

RESEARCH FACILITY AND CENTRAL INSTRUMENT LABORATORY

Information Brochure



Shri Vile Parle Kelavani Mandal's



Dr. Bhanubhen Nanavati College of Pharmacy



NBA Accreditation for 5 Years
(AY 2017- 2022)



All India Ranking 30
(Pharmacy Category 2020)



Best Industry-Linked Pharmacy
College Award (2015 & 2017)



To be recognised as a top most institute of Pharmaceutical Science in the country which develops professionally competent and socially sensitive individuals who cater to the needs of higher pharmacy education, research and industry.



To create and provide congenial environment for higher education and research through well qualified motivated faculty and the state of the art infrastructure.
To strengthen the learning process through innovative teaching methodology and stimulate professional competency that meet the dynamic needs of the pharmaceutical and healthcare industry.
To imbibe the graduates, attributes of inquisitiveness, leadership, sensitivity and responsiveness towards the social healthcare needs.



ABOUT SVKM's BNCP

SVKM's Dr. Bhanuben Nanavati College of Pharmacy is one of the top most Pharmacy institute in the state of Maharashtra situated in Mumbai, Vile Parle, West. Since 2004 it has achieved brilliance of pharmaceutical culture and research and has become a center of excellence in the field of pharmaceutical science.

The college is affiliated to University of Mumbai and approved by All India Council for Technical Education (AICTE), Pharmacy Council of India (PCI). At present the college conducts four year B. Pharm degree program which is accredited by National board of Accreditation (NBA) for full term of five years till 2022. In 2012, the college introduced two year course of M. Pharm with specialization in two streams Pharmaceutics and Quality Assurance to support higher education and research. In 2013, another M. pharm course was introduced with specialization in Pharmacology. The college is an approved center of Ph.D. program in Pharmaceutical chemistry and Pharmaceutics. The faculty is actively involved in research activities including consultancy of national and international industries. They have strong industry connect because of which the college was selected for the AICTE-CII award. The college received prestigious AICTE-CII best industry-linked pharmacy institute degree survey award 2015 and 2017. It was conferred the platinum category in Pharmacy degree (standard) category for 2016. The college is ranked All India NIRF ranking at 30th rank in Pharmacy college category for the year 2020.

Consistent and unstinting efforts in this direction are borne out by the fact that student enter the college young, immature, uncertain, bewildered, but leave its portal still young, but much more mature, self-confident professionals ready to lead rich lives by their own while enriching part of society.



AREAS OF EXPERTISE

Pharmaceutical Chemistry

- Computer aided drug design and synthesis of anti-tubercular agents, anti-cancer agents and antimicrobial agents
- Impurity synthesis

Pharmaceutics

- Design and development of targeted and Nano drug delivery
- Optimization of pharmaceutical formulations using design of experiments (DoE)
- Bioavailability and dissolution enhancement studies
- Solubility enhancement of poorly water soluble drug

Pharmaceutical analysis

- Analytical method development for estimation of API in dosage form
- Development and validation of UV, HPLC, and stability-indicating assay method
- Bio-analytical method development

Pharmacology

- Neurobiology and behavioural pharmacology
- Metabolic disorders such as diabetes, obesity etc.

Pharmacognosy

- Studies on Phytochemicals and biological profiling of herbal extracts
- Bioactivity-directed fractionation of medicinal plant extracts for isolation of phytoactives.
- Phytochemical Standardization of herbal products by development of analytical techniques



Core Research Facilities

- **Central Instrument Laboratory**
 - **Cell Line Study Center**
- **Small Animal Facility (CPCSEA approved lab)**
 - **Drug Development Facility**



I. CENTRAL INSTRUMENT LABORATORY (CIL)

This sophisticated instrumentation facility has high-end instruments which provides a platform to graduating students to develop their skills in handling latest instruments and is also helpful to masters' students, doctoral research scholars and faculty members who are involved in pursuing research activities. The facility will help them to carry out cutting edge interdisciplinary research of national and international importance. Centre facilitates procurement of high-end instruments as it requires huge investment, maintenance as well as expertise, which is otherwise difficult for individual researchers. This Central Instrument Lab facility will enhance the research activities.

The main objectives of CIL are as follows:

- To provide and maintain innovativeness, impact of research within a framework of infrastructure, training and integrity.
- To facilitate the creative autonomy of students to emerge as a better professional.
- To work in collaboration with industrial interface to cater the solution of their real problems. It also escalates the exposure of students to industrial environment.
- To maintain and develop resources for the upcoming research areas of long-term worth.
- To provide support to R&D centers and industries to design and develop their products also provide support to students to complete their research work.



List of Instruments

1. High pressure liquid chromatography
2. High pressure homogenizer
3. UV-Visible spectrophotometer
4. Zetasizer and zeta potential
5. Microplate reader
6. FTIR- ATR
7. Lyophiliser
8. Semi-auto biochemical analyser
9. Particle size analyser (Zetasizer)
10. Data acquisition system
11. Brookfield viscometer
12. Electronic spinning machine
13. Orbital shaker
14. Probe sonicator
15. Photographic microscope
16. Rotary vacuum evaporator



1. High Pressure Liquid Chromatography

Principle: The separation principle of HPLC is based on the distribution of the analyte (sample) between a mobile phase (eluent) and a stationary phase (packing material of the column). Depending on the chemical structure of the analyte, the molecules are retarded while passing the stationary phase.

Applications: High-performance liquid chromatography (HPLC) is a chromatographic technique used to split a mixture of compounds in the fields of analytical chemistry, biochemistry and industrial. The main purposes for using HPLC are for identifying, quantifying and purifying the individual components of the mixture.





2. High Pressure Homogenizer

Principle: It is based on the principle that when large globules in coarse emulsion are passed under high pressure through a narrow orifice are broken into smaller globules having a greater degree of uniformity.

Applications: A homogenizer is a piece of laboratory or industrial equipment used for the homogenization of various types of material, such as tissue, plant, food, soil, and many others. Many different models have been developed using various physical technologies for disruption.





3. UV Vis Spectrophotometer

Principle: The Principle of UV-Visible Spectroscopy is based on the absorption of ultraviolet light or visible light by chemical compounds, which results in the production of distinct spectra. Spectroscopy is based on the interaction between light and matter. When the matter absorbs the light, it undergoes excitation and de-excitation, resulting in the production of a spectrum.

Applications: UV-Visible spectroscopy is widely used in the field of analytical chemistry, especially during the quantitative analysis of a specific analyte. For example, the quantitative analysis of transition metal ions can be achieved with the help of UV-Visible spectroscopy. Furthermore, the quantitative analysis of conjugated organic compounds can also be done with the help of UV-Visible spectroscopy. It can also be noted that this type of spectroscopy can also be carried out on solid and gaseous analytes in some conditions.





4. Zetasizer and Zeta Potential

Principle: The principle of dynamic light scattering is that fine particles and molecules that are in constant random thermal motion, called Brownian motion, diffuse at a speed related to their size, smaller particles diffusing faster than larger particles

Zeta potential measurement principle (Laser Doppler Electrophoresis) Many nanoparticles or colloidal particles have a surface charge when they are suspension. When an electric field is applied, the particles move due to the interaction between the charged particle and applied field.

Application: Zeta sizer is used for the measurement of protein size, electrophoretic mobility of proteins, zeta potential of colloids and nanoparticles, and optionally the measurement of protein mobility and microrheology of protein and polymer solutions.

Zeta potential measurements to improve formulation stability and shelf life and reduce formulation time and cost. Zeta potential is a measure of the magnitude of the electrostatic or charge repulsion/attraction between particles and is one of the fundamental parameters known to affect stability.





5. Microplate Reader

Principle: Microplate reader detects light signals produced by samples which have been pipetted into a microplate. Microplate-based measurements detect light signals produced by a sample, converted by a sample or transmitted through a sample. The signal is measured by a detector, usually a photomultiplier tube.

Applications: The microplate reader is a widely-used instrument that allows for many samples to be simultaneously measured, as if many miniscule experiments were being performed at the same time. This apparatus is used in conjunction with multiwell plates, like the 96 well plate.





FTIR-ATR

Principle: Fourier-transform infrared spectroscopy (FTIR) is a technique used to obtain an infrared spectrum of absorption or emission of a solid, liquid or gas. An FTIR spectrometer simultaneously collects high-spectral-resolution data over a wide spectral range.

Applications: FTIR spectroscopy is used to quickly and definitively identify compounds such as compounded plastics, blends, fillers, paints, rubbers, coatings, resins, and adhesives. It can be applied across all phases of the product lifecycle including design, manufacture, and failure analysis.





6. Lyophiliser

Principle: Lyophilization is based on a simple principle of physics called “SUBLIMATION”. Sublimation is the process of transition of a substance from solid to the vapor state without passing through an intermediate liquid phase. Once the ice has been sublimated, the products are freeze-dried and can be removed from machine.

Application: A lyophilizer executes a water removal process typically used to preserve perishable materials, to extend shelf life or make the material more convenient for transport. Lyophilizers work by freezing the material, then reducing the pressure and adding heat to allow the frozen water in the material to sublimate.

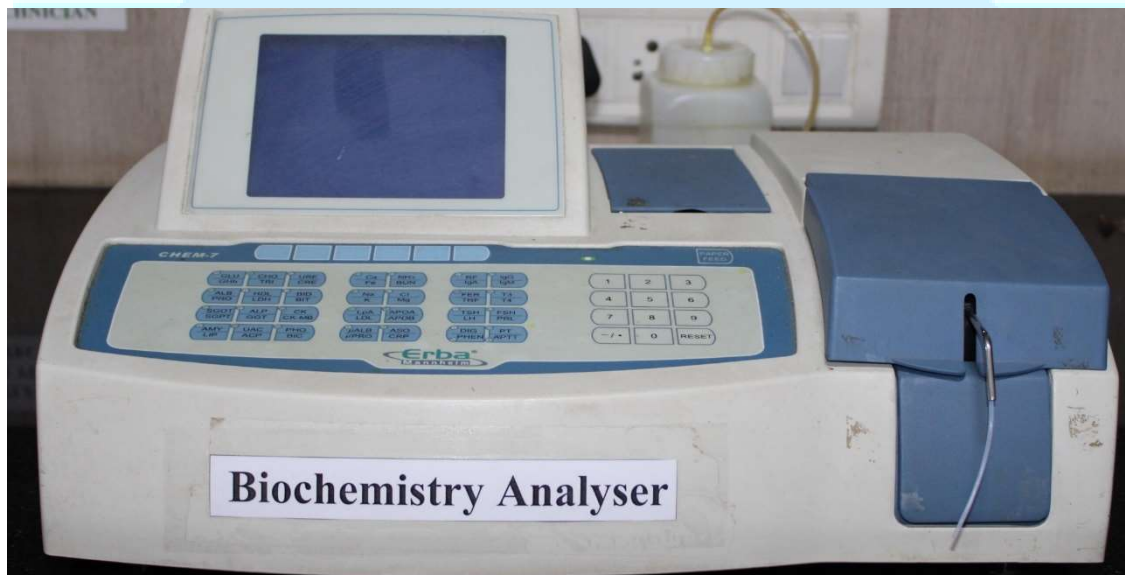




7. Semi-Auto Biochemical Analyzer

Principle: An automatic biochemistry analyzer utilizes this kind of reaction, and converts the quantity of a specific substance in blood into an amount of colour change for measurement. The analysis method of measuring the amount of colour change is called the colorimetric analysis method.

Applications: Biochemistry Analyzer is an instrument that uses the pale yellow supernatant portion (serum) of centrifuged blood sample or a urine sample, and induces reactions using reagents to measure various components, such as sugar, cholesterol, protein, enzyme, etc.





Data acquisition system

Principle- Data acquisition is the process of sampling signals that measure real world physical conditions and converting the resulting samples into digital numeric values that can be manipulated by a computer. Signal conditioning circuitry, to convert sensor signals into a form that can be converted to digital values.

Application- Data acquisition systems (DAS) are used widely in the industry. They are applied in research, development, production, process control, quality control, testing, management, etc.





8. Brookfield Viscometer

Principle: Rotational viscometers use the idea that the torque required to turn an object in a fluid is a function of the viscosity of that fluid. They measure the torque required to rotate a disk or bob in a fluid at a known speed.

Applications: Viscometer measures fluid viscosity at given shear rates. Viscosity is a measure of a fluid's resistance to flow.





11. Electronic Spinning Machine

Principle: The main principle of the electrospinning process is the effect that high voltage has on a polymer solution. High voltage (tens of kV) is connected to the end of a capillary containing liquid solution. ... The strand of polymer solution undergoes a process of instability and lengthening, during which solvent evaporates.

Applications: The continuous manner and the effective drying effect enable the integration of electrospinning into continuous pharmaceutical manufacturing systems. The synthesized liquid drug can be quickly turned into an electrospun solid product processable for tableting and other dosage forms.





12. Orbital Shaker

Principle: Orbital shaker is a piece of laboratory equipment used to mix, blend, or to agitate substances in tubes or flasks by shaking them, which is mainly used in the fields of chemistry and biology. An orbital shaker has a circular shaking motion and it is suitable for culturing microbes, washing blots, and general mixing.

Applications: Orbital Shaker is used in many applications including chemistry, biochemistry, molecular biology, microbiology, environmental and food sciences, clinical diagnostics, and eukaryotic cell culture.





13. Probe Sonicator

Principle: Principle of Ultra- Sonication During the low-pressure cycle, high-intensity ultrasonic waves create small vacuum bubbles or voids in the liquid. When the bubbles attain a volume at which they can no longer absorb energy, they collapse violently during a high-pressure cycle.

Application: Sonication is a process in which sound waves are used to agitate particles in solution. Such disruptions can be used to mix solutions, speed the dissolution of a solid into a liquid (like sugar into water), and remove dissolved gas from liquids.

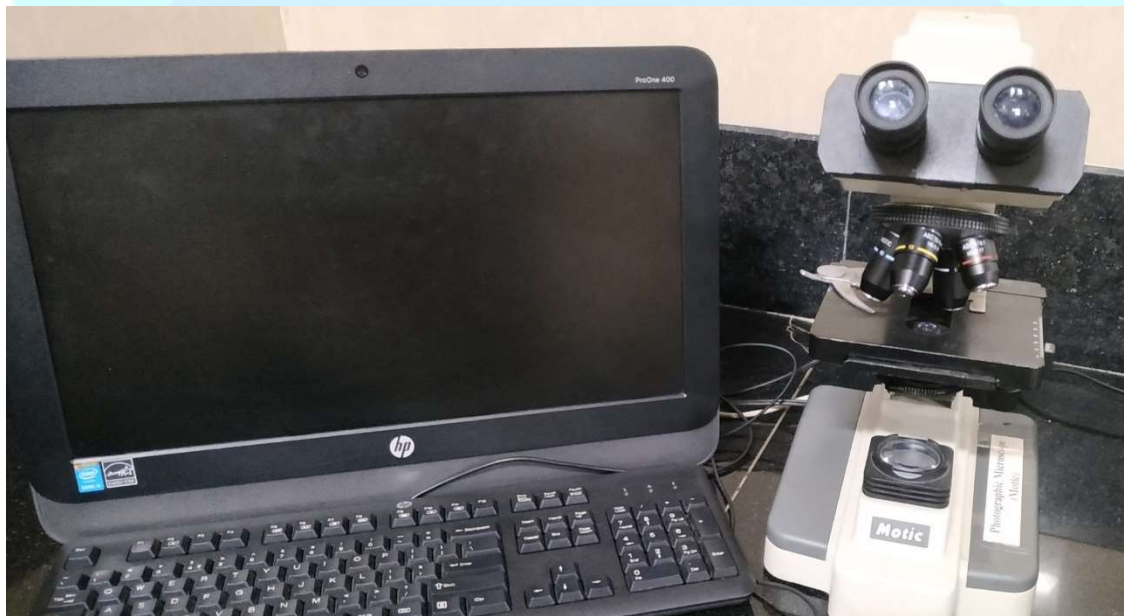




14. Photographic Microscope

Principle: A microscope works on the principle that when a tiny object is placed within its focus, a virtual, erect and magnified image of the object is formed at the least distance of distinct vision from the eye held close to the lens. photomicrography involves the use of classical microscopy techniques of bright field and cross polarized illumination.

Applications: The main application of photographic microscope is in scientific research. use them in biology to study cells with optical/light.





15. Rotary Vacuum Evaporator

Principle: The principle of the rotary evaporator is electronically controlling the distillation flask to rotate at a constant speed at the optimum speed to increase the evaporation area. At the same time through the vacuum pump to make the evaporation flask in the state of negative pressure.

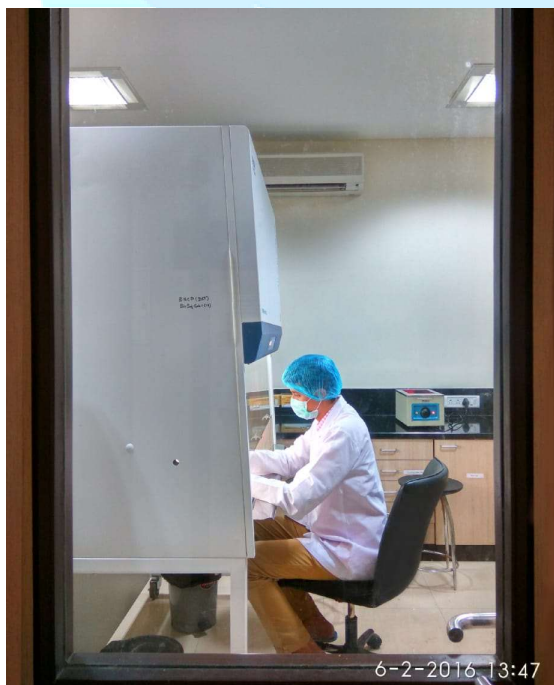
Applications: A rotary evaporator (or rotavap/rotovap) is a device used in chemical laboratories for the efficient and gentle removal of solvents from samples by evaporation. Rotary evaporators are also used in molecular cooking for the preparation of distillates and extracts.





II. CELL LINE STUDY CENTER

The Cell Culture Facility provides a variety of services and maintains a large cell line repository. Some of the services provided by the core are: isolation, maintenance and cryopreservation of cells, media preparation, training in aseptic and cell culture techniques, and consultation. The facility maintains a large variety of cryopreserved cell lines. Many human cancer cell lines are also being worked upon for apoptotic induction/anti-cancer activity studies using Colorimetry, Fluorescent Microscopy & Western Blotting. Cell proliferation assays, immortalization of cells, expansion of cell lines, establishment of transient and stable cloned cell lines, and preparation of cells for experiments are also provided. Cell storage facilities like -80°C Freezer & Liquid Nitrogen are also available.





III. SMALL ANIMAL FACILITY (CPCSEA approved Lab)

In-house central animal house facility is a two-block animal house equipped with sophisticated instruments for maintenance of animals for experiments. A trained qualified veterinarian and technical personnel are always at hand to 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). The CPCSEA approved the facility for Small animal Research.

The animal house facility supports the research mission of institute in biomedical research areas including, but not limited to, pharmacodynamic studies (cancer, cardiovascular, diabetes, neurological disorders, inflammation & pain, respiratory disorders, etc.), pharmacokinetic and ADME studies, toxicity studies, surgical models.





DRUG DEVELOPMENT FACILITY

The Drug Discovery & Development Facility is designed to promote the design, discovery and development of new drugs through multi-disciplinary research involving chemistry, medicinal chemistry, pharmaceuticals, pharmaceutical technology and biology. The architecture provides facilities for computer-aided drug design, computational pharmaceuticals, organic synthesis, molecule purification and characterization as well as in vitro and in vivo biological screening.

- Computer-aided drug design and development
- Target-based / Ligand-based / Cheminformatics-based drug designing
- In-silico 'Knock-out' / Mutation studies
- Lead optimization (binding affinity, selectivity, off-target effects, solubility enhancement)
- In-silico formulation development studies
 - Chemical synthesis and characterization of novel chemical entities
 - API and API intermediate synthesis
 - Impurity synthesis (in collaboration with Indian Pharmacopoeia Commission)
 - Formulation development of Novel Nanotechnology based Herbal and Nutraceutical Products
 - Standardization of herbal extracts, herbal and nutraceutical products (AYUSH products)
 - Cell line studies of API, Finished products, Herbal extracts, phytoconstituents
- Anticancer bioassays
- Cytotoxicity assays



Contact Us

Dr. Bhanuben Nanavati College of Pharmacy
Gate No.1, Mithibai College Campus,
V.M. Road, Vile Parle (West),
Mumbai- 400 056

Phone: 022-42332052 / 51

Email: Office @bncp.ac.in / Principal@bncp.ac.in

WhatsApp number- 9167197376