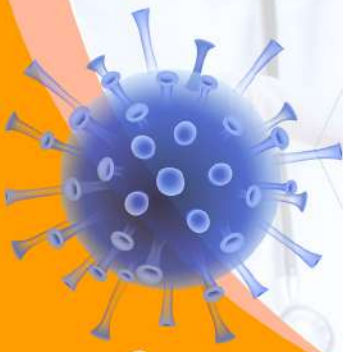


CENTRAL RESEARCH LABORATORY RAJAS MEDICAL INSTITUTIONS



(RESEARCH UNIT AT RAJAS DENTAL COLLEGE & HOSPITAL)

Kavalkinaru Junction - 627105. Tirunelveli District



Prof. Dr. Jacob Raja, M.D.S., F.I.D.A.
Chairman, Rajas Medical Institutions





PREFACE

Central Research Laboratory(CRL) was established at Rajas Dental College & Hospital campus by our honourable chairman Dr. Jacob Raja, with views to contribute multidisciplinary R&D activities and offer a platform to researchers to avail such lab facilities. CRL functions as the flagship enterprise of Rajas Medical Institutions with a dedicated team of experienced clinicians, academicians, scientists, and public health researchers. CRL is committed to link the bench-to-bedside gap by reaching the benefits of research to patients through the energetic teamwork of clinicians and scientists. CRL is devoted towards translational research in the area of clinical dentistry and life sciences. CRL is well-equipped with advanced instrument facilities, and state of the art technologies. CRL has separate labs viz. animal cell culture facility for *in vitro* studies, biochemistry facility for salivary biomarker studies, molecular biology facility for genomic studies, microbiology and pharmacology facilities for alternative and complementary medicine studies.

CRL is the pivotal hub with S.A. Raja Pharmacy College's Committee for Control and Supervision of Experiments on Animals(CCSEA) in undertaking approved animal research using the animal house facility for *in vivo* preclinical, toxicology and histopathology experiments. Clinical studies conducted at CRL undergo Institutional Review Board approval and Institutional Ethical Clearance before their execution. CRL assists extramural and intramural research projects / dissertations/ internship training/ short studies of undergraduate, post graduate students and PhD scholars and also undertakes contract research.



Chairman Sir's Message

The Central Research Laboratory (CRL) was envisaged to be the crucible of ideas and the crux of all research work of Rajas Medical Institutions. A corpus of INR 10 Lakhs was demarcated as a core fund for invigorating and bolstering the research temper of our students and faculty alike during their quest for a PhD thesis or MDS dissertation or even a Short Term Study (STS) undertaken by our undergraduates.

The CRL endeavors to provide a congenial environment for translating the fruits of research to the common man's bedside/ chairside. The research facilities of the CRL is intended to instill the spirit of scientific investigation and foster innovation in our talented Faculty and thus guide them to rediscover their own potential and realize their dreams.

The CRL has partnered with elite and premier bodies such as the Indian Council for Medical Research (ICMR) and the Tamilnadu State Council for Science and Technology (TNSCST) in the conduct of several symposia or workshops and research projects for which we have received several grants.

We hope that we could reach out and partner with likeminded and research oriented Institutions, Universities and Individuals to further foster this outlook of inquisition and enterprise, and in doing so, may arrive at the goals of newer advances, discovery and invention in concert.

Best Wishes

Prof. Dr. Jacob Raja, MDS., FIDA.,

FACILITIES AND DIVISION OF CRL



Dental Research

- Development of new oral hygiene products like mouthwash, toothpaste and gel.
- Development of new markers in disease pathology and its therapeutics.
- Development of novel biomarkers in saliva and serum.
- Genotoxic markers of oral health.
- Corrosion susceptibility of orthodontic brackets.
- Molecular screening of endodontic and periodontal pathogens.
- Microbiological and molecular evaluation of pathogens during fixed orthodontic treatment.

Phytochemical - herbal research

- Discovery of new drugs and its phytochemical evaluation to assess various bioactive compounds present in it.

Nanotechnology

- Synthesis and evaluation of Nanoformulations for the drug discovery and development research.

Molecular and Cell line studies

- *In vitro* cell line studies to analyze the various mechanisms and also to develop novel diagnostic markers and methods.
- Evaluating clinical samples using recent techniques for the molecular level analysis of the disease diagnosis and prognosis with pharmacological and surgical therapy.

In vivo animal studies

- Evaluation of newly synthesized Drugs or developed Pharmaceutical Formulations to know their potency, efficacy and toxicity in living animal model.

Microbiological and Immunological studies

- Microbiological identification and analysis of various microorganisms in the clinical samples using standard techniques.
- Evaluation of antimicrobial activity of various drugs through *in vitro* experiments.

Hematological and biochemical analysis

- Estimation and validation of various hematological parameters along with biochemical assays for the clinical samples.

Histopathological and image analysis

- Histopathological evaluation of human-dental and animal samples to analyze the various pathological features.

RAJAS MEDICAL INSTITUTIONS



Rajas Dental College and Hospital
Kavalkinaru Jn



S.A. Raja Pharmacy College
Vadakkankulam



Sardar Rajas College of Nursing
Kavalkinaru Jn



Rajas institute of Allied Health Sciences
Vadakkankulam



Sardar Raja Arts and Science College
Vadakkankulam



Rajas Institute of Laboratory Medicine
Kavalkinaru Jn

COLLABORATION AND MOU WITH INSTITUTES

- Research collaboration and students exchange programme
Lincoln University College, Malaysia & AIMST University, Malaysia.
- Central Animal House Facility, S. A. Raja Pharmacy College,
Vadakkankulam.
- Herbal Garden - Indian Agriculture College, Radhapuram.
- Education and Research -
Kalasalingam Academy of Research and Education, Krishnankoil.
- Research and Outreach Programme- Department of Zoology,
Holy Cross College, Nagercoil.
- Research Collaboration -
Centre for Research on Molecular and Applied Science (CRMAS),
Thiruvananthapuram-695006.
- Education & Research - Bishop Heber College, Trichy.

CHARGES FOR CELL CULTURE STUDIES AND RELATED STUDIES

S. NO.	STUDY	NUMBER OF SAMPLES	PRICE (RS)
1	Anticancer activity	3	5,000/-
2	Cytotoxicity assay by MTT	1	3,000/-
3	Cytotoxicity assay by LDH	1	5,000/-
4	Wound closer assay	1	4,000/-
5	Colony formation assay	3	3,000/-
6	DNA fragmentation assay	3	6,000/-
7	Apoptotic study by PCR and western blot (Caspase 3,9 , p53, Bcl2, bax, bad, cyt c)	3	2,00,000/-
8	Anti-oxidant assay	3 (3 ASSAY)	10,000/-
9	Gene expression by semi-quantitative PCR	2 (5 GENES)	10,000/-
10	Protein separation by SDS page	5	5,000/-
11	Western blot studies	3 (5 PROTEINS)	1,50,000/-
12	Immunological studies Cytokine markers using ELISA (IL1, IL2, IL6, TNF alpha)	-	CUSTOMIZED PRICE
13	Anaerobic culture	-	CUSTOMIZED PRICE
14	Phenotypic characterization of Bacterial and Fungal species	-	CUSTOMIZED PRICE
15	<i>In vitro</i> Genotoxicity assay	-	CUSTOMIZED PRICE
16	Genotyping analysis by PCR	-	CUSTOMIZED PRICE
17	Antimicrobial activity and all type of related Microbial studies a) Disc diffusion method b) Well diffusion method c) Minimum Inhibitory Concentration determination (MIC) d) Stainings e) Swabings	-	CUSTOMIZED PRICE

CHARGES FOR CELL CULTURE STUDIES AND RELATED STUDIES

S. NO.	STUDY	NUMBER OF SAMPLES	PRICE (RS)
18	Estimation of total phenols	1	1,500/-
19	Estimation of total flavonoids	1	1,500/-
20	IAEC approval	1 PROPOSAL	7,000/-
21	In vivo studies (Anti inflammatory/Diuretic Wound healing/Skin permeation studies/ Analgesic and all related Pharmacological studies.	-	CUSTOMIZED PRICE

NOTE

- The aforementioned charges for experiments apply only to studies involving a single cell line. If an additional cell lines or samples is included in the study, the pricing will be calculated accordingly.
- A charge of 18% GST has to be paid along with the above charges.
- Charges valid up to December 2024 only.

MAJOR INSTRUMENTS AVAILABLE IN CRL



WEIGH BALANCE (0.01GM),

WENSAR,PGB-600



ANALYTICAL BALANCE (D = 0.1MG)

SHIMADZU, AUX220



HOT AIR OVEN



TRINOCULAR MICROSCOPE WITH

IMAGE CAPTURING SYSTEM,

MAGNUS, CH20ITR



CO₂ INCUBATOR,

HIMEDIA, AI006HS



COOLING CENTRIFUGES (6000 RPM),

REMI, CM8PLUS



DEEP FREEZER (-16°C TO -24°C),

REMI, RFV-245



MAJOR INSTRUMENTS AVAILABLE IN CRL



LAMINAR AIR FLOW CHAMBERS

(MICROBIOLOGY AND CELL CULTURE)

KLEANZONE, BS1350



MAGNETIC STIRRER, REMI, 2MLH



pH METER, SYSTRONICS, 361



PCR (THERMAL CYCLER),

BIO-RAD, T100™



UV-VIS-SPECTROPHOTOMETER,

SYSTRONICS, AU-2702



GEL DOCUMENTATION SYSTEM,

BIOTECH, YERCAUD

Experiments and assays

S. No	Experiments
	Phytochemical analysis and herbal research
1	Herbal Plant extraction (polar and non polar solvents)
2	Preliminary phytochemical analysis (alkaloid, flavonoid, tannin, saponin, protein, glycosides, carbohydrate, sterols)
3	Advanced phytochemical analysis - HPLC
4	Estimation of total flavonoids
5	Estimation of total phenols



	Antioxidant assays
6	<i>In vitro</i> Antioxidant assay - DPPH, Nitric oxide, Hydrogen peroxide scavenging activity
7	Enzymatic antioxidant assay - GSH, GPX, Catalase

	In- vitro pharmacological assay
8	<i>Invitro</i> anti inflammatory activity 1) HRBC membrane stabilization activity 2) Protein denaturation inhibitory assay 3) Protease inhibition assay
9	<i>In vitro</i> anti proteinase assay 1) Anti collagenase assay 2) Anti elastase assay

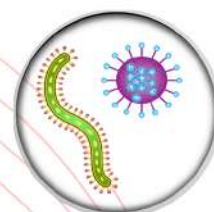


	Nanotechnology
10	Synthesis of Novel Nanoformulations (Natural/Synthetic source)

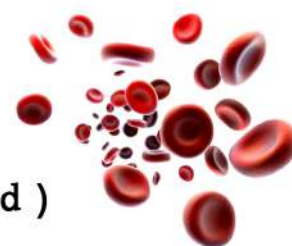
S. No	Experiments
	Molecular and Cell line studies
11	Genotyping analysis by PCR
12	Protein separation and quantification using Gel electrophoresis
13	<i>In vitro</i> MTT assay (cytotoxicity assay)
14	<i>In vitro</i> genotoxicity assay
15	<i>In vitro</i> animal cell culture studies

	<i>In- vivo</i> animal studies
16	<i>In vivo</i> acute toxicity studies in animals and Pharmacological evaluation
17	<i>In vivo</i> anti inflammatory study
18	<i>In vivo</i> analgesic activity
19	<i>In vivo</i> learning and memory & anti Alzheimer studies
20	<i>In vivo</i> hepatoprotective study
21	<i>In vivo</i> anti- diabetic studies

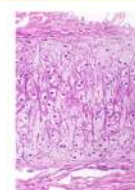
	Microbiological and Immunological studies
22	Anaerobic culture
23	Immunological studies Cytokine markers using ELISA (IL1, IL2, IL6, TNF alpha)
24	Antimicrobial activity a) Disc diffusion method b) Agar dilution method c) E- test d) Minimum Inhibitory concentration determination (MIC)



S. No	Experiments
	Hematological and biochemical analysis
25	Hematological studies – Complete Blood Count (CBC)
26	Erythrocyte Sedimentation Rate (ESR)
27	Serum analysis – SGOT, SGPT and ALP
28	Vitamin – D (ELISA method)
29	Serum Phosphorus estimation
30	C- Reactive Protein (semi quantitative method)
31	Lymphocyte culture



	Histopathological and image analysis
32	Immunohistochemistry assay
33	Histopathological evaluation



STATISTICAL CONSULTING SERVICES
 WE HAVE IN HOUSE STATISTICAL ANALYSIS CENTRE TO
 VALIDATE THE DATA FOR THE REFINEMENT OF
 THE RESEARCH STUDY.

- Research Design
- Sample size Calculation
- Data tabulation
- Data analysis and comparison using new statistical post-hoc tests.
- Graphical representation of data
- Questionnaire analysis



TRAINING AND INTERNSHIP FACILITY

Professionally-competent experts provide assistance in scientific presentation in conference, seminars and continuing dental/medical education (CDE/CME) programs. CRL enriches research activities by organizing training programs, CDE, symposia, workshops, seminars and conferences regularly.

We offer various training Programs for Dental, Medical, Life science students and scholars. We also arrange special training programs for the undergraduate, post graduate and research scholars of Dental, Medical, Pharmacy, Nursing and Life Science Departments on request.

COMPLETED TRAINING WORKSHOPS AND SEMINARS

- “Confront and perspective of Nano research in Healthcare” on 5th January 2019.
- Hands-on Workshop on “Zebrafish, a molecular tool box” on 28th & 29th March 2019.
- ICMR sponsored five days national level practicum workshop on “Molecular diagnostic techniques for dental clinic” on 26th-30th December 2022.
- ICMR sponsored five days national level workshop on “Alternatives to animal experiments and *Invitro* cell culture techniques for dental research” on 17th -21st April 2023.
- Two days “Extramural training program on molecular biology” for APA college life science students was conducted on 12th & 13th April 2023.

RESEARCH GRANTS RECEIVED FROM GOVT BODIES

- Department of Science and Technology, Tamilnadu State Council for Science and Technology. (TNSCST), Chennai.
- Students’ STS project, Indian Council for Medical Research (ICMR), New Delhi.

INSTITUTIONAL REVIEW BOARD (IRB)

IRB of Rajas Dental College and Hospital is an appropriately constituted group registered with Department of Health Research (DHR), Ministry of Health and Family Welfare, that has been formally designated to review and monitor biomedical research involving human subjects. In accordance with FDA regulations, an IRB has the authority to approve, require modifications in (to secure approval), or disapprove research. This group review serves an important role in the protection of the rights and welfare of human research subjects.

The purpose of IRB review is to assure, both in advance and by periodic review, that appropriate steps are taken to protect the rights and welfare of humans participating as subjects in the research. To accomplish this purpose, IRB uses a group process to review research protocols and related materials (e.g., informed consent documents and investigator brochures) to ensure protection of the rights.

INSTITUTIONAL ETHICAL COMMITTEE (IEC)

INSTITUTIONAL HUMAN ETHICAL COMMITTEE

The primary duty of IEC of Rajas is to review and approve all types of research proposals involving Human Related research experimentation before the start of the study. The Committee also monitors research throughout the study and after completion of the study through periodic reports besides regular visits to the research faculty laboratories where the experiments are conducted.

PROTOCOL FOR IRB AND IEC APPROVAL

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INSTITUTIONAL ANIMAL ETHICAL COMMITTEE - S. A. RAJA PHARMACY COLLEGE

The Animal House is registered with the Committee for Control and Supervision of Experiments on Animals Committee for Control and Supervision of Experiments on Animals (CCSEA) (Reg No: 2009/PO/RE/S/18CPCSEA), Ministry of Environment and Forests, Govt. of India and has an established Institutional Animal Ethics Committee (IAEC) that advises the students, Faculties/researchers on facilities, policies and practices concerning the care and use of animals.

FACILITIES AVAILABLE:

- Separate mice and rat colony chambers
- Quarantine room
- Feed section
- Bedding material room
- Working platforms for short procedures
- Documentation room
- Cage and bottle storage section
- Cupboards for storing essential drugs
- Separate washing area to avoid contamination

Proper bio-medical waste management guidelines are followed to dispose of the animal house waste.

LIVINGSTON RAJA MEMORIAL ANIMAL HOUSE



CENTRAL RESEARCH LABORATORY

RAJAS MEDICAL INSTITUTIONS,
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