9 th June 2023	Community Medical College – INHS Aswini	16
11	27 th June 2023	Community Medicine - G. S. Medical college	26
12	3 rd July 2023	Trainees- Virology department –HITRT	05
13	7 th July 2023	SIP Students	15
14	25 th July 2023	Community Medicine - G. S. Medical college	24
15	1 st August 2023	Mr. Dharmrao Baba Atram Hon. Minister– FDA Maharashtra State	01
16	2 nd August 2023	K. G. Mittal Ayurvedic College –Marine Drive Mumbai	46
17	10 th August 2023	MSc/Ph.D. Students and Staff HITRT– Haffkine Foundation Day	16
18	17 th August 2023	Shri Sanket Patel Memorial Nursing College –Surat	29
19	28 th August 2023	Community Medicine - G. S. Medical college	27
20	28 th August 2023	Community Medicine – B. Y. L. Nair Medical college	35
21	29 th August 2023	Lord College Mumbai	72
22	11 th September 2023	Orchids International School Mumbai	96
23	14 th September 2023	Mr. Yatin Sawant – Additional Commissioner, State Excise	12
24	15 th September 2023	Dr. Babuben Mahendra Nanavati College of Home Science – Matunga	32
25	22 nd September 2023	School of Medical Assistant INHS Aswini –Colaba	33
26	19 th October 2023	Mr. Rishabh Kachroo PhD Scholar –NCR Delhi	01
27	23 rd October 2023	Community Medicine - G. S. Medical college	22
28	9 th November 2023	Swami Vivekananda College –Chembur -Mumbai	37
29	14 th December 2023	Community Medicine - G. S. Medical college	23
30	17 th December 2023	Heritage Walk- Maharashtra Tour Guide Association Guide	05
31	19 th December 2023	Community Medicine - G. S. Medical college	25
32	12 th January 2024	Faculty of Veterinary College – Shere-Kashmir University, Kashmir	33
33	15 th January 2024	Government College of Nursing – Kolkata	06
34	17 th January 2024	Suryavanshi Kshatriya Samaj Yoga Class – Dadar	30
35	23 rd January 2024	Community Medicine - G. S. Medical college	28
36	23 rd January 2024	Mr. Ben Tiawbman – London-UK	02
37	05 th January 2024	College of forestry –Pannampet, Karnataka	70
38	21 st February 2024	ESM department- G. S. Medical College and KEM hospital	24
39	22 nd February 2024	Dapoli Urban Bank Senior College of Science - Dapoli	41
40	26 th February 2024	Mr. Anil Patil IAS- MD HBPCCL	02
41	26 th February 2024	Interns from HBPCCL	14
42	27 th February 2024	Mr. Prashant Rao- Historian	02
43	29 th February 2024	Khalsacollege of veterinary and Animal Science – Amritsar, Punjab	50
44	19 th March 2024	Community Medicine – G.S. Medical College	24

Collaborations and Events:

- Celebrated "World Museum Day" from 18th May 2023. Museum was kept open for all staff, Student and visitors during working hours. Museum coordinators were felicitated by Anam Prem NGO
- "Heritage Walk to Haffkine Institute" an Innovative museum tour was initiated in collaboration with Maharashtra Tour Guide's & Tourist Facilitator Association and MTDC.



Add. Commissioner and Team - State Excise



Suryavanshi Skharitya Samaj Yoga Class Daradar



Government College of Nursing-Kolkata



Faculty of Veterinary College- Kashmir



Community Medicine GSMC



Community Medicine GSMC



Community Medicine GSMC



**Bhanuben Mahendra Nanavati College
of Home Science**



Community Medicine-GSMC



Haffkine Day- 2023



Community Medicine-GSMC



Inspectors- Charity Commissioner Mumbai



Community Medicine BYL Nair Hospital



School of Medical Assistants- INHS Aswini



Lords College Mumbai

Publication

Publications 2023-24

Department of Bacteriology

1. Rege AA, Kolte DB and Ambre MS: Evaluation of Antimicrobial and Antibiofilm potential of Alum (*Sphatika*) and it's *Bhasma* (*Sphatika Bhasma*) against Clinical Isolates- An *In vitro* Study. World Journal of Pharmacy & Pharmaceutical Sciences, (2023); 12(8): 1331-1350.
2. Rege AA and Kolte DB: *In vitro* Evaluation of Antimicrobial and Antibiofilm potential of *Shilajit*. World Journal of Pharmacy & Pharmaceutical Sciences, (2023); 12(1): 1735-1752.
3. Rege AA and Kolte DB: Determination of Antimicrobial and Antibiofilm activities of *Shilajit* against Clinical Isolates- An *In vitro* Study. World Journal of Pharmaceutical Research, (2023); 12(4): 993-1010.
4. Rege AA and Kolte DB: *In vitro* Evaluation of Antibacterial and Antibiofilm Effect of Gallic Acid against Standard Strains and Clinical Isolates. World Journal of Pharmaceutical Research, (2023); 12(15): 1019-1039.
5. Pachpore S, Rege A, Kolte D and Dongarkar A: *In vitro* determination of Nutraceutical, Antimicrobial and Antioxidant potential of dried *Hibiscus rosa-sinensis* L. Flowers. World Journal of Pharmacy & Pharmaceutical Sciences, (2023); 12(8): 1013-1026.

Department of Biochemistry

1. Mishra Priyanka & Padmanabhan Usha; Naja sp. clone molt sample 1 cytochrome b-like gene, partial sequence, mitochondria; Genbank Submission, 2023-24

Research Article ISSN GenBank accession number-

Article Received on revised on - Original submission Feb 16, 2024, Revision Feb 22, 2024 Accepted on - Feb 26, 2024

DOI: Accession No. Pp350416-

2. Mishra Priyanka & Padmanabhan Usha; Naja sp. clone molt sample 2 cytochrome b-like gene, partial sequence, mitochondria; Genbank Submission, 2023-24

Research Article ISSN GenBank accession number-

Article Received on revised on - Original submission Feb 16, 2024, Revision Feb 22, 2024 Accepted on - Feb 26, 2024

DOI: Accession No. Pp350417

3. Mishra Priyanka & Padmanabhan Usha; Naja naja voucher Molt cytochrome c oxidase subunit I (COX1) gene, partial cds; mitochondrial, Genbank Submission, 2023-24 Research Article ISSN GenBank accession number-

Article Received on revised on - Original submission Feb 16, 2024, Revision Feb 22, 2024 Accepted on - Feb 26, 2024

DOI: Accession No. Pp403905

Department of Cell Biology

1. Padmanabhan, Usha; Munne, Kiran; Bhor, Vikrant; Patel, Vainav; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880838.
2. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880849.

3. Padmanabhan, Usha; Munne, Kiran; Bhor, Vikrant; Patel, Vainav; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880839
4. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880847.
5. Padmanabhan, Usha; Vahval, Rohit; Prasad, Priyanka; Nataraj, Gita; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880858.
6. Padmanabhan, Usha; Vahval, Rohit; Prasad, Priyanka; Nataraj, Gita; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880837.
7. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880848.
8. Padmanabhan, Usha; Vahval, Rohit; Prasad, Priyanka; Nataraj, Gita; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880841.
9. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880852.
10. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880842.
11. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880853.
12. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880850.
13. Padmanabhan, Usha; Chaudhari, Kavita; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880840.
14. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880851.
15. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880845.
16. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880856.
17. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880846.
18. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880857.
19. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880843.
20. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880854.
21. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880844.
22. Padmanabhan, Usha; Shastri, Jayanthi; Amruta, Dhawale; Ingole, Nayana; Sarang, Shashank; GISAID Accession No.EPI_ISL_18880855.

Department of Chemical Testing

1. Pachpore S, Rege A., Kolte D, Dongarkar A. *In vitro* Determination of Nutraceutical, Antimicrobial and Antioxidant Potential of Dried *Hibiscus Rosa-Sinensis* L. Flowers. World Journal of Pharmacy and Pharmaceutical Sciences, (2023); 12(08): 1013-1026.

Department of Clinical Pathology

1. Gupta, Chandan, Pinky Singh, Shashikant Vaidya, Premrata Ambre, and Evans Coutinho.

"A novel thermoresponsive nano carrier matrix of hyaluronic acid, methotrexate and chitosan to target the cluster of differentiation 44 receptors in tumors." International Journal of Biological Macromolecules, 2023, Vol. 243, p.125238

Research Article ISSN: 0141-8130

Accepted on - 15 July 2023

DOI:<https://doi.org/10.1016/j.ijbiomac.2023.125238>

Department of Chemotherapy

Journal Articles

Pandey Radha, Chaurasiya Kirti, Asrondkar Ashish, Nair Divya, Kamath Chitra; Synthesis and study of anticancer activity of quinoline derivative using computational chemistry, Heterocyclic Letter, 13 (3), 477-488.

Poster Presentation

DARWIN SYMPOSIUM: Assessing Peptides with In-Silico Molecular Docking, Simulations And ADME/Pharmacokinetic Prediction as Anti-Rabies Agents" Date: 1st December 2023.

Department of Toxicology and Zoonosis

Journal Articles

Dr. Ghag Sawant Mrunal, Dr. Dagli Nilesh. R, Shetty Sheetal S. and Dr. Prof. Chawdhary Abhay

Research Article : Determination of spermicidal activity of plant extract on goat semen World Journal of Pharmaceutical Research

Volume 12, Issue 17, 1365-1385. Research Article ISSN 2277-7105

Research Article ISSN- 2277-7105 Article Received on 25 August 2023,

Revised on - 15 Sept. 2023,

Accepted on -05 Oct. 2023

DOI: 10.20959/wjpr202317-29867

Poster Presentation

1. Assessing the Comparative Toxicity of Viperidae Venom on Murine Models Dr. Mrunal Ghag Sawant and Sandeepan Mukherjee

Presented at 11th International Conference of Laboratory Animal Scientists Association (LASA), India on Advanced of 3R's in Biomedical Research, Laboratory Animal Science and Welfare: International Perspectives at Indian Institute of Science, Bengaluru during 7th to 8th November 2023
2. *Plasmodium berghei* *In vitro* Culture: A New Approach

Ms. Sheetal S. Shetty, Dr. Mrunal Ghag-Sawant, Ms. Neha Desale, Ms. Trupti Satvekar Presented at 11th International Conference of Laboratory Animal Scientists Association (LASA), India on Advanced of 3R's in Biomedical Research, Laboratory Animal Science and Welfare: International Perspectives at Indian Institute of Science, Bengaluru during 7th to 8th November 2023.
3. Determination of the Oxidative Effects of Cobra Venom on Zebra Fish embryos: An alternative Approach

Ms. Madhura Ghatkar, Dr. Mrunal Ghag-Sawant, Ms. Swati Mumbarkar, Ms. Ankita Chauhan, Presented at 11th International Conference of Laboratory Animal Scientists Association (LASA), India on Advanced of 3R's in Biomedical Research, Laboratory Animal Science and Welfare: International Perspectives at Indian Institute of Science, Bengaluru during 7th to 8th November 2023.
4. Understanding Snake Venom Protein Concentration

Ms. Shreya Vilas Thakur, Dr. Mrunal Ghag-Sawant, Ms. Swati Mumbarkar, Ms. Madhura Ghatkar, Ms. Sheetal S. Shetty.

Presented at 11th International Conference of Laboratory Animal Scientists Association (LASA), India on Advanced of 3R's in Biomedical Research, Laboratory Animal Science and Welfare: International Perspectives at Indian Institute of Science, Bengaluru during 7th to 8th November 2023.

Training Services

TRAINING SERVICES 2023-24

Department of Bacteriology

Name of Training Program	Name of Mentor	Duration	No. of Students	Revenue Generated (Rs.)
Short Term Research Internship Program (STRIP)	Dr. Anuya Rege	January 2023 to June 2023	1	25,000/-
	Dr. Anuya Rege	November 2023 to March 2024	2	50,000/-
	Mrs. Jayashree More	December 2023 to May 2024	1	25,000/-

Department of Biochemistry

Sr. No.	Name of Training Program	Duration	No. of Students	Revenue Generated (Rs.)
1	NCDC rabies workshop	2 days	20	Rs. 10,00,000/-

Courses / Degree	Guide / Mentor
Master of Science (M.Sc.)	- Dr. Usha Padmanabhan - Dr. Amruta Naik
Doctorate of philosophy (Ph.D.), MU and MUHS	Dr. Usha Padmanabhan

Details of Ph.D. students

Sr. No	Student Name	Project Title	Guide/ Mentor	Duration	Status
1.	Ms. Priyanka Mishra	An investigation of endogenous Indian snake(s), such as Saw scaled viper through whole genome sequencing.	Dr. Usha Padmanabhan	Mar 2023 onwards	Ongoing
2.	Ms. Amalamerin George Kanjupally	Whole Genome Sequencing of Scorpions	Dr. Usha Padmanabhan	Apr 2023 onwards	Ongoing

Details of S.T.R.I.P students

Sr. No.	Name	Duration (Months)	Mentor
1.	Ms. Tanaya Vijay Acharya	6	Dr. Amruta Naik
2.	Ms. Vaidehee Pramod Diware	6	Dr. Amruta Naik
3.	Ms. Mukta Gulavane	6	Dr. Usha Padmanabhan
4.	Ms. Tanvi Thakur	6	Dr. Usha Padmanabhan
5.	Mr. Debashish Mukharjee	4	Dr. Usha Padmanabhan
6.	Ms. Juveriya Nabilal Sayyed	4	Dr. Usha Padmanabhan
7.	Shreya Gore	4	Dr. Amruta Naik
8.	Mr. Gunjan Awari	6	Dr. Usha Padmanabhan

Details of S.T.R.I.P students

Sr. No	Student Name	Project Title	Mentor	Duration (Months)	Status
1.	Ms. Mukta Gulavane	Isolating Snake Venom Proteins Through Gel Filtration Chromatography and subsequent analysis.	Dr. Usha Padmanabhan	6	ongoing
2.	Ms. Vaidehee Pramod Diware	Analysis of Caspase-3 Mediated Apoptosis Induced by Cobra Venom.	Dr. Amruta Naik	6	ongoing
3.	Ms. Tanaya Vijay Acharya	Effects of Snake Venom on Neurotransmitter levels of Neuronal Cells.	Dr. Amruta Naik	6	ongoing
4.	Ms. Tanvi Thakur	Size Exclusion Chromatography of Snake venom proteins to understand antigenicity.	Dr. Usha Padmanabhan	6	ongoing
5.	Mr. Debashish Mukharjee	Sequence analysis of the 3FTx – Cardiotoxin 3 precursor gene from Indian Cobra (Naja naja).	Dr. Usha Padmanabhan	4	ongoing
6.	Ms. Juveriya Nabilal Sayyed	Molecular characterization of Indian red scorpion based on COI gene.	Dr. Usha Padmanabhan	4	ongoing
7.	Shreya Gore	Comparative analysis of the effect of serum free media on the neuronal cells.	Dr. Amruta Naik	4	Ongoing
8.	Mr. Gunjan Awari	Characterization of pathogens infecting lung of rabbit.	Dr. Usha Padmanabhan	6	Ongoing

Other Training Activities

Sr. No	Name of Training Program conducted by Department	Period over which conducted	No. of students	Min. Qualification of students eligible for the course
1	M.Sc.	2-4 years	-	B.Sc.
2	Ph.D.	4-6 years	2	M.Sc.
3	S.T.R.I.P.	4/6 months	12	M.Sc.

Details of I.B.T.P. students

Sr. No.	Name	Duration (Months)	Mentor
1	Ms. Pooja Chauhan	1	Dr. Usha Padmanabhan
2	Ms. Priyanka.R	1	Dr. Usha Padmanabhan
3	Ms. Rutisha Trivedi	1	Dr. Usha Padmanabhan
4	Ms. Pooja Gaikwad	1	Dr. Usha Padmanabhan
5	Mr. Rahul Sharma	1	Dr. Usha Padmanabhan

Details of B.I.T.P. students

Sr. No.	Name	Duration (Months)	Mentor
1	Shivam Kesarwani	6	Dr. Usha Padmanabhan
2	Karthik R Shrinivasan	6	Dr. Amruta Naik

Department of Cell Biology

Training Services

The department has 1 guides for MSc and PhD degree in subject of Applied Biology & Applied Medical Biology as below:

Courses / Degree	Guide / Mentor
Master of Science (M.Sc.)	• Dr. Usha Padmanabhan
Doctorate of philosophy (Ph.D.), MU and MUHS	• Dr. Usha Padmanabhan

Details of MSc / PhD students

Sr. No	Name	Project Title	Status
1	Mr. Pawan Kumar Todkar (Feb 2023 onwards)	Assessment of Tribal population in Maharashtra's Bhandara, Gondia & Gadchiroli districts: Awareness, Treatment Access and Seroprevalence survey for Rabies.	Ongoing

Other Training Activities

A new program called Advanced Research Techniques (ART) was initiated in the department in year 2022. The program got a lot of response from students desirous of hands on training.

Sr. No	Name of Training Program conducted by Department	Period over which conducted	No. of students	Min. Qualification of students eligible for the course
1	MSc PhD	2023 onwards	1	M.Sc.
2	S.T.R.I.P	2023 onwards	2	M.Tech B. Tech M.Sc, B.Sc,
3	A.R.T	2022 onwards	2	B.Sc, B.Tech
4	SIP	2023 onwards	1	MBBS from MUHS
5	BITP	2023 onwards	1	M.Tech from DBT
6	IBTP	2023 onwards	6	M.Tech, Gujrat Biotech

Details of BITP/ S.T.R.I.P students

Sr. No.	Name	Project Title	Status
1	Mr. Khalid Mohd Bhat	Plasmodium falciparum genomics: Standardization of Target based PCR and sequencing of genes involved in drug resistance	Completed
2	Mr. Shaurya Giri	Identification of genetic markers responsible for cardiac myocyte function during chick embryo (Gallus gallus domesticus) development	Ongoing
3	Ms. Afrah Nawab	Effect of hormones on the endocrinic axis during chick embryo (Gallus gallus domesticus) development	Ongoing

Details of A.R.T. students

Sr. No.	Name	Status
1	Mr. Sahil Chalke	Completed
2	Ms. Aishwarya Shetty	Completed

Department of Chemical Testing

Details of NATS students

Sr. No.	Name	Duration (Months)	Mentor
1	Miss. Amulya Ryakala	12 months	NA

Department of Clinical Pathology

Details of Ph.D. students

Sr. No	Student Name	Project Title	Guide/ Mentor	Duration	Status
1.	Ms. Durga Apparao Bethala	Identification of ligand receptor interactions across blood brain barrier inviral neuro-pathogenesis.(Extramural)	Dr. Shashikant Vaidya	March 2017 till date	Ongoing
2.	Ms. Pinky Ravindra Singh	Quantitative phosphoproteome profiling of circulating influenza virus strains in Mumbai region. (Intramural)	Dr. Shashikant Vaidya	Dec 2017 till date	Ongoing

Department of Chemotherapy

Sr. No.	Name of Training Program	Duration	No. of Students	Revenue Generated (Rs.)
1	Training for graduates & undergraduates	01 Months	07	35,000/-
2	Training for Biotechnology students	03 Months	10	1,50,000/-
3	Training on Analytical instrumentation	45 days	05	37,500/-
4	Short Term Research Internship Programme (STRIP)	06 months	02	50,000/-
			Total	2,72,500/-

Training Services

Courses / Degree	Guide / Mentor
Master of Science (M.Sc. by research), Mumbai University	Dr. Ashish L Asrondkar Dr. Vrushali N Patil
Doctorate of philosophy (Ph.D.) ,Mumbai University	Dr. Ashish L Asrondkar Dr. Vrushali N Patil

Details of Ph.D. students

Sr. No	Student Name	Project Title	Guide/ Mentor	Duration	Status
1.	Miss. Harshada Sawant	Design, development, and biological assessment of Rabies using heterocyclic derivatives.	Dr. Vrushali Patil	2021- 2026	In progress

Details of S.T.R.I.P students

Sr. No	Student Name	Project Title	Mentor	Duration (Months)	Status
1	Mr Rahul Patel	In-silico studies of heterocyclic compounds against Filariasis	Dr Ashish Asrondkar	6 months	In progress
2	Ms Sakshi Parmar	Synthesis of Peptide using solid phase peptide synthesis	Dr. Vrushali Patil	6 months	In progress

Other Training Activities

Sr. No	Name of Training Program conducted by Department	Period over which conducted	No. of students	Min. Qualification of students eligible for the course
1	M.Sc.	02 years		Graduate degree in Chemistry
2	Ph.D.	03 years		Master's degree in Chemistry
3	S.T.R.I.P	6 months	06	Graduate degree in Science

Details of NATS students

Sr. No.	Name	Duration (Months)	Mentor
1	Miss. Janvi Korgaonkar	12 months	NA
2	Saish Chavan	12 months	NA
3	Aakansha Yadav	12 Months	NA

Department of Toxicology

Courses / Degree	Guide / Mentor
Master of Science (M.Sc.)	Dr. Mrunal Ghag Sawant
Doctorate of philosophy (Ph.D.), MU and MUHS	---

Details of M.Sc. students

Sr. No	Student Name	Project Title	Guide/ Mentor	Duration	Status
1.	Ghatkar Madhura Pramod	Zebra Fish as An Alternative Model for Determining the Median Lethal Concentration of Cobra Venom	Dr. Mrunal Ghag Sawant	15th January 2023 to 14th January 2026	In process
2.	Ms. Shreya Thakur	Determining genotoxic potential of Cobra Venom using in vivo method.	Dr. Mrunal Ghag Sawant	15th January 2023 to 14th January 2026	In process

Sr. No.	Name of Training Program	Duration	No. of Students	Revenue Generated (Rs.)
1	Strip students	January 2023 to June 2023	01	25,000.00
		December 2023 to May 2024	01	25,000.00
		January 2024 to June 2024	01	25,000.00
2	Basic Training on Zebra fish as an evolving Model for Research	15th June 2023 and 16th June 2023	04	12000.00
	Basic Training on Small Laboratory Animal handling	1 month and 3 month	02	16000.00
3	Techniques in Applied and regulatory Toxicology (TART) 3 month	1 month 2 nd May 2023 and 1 st June 2023	01	5000.00
		1 month 20 th June 2023 to 19 th July 2023	01	5000.00
		1 month 5 th July 2023 to 4 th August 2023	01	5000.00
		1 month 24 th July 2023 to 23 rd August 2023	01	5000.00
		3 month 24 th July 2023 to 23 rd August 2023	01	5000.00
		3 month 7 th July 2023 to 6 th September 2023	01	15000.00
		8 th December 2023 to 7 th March 2024	01	15000.00
4	"Summer Internship Programme MUHS"	12 th June 2023 to 11 th July 2023	01	-----
5	Indian college of lab animal training	18 th October 2023 to 25 th October 2023	01	5000.00
Total				72,000.00

Details of S.T.R.I.P students

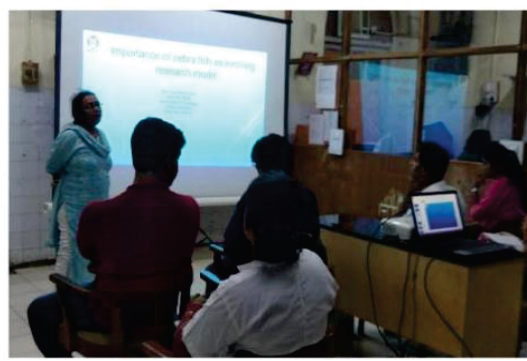
Training Services

Sr. No	Student Name	Project Title	Mentor	Duration (Months)	Status
1	Ms. Rutuja Shikhare	Quantitative estimation of nitric oxide and glutathione in cobra venom-induced oxidative stress in zebrafish embryos	Dr. Mrunal Ghag Sawant	6 months	Completed
2	Mr. Tanmay Shinde	"Design, synthesis and evaluation of substituted Indole and quinoline derivatives as a potent tyrosine kinase inhibitor" (N'-(3,5 dihydroxybenzylidene)-6-methoxy-2-(4-methoxyphenyl)quinoline-4-carbohydrazide: (4a) MW: 443.46 Molecular Formula: C ₂₅ H ₂₁ N ₃ O ₅)	Dr. Mrunal Ghag Sawant	6 months	In process
3	Miss Siddhi Nigade	"Design, synthesis and evaluation of substituted Indole and quinoline derivatives as a potent tyrosine kinase inhibitor" (N'-(4-chlorobenzylidene)-6-methoxy-2-(4-methoxyphenyl)quinoline-4-carbohydrazide: (4b) MW: 445.90 Molecular Formula: C ₂₅ H ₂₀ ClN ₃ O ₅)	Dr. Mrunal Ghag Sawant	6 months	In process

Other Training Activities

Sr. No	Name of Training Program conducted by Department	Period over which conducted	No. of students	Min. Qualification of students eligible for the course
1	Basic Training on Zebrafish as an evolving Model for Research	15th June 2023 and 16th June 2023	04	Students who are studying/ have passed their B.Sc. /B. Tech. /M.Sc. /M. Tech degrees in Microbiology/ Biochemistry/ Biotechnology/ Zoology/ Botany/ Life Sciences from any recognized University. People already in service, working in the above areas, can also apply
2	Basic Training on Small Laboratory Animal handling	1 month and 3 month	02	Minimum graduate and post graduate of any science faculty
3	Techniques in Applied and regulatory Toxicology (TART) 1 month and 3 month	1 month 2 nd May to 1 st March 2024	01	Students who are studying/ have passed their B.Sc /B.Tech/ M.Sc/ M.Tech. degree from appropriate universities of biological Sciences and Toxicology faculty. People already in service, working in the above areas, can also apply.
		20 th June to 19 th July 2023	01	
		5 th July to 4 th August 2023	01	
		24 th July to 23 rd August 2023	01	
		24 th July to 23 rd August 2023	01	
		3 month 7 th July to 6 th September 2023	01	
		8 th December to 7 th March 2024	01	
4	Summer Internship programme	23rd June 2023 to 22 July 2024	03	MBBS Students
5	Indian College of Lab animal training	18th October 2023 to 25th October 2023	01	Dr. Yogita Pawar Scientific officer D TATA Memorial Hospital

Basic Training on Zebra fish as an evolving Model for Research



Techniques in Applied and regulatory Toxicology (TART) 1 month and 3 month



Oral dosing In Mice



Mice Handling



Observation of Oral dosing

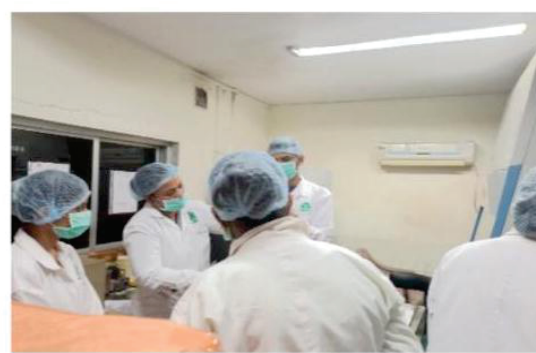


Artemia feeding of Zebra fish

Summer Internship programme



Toxicology Team members with SIP students



Observation of Intramuscular route of injection in Mice



NCDC Batch-I (30th October 2023)



NCDC Batch - II (31st October 2023)

Details of S.T.R.I.P students

Sr. No.	Name	Duration (Months)	Mentor
1	Mr. Tanmay Shinde	6 months	Dr. Mrunal Ghag Sawant
2	Miss Siddhi Nigade	6 months	Dr. Mrunal Ghag Sawant

Details of A.R.T. / NATS students

Sr. No.	Name	Duration (Months)	Mentor
1	Miss Divya Karepaka NATS Trainee	21 st February 2023 to 31 st March 2024	Dr. Mrunal Ghag Sawant

Department of Virology

Training Services

Sr. No.	Name of Training Program	Duration	Faculty	No. of Students	Revenue Generated (Rs.)
1	Hand-On-Training & Various Techniques in Virology	5 Days	Mr Pavankumar Todkar Mrs Manjula Jadhav Mr Chetan Zope	13	84500
2	Demonstration of IN-OVO methods using the Fertile Chick Embryo System	1 Day	Mrs Manjula Jadhav	61	9150
3	Orientation to Biosafety Levels, Cell Culture Briefing & Techniques in Virology	1 Day	Mr Pavankumar Todkar Mrs Manjula Jadhav	41	6150

Details of S.T.R.I.P students

Sr. No	Student Name	Project Title	Mentor	Duration (Months)	Status
1	Mr. Santosh Ghuge	Evaluation Of Synergistic Antiviral Activity of Oseltamivir and Amantadine Against Influenza H1N1 Virus.	Mrs Manjula Jadhav Mr.Pavankumar Todkar	6 Months	Completed
2	Mr Krushna Tambe	Quality Assurance in Molecular Testing: Evaluating Manual vs. Automated RNA Extraction Techniques using RT-PCR-Based Methods.	Mr. Chetan Zope Mr. Pavankumar Todkar	6 Months	On Going

Other Training Activities

Sr. No	Name of Training Program conducted by Department	Period over which conducted	No. of students	Min. Qualification of students eligible for the course
1	S.T.R.I.P	6 Month	2	UG/PG in Life Science

Details of A.R.T. / NATS students

Sr. No.	Name	Duration (Months)	Mentor
1	Mohammad Danish (BITP)	6	Dr Sandeepan Mukherjee & Mr. Pavankumar Todkar

Department of Zoonosis

Sr. No.	Name of Training Program	Duration	No. of Students	Revenue Generated (Rs.)
1	Mission to Control Mosquito Menace	1 day	22 (Summer Internship Programme students) +01	500/-
2	Introduction to Covert Existence of Snakes	1 day	22 (Summer Internship Programme students)	Free
3	Principle and Practices of Laboratory Animal Care	2 day	05	22,500/-
4	Techniques in Applied Zoology	1 Month	01	5000/-
		3 Month	04	60,000/-
5	Strip Students	6 Month	01	25,000/-
6	IBTP (Industrial Biotech Training Programme)	1 Month	04	---
Total				1,13,000/-

Training Services

Courses / Degree	Guide / Mentor
Master of Science (M.Sc.)	Dr. Mrunal Ghag Sawant

Details of M.Sc. students

Sr. No	Student Name	Project Title	Guide/ Mentor	Duration	Status
1.	Ms. Sheetal Shetty	<i>In vitro</i> and <i>In vivo</i> Activity of Phospholipase A ₂ enzyme against <i>Plasmodium</i> sp.	Dr. Mrunal Ghag Sawant	17/06/2022-17/06/2025	Ongoing
2.	Mr. Pradeep Jadhav	Mapping mosquito vectors and monitoring insecticide resistance in and around Mumbai Metropolitan Region.	Dr. Mrunal Ghag Sawant	14/10/2022-14/10/2025	Ongoing

Details of Ph.D. students

Sr. No	Student Name	Project Title	Guide/ Mentor	Duration	Status
1.	Dr. Mrunal Ghag Sawant	To Study the interplay of oxidative Stress, Tissue Damage and Immunological Effects of Viperidae Venom in Mice	Dr. Sandeepan Mukherjee	05/05/2022 - 05/05/2025	Ongoing

Details of S.T.R.I.P students

Sr. No	Student Name	Project Title	Mentor	Duration (Months)	Status
1	Ms. Shridevi Mankoji	Estimate lethal toxicity of saw-scaled viper venom through induced oxidative stress in mice.	Dr. Mrunal Ghag Sawant	6 Month	Ongoing
2	Ms. Sayali Salunke	Techniques in Applied Zoology (Department Training Course)	Dr. Mrunal Ghag Sawant	3 Month	Completed
3	Ms. Henna Mehaboo b	Techniques in Applied Zoology (Department Training Course)	Dr. Mrunal Ghag Sawant	3 Month	Completed
4	Mr. Shreyas Vishwarao	Techniques in Applied Zoology (Department Training Course)	Dr. Mrunal Ghag Sawant	3 Month	Completed
5	Ms. Tanvi Mhaske	Techniques in Applied Zoology (Department Training Course)	Dr. Mrunal Ghag Sawant	1 Month	Completed
6	Mr. Mohsin Sayyad	Techniques in Applied Zoology (Department Training Course)	Dr. Mrunal Ghag Sawant	3 Month (27/02/24 -27/05/24)	Ongoing

Other Training Activities

Sr. No	Name of Training Program conducted by Department	Period over which conducted	No. of students	Min. Qualification of students eligible for the course
1	M.Sc.	2022 to till date	02	B.Sc
2	Ph.D.	2022 to till date	01	Master degree
3	S.T.R.I.P	2023 to till date	06	B.Sc./M.Sc.

Details of S.T.R.I.P students

Sr. No.	Name	Duration (Months)	Mentor
1	Ms. Shridevi Mankoji	6 month	Dr. Mrunal Ghag Sawant
2	Ms. Sayali Salunke	3 month	Dr. Mrunal Ghag Sawant
3	Ms. Henna Mehaboob	3 month	Dr. Mrunal Ghag Sawant
4	Mr. Shreyas Vishwarao	3 month	Dr. Mrunal Ghag Sawant
5	Ms.Tanvi Mhaske	1 month	Dr. Mrunal Ghag Sawant
6	Mr.Mohsin Sayyad	3 month	Dr. Mrunal Ghag Sawant

Details of A.R.T. / NATS students

Sr. No.	Name	Duration (Months)	Mentor
1	Ms.Sanjana Rampurkar	1 year recruitment from NAT(Completed on 31/01/2024)	Dr. Mrunal Ghag Sawant
2	Ms.Anisha Mane	1 Sept.2023-16 Jan.2024 (4 month 15 days)	Dr. Mrunal Ghag Sawant
3	Ms. Sushma Ramchandra Yadav	1 year recruitment from NAT (Joining date 06/03/2024)	Dr. Mrunal Ghag Sawant
4	Ms.Namrata Sanjay Vichare	1 year recruitment from NAT (Joining date 12/03/2024)	Dr. Mrunal Ghag Sawant



Testing Services

Testing Services 2023-24

Department of Bacteriology

Testing

Total Revenue generated from Testing = Rs. 5,46,000/- (April 2023 to March 2024)

Department of Bacteriology		
Sr. No	Name of Testing Service (alphabetical)	No. of Samples
1	Animal Bedding Sample Testing (Free- Institutional- VAU Department)	1
2	Animal Feed Sample Testing (Free- Institutional- VAU Department)	2
3	Antimicrobial Coated Product Testing	1
4	Antimicrobial Susceptibility Testing (20 Free- Institutional- Chemotherapy Department)	22
5	Disinfectants	13
6	Swab sample Testing	6
7	Water Samples (Three Free- Institutional)	29
	Total No. of samples	74

Contact Email: bacteriology@haffkineinstitute.org

Department of Biochemistry

Testing

Total Revenue generated (Period From April 2023– February 2024 Till) = Rs. 600/-)

Serial No.	Name of Testing Services	No. of Samples Tested	Total Revenue Generated (Rs.)
1	Renal stone analysis	2	600/-
2	Rabbit blood testing	1	standardization
3	Human Blood samples (KEM)	10	standardization
Total (Rs)		2	600/-

Contact Email: biochemistry@haffkineinstitute.org

Staff Involved are:

Sr. No	Name of Staff/Student	Designation
1	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.
2	Dr. Amruta Naik	S.O.
3	Mr. Sameer Patil	S.T.A.
4	Mrs. Sanika Parkar	S.T.A.
5	Mr. Pravin Shirsat	Lab Assistant
6	Mr. Samrat More	Lab Attendant

The number of samples received as on date are:

Cannot be disclosed

Testing

The department wishes to go for NABL accreditation for its testing activities. With this in view, the Lab 3 and new BCR lab has been designated for the purpose.

Renal stone testing

The department used to conduct Renal stone testing on a routine basis which has been restarted now and planning to go for the NABL accreditation for the same.

Biochemical Testing

The department used to conduct Biochemical testing on a routine basis. The calibration of the instrument is under process in order to restart the Biochemical testing.

The department has sought permission to standardize Prostate serum antigen and BRCA genetic testing for prostate cancer and breast cancer diagnosis respectively. The department has already received Ethics permission for the same.

In vitro testing

The department has been performing the in vitro cell based assays i.e. MTT assay, wound healing assay and currently have received the samples for the same

Snake venom testing

The department has been performing the in vitro biochemical assays for the snake venom analysis and anti snake venom (ASV) analysis. The department has actively worked with the seized potentially poison samples from the Govt of West Bengal and Assam. Currently the department is standardizing ELISA and Comet Assays for the same.

Testing of RNA quantity and quality for nSARS Cov2 Genome sequencing

The department has been measuring OD 280 and 260 to estimate RNA quality and quantity to set QC conditions prior to sequencing. This is largely because the department has a nanodrop which can measure RNA concentration in volumes as low as 2 ul.

Department of Cell Biology

Testing

The department is a Indian Genome sequencing laboratory (IGSL) designated by INSACOG for nSARS-Cov2 sequencing

Staff involved are

Usha Padmanabhan, Shashank Sarang, & Bhagyawan Pawar

The hospitals and the number of samples from each received as on date are:

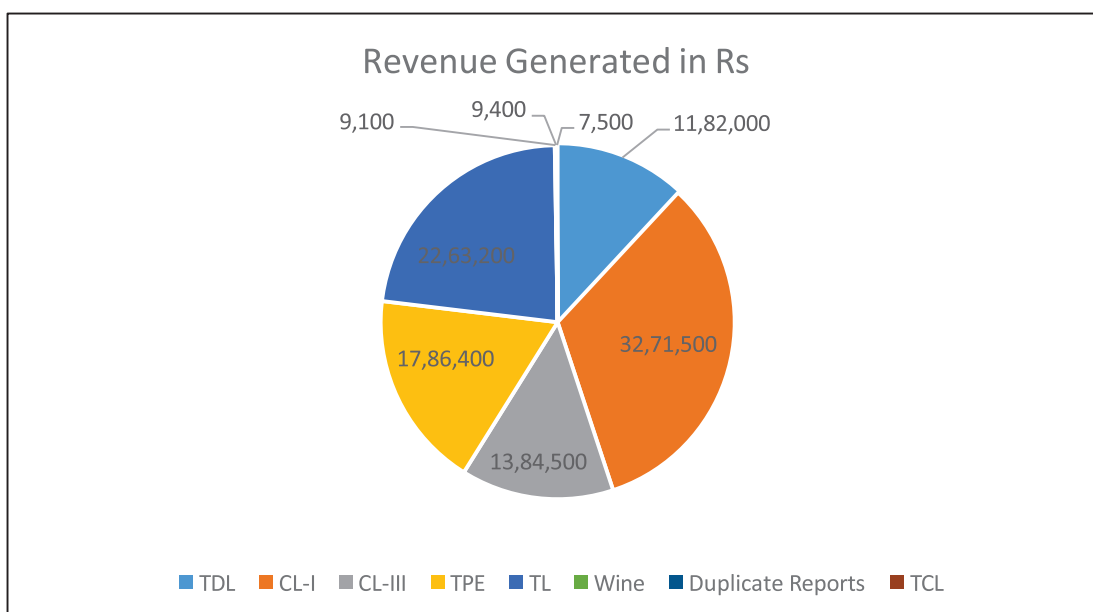
Sr. No.	Details of Hospital	No. of Samples Received
1	KEM	64
2	Kasturba	119
3	NIRRH	92
4	Dr. Lalpathlabs	1
5	MGM Kamothe	9
6	WMC	14
7	Metropolis (MET)	9
8	MBMC	12
9	KDMC	3
	Total	323

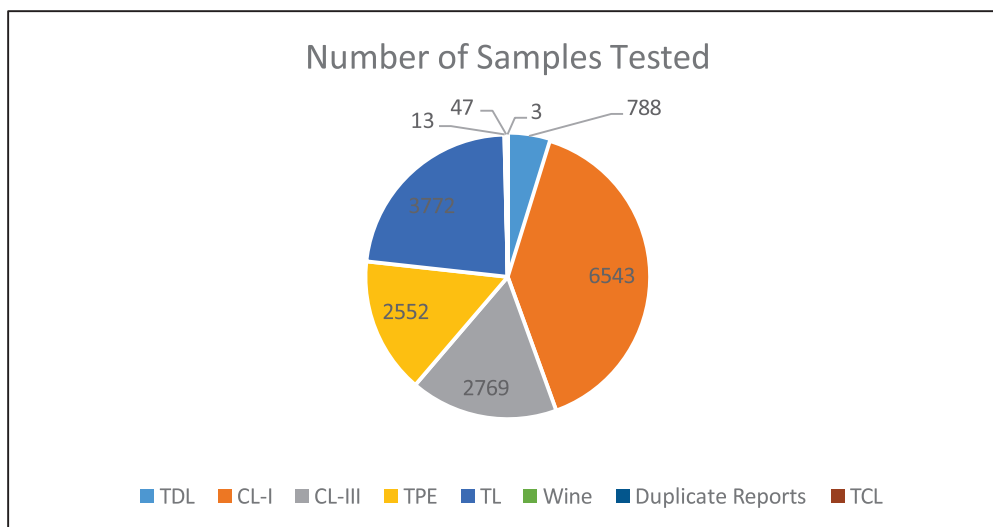
Department of Chemical Testing

Testing Services

Total Revenue generated (1st April 2023 to 31 March 2024.) = Rs 99,13,600/-

Serial No.	Name of Testing Services	No. of Samples tested 01 April 2023 to 31 March 2024	Total Revenue generated(Rs.)
1	TDL	788	9,15,000
2	CL-I	6,543	27,96,000
3	CL-III	2,769	12,43,500
4	Toddy	2,552	15,28,800
5	TL(Beer,IMFL)	3,772	15,07,800
6	Wine	13	5,600
7	TCL	03	7500
8	Duplicate Reports	47	9,400
Total(Rs)		16,487	99,13,600





Staff Involved in Testing Activities are:

Sr. No.	Name of Staff/ Student	Designation
1	Smt. Suvarna Pachpore	Senior Scientific Officer & Head
2	Shri. Manoj Patil	Scientific Officer
3	Shri. Santosh Bagal	Scientific Officer
4	Smt. Hemangee N. Khanolkar	Statistician
5	Smt. Shweta Dalvi	Senior Technical Assistant
6	Smt. Prachi Ghadage	Senior Technical Assistant
7	Smt. Deepali Kambli	Senior Technical Assistant
8	Shri. Subhash Kulal	Senior Technical Assistant
9	Shri. Praveen Thakur	Laboratory Assistant
10	Shri. Ravindra Katkar	Laboratory Assistant
11	Shri. Dilip S. Pawar	Laboratory Assistant
12	Smt. Bhargavi Sawant	Laboratory Assistant
13	Shri. Anil Rawale	Laboratory Attendant
14	Shri. Sandesh Kadam	Laboratory Attendant
15	Shri. Nikhil Bhendkar	Laboratory Attendant

Department of Clinical Pathology

Testing

O.T swab testing has been restarted at Clinical Pathology Department.

Department of Toxicology

Testing

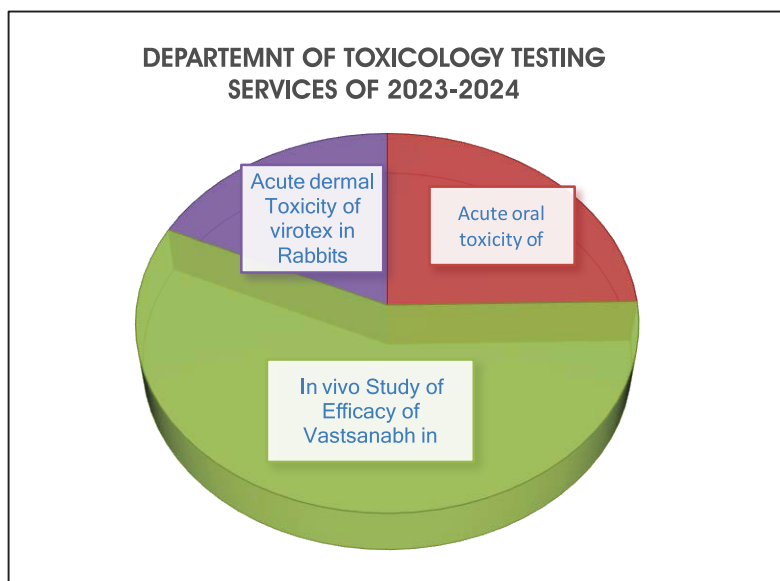
Services offered for pre-clinical in vivo toxicity testing include following tests.

- | | |
|--|---|
| <ul style="list-style-type: none"> i. Acute oral toxicity in rats/ mice ii. Acute Oral LD50 in rats/ mice iii. Sub-acute oral toxicity in rats/ mice iv. Repeated dose toxicity study in rats/ mice (90 day) v. Acute dermal irritation/ corrosion test in rabbits vi. Acute dermal LD50 in rabbits. | <ul style="list-style-type: none"> vii. Sub-acute dermal toxicity in rabbits /rats (28 day) viii. Mucus membrane irritation in rabbits ix. Skin sensitization test in guinea pigs. x. Fish acute toxicity test xi. Fish early life-stage toxicity test |
|--|---|

Total Revenue generated (Period from March 2023 – Till 2024) = Rs. 2.52 lac

Serial No.	Name of Testing Services	No. of Samples Tested	Total Revenue Generated (Rs.)
1	Acute oral toxicity of Micro-110-OD	01	62,260.00
2	In vivo Study of Efficacy of Vastanabh in Russell's Viper venome poisoning in Albino Mice	01	1,43,960.00
3	Acute dermal Toxicity of virotex in Rabbits	01	45,860.00
Total (Rs)			2,52,080.00

Pie Chart



Testing Staff Involved are

Sr. No.	Name of Staff/ Student	Designation
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department
2	Mrs. Swati Mumbarakar	Sc. Officer (CLII)
3	Mrs. Meenal Mulkutkar	Sr. Technical Assistant
4	Mr. Siddhesh Thorat	Jr. Research Fellow
5	Mr. Mahesh Gaonkar	Laboratory Attendant
6	Miss Divya Karepaka	NATS Trainee



Departmental Photograph



Oral Dosing in rat



Intratracheal dosing in rat



Intraperitoneal injection
in Mice



Dermal Toxicity study in rabbits



Retro orbital blood collection



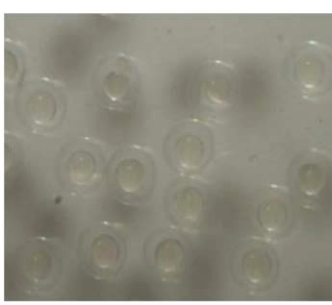
Intravenous injection in Mice



Microscopic observation
of zebra fish larvae



Artemia Hatchery



Microscopic observation
of Zebrafish Embryo

Department of Virology

Testing

Serial No.	Name of Testing Services	No. of Samples Tested	Total Revenue Generated (Rs.)
1	Detection of pH1N1 by qRT-PCR	00	Test Carried out free of cost Under NCDC – IDSP Project)
2	Detection of Rabies by qRT-PCR (Veterinary)	28	Carried out free of cost Under NCDC –Project)
	Detection of Rabies by qRT-PCR (Human)	05	
3	Detection of COVID-19 by qRT-PCR	00	Carried out free of cost Under ICMR & DMER funds
4	Evaluation of Virucidal Activity of Disinfectant/Products	00	00
Total (Rs)		NA	

Contact Email: virology@haffkineinstitute.org

Department of Zoonosis

Testing

Total Revenue generated (Period from March 2023 – Till March 2024) = Rs. 31,21,166/-

Serial No.	Name of Testing Services	No.of Samples Tested	Total Revenue Generated (Rs.)
1	Bioefficacy and Persistency study (syngenta)	04	688266/-
2	Bio-efficacy Study (Lifeline)	01	208800/-
3	Bio-efficacy Study (Indian oil)	01	56640/-
4	Bio-efficacy Study (Ross life)	03	254880/-
5	Anti-Rodent Testing (Delfingen)	02	43160/-
6	Anti-Rodent Testing (Delfingen)	14	265740/-
7	Bio-efficacy Study (Ross)	02	311040/-
8	Bio-efficacy testing (Bharat Petroleum)	01	56640/-
9	Bio-efficacy Study (Asian Paint)	02	362880/-
10	Bio-efficacy Study (National)	01	14160/-
11	Bio-efficacy Study (Shriram)	01	14160/-
12	Bio-efficacy Study (Dolphin)	01	14160/-
13	Bio-efficacy Study (Indigo)	24	816480/-
14	Bio-efficacy Study (Mangalam)	02	14160/-
	Total (Rs)	58	31,21,166/-

Contact Email:

Sr. No.	Company Name	Contact E-mail ID
1	Syngenta India Ltd	Preeti.Aggarwal@syngenta.com
2	Life line Technologies	technical1@lifelinetechnologies.in
3	Indian oil Pvt. Ltd.	ashishkmishra@bharatpetroleum.in
4	Ross Life Science	chinmay@rosslife.net
5	Parmacel Private Ltd	rahul.pednekar@prs-permacel.com
6	Delfingen India Pvt. Ltd	nthovaray@delfingen.com
7	Synectics Bioscience	info@synecticsbioscience.com
8	Asian Paint	chandrashekara.haramagatti@asianpaints.com
9	Bharat Petroleum Co.Ltd.	ashishkmishra@bharatpetroleum.in
10	Ross Life Science (Tenopa)	swapneel.k@rosslife.net
11	Ross Life Science (Paint)	yadav.dnyaneshwar@rosslife.net
12	Mangalam Brand Pvt.Ltd.	akshay@mangalamorganics.com

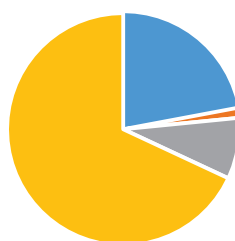
Testing Staff Involved are:

Department of Zoonosis		
1.	Dr. Mrunal Ghag Sawant	Head of Department
2.	Mrs. Trupti A. Satvekar	Scientific Officer- CL II
3.	Mr. Pradeep Jadhav	Sr. Lab Tech. Assistant
4.	Mr. Sanjay Mane	Sr. Lab Tech. Assistant
5.	Mrs. Joshna Naik	Lab. Assistant
6.	Mr. Kailas Agalawe	Insect Collector
7.	Mr. Ashirwad Raorane	Snake man
8.	Mr. Rohan Nimbalkar	Snake man
9.	Mr. Vagesh Walhekar	Assistant Snake man
10.	Mr. Vikrant Ghadi	Animal Attendant
11.	Mr. Siddhesh Thool	Lab. Attendant
12.	Mrs. Yugantika Mokashi	Lab. Attendant
13.	Mr. Pankaj Jhavar	Lab. Attendant
14.	Ms. Swapnali Kadam	Peon

The number of samples received as on date are:

Sr. No	Date of receipt	Details of Hospital/Company	No. of samples Received
1	273 / 25.5.23	Syngenta India Ltd	04
2	839 / 21.8.23	Life line Technologies	01
3	933 / 31.8.23	Indian oil Pvt.Ltd.	01
4	1320 / 28.11.23	Ross Life Science	03
6	713/31.07.23	Delfingen India Pvt.Ltd	16
	1064/30.09.23		
7	2187/19.03.24	Ross Life Science (Tenopa)	02
8	1963/16.02.23	Bharat Petroleum Co.op.Ltd.	01
9	2253/31.03.24	Asian Paint Ltd.	02
10	2091/12.03.24	National Pesticides and Chemicals	01
11	2000/28.02.24	Shreeram Agro Agencies	01
12	2001/28.02.24	Dolphine Sales Co.	01
13	2171/15.03.24	Indigo Paints Ltd.(Ross Life Science)	24
14	2252/31.03.24	Mangalam Brand Pvt.Ltd.	02
		Total	59

Revenue generated from Testing



■ Bioefficacy and Persistency study
 ■ Anti-Rodent Testing
■ Anti-Rodent Testing
 ■ Bio-efficacy Study

Total Revenue generated from Testing

Other Scientific Activities

Department of Bacteriology

Workshops/Conferences/Training/Seminar/Webinar

1. Dr. Anuya Rege, Senior Scientific Officer, Dept. of Bacteriology

Sr. No.	Name of Program	Organizer	Location	Date	Duration
1	Lecture series on "Human Rabies Management"	HITRT- NCDC- NOHPPCZ Program	Online	27-9-2023	1 Day
2	वाचन प्रेरणा दिवस २०२३ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	Bacteriology Department	16-10-2023	1 Day
3	मराठी भाषा संवर्धन पंधरवडा २०२४ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	HITRT Library	23-1-2024 to 25-1-2024	3 Days
4	मराठी भाषा गौरव दिवस २०२४ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	अणुजीवशास्त्र विभाग	27-2-2024	1 Day

Note :

- मराठी भाषा संवर्धन समिती अध्यक्ष म्हणून डॉ. अनुया रेगे यांनी “वाचन प्रेरणा दिवस २०२३” कार्यक्रमाचे आयोजन केले आणि कार्यक्रमात सहभाग घेतला.
- मराठी भाषा संवर्धन समिती अध्यक्ष म्हणून डॉ. अनुया रेगे यांनी मराठी भाषा संवर्धन पंधरवडा २०२४ निमित्त संस्थेच्या ग्रंथालय विभागात पुस्तक - प्रिधनाचे आयोजन केले. तसेच, सर्व कार्यक्रमा अंतर्गत आयोजित पुस्तक प्रिधना दरम्यान स्वतःकडील २० पुस्तके ठेऊन सहभाग घेतला.
- मराठी भाषा गौरव दिवस २०२४ अणुजीवशास्त्र विभागात साजरा करताना डॉ. अनुया रेगे यांनी स्वयं Talks मराठी डॉ. मेघा ताडपत्रीकर यांच्या टाकाऊ प्लास्टिक ते उपयुक्त इर्न या विषयावरील ऑनलाईन मराठी व्याख्यान बाबतची पार्श्वभूमी उपस्थितांना सांगितली व सर्वांनी व्याख्यानाचा आस्वाद घेतला.

Nominations

- 1) Dr. Anuya Rege is nominated as a Member of Research & Recognition Committee (RRC) for Board of Studies in Analytical Chemistry as an External Subject Expert by S.N.D.T. Women's University. (April 2023)
- 2) Dr. Anuya Rege was appointed as Practical Examiner for the course C107/Techniques in Animal Biotechnology of M. Sc. (Biotechnology), University exams of D Y Patil Deemed to be University, Mumbai. (November 2023)
- 3) Dr. Anuya Rege is nominated as a Chairperson of Institutional Animal Ethics Committee (IAEC) by Department of Animal Husbandry and Dairying, Committee for Control and Supervision of Experiments on Animals (CCSEA), Delhi. (January 2024)

2. Mrs. Jayashree More, Scientific Officer, Dept. of Bacteriology

No.	Name of Webinar/Seminar	Organizer	Location	Date	Duration
1	National Seminar for Soft Skill Development on "Goal Setting and Time Management"	CENTRE OF EXCELLENCE FOR ADVANCED RESEARCH ON ANIMAL FOOD SAFETY Mumbai Veterinary College, Parel, Mumbai	Online (Hybrid Mode)	26 th May 2023	1 Day
2	National Seminar for Soft Skill Development on "Critical Thinking and Problem Solving"	ICAR-NAHEP-CAAST- MAFSU	Mumbai Veterinary College (Hybrid Mode)	27 th May 2023	1 Day
3	National Seminar on "WORLD FOOD SAFETY DAY- 2023"	CENTRE OF EXCELLENCE FOR ADVANCED RESEARCH ON ANIMAL FOOD SAFETY Mumbai Veterinary College, Parel, Mumbai	Online	7 th June 2023	1 Day
4	National CME and Workshop on Surveillance of Health Care Associated Infection (HCAI)	Breach Candy Hospital Trust	BCHT	22 nd June 2023	1 Day
5	Surgical Site Infection Prevention	HIS-MF CME	Online	29 th July 2023	1 Day

No.	Name of Webinar/Seminar	Organizer	Location	Date	Duration
6	"ENHANCING LIVESTOCK PRODUCTION AND FOOD SAFETY THROUGH ONE HEALTH APPROACH"	CENTRE OF EXCELLENCE FOR ADVANCED RESEARCH ON ANIMAL FOOD SAFETY Mumbai Veterinary College, Parel, Mumbai	Online	20 th September, 2022 to 18 th October 2022	Four Week
7	Lecture Series on Human Rabies Management "World Rabies Day Celebration"	HITRT and NCDC	HITRT	27 th Sept 2023	1 Day
8	Alternatives to Antibiotics for Control of Bacterial Infections	College of Veterinary Science, Rampura Phul, Guru Angad Dev Veterinary and Animal Sciences University	Online	09 th – 11 th Oct 2023	3 Days
9	International Symposium on Antimicrobial Stewardship and One Health	HISCON2021	Online	21 st Oct 2023	1 Day
10	ICNs – PIVOTAL IN TRANSFORMING INFECTION PREVENTION AND CONTROL IN HOSPITAL	INFECTION PREVENTION AND CONTROL DEPARTMENT AND DEPARTMENT OF NURSING	TMH	26 th Oct 2023	1 Day
11	Antimicrobial Resistance: A One Health Perspective	Maharashtra Animal and Fishery Sciences University, Nagpur Nagpur Veterinary College, Nagpur	Online	23 rd Nov 2023	1 Day
12	The national One Health program for the Prevention & control of Zoonotic disease	HITRT- NCDC-NOHPPCZ Program	HITRT	24 th Nov 2023	1 Day
13	Webinar: WHONET and Multidrug Resistance	HIS-MF	Online	29 th Nov 2023	1 Day
14	वाचन प्रेरणा दिवस २०२३ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	Bacteriology Department	16-10-2023	1 Day
15	मराठी भाषा गौरव दिवस २०२४ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	अणुशास्त्र विभाग	27-02-2024	1 Day

Note:

1. Mrs. Jayashree More participated and scored 64% of marks in **National E-Quiz** conducted on the occasion of "World Rabies Day - 2022" On **28th September, 2022** organized under **ICAR-NAHEP-CAAST** Project entitled "Centre of Excellence for Advanced Research on Animal Food Safety".
2. Mrs. Jayashree More participated in "Meri Maati Mera Desha" Program organized by Central Government on 10th August 2023.
3. **Mrs. Amita Patil, Scientific Officer, Dept. of Bacteriology**

Sr. No.	Name of Training / Seminar/ Webinar	Organizer	Location	Date	Duration
1	Hands on Training on "Polymerase chain reaction & Agarose Gel Electrophoresis"	National facility for Biopharmaceuticals	Mumbai	11.08.2023 & 12.08.2023	2 Days
2	AMR Masterclass 4.0 –Session 3 " Best practices in urine culture for better patient Outcomes"	Becton Dickinson India PVT.LTD. in association of American Society of Microbiology	Online	28.04.2023	1 Day
3	Next generation molecular methods in Tuberculosis diagnostics	Becton Dickinson India PVT.LTD. in association of American Society of Microbiology	Online	08.05.2023	1 Day
4	Antimicrobial resistance and infection prevention & control society	World Health Organization	Online	11.05.2023	1 Day
5	AMR Masterclass 4.0 –Session 4: "Importance of follow up Blood Cultures"	Becton Dickinson India PVT.LTD. in association of American Society of Microbiology	Online	24.05.2023	1 Day
6	Getting the Most out of your AAS: "Best practices & Strategies"	Analytikjena	Online	25.05.2023	1 Day
7	Global challenges on Food safety	ICAR-NAHEP-CAST MAFSO Subproject center of Excellence for advances Research on Animal food safety	Online	07.06.2023	1 Day

Sr. No.	Name of Training / Seminar/ Webinar	Organizer	Location	Date	Duration
8	Sterilization & Disinfection in OT set-up	Department of Microbiology- Prakash Institute of Medical science & Research, Urun-Islampur & Maharashtra University of Health Science, Nashik	Online	28.07.2023	1 Day
9	Enrich & Enhance your Laboratory's Molecular testing potential	Becton Dickinson India PVT.LTD. in association of American Society of Microbiology	Online	27.08.2023	1 Day
10	Isolation & Importance of clinically Significant Anaerobes in clinical Microbiology Laboratory	Becton Dickinson India PVT.LTD. in association of American Society of Microbiology	Online	26.09.2023	1 Day
11	Surgical site Infection Prevention	Hospital Infection Society Mumbai forum	Online	29.07.2023	1 Day
12	Lecture series on "Human Rabies Management"	HITRT- NCDC- NOHPPCZ Program	Online	27.09.2023	1 Day
13	The national One Health program for the Prevention & control of Zoonotic disease	HITRT- NCDC- NOHPPCZ Program	Online	24.11.2023	1 Day
14	वाचन प्रेरणा दिवस २०२३ Celebration.	मराठी भाषा संवर्धन समिती, हाफकीन संस्था	Bacteriology Department HITRT	16-10-23	1 Day
15	मराठी भाषा गौरव दिवस २०२४ Celebration.	मराठी भाषा संवर्धन समिती, हाफकीन संस्था	अणुजीवशास्त्र विभाग	27-2-2024	1 Day

4. Mrs. Dipti Kolte, Senior Technical Assistant, Dept. of Bacteriology

Sr. No.	Name of Seminar/Webinar	Organizer	Location	Date	Duration
1	Lecture series on "Human Rabies Management"	HITRT- NCDC- NOHPPCZ Program	Online	27.09.2023	1 Day
2	The national One Health program for the Prevention & control of Zoonotic disease	HITRT- NCDC- NOHPPCZ Program	Online	24.11.2023	1 Day
3	वाचन प्रेरणा दिवस २०२३ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	Bacteriology Department HITRT	16-10-23	1 Day
4	मराठी भाषा गौरव दिवस २०२४ Celebration.	मराठी भाषा संवर्धन समिती हाफकीन संस्था	अणुजीवशास्त्र विभाग	27-2-2024	1 Day

Department of Biochemistry

1. Training Programs

Sr. No.	Name of the Staff	Designation Department	Name of Course Attended	Period
1	Mrs. Sanika Parkar	S.T.A.	Training in Biochemical techniques, Tata Hospital	15 to 16 December 2023
2	Mr. Sameer Patil	S.T.A.	Training in Biochemical techniques, Tata Hospital	15 to 16 December 2023

2. Conferences

Sr. No.	Name of Staff	Designation Department	Name of Conference Attended	Topic	Period	Type of presentation (oral / poster)
1	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.	MAHA-SAPCAR, Mumbai	Policy for anti microbial resistance	8-9 Jun 23	Invited delegate
2	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.	Biopharma Conclave , Mumbai	Cell & gene Therapy	11-12 Oct 23	Invited delegate
3	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.	National Conclave on NAP-SE, New Delhi	National Action Plan for prevention & Control Of Snakebite Envenoming by stakeholders	18-19 Oct 23	Invited delegate
4	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.	Iv International Conference, St. Petersburg, Russia	Combating New corona virus infection and other infectious diseases including joint scientific centers in Africa, Asia & South America	7-9 Jan 24	Invited oral presentation
5	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.	16 th Avishkar, GoM	Inter university research convention	12-15 Jun 23	Invited judge

3. Lectures Given

Sr. No.	Name of the Staff	Designation Department	Title of Lecture & Program	Date of Lecture
1	Dr. Usha Padmanabhan	Sr. Sci Officer & HOD.	NCDC rabies lecture series	31 st October 2023 1 st November 2023
2	Dr. Amruta Naik	S.O.		
3	Mrs. Sanika Parkar	S.T.A.		

4. Hands on Training Given

Sr. No.	Topic	Organizer	Date
1	Demonstrations of ATC for NCDC rabies workshop	Biochemistry Department	31 st October 2023 1 st November 2023

Department of Chemotherapy

Training Programs

Sr. No.	Name of the Staff	Designation Department	Name of Course Attended	Period
1	Miss Harshada Sawant	PhD Student	Basic Research Methodology Workshop	5 day
2	Miss Harshada Sawant	PhD Student	"Current Trends and Future Of '3Rs' In Laboratory Animal Experimentation"	1 day

Conferences

Sr. No.	Name of Staff	Designation Department	Name of Conference Attended	Topic	Period	Type of presentation (oral / poster)
1	Miss Harshada Sawant	PhD Student	DARWIN Symposium	Assessing Peptides With In- Silico Molecular Docking, Simulations & ADME/Pharmacokinetic Prediction As Anti-Rabies Agents"	3 days	Oral

Department of Toxicology

Training Programs

Sr. No.	Name of the Staff	Designation Department	Name of Course Attended	Period
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Lecture on 'Mission to Control Mosquito Menace (MCM)' organised by Haffkine Institute	6 th July 2023
2	Mrs. Swati Mumbarakar	Sc. Officer (CLII)		
3	Mrs. Meenal Mulkutkar	Sr. Technical Assistant		
4	Mr. Siddhesh Thorat	Jr. Research Fellow		
5	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
6	Ms. Shreya Vilas Thakur	M.Sc by Research Student		
7	Miss Divya Karepaka	NATS Trainee		
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Lecture on 'Organ Transplant- Social And Legal Aspects' organised by Haffkine Institute	10 th July 2023
2	Mrs. Swati Mumbarakar	Sc. Officer (CLII)		
3	Mrs. Meenal Mulkutkar	Sr. Technical Assistant		
4	Mr. Siddhesh Thorat	Jr. Research Fellow		
5	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
6	Ms. Shreya Vilas Thakur	M.Sc by Research Student		
7	Miss Divya Karepaka	NATS Trainee		
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Lecture on 'Human Rabies Management' organised by Haffkine Institute	27 th September 2023
2	Mrs. Swati Mumbarakar	Sc. Officer (CLII)		
3	Mrs. Meenal Mulkutkar	Sr. Technical Assistant		
4	Mr. Siddhesh Thorat	Jr. Research Fellow		
5	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
6	Ms. Shreya Vilas Thakur	M.Sc by Research Student		
7	Miss Divya Karepaka	NATS Trainee		

1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Webinar on 'Veterinarians and Zoonosis' under NCDC Programme organised by Haffkine Institute	24 th November 2023
2	Mrs. Swati Mumbarakar	Sc. Officer (CLII)		
3	Mrs. Meenal Mulkutkar	Sr. Technical Assistant		
4	Mr. Siddhesh Thorat	Jr. Research Fellow		
5	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
6	Ms. Shreya Vilas Thakur	M.Sc by Research Student		
7	Miss Divya Karepaka	NATS Trainee		
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Workshop on Ecotoxicology organised by Sophia College, Mumbai	3 rd and 4 th October 2023
2	Mrs. Swati Mumbarakar	Sc. Officer (CLII)		
3	Mrs. Meenal Mulkutkar	Sr. Technical Assistant		
4	Mr. Siddhesh Thorat	Jr. Research Fellow		
5	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
6	Ms. Shreya Vilas Thakur	M.Sc by Research Student		
7	Miss Divya Karepaka	NATS Trainee		
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Seminar on 'Orientation of Biosafety, Biosecurity and Biorisk Management' at Mumbai Veterinary College, Parel	30 th August 2023
2	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
3	Ms. Shreya Vilas Thakur	M.Sc by Research Student		
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	'Annual Conference on Toxicology Research and Development' organised by Department of Zoology and RUSA, Sophia College, Mumbai	7 th and 8 th December 2023
2	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		
3	Ms. Shreya Vilas Thakur	M.Sc by Research Student		

Conferences

Sr. No.	Name of Staff	Designation Department	Name of Conference Attended	Topic	Period	Type of presentation (oral / poster)
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	11th International Conference of Laboratory Animal Scientist's Association (LASA), India on Advancement of 3R's in Biomedical Research, Laboratory Animal Science and Welfare: International Perspectives at Indian Institute of Science, Bengaluru	Secession 1A Advancements of 3R's in animal welfare	6th, 7th and 8th Nov 2023	Poster presentation
2	Ms. Madhura Pramod Ghatkar	M.Sc by Research Student		Secession II A The 3 rs in pharmaceutical Biochemical, Contract Research and Digital Biomarkers.		
3	Ms. Shreya Vilas Thakur	M.Sc by Research Student		Secession II B Alternative to Animal Experimentation an overview		
				Secession III A Role of Nonclinical Studies and Process Involved in Biomedical Research		
				Secession III B Modern Husbandry Refinement methods, Enrichment programme and management.		
				Secession IV A Improving research Reporting on scientific communications and Animal Experimentations		
				Secession IV B Labouratory animal research and New Aoroch Methadologies (NAMs)		
				Secession V A Regulatory framework and Animal Experiments in Global Scenario		
				Secession V B Technical trade presentation on Animal Models and Technology platform		
			Secession VI A Laboratory animal health monitoring and Implementing the quality control Program	Secession VI B Presentation on Laboratory		

Lectures Given

Sr. No.	Name of the Staff	Designation Department	Title of Lecture & Program	Date of Lecture
1	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Lecture on 'Awareness about Snake and Snake Myths' organized by Haffkine Institute	7/07/23
2	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Lecture on 'Awareness about Snake "organized by Children's Academy, Malad.	21/08/2023
3	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Snake bite and first aid treatment ,R.A.Podtar Medical College,Worli	26/09/23
4	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Introduction to alternate animal models in ZMER workshop at Haffkine Institue, Parel.	15th June 2023
5	Mrs. Swati Mumbarakar	Sc. Officer (CLII)	Importance of zebra fish as evolving research model, in ZMER workshop at Haffkine Institutes, Parel.	16th June 2023
6	Mrs. Swati Mumbarakar	Sc. Officer (CLII)	1. Animals in bio Medical research. 2. CPCSEA 3R 3. Techniques of animal Handling 4. Importance of zebra fish as evolving research model 5. Details of Form A, Form B, Form C and Form D	8 th may to 12 th May 2023
7	Mrs. Swati Mumbarakar	Sc. Officer (CLII)	1. Animals in bio Medical research. 2. CPCSEA 3R 3. Techniques of animal Handling 4. Importance of zebra fish as evolving research model 5. Details of Form A, Form B, Form C and Form D	26 th June to 30 th June

8	Mrs. Swati Mumbarakar	Sc. Officer (CLII)	1. Animals in bio Medical research. 2. CPCSEA 3R 3. Techniques of animal Handling 4. Importance of zebra fish as evolving research model Details of Form A, Form B, Form C and Form D	24 th July to 28 th July
9	Dr. Mrunal Ghag Sawant	Head of Toxicology Department	Awareness training for the prison inmates in Mumbai and Thane District	26 th February 2024

Hands on Training Given

Sr. No.	Topic	Organizer	Date
1	ZMER workshop Microscopic identification of embryo	Dr Mrunal Ghag sawant Training given by All toxicology team Members (Zebra fish facility)	15 th and 16 th June
	Various handling techniques of embryo		
	Behavioral observation of Embryo		
	Staining observation of larvae		
	Histological observation of larvae		
2	Techniques in Applied and regulatory Toxicology (TART) 1. Animal Handling 2. Various Injectable routes 3. Blood collection. 4. Dissections and organ collection.	Dr Mrunal Ghag sawant Training given by All toxicology team Members (Animal house facility)	From 2 nd may to 6 th of September

Award

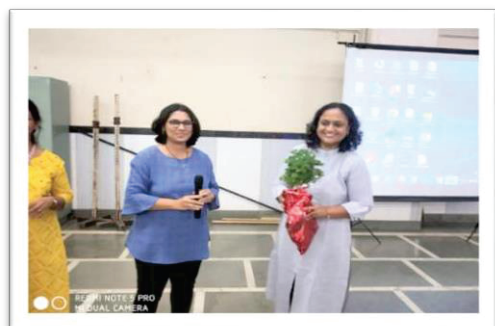
Dr. Mrunal Ghag Sawant awarded for Krantijyoti Savitribai Phule Women's Achievers Award 2024 for outstanding Individual Accomplishment &

Distinguished Veterinary Services to the Nation on the occasion of Republic Day of India, 26th Jan 2024.





Lecture on Type of snakes and awareness of Snake bites in potdar ayurvedic medical college at worali.



Lecture on Type of snakes and awareness of Snake bites in international school.

Ms. Madhura Pramod Ghatkar's poster won third prize in 11th International Conference of Laboratory Animal Scientist's Association (LASA),

India on Advancement of 3R's in Biomedical Research, Laboratory Animal Science and Welfare:

International Perspectives at Indian Institute of Science, Bengaluru





Department of Virology

Training Programs

Sr. No.	Name of the Staff	Designation Department	Name of Course Attended	Period
1	Mr. Pavankumar Todkar	Scientific Officer	Implementation of Effective Canine Rabies Control Strategies in Mumbai	11/12/2023

Lectures Given

Sr. No.	Name of the Staff	Designation Department	Title of Lecture & Program	Date of Lecture
1	Dr Sandeepan Mukherjee	Scientific Officer & Head	Rabies : The Virus & The Diseases	15/06/2023, AFMC Pune
2	Dr Sandeepan Mukherjee	Scientific Officer & Head	One Health & Laboratory Diagnosis of Rabies	01/09/2023, DHS, Pune
3	Dr Sandeepan Mukherjee	Scientific Officer	Rabies: Deciphering the Enigma	30/09/2023, SIES College , Mumbai
4	Mr. Pavankumar Todkar	Scientific Officer	National Action Plan for Dog Mediated Rabies Elimination (NAPRE) Guidelines	11/12/2023, BMC Veterinary Department, Mumbai, Deoner Abattoir
5	Mr. Pavankumar Todkar	Scientific Officer	Awareness Lecture on Rabies for Prison Inmates at Mumbai District Central Jail, Byculla Mumbai	26/02/2024, Mumbai District Central Jail, Byculla Mumbai



Hands on Training Given

Mr. Pavankumar Todkar

Sr. No.	Topic	Organizer	Date
1.	Hands on Training on Donning & Doffing of PPE	Under NOHPPCZ-NCDC-HITRT	30/10/2023-01/11/2023
2.	Hands on Training on RNA Extraction		
3.	Hands on Training on Diagnosis of Rabies Virus by RT PCR		

Mrs Manjula Jadhav

Sr. No.	Topic	Organizer	Date
1.	Hands on Training on Virus Culture	Under NOHPPCZ-NCDC-HITRT	30/10/2023-01/11/2023

Mr Chetan Zope

Sr. No.	Topic	Organizer	Date
1.	Hands on Training on Handling of Brain Samples	Under NOHPPCZ-NCDC-HITRT	30/10/2023-01/11/2023
2.	Hands on Training on RNA Extraction		

Department of Zoonosis/VAU Section/Experimental Animal Facility

Training Programs

Sr. No.	Name of the Staff	Designation Department	Name of Course Attended	Period
1	Dr. Mrunal Ghag Sawant	Head of Department	Advancement of 3R's in Biomedical research, lab. animal Science and welfare: International perspectives. (Preconference workshop-training LASACON 2023)	6 th Nov. 2023
2.	Ms. Sheetal Shetty	M.Sc. Student	Advancement of 3R's in Biomedical research, lab. animal Science and welfare: International perspectives. (Preconference workshop-training LASACON 2023)	6 th Nov. 2023
3.	Dr. Mrunal Ghag Sawant	Head of Department	Research Methodology, Terna Nursing College, Nerul, Navi Mumbai	18 th April - 20 th April 2023

Hands on Training Given

Sr. No.	Topic	Organizer	Date
1.	Principle and Practices of Laboratory Animal Care (PPLAC)	Experimental Animal House Facility. (Zoonosis Dept.)	02/05/23-03/05/23
2.	Techniques in Applied Zoology (Department Training Course)	Zoonosis Department (3 month)	23/10/2023 - 23/01/2024
3	Techniques in Applied Zoology (Department Training Course)	Zoonosis Department (1 month)	13/11/2023 - 22/12/2023
4.	Techniques in Applied Zoology (Department Training Course)	Zoonosis Department (3 month)	27/02/2024 - 27/05/2024

Conferences/Workshop/Seminar

Sr. No.	Name of Staff	Designation Department	Name of Conference Attended	Topic	Period	Type of presentation (oral / poster)
1	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	World Laboratory Animal Day at BARC	Current Trends and Future Of '3Rs' In Laboratory Animal Experimentation	24/04/2023	Seminar
2	Ms. Sheetal Shetty	M.Sc. Student				
3	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	SIP-2023	Induction Workshop as a part of Silver Jubilee Week	07/06/2023	Workshop
4	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Seminar at Mumbai Veterinary College	Orientation of Biosafety, Biosecurity and Biorisk Management	30 th August 2023	Seminar
5	Ms. Sheetal Shetty	M.Sc. Student				
6	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	LASACON 2023	Advancement of 3R's in Biomedical research ,lab.animal Science and welfare: International perspectives	6 th Nov.2023-8 th Nov.2023	Poster Presentation
7	Ms. Sheetal Shetty	M.Sc. Student				
8	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	National Conclave , NCDC, New Delhi	National Action plan for prevention and control of snakebite envenoming	18 th and 19 th Oct.2023	Conclave
9	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Workshop organized by Haffkine Institute	Human Rabies Management	27 th Sept 2023	Sponsored by NCDC Webinar
10	Mrs.Trupiti Satvekar	Scientific Officer II				
11	Mr.Pradeep Jadhav	Sr.Tech. Assist.				
12	Ms.Sheetal Shetty	M.Sc. Student				
13	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Online Webinar organized by Haffkine Institute	Veterinarian and Zoonosis	24 th Nov.2023	Sponsored by NCDC Webinar
14	Mrs.Trupiti Satvekar	Scientific Officer II				
15	Mr.Pradeep Jadhav	Sr.Tech. Assist.				
16	Ms.Sheetal Shetty	M.Sc. Student				

Sr. No.	Name of Staff	Designation Department	Name of Conference Attended	Topic	Period	Type of presentation (oral / poster)
17	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Aavishkar Research Convention	16 th Aavishkar: "Maharashtra state Inter-University Research Convention for Agriculture and Animal Husbandry" attended as a Judge.	12/01/2024-15/01/2024	MUHS, Nashik

Lectures Given

Sr. No.	Name of the Staff	Designation Department	Title of Lecture & Program	Date of Lecture
1.	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Lecture on 'Awareness about Snake and Snake Myths' organized by Haffkine Institute	7/07/23
3.	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Lecture on 'Awareness about Snake' organized by Children's Academy, Malad.	21/08/23
4.	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Snake bite and first aid treatment, R.A. Poddar Medical College, Worli	26/09/23
5.	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Introduction To Covert Existence Of Snakes"	07/07/23
6.	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Workshop On "Principle And Practices Of Laboratory Animal Care	02/05/23-03/05/23
7.	Mrs. Trupti Satvekar	Scientific Officer - II	Mission to Control Mosquito Menace	06/07/23
8.	Mr. Pradeep Jadhav	Sr.Tech.Assist.	Mission to Control Mosquito Menace	06/07/23
9.	Ms. Sheetal Shetty	M.Sc. Student.	Mission to Control Mosquito Menace	06/07/23
10	Dr. Mrunal Ghag Sawant	HOD of Zoonosis Dept.	Awareness Training for the prison inmates in Mumbai and Thane district	26/02/2024

Departmental Staff participated in different departmental activities



Snake bite and first aid treatment, R. A.Podtar Medical College Worli On 26th Sept.2023



Visit of Russian Scientist to Snakefarm – 26th Sep.2023



National Conclave on Endorsement of NAP-SE, Delhi (18th -19th Oct.2023)



NCDC Batch-I (30th October 2023)



NCDC Batch-II (31st October 2023)



LASACON (6th – 8th November 2023)

Departmental Staff participated in different departmental activities



LASACON (6th – 8th November 2023)



16th Aavishkar Research Convention
12th -15th Jan.2024



Women's Achiever's Award -2024



Awareness Training for the prison inmates in
Mumbai and Thane district – Feb.2024

Staff
and
Students

Director: Mrs. Seema Vyas, IAS
(Addl. Charge)
as on 31st March 2024

Director's Office

Sr. No.	Name of staff	Designation
1	Smt. Supriya P. Gulekar	Stenographer

Administration

Sr. No.	Name of staff	Designation
1	Shri Sharad Makane	Chief Administrative Officer, Addl. Charge (20.02.2023 to 30.06.2023)
	Shri. Dharendra Ramteke	Chief Administrative Officer, Addl. Charge (01.07.2023 to Till Date)
2	Shri. Mahendra S. Bhurkunde	Senior Clerk
3	Smt. Vaidehi P. Vanjare	Clerk
4	Smt. Sonali J. Kale	Clerk
5	Shri. Navnath M. Ghode	Driver
6	Shri. Mandar Y. Shinde	Driver
7	Shri. Shishupal G. Kamble	Laboratory Attendant
8	Smt. Seema B. Borate	Laboratory Attendant
9	Shri. Hemant S. Salvi	Peon
10	Shri. Madhukar S. Shengal	Laboratory Attendant
11	Shri. Suresh D. Madgude	Peon
12	Shri. Paresh S. Ghosalkar	Servant
13	Shri. Sanjay S. Surve	Mukadam
14	Shri. Nanjibhai M. Baria	Sweeper
15	Shri. Hemant Shinde	Sweeper
16	Shri. Santosh R. Gurav	Sweeper
17	Smt. Trupti R. Ghadi	Sweeper
18	Shri. Anil W. Bukane	Sweeper
19	Shri. Swapnil S. Kasale	Sweeper

Administration

Sr. No.	Name of staff	Designation
20	Shri. Amol Gaikwad	Sweeper
21	Shri. Akash S. Gorla	Sweeper
22	Miss. Vandana Mane	Mali
23	Shri. Prakash Kalsulkar	Mali
24	Shri. Baburao Khotare	Mali
25	Shri. Raju Gaikwad	Mali
26	Shri. Laxmikant Avale	Mali
27	Shri. Anil Somshetty	Mali cum watchman
28	Shri. Shrikant Mohite	Mali cum Shetrapal

Accounts

Sr. No.	Name of staff	Designation
1	Shri. Shantaram Barkade	Accounts Officer
2	Smt. Priyanka Ghag	Assistant Accounts Officer
3	Ms. Vaishali V. More	Assistant Superintendent
4	Smt. Pramila K. Tambe	Clerk
5	Shri. Sandeep I. Ingavale	Clerk
6	Shri. Mahmad Fakir Kasim	Laboratory Attendant
7	Shri. Rohan Mhatre	Laboratory Attendant
8	Shri. Sachin U. Somshetti	Peon
9	Shri. Hemant Salvi	Peon

Stores

Sr. No.	Name of staff	Designation
1	Shri. Nilesh Gaikwad	Medical Social Worker Store, Addl. Charge
2	Smt. Anita V. Raut	Clerk
3	Shri. Santosh M. Mungekar	Clerk
4	Shri. Raju A. Mavlankar	Laboratory Attendant (Till 23/02/ 2024)

Training

Sr.No.	Name of staff	Designation
1	Dr. Vrushali Patil	Scientific Officer, In-Charge of Training Department
2	Shri Anant M. Kandalgaonkar	Assistant Superintendent
3	Shri. Rohidas M. Kahandole	Servant

Department of Bacteriology

Sr.No.	Name of staff	Designation
1	Dr. Anuya A. Rege	Sr. Scientific Officer & Head
2	Smt. Jayashree A. More	Scientific Officer
3	Smt. Amita S. Patil	Scientific Officer
4	Smt. Dipti B. Kolte	Senior Technical Assistant
5	Shri. Ravindra T. Bire	Laboratory Assistant
6	Shri. Sandip V. Kegde	Laboratory Attendant

Department of Biochemistry

Sr.No.	Name of staff	Designation
1	Dr. Usha Padmanabhan	Senior Scientific Officer & Head
2	Dr. Amruta Naik	Scientific Officer
3	Smt. Sanika Parkar	Senior Technical Assistant
4	Shri. Sameer Patil	Senior Technical Assistant
5	Shri. Pravin Shirsat	Laboratory Assistant
6	Shri. Samrat More	Laboratory Attendant

Department of Cell Biology

Sr.No.	Name of staff	Designation
1	Dr. Usha Padmanabhan	Senior Scientific Officer & Head
2	Shri. Bhagyavan Pawar	Laboratory Assistant
3	Shri. Shashank Sarang	Laboratory Assistant

Chemical Testing Unit

Sr. No.	Name of staff	Designation
1	Smt. Suvarna Pachpore	Senior Scientific Officer & Head
2	Shri. Manoj Patil	Scientific Officer
3	Shri. Santosh Bagal	Scientific Officer
4	Smt. Hemangee N. Khanolkar	Statistician
5	Smt. Shweta Dalvi	Senior Technical Assistant
6	Smt. Prachi Ghadage	Senior Technical Assistant
7	Smt. Deepali Kambli	Senior Technical Assistant
8	Shri. Subhash Kulal	Senior Technical Assistant
9	Shri. Praveen Thakur	Laboratory Assistant
10	Shri. Ravindra Katkar	Laboratory Assistant
11	Shri. Dilip S. Pawar	Laboratory Assistant
12	Smt. Bhargavi Sawant	Laboratory Assistant
13	Shri. Anil Rawale	Laboratory Attendant
14	Shri. Sandesh Kadam	Laboratory Attendant
15	Shri. Nikhil Bhendkar	Laboratory Attendant

Department of Chemotherapy

Sr. No.	Name of staff	Designation
1	Dr. Ashish L Asrondkar	Scientific Officer & Head
2	Dr. Vrushali N Patil	Scientific Officer
3	Shri. Sushant R Kaple	Scientific Officer
4	Smt. Swati Sanap	Senior Technical Assistant
5	Shri. Jitendra S. Dalvi	Laboratory Assistant
6	Shri. Rohan A Patil	Laboratory Attendant
7	Shri. Maruti V Chile	Laboratory Attendant

Department of Clinical Pathology

Sr. No.	Name of staff	Designation
1	Dr. Sandesha N. Pashte	Medical Officer, Addl. Charge of HOD
2	Smt. Vibhuti A. Thakur	Scientific Officer
3	Shri. Ravikant Khochare	Laboratory Assistant
4	Shri. Avinash More	Laboratory Attendant

Department of Toxicology

Sr.No.	Name of staff	Designation
1	Dr. Mrunal Ghag Sawant	Scientific Officer and Head
2	Smt. Swati Mumbarakar	Scientific Officer
3	Smt. Meenal Mulkutkar	Senior Technical Assistant
4	Shri. Mahesh Gaonkar	Laboratory Attendant

Department of Virology

Sr.No.	Name of staff	Designation
1	Dr. Sandeepan Mukherjee	Scientific Officer and Head (20/12/2020 -30/11/2023)
2	Shri. Pavankumar Todkar	Scientific Officer and Head (01/12/2023 -31/03/2024)
3	Smt. Manjula Jadhav	Senior Technical Assistant
4	Shri. Chetan Zope	Senior Technical Assistant
5	Smt. Monica Bhurkunde	Laboratory Assistant
6	Smt. Rajashree Patil	Laboratory Attendant (Till 22/02/ 2024)
7	Shri. Amol Rane	Laboratory Attendant
8	Shri. Santosh Gujar	Laboratory Attendant

Department of Zoonosis and Venomous Animal Unit and Experimental Animal Facility

Sr.No.	Name of staff	Designation
1	Dr. Mrunal Ghag Sawant	Scientific Officer and Head
2	Shri. Trupti Satvekar	Scientific Officer
3	Shri. Pradeep Jadhav	Senior Technical Assistant
4	Shri. Sanjay Mane	Senior Technical Assistant
5	Smt. Jyostna Naik	Laboratory Assistant
6	Shri. Aashirwad Raorane	Snake Man
7	Shri. Rohan Nimbalkar	Snake Man
8	Shri. Vagesh Walhekar	Assistant Snake man
9	Shri. Kailas Aaglave	Insect Collector
10	Shri. Siddhesh Thool	Laboratory Attendant
11	Smt. Yugantika Mokashi	Laboratory Attendant
12	Shri. Pankaj Javir	Laboratory Attendant
13	Shri. Vikrant Ghadi	Animal Attendant
14	Ku. Swapnali S. Kadam	Peon

Dispensary

Sr. No.	Name of staff	Designation
1	Dr. Sandesha N. Pashte	Medical Officer, Addl. Charge of HOD
2	Dr. Shital U. Mane	Medical Officer
3	Smt. Rupali K. Ghugare	Nurse
4	Shri. Sunil B. Khair	Laboratory Attendant

Library

Sr. No.	Name of staff	Designation
1	Smt. Sarita Wadekar	Librarian
2	Shri. Tushar Borse	Assistant Librarian
3	Shri. Pramod Andhere	Laboratory Assistant
4	Shri. Abhishekh Manjarekar	Laboratory Attendant

Radiation Biology Unit (RBU)

Sr. No.	Name of staff	Designation
1	Dr. Anuya Rege	Senior Scientific Officer
2	Shri. Manoj Patil	Scientific Officer and Radiological Safety Officer
3	Shri. Anil Rawale	Laboratory Attendant

Ph.D. Students

Sr. No.	Name of Student	Designation (M.Sc. / Ph.D.)
1	Harshada Sawant	Ph.D
2	Dr. Mrunal Ghag -Sawant	Ph.D
3	Pawankumar Todkar	Ph.D
4	Priyanka Mishra	Ph.D
5	Amalamerin George	Ph.D
6	Bhupali Kore	Ph.D

M.Sc. Students

Sr. No.	Name of Student	Designation (M.Sc. / Ph.D.)
1	Sheetal Shetty	M.Sc.
2	Madhura Ghatkar	M.Sc.
3	Shreya Thakur	M.Sc.
4	Pradeep Jadhav	M.Sc.

BITP Trainee

Sr. No.	Name of Trainee	Designation
1	Karthik Shrinivasan	BITP -Trainee
2	MD Danish	BITP -Trainee
3	Mohammad Khalid Bhat	BITP -Trainee
4	Shivam Kesarwani	BITP -Trainee

NATS Trainee

Sr. No.	Name of Trainee	Designation
1	Janhavi Koregaonkar	NATS -Trainee
2	Sanjana Rampurkar	NATS -Trainee
3	Saish Chavan	NATS -Trainee
4	Divya Karepaka	NATS -Trainee
5	Akansha Yadav	NATS -Trainee
6	Amulya Ryakala	NATS -Trainee
7	Karina Pawaskar	NATS -Trainee
8	Samruddhi Jadhav	NATS -Trainee
9	Anisha Mane	NATS -Trainee
10	Gayatri More	NATS -Trainee

IBTP Trainee (GSBTM) Gujarat State Biotechnology Mission

Sr.No.	Name of Trainee	Designation
1	Rutisha Trivedi	IBTP -Trainee
2	R. Priyanka	IBTP -Trainee
3	Pooja Chavan	IBTP -Trainee
4	Pooja Gaikwad	IBTP -Trainee
5	Rahul Sharma	IBTP -Trainee

STRIP Students (Oct 2023 to March 2024) Batch

Sr.No.	Name of Students	Designation
1	Afrah Nawab	STRIP Student
2	Santosh Ghuge	STRIP Student
3	Debashish Mukherjee	STRIP Student
4	Juveria Sayyad	STRIP Student
5	Sakshi Parmar	STRIP Student
6	Shreya Gore	STRIP Student
7	Rahul Patel	STRIP Student
8	Shridevi Mankoji	STRIP Student
9	Saloni Akhadkar	STRIP Student
10	Disha Thakur	STRIP Student

STRIP Students (Dec 2023 to May 2024) D.Y.PATIL Batch

Sr.No.	Name of Students	Designation
1	Tanvi Thakur	STRIP Student
2	Mukta Gulavane	STRIP Student
3	Vaidehi Diware	STRIP Student
4	Nishitta Nayak	STRIP Student
5	Tanaya Acharya	STRIP Student
6	Shourya Giri	STRIP Student
7	Gunjan Awari	STRIP Student
8	Tanmay Shinde	STRIP Student

STRIP Students (Jan 2024 to June 2024)

Sr.No.	Name of Students	Designation
1	Siddhi Nigade	STRIP Student
2	Krushna Tambe	STRIP Student

SIP Students 2023 (Summer Internship Programme)

Sr.No.	Name of Students	Designation
1	Gargi Patil	SIP Student
2	Utkarsha Ichake	SIP Student
3	Keyur Sabnis	SIP Student
4	Faraj Yusuf Shaikh	SIP Student
5	Sonal Sinha	SIP Student
6	Sanjyot Annadate	SIP Student
7	Dhirti Sukheja	SIP Student
8	Nahid Fatema Sayyad	SIP Student
9	Nandani Goswami	SIP Student
10	Prathamesh Sakhore	SIP Student
11	Riya Arvind Pandey	SIP Student
12	Vedant Bahiwal	SIP Student
13	Sailee Nawathe	SIP Student
14	Antara Agarwal	SIP Student
15	Aarya Chati	SIP Student
16	Siddhi Bhogaonkar	SIP Student

