



**CATEGORY 1
UNIVERSITY**
BY MHRD, Govt. of India

**KL ACCREDITED BY
NAAC WITH A++
GRADE**

nirf RANKED 22
2024 AMONG ALL
UNIVERSITIES

**44 YEARS OF
EDUCATIONAL
LEADERSHIP**

Center for Drug Discovery and Development (C3D)



KL College of Pharmacy

Website : <https://www.kluniversity.in/pharmacy/>

About C3D

The Centre for Drug Discovery and Development (C3D) at KL College of Pharmacy is one of its kind, focused on bringing new medicines to life. Here, the faculty involve in bridging the gap between scientific discoveries and usable drugs. This often involves translating promising research from lab into tangible therapies through a multi-step process. They often collaborate with researchers, pharmaceutical companies, and government agencies to develop potential drugs and formulations.

Vision

To be a global leader in pioneering innovative, safe, and effective therapeutics that transform human health and well-being by addressing unmet medical needs through cutting-edge research and technology.

Mission

1. To discover and develop novel drugs that improve patient outcomes across a wide range of diseases and disorders.
2. To foster collaborative partnerships with academia, industry, and regulatory bodies to accelerate drug discovery and development.
3. To advance scientific knowledge and innovation in pharmacology, medicinal chemistry, and biotechnology through interdisciplinary research.
4. To train and support the next generation of researchers and professionals in drug discovery and development.

Key Objectives

- To develop and evaluate novel formulations for efficient drug delivery, improved patient compliance, enhanced efficacy and reduced side effects.
- To design small molecules using computational tools, optimize synthetic routes and characterize the synthesized compounds by Mass and NMR spectral methods.
- To conduct preclinical evaluation of novel molecules from both natural and synthetic origins for their pharmacological and toxicological effects.

Core Research Areas-

Formulation development- Development of various formulations including transdermal patches, microneedles array patches of various design features using 3D printing, nanoparticles, and their precise characterization and evaluation

Medicinal Chemistry- Design and Synthesis of small molecules for potential targets of Cancer, Tuberculosis and Diabetes

Preclinical Evaluation- Neuropharmacology, Regulatory toxicology studies

Analytical- Method Development and Validation, Impurity profiling

Team Members



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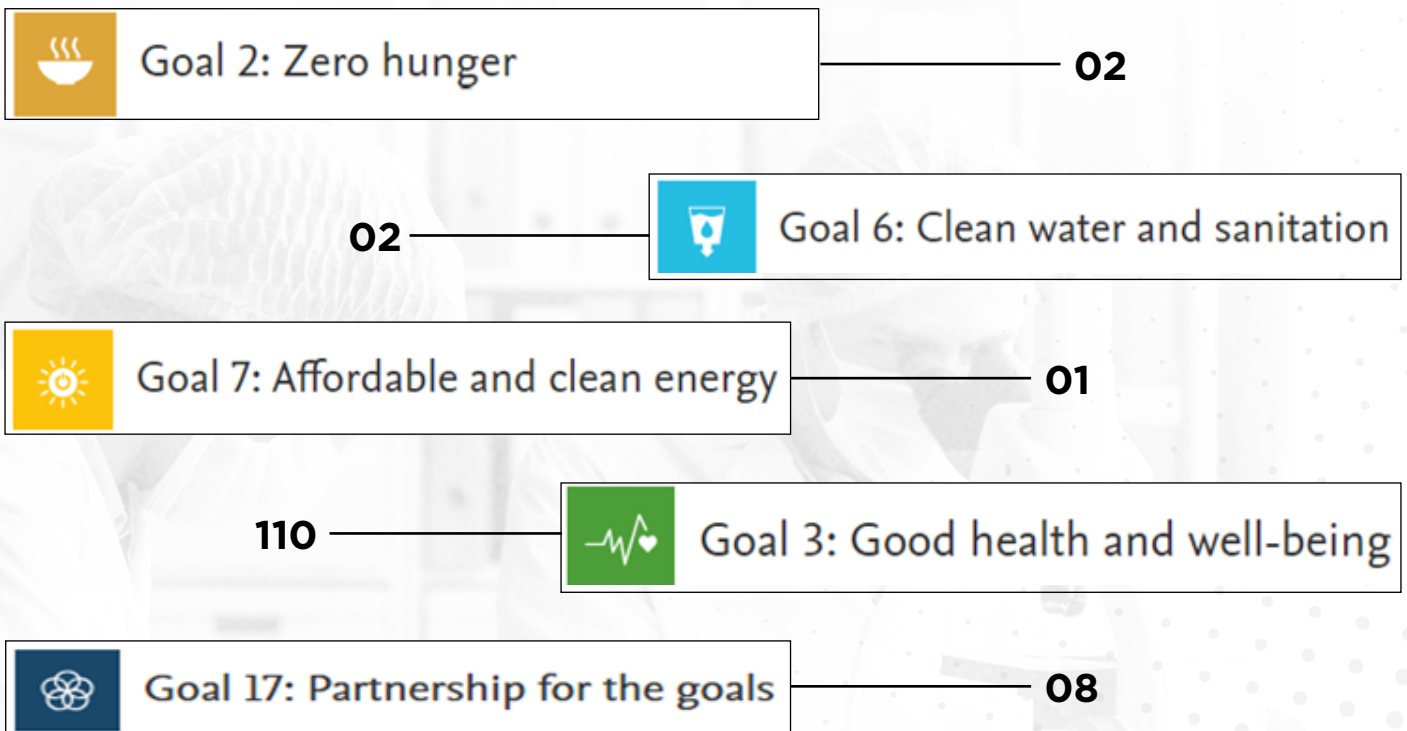


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Dr. U. Chandra Teja,
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Sustainable Development Goals



Ongoing Projects

1. Development of Microneedle Array Patch Based Haemophilus Influenza Type-B (Hib) Vaccine Delivery System for Improved Logistics and Better Patient Compliance

Investigators- Prof. Buchi Nalluri, Dr. U. Chandra Teja and Dr. B. Srinivas

Funding Agency- ICMR-IIRP-SG

Order No.: IIRPSG-2024-01-04481

Sanctioned Date: 24-10-2024



2. Development of Microneedle Sensor Based Device for Continuous Monitoring of Lactate in Point of Care Testing using Dermal Interstitial Fluid

Investigators- Prof. Buchi Nalluri & Dr. Pradeep Kumar

Funding Agency- DBT- Biomedical Devices

Order No.: 102/IFD/SAN/2367/2023-24

Sanctioned Date: 11-01-2024



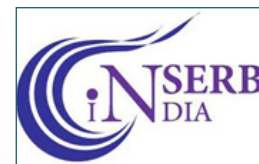
3. Pharmacological modulation of platelet glucose metabolism, mitochondrial dysfunction, and platelet aggregation against co-morbid conditions of Diabetes mellitus and Ischemic stroke

Investigators- Dr. K. Ramakrishna

Funding Agency- SERB- EMEQ

Order No.: EEQ/2023/000766

Sanctioned Date: 19-02-2024



4. Vaccine delivery using Microneedle Array Patches to Overcome Last Mile Logistics Issues, Thermal-Instability, and Improve Patient Compliance

Investigators- Dr. U. Chandra Teja, Prof. Buchi N. Nalluri

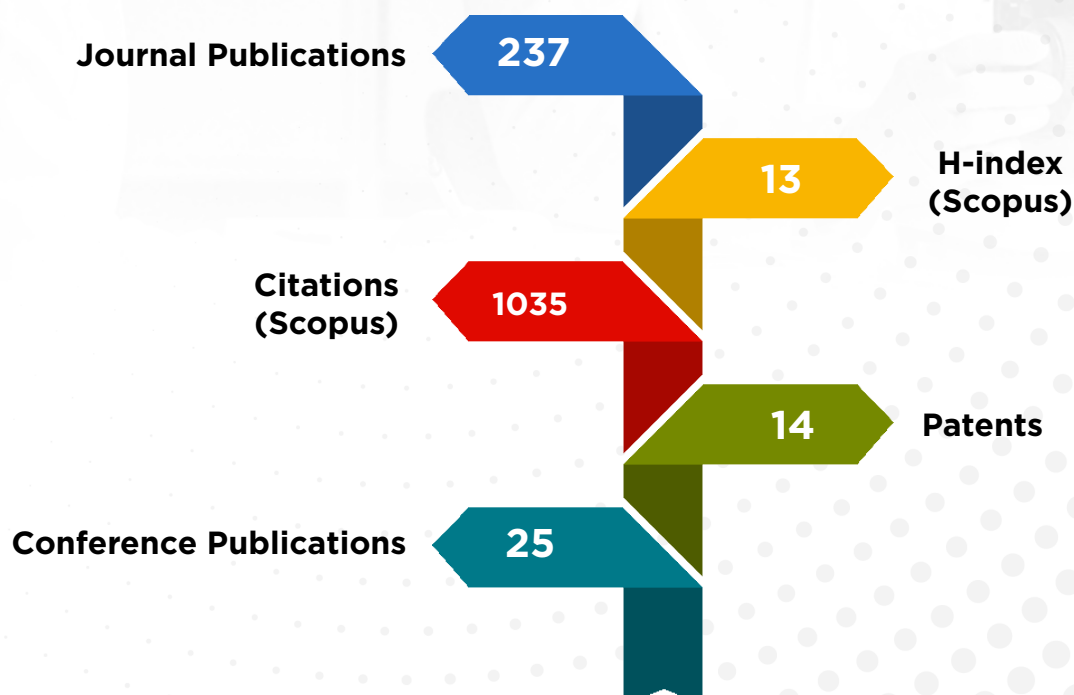
Funding Agency- KLEF Seed Grant

Order No.: KLEF/SRG/2023-24/Pharmacy/002

Sanctioned Date: 02-12-2023



Research Milestones



Infrastructure

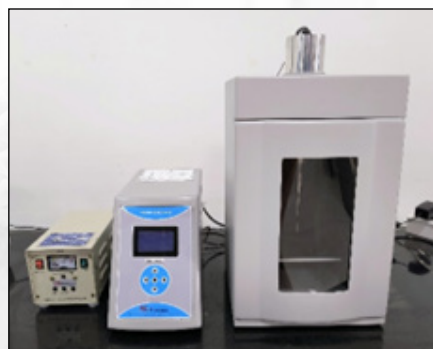
Research Centre is well equipped with state-of-the-art instruments such as HPLC, FTIR-ATR, UV-Visible spectrophotometer, Probe Sonicator, 8 station Dissolution apparatus, Rota evaporator, Moisture Analyzer etc.



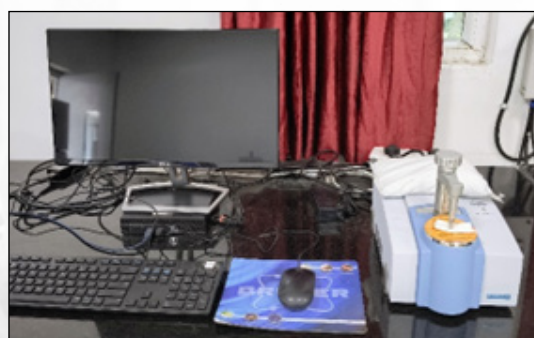
6 Stage Franz Diffusion Cell Apparatus, Orchid Scientific



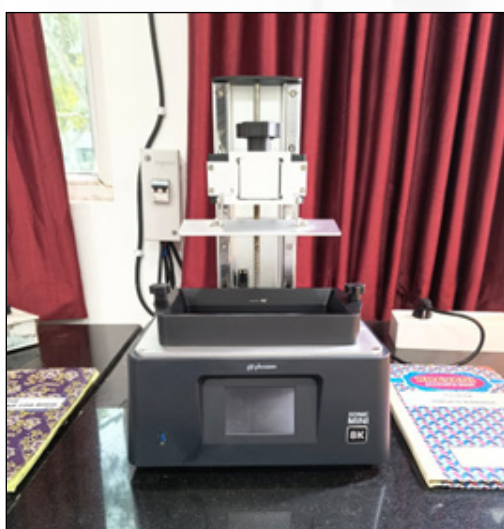
UV/Visible Spectrophotometer UV-1900i, Shimadzu



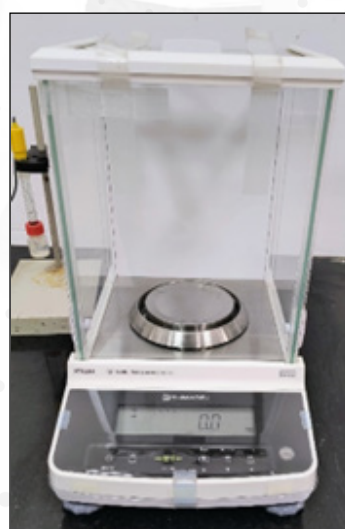
Probe Sonicator (with multiple probes) PCi Analytics



ATR FT-IR Alpha II, Bruker



High Resolution 3D Printer Sonic 8K mini, Phrozen



Digital Analytical Balance ATX224R, Shimadzu

Software

- GastroPlus® (Academic license, Simulations Plus, USA) for biopharmaceutical modelling and simulations,
- Systat Software (Grafiti LLC, USA) for statistical data analysis.
- BIOVIA- Computational design of small molecules for various therapeutic targets
- GROMACS- Molecular dynamics simulations integrated with MM-PBSA binding energy calculations

Animal Testing Facility for Pre-clinical Evaluation:

The existing animal house facility at KLEF is registered with CCSEA, Govt. of India (Reg. No. 2263/PO/Re/S/2023/CCSEA) and is valid up to 10/2028. The animal house can accommodate around 500 laboratory animals including different strains of rats, mice, guinea pigs, rabbits. KLEF has a state-of-the-art animal house facility dedicated to pre-clinical experimentation in a wide range of pharmacokinetic, tissue distribution & toxicological, pharmacodynamic and behavioral studies.

The facility is fully air-conditioned to maintain the animals under controlled environmental conditions like temperature ($23\pm 3^{\circ}\text{C}$), relative humidity (30-70%); 12:12 h light and dark cycle; and 100% fresh air exchange in animal rooms.

A full-time veterinarian is available on-campus to provide animal care, who is also a part of the Institutional animal ethics committee (IAEC) that oversees the protocols on animal experimentation by various investigators/researchers in accordance with the national and international guidelines on animal experimentation.

The facilities in the animal house are extended to the existing incubation center under the collaborative/sponsored research schemes with the supervision of the pharmacy faculty to perform laboratory animal research and conducts different field workshops to train them in handling the animal. Also, the facility is utilized under collaborative sponsored research projects with other research institutes. Some notable equipment and facilities include:

S. No.	Generic Name of the Equipment	Details
1	Water-maze, T-maze, Plus-maze, etc., for behavioral studies	Yamto Instruments, Hyderabad
2	Automated Immuno-assay analyzer	Access-2, Beckman Coulter
3	6 Part XN 550 Hematology Analyzer	Sysmex
4	UV/Vis & Fluorescence microplate reader	Molecular Devices



Training of UG and PG students at Animal House Facility

Extended Research Facilities at KLEF



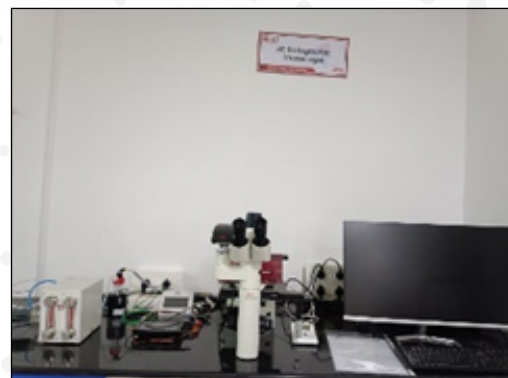
LC-MS/MS (Agilent 6470 LC/TQ)



Automated Immuno-assay analyzer
(Buckman Coulter - Access 2)



Benchtop Spray Dryer (BUCHI B-290)



Microscope (Leica DM IL LED)

Our Collaborators



Prof. B N Srikumar
Neurophysiology
NMIMS, Bangalore



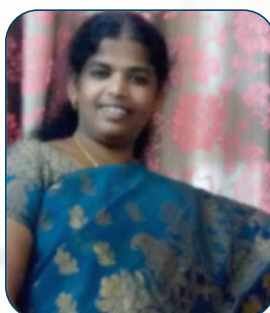
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Recent Publications

1. Alla, N., Palatheeya, S., Challa, S.R. and Kakarla, R., 2024. Morin attenuated the global cerebral ischemia via antioxidant, anti-inflammatory, and antiapoptotic mechanisms in rats. *Metabolic Brain Disease*, pp.1-12.
2. Kakarla, R., Vinjavarapu, L.A. and Krishnamurthy, S., 2024. Diet and Nutraceuticals for treatment and prevention of primary and secondary stroke: emphasis on nutritional antiplatelet and antithrombotic agents. *Neurochemistry International*, p.105823.
3. Kollipara, S., Ahmed, T., Chougule, M., Guntupalli, C. and Sivadasu, P., 2024. Conventional vs Mechanistic IVIVC: A Comparative Study in Establishing Dissolution Safe Space for Extended-Release Formulations. *AAPS PharmSciTech*, 25(5), p.118.
4. Bonlawar, J., Setia, A., Challa, R.R., Vallamkonda, B., Mehata, A.K., Viswanadh, M.K. and Muthu, M.S., 2024. Targeted Nanotheranostics: Integration of Preclinical MRI and CT in the Molecular Imaging and Therapy of Advanced Diseases. *Nanotheranostics*, 8(3), p.401.

5. Chirra, N., Abburi, N.P., Rekha, E.M., Pedapati, R.K., Bollikanda, R.K., Murahari, M., Sriram, D., Sridhar, B. and Kantevari, S., 2024. N-Substituted piperazine-coupled imidazo [2, 1-b] thiazoles as inhibitors of Mycobacterium tuberculosis: Synthesis, evaluation, and docking studies. Drug Development Research, 85(1), p.e22153.
6. Kakarla, R., Karuturi, P., Siakabinga, Q., Kasi Viswanath, M., Dumala, N., Guntupalli, C., Nalluri, B.N., Venkateswarlu, K., Prasanna, V.S., Gutti, G. and Yadagiri, G., 2024. Current understanding and future directions of cruciferous vegetables and their phytochemicals to combat neurological diseases. Phytotherapy Research, 38(3), pp.1381-1399.



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