MALABAR CANCER CENTRE
(POST GRADUATE INSTITUTE OF ONCOLOGY SCIENCES & RESEARCH)
(An autonomous centre under Government of Kerala)

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ADVERTISEMENT FOR PhD PROGRAM AT MALABAR CANCER CENTRE-POST GRADUATE INSTITUTE OF ONCOLOGY SCIENCES AND RESEARCH (MCC-PGIOSR), THALASSERY.

No. Date: 26-09-2024

Malabar Cancer Centre (PGIOSR) invites applications for the PhD program (October 2024 session) in various domains including Cancer Biology, Microbiology, and Biochemistry. The MCC PhD program is affiliated with both Kannur University and Kerala University of Health Sciences (KUHS). Selected candidates will be registered for the PhD program with either Kannur University or KUHS and are required to adhere to the respective guidelines set forth by the affiliated university and Malabar Cancer Centre (PGIOSR) for the completion and award of the PhD degree.

IMPORTANT DATES

October 18, 2024	Walk in Interview
October 18, 2024	Date of publication of the list of shortlisted candidates
October 19, 2024	Last date of registration to kannur University

Joining for PhD based on the Kannur university approval

1. Eligibility for PhD admission

Candidates with a postgraduate degree in Life/ Agricultural/ Environmental/ Veterinary/ Pharmaceutical/ Medical Sciences or allied subjects (Biochemistry/ Biotechnology/ Bioinformatics/ Biophysics/ Chemistry/ Microbiology, etc.) with a minimum of 60% marks in aggregate or equivalent grade in the UGC 10 point scale (or an equivalent grade in a point scale wherever grade system is followed) or an equivalent from a foreign educational institution accredited by an assessment and accreditation agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any

other statutory authority in that country which assess, accredit or assure quality and standard of the educational institutions are eligible to apply.

A relaxation of 5% of marks (from 60% to 55%), or an equivalent relaxation in grade point, may be allowed for those candidates belonging to the SC, ST and differently abled candidates. The candidate should have a valid JRF (UGC/ CSIR/ ICMR/ DBT/ DST-INSPIRE or any other nationally-competitive fellowship) for a period of 5 years offered by the Government.

2. Selection Procedure

Candidates with valid JRF will be selected based on interview performance in the walk in interview.The interview will be held at Malabar Cancer Centre (PGIOSR), Thalassery, Kannur, Kerala. PhD interviews will be held offline only. List of the selected candidates will be displayed on Malabar Cancer Centre (PGIOSR) website on October 18, 2024.

3. Fees for PhD Programme

Students admitted for PhD programme will have to pay an administrative fee of ₹6000 per semester

All the students have to pay the MCC (PGIOSR) administrative fees.

Note

1. All communications with candidates will be by email only.
2. Kindly check this website for periodic updates.
3. In case of any application-related queries, contact:academicoffice@mcc.kerala.gov.in

Sd/-
DIRECTOR

List of Faculties and their Project Vacancies available for Malabar Cancer Centre (PGIOSR)Ph.D program, October 2024

Sl No	Name of the Faculty	Details of Research Topics
1	Dr. Sindhu E. R	Project Title: Exploring the potential of natural compounds in cancer prevention and treatment The project will focus on identifying bioactive molecules from natural sources especially nutraceutical that exhibit anticancer properties. The project will employ a multidisciplinary approach, integrating molecular biology, pharmacology, and boinformatics to screen and characterize these compounds. Mechanistic studies will also be conducted to understand the pathways through which these compounds exert their anticancer effects, including apoptosis induction, cell cycle arrest, and inhibition of metastasis. This project holds significant potential to contribute to the field of oncology by offering novel insights into natural compounds as viable alternatives or adjuncts to conventional cancer therapies. Project Title: Impact of sleep disruption on systemic inflammatory response in breast cancer patients undergoing curative intent treatment The research projects focus on the identification of specific patterns of sleep disruption associated with an increased risk of breast cancer and its progression, with the goal of developing sleep-based interventions to enhance cancer prevention and management, particularly in breast cancer.
2	Dr. R Parthiban	Project Title: Investigating how resistance emerges and spreads among pathogenic bacteria in clinical and environmental settings. This research topic focuses on investigating the mechanisms behind the transfer of antimicrobial resistance genes between bacteria. It employs a range of approaches, including epidemiology, genomics, statistics, evolutionary biology, structural biology, chemical biology, and modeling. By using this multidisciplinary strategy, the study aims to identify the key factors driving the spread of resistant strains and resistance genes. Project Title: Exploring the impact of vaginal and gut microbiomes on ovarian cancer: Unraveling microbial contributions to tumorigenesis and therapeutic response This project seeks to explore the intricate interactions between the vaginal and gut microbiomes and their relationship with ovarian cancer, a major cause of gynecological cancer-related deaths. The study will involve characterizing the microbial

		communities in the vaginal and gut environments of ovarian cancer patients and comparing them with those of healthy individuals. Advanced sequencing methods, such as 16S rRNA gene sequencing and metagenomic analysis, will be used to identify microbial species and evaluate their diversity and abundance. The research will investigate how microbial imbalance, or dysbiosis, in these microbiomes might contribute to ovarian cancer's onset and progression. By combining microbiome analysis with clinical data, the project aims to discover microbial biomarkers linked to ovarian cancer risk and treatment outcomes.
3	Dr. Sajani Samuel	Project Title: Exploring the Diagnostic and Therapeutic Potential of Circulating Exosomes in the Serum of Breast Cancer Patients Exosomes are small extracellular vesicles secreted by cells, including cancer cells, that play a key role in cell communication by transporting proteins, lipids, and nucleic acids. In breast cancer, circulating exosomes found in the serum may carry tumor-specific biomarkers, such as microRNAs, DNA fragments, and proteins, making them valuable tools for non-invasive diagnostics and monitoring. This research focuses on identifying and characterizing these exosomes in the serum of breast cancer patients to evaluate their potential for early detection, prognosis, and monitoring response to therapy. Additionally, exosomes hold promise for therapeutic applications, as they could be engineered to deliver targeted treatments or modulate the immune system in the fight against cancer. This study explores the diagnostic and therapeutic potential of exosomes, offering insights into personalized medicine approaches for breast cancer management. Project Title: Bioprospecting of Phytocompounds for Inhibition of PBP2a in Methicillin-Resistant *Staphylococcus aureus* Methicillin-resistant *Staphylococcus aureus* (MRSA) poses a significant global health threat due to its resistance to β-lactam antibiotics, mediated by the altered penicillin-binding protein 2a (PBP2a). PBP2a has a low affinity for β-lactams, enabling MRSA to continue synthesizing its cell wall even in the presence of these antibiotics. The rise of MRSA has spurred the need for novel antimicrobial agents. Bio prospecting of phytocompounds—bioactive compounds derived from plants—offers a promising avenue for discovering new inhibitors of PBP2a. Plant-derived compounds have been used for centuries in traditional medicine and are known for their diverse chemical structures and mechanisms of action. This research focuses on identifying and characterizing phytocompounds that can effectively inhibit the activity of PBP2a, thereby restoring the efficacy of β-lactam antibiotics against MRSA. Through a combination of in silico screening, in vitro assays, and potentially in vivo studies, this work aims to uncover new, plant-based antimicrobial agents that could lead to the development of alternative therapies to combat MRSA

		infections.
4	Dr. Saravanan M	Project Title: Deciphering the mechanisms of antimicrobial resistance: Understanding microbial strategies for developing and spreading drug resistance. The project is designed to address one of the most critical challenges in modern medicine: the rise of antimicrobial resistance (AMR).This research project aims to unravel the complex biological processes that underpin the development and dissemination of antimicrobial resistance among pathogenic microorganisms. By employing a multidisciplinary approach, the project will investigate the genetic, biochemical, and environmental factors that contribute to the emergence and spread of resistance traits. Conducting in-depth genomic and proteomic studies to identify the specific genes, mutations, and proteins involved in resistance mechanisms. This will help in mapping out the molecular pathways that microbes utilize to evade the effects of antimicrobial agents. Investigating how microbes adapt and evolve in response to selective pressures imposed by antimicrobial treatments, leading to the development of resistance. The project will explore the evolutionary pathways and fitness costs associated with resistance, providing a comprehensive understanding of how resistance emerges and stabilizes within microbial populations. Project Title: Understanding the replication dynamics of Human Papillomavirus (HPV): Foundations for antiviral therapy development. This project explores the replication mechanisms of Human Papillomavirus (HPV) in a BSL-2 setting. By dissecting the viral life cycle and host interactions, the research aims to provide insights that could lead to the development of antiviral therapies targeting HPV infections.
5	DrDeepak Roshan V G	Project Title: Developing 3D organoid cultures for personalized cancer therapy: A novel approach to tailored treatment. This project focuses on the development of 3D organoid culture systems to model patient-specific cancers, providing a cutting-edge platform for personalized therapy. By utilizing organoids derived from patient tumor samples, the research aims to replicate the complex architecture and microenvironment of tumors in vitro. These 3D cultures will be used to test and evaluate the efficacy of various therapeutic agents, allowing for the identification of the most effective treatment options tailored to individual patients. This approach has the potential to revolutionize cancer therapy by enabling personalized treatment strategies that are more precise, effective, and responsive to the unique characteristics of each patient's cancer. Project Title: Design and development of a peptide vaccine for targeted immunotherapy in lung cancer. This project aims to design and develop a peptide-based vaccine for lung cancer, focusing on harnessing the immune

		system to target and eliminate cancer cells. By identifying specific tumor-associated antigens that are prevalent in lung cancer, the research will create synthetic peptides that can stimulate a robust immune response against these targets. The vaccine will be tested for its ability to induce cytotoxic T-cell responses and reduce tumor growth in preclinical models. This innovative approach has the potential to provide a new, effective immunotherapy option for lung cancer patients, offering a tailored treatment strategy with reduced side effects compared to traditional therapies. Project Title: Unravelling the tumor biology of multiple myeloma: insights into disease progression and therapeutic targets. This project aims to investigate the complex tumor biology of multiple myeloma, a malignant plasma cell disorder characterized by abnormal proliferation within the bone marrow. The research will focus on understanding the molecular and cellular mechanisms that drive disease progression, including the interactions between myeloma cells and the bone marrow microenvironment, the role of genetic mutations, and signaling pathways involved in survival and drug resistance. By dissecting these biological processes, the project seeks to identify novel therapeutic targets and biomarkers that can lead to more effective treatment strategies for multiple myeloma, ultimately improving patient outcomes.
6	Dr. Vipin Gopinath	Project Title: Development of nano drug delivery system for breast cancer. This project focuses on the development of an advanced nano drug delivery system designed to improve the precision and effectiveness of breast cancer treatment. By engineering nanoparticles specifically tailored to target breast cancer cells, this research aims to deliver therapeutic agents directly to the tumor while minimizing collateral damage to surrounding healthy tissue. This approach will involve optimizing the size, surface properties, and drug-loading capacity of nanoparticles to ensure targeted delivery and controlled release of anticancer drugs. The project has the potential to revolutionize breast cancer therapy by offering a more effective and less toxic treatment option, addressing the significant challenges posed by this devastating disease. Project Title: Design and development of an mRNA vaccine for targeted immunotherapy in ovarian cancer. This project is focused on the design and development of an mRNA vaccine specifically targeting ovarian cancer. The research aims to identify and encode tumor-associated antigens unique to ovarian cancer cells into mRNA sequences, which, when delivered into the body, can stimulate a robust immune response. The vaccine will be tested for its ability to activate cytotoxic T cells to recognize and eliminate ovarian cancer cells, potentially reducing tumor growth and preventing metastasis. By leveraging the flexibility and precision of mRNA technology, this project seeks to create a novel and

		personalized immunotherapy option for ovarian cancer, addressing the significant challenges posed by this often-diagnosed disease in its advanced stages. Project Title: Development of circulating Extracellular Vesicle-based biomarker system for early detection and monitoring of brain cancer. This project aims to develop a novel biomarker system based on circulating extracellular vesicles (EVs) for the early detection and monitoring of brain cancer, including glioblastoma. Extracellular vesicles, which are naturally released by cells into bodily fluids, carry molecular signatures reflective of their cell of origin. This project will focus on isolating and characterizing EVs from blood samples of brain cancer patients, identifying specific proteins, RNAs, and other biomolecules that serve as reliable biomarkers for brain cancer. The ultimate goal is to create a non-invasive diagnostic tool that can detect brain cancer at an early stage, monitor disease progression, and potentially guide treatment decisions, improving patient outcomes and survival rates.