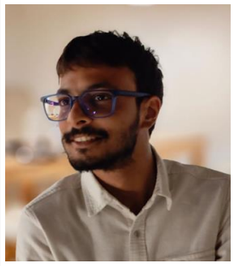
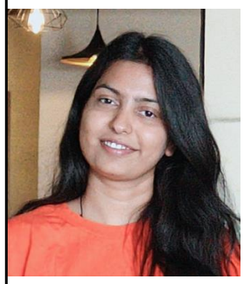
S.No.	MU Roll No	Name	Email ID	Supervisor	Research Area	Research Brief	Photo
1	se23plsc001	Adyasha Mishra	se23plsc001@mahindrauniversity.edu.in	Dr Pijus Kanti Barman	Studying the mechanisms underlying cardiovascular disease risk during aging	Adyasha's PhD research work aims to define how aging associated dysfunction of monocytes, one subtype of the innate immune cells, renders increased risk of atherosclerosis during aging. Specifically, she is studying molecular mechanisms underlying monocyte adhesion to aortic endothelial cells and calcification of vascular smooth muscle cells in the context of aging which are critical for the development of atherosclerotic plaques. She is employing gene overexpression and knockout models in vitro as well as their validation in mouse models to address these questions. Her work also involves the use of human clinical samples to extend the data from experimental animal models into the cells from human subjects.	
2	se23plsc002	Anu Priya B	se23plsc002@mahindrauniversity.edu.in	Dr Mrittika Sengupta	Bacteriophage-based antimicrobials development	Food spoilage is an important global concern. In developing nations reducing food spoilage is an important step towards providing food security. Packaged food that has been prepared hygienically can be an efficient means of providing nutrition in resource limited settings. We are working towards developimg bacteriophage based food packaging material with activity against food spoilage causing bacteria and food borne pathogens.	
3	se23plsc004	Deogaonkar Shreevatsa Umesh	se23plsc004@mahindrauniversity.edu.in	Dr Runa Kuley	Neutrophils as drivers of inflammation in Autoimmune Diseases	Neutrophils are critical components of the immune system, playing a key role in defending against infections. However, excessive activation of neutrophils has been associated with inflammation and autoimmune diseases. This study aims to investigate the contribution of neutrophils in the pathogenesis and inflammation of autoimmune diseases, specifically focusing on Oral Lichen Planus (OLP), a chronic inflammatory condition characterized by lesions in the oral cavity. The research will examine the clinical utility of neutrophil activation markers for the diagnosis, prognosis, and monitoring of OLP patients. Additionally, it will assess the mechanisms of neutrophil activation and explore their therapeutic potential in reducing neutrophil-mediated inflammation using human clinical samples.	
4	se23plsc005	Pragyan Mohapatra	se23plsc005@mahindrauniversity.edu.in	Dr Manu Smriti Singh	Nanomedicine based Photodynamic Theranostics	Photodynamic therapy (PDT) is a minimally invasive treatment for cancer that uses light-sensitive molecule-Photosensitizer and a specific wavelength of light to selectively destroy cancerous cells. Photosensitizers are hydrophobic molecules with solubility issues. Nanomedicine can enhance PDT through stable formulation of Photosensitizer in nanocarriers, improving drug delivery, increasing light absorption. Nanoparticles also offers the advantage of targeting tumors precisely while sparing surrounding healthy tissue. In this study, our aim is to develop dual function nanocarrier for both therapeutics and diagnostics (Theranostics) of Cervical Cancer.	
5	se23plsc006	Priya Bhatt	se23plsc006@mahindrauniversity.edu.in	Dr Manu Smriti Singh	3D Tumoroid model development	The 3D cell culture model or tumoroid model mimics the in vivo tumor microenvironment more accurately than traditional 2D cultures. It enhances the evaluation of drug efficacy and toxicity by maintaining cell-cell and cell-matrix interactions akin to tumor extracellular matrix. In our work, we plan to develop cell-line and patient-derived tumoroid-on-scaffold model providing a more realistic platform for drug screening. We would further test drug/ gene therapy and nanomedicine to evaluate efficacy in comparison to 2D model. This model will help bridge the gap between in vitro studies and clinical outcomes, improving the predictability of drug responses.	

6	se23plsc007	Saba Parveen	se23plsc007@mahindrauniversity.edu.in	Dr Souradyuti Ghosh	DNA nanostructure based sensing and therapeutic applications	DNA nanostructures are malleable and programmable conformations made up of DNA. They can be integrated with multiple type of functional materials such as aptamers, loops, stems etc, and can be engineered to selectively display particular type of functional material over the others. In this project, we will explore stability of DNA nanostructures that has been integrated with moieties such as catalytic modules, therapeutic oligonucleotides, and internal stabilizers and then probe their effect on sensing and therapeutic applications related to cancer and neurodegenerative diseases.	
7	se23plsc008	Sangramjit Mondal	se23plsc008@mahindrauniversity.edu.in	Dr. Yugandhar Kumar	Interactome studies towards cancer therapy	Our research team is focused on studying major protein-protein interactions (PPIs) to uncover how drug treatments alter the interactome and lead to side effects. By comprehensively mapping the PPI networks within cancer cells, we aim to understand the baseline interactions that are essential for cellular function and how these are perturbed by therapeutic interventions. Our approach involves identifying key PPI networks and pathways that are most affected by drug treatments, providing insights into both the therapeutic mechanisms and unintended consequences. By analysing changes in the interactome, we can pinpoint specific PPIs that are disrupted by drug action, leading to side effects. This detailed understanding allows us to distinguish between desirable effects on cancerous cells and adverse effects on normal cellular processes. Our research seeks to optimize cancer drug development by minimizing these adverse effects, ultimately leading to safer and more effective cancer therapies. Furthermore, our work has the potential to significantly reduce drug development costs. By predicting side effects early in the drug development process, we can avoid late-stage failures and streamline the path to clinical trials. This targeted approach not only enhances the precision of new cancer treatments but also ensures a more efficient allocation of resources in the drug discovery pipeline. Our study aims to bridge the gap between effective cancer treatment and minimal side effects, contributing to the development of next-generation therapeutics.	
8	se23plsc009	Gaurav Birendra Singh	se23plsc009@mahindrauniversity.edu.in	Dr. Ravi Kiran Donthu	Population genomics	Research in population genomics of agriculturally important insects is economically vital due to its direct impact on crop production and food security. These insects, which include pests like thrips, brown planthoppers, and others, cause substantial yield losses and increase production costs through feeding damage and disease transmission. By examining the genetic diversity and adaptive mechanisms of these pest populations, we can uncover genetic markers linked to pesticide resistance and other traits.	
9	se23plsc010	Sourab Paul	se23plsc010@mahindrauniversity.edu.in	Dr Jayato Nayak	Microbial production of Biotheraputic materials with associated bioprocess optimization	Given the growing demand for biosurfactants, with the global market projected to reach USD 6.71 billion by 2032 at a CAGR of 5.4%, and the high associated production costs, the goal of this research is to develop a cost-effective and sustainable manufacturing process for biolipids using agro-industrial waste as substrates, along high throughput optimization in both upstream and downstream processes through the application of various biostatistical tools and kinetic modeling techniques.	

10	se23plsc012	Hinna Mushtaq	se23plsc012@mahindrauniversity.edu.in	Dr Aruna Kumar Ch.	Development of a suicidal gene therapy approach for cancer treatment	Suicide gene therapy is a promising cancer treatment that induces selective tumor cell death. My research focuses on enhancing this approach using Adeno-associated virus (AAV) vectors combined with CRISPR-Cas9 technology to develop more targeted and efficient Suicidal gene therapy. By engineering the AAV capsid, we aim to improve the specificity and efficiency of gene delivery, overcoming traditional barriers in gene therapy. Integrating AAV-based delivery with CRISPR-Cas9, we strive to induce cell death in tumor cells with high precision, enhancing therapeutic efficacy and minimizing off-target effects. Our work involves designing and optimizing AAV vectors and CRISPR-Cas9 components to ensure precise targeted knockout of critical genes in malignant tissues to induce cell death. This approach aims to improve clinical outcomes and quality of life for cancer patients by providing cutting-edge, targeted therapy.	
11	se23plsc013	Sapna Sharma	se23plsc013@mahindrauniversity.edu.in	Dr Aruna Kumar Ch.	AAV engineering for monogenic cancers and rare diseases	Our research focuses on the development and optimization of AAV vectors for gene therapy, aiming to correct or replace defective genes responsible for monogenic driven disorders. By leveraging the natural ability of AAVs to deliver genetic material into cells, we are centering to design novel hybrid AAV vectors to enhance their efficiency, specificity, and durability. Advanced techniques, such as capsid modification and the use of tissue-specific promoters, are employed to target affected cells with transgene delivery. This innovative approach has the potential to provide long-term therapeutic benefits and possibly cures for patients suffering from genetic disorders that currently have limited treatment options. AAV engineering for monogenic cancers and rare diseases not only promises to revolutionize personalized medicine but also offers a hope for many individuals and families affected by these challenging conditions.	
12	se23plsc014	Rashi Satish Prasad	se23plsc014@mahindrauniversity.edu.in	Dr Bipin Singh	Endolysins based Antimicrobial Peptides	The work aims to use molecular modeling, molecular dynamics simulations, and machine learning techniques to design and optimize potent antimicrobial peptides from endolysins. Machine learning algorithms will be employed to predict and refine peptide designs, enhancing their stability and efficacy against resistant bacterial strains/species. By elucidating the structural and functional dynamics of endolysins at the atomic level through MD simulations, we will identify key features important for specific antimicrobial activity. This integrative approach would help to accelerate the development of novel, effective antimicrobial therapeutics.	
13	se23plsc015	Shrawan Kumar	se23plsc015@mahindrauniversity.edu.in	Dr Souradyuti Ghosh	Development of aptamer integrated sensors for small molecules and pathogens	Electrochemical sensing has several advantages over optical sensing such as portability, fast response time, and relatively low cost, making them more suitable for limited resource biosensing. In my thesis work, I will explore several methods to integrate aptameric sensing into electrochemical sensing. My work will specifically look into novel aptamers of small molecules as well as pathogens, configuration of new electrodes, novel biochemistry, device, and materials engineering.	
14	se23plsc016	Aayushi Gupta	se23plsc016@mahindrauniversity.edu.in	Dr Bipin Singh	Development of Antivenom Peptides	The goal of this work is to develop highly effective, specific, and safe antivenom peptide candidates. This research focuses on developing antivenom peptides through molecular modeling, molecular dynamics (MD) simulations, and machine learning. Molecular modeling will be used to design and optimize peptides with high binding affinity to diverse venom toxins. MD simulations will be used to investigate the stability and dynamic behavior of these peptides in realistic complex environments. Machine learning and generative AI methods will be used to generate peptides with specific structural characteristics and binding affinities.	

15	se23plsc017	Tanya Verma	se23plsc017@mahindrauniversity.edu.in	Dr Sanjeev K. Choudhry	Functional diversity of nuclear pore complexes	Nuclear pore complexes (NPCs) are large protein assemblies which control the import of essential proteins and the export of RNA molecules into and out of the nucleus, thereby influencing the synthesis and regulation of proteins necessary for various cellular processes. As NPCs are key regulator impacting gene expression and cellular function, understanding the biology of the NPC is crucial. Insights into NPC structure and function can help us understand how cells maintain homeostasis and respond to changes in their environment. This knowledge is particularly important for uncovering the mechanisms behind diseases linked to NPC dysfunction, such as certain cancers, neurodegenerative disorders, and viral diseases. Tanya's PhD research focuses on gaining a mechanistic understanding of the novel functions of NPCs. Using systems biology approaches, she examines how perturbations in NPC components affect their functions, particularly chromatin activities and gene expression.	
16	SE24plsc001	Riya Akhil Jain	se24plsc001@mahindrauniversity.edu.in	Dr Swarit	Computer-aided discovery and design of antifungal agents	This work aims to search for potential antifungal agents using computational techniques. Due to the increased rate of fungal infections worldwide and limitations of already existing drugs, such as drug resistance, new compounds are needed in limited time to combat these infections. Utilizing the knowledge embedded in structural features and physiochemical properties of compounds curated from publicly available databases such as ChEMBL and PubChem, we aim at building ML/regression models for the prediction of antifungal activity. This can further aid in screening databases for antifungal agents. Furthermore, we would try to integrate data from different domains to build models with better accuracy and rationalization. Finally, we would aim at extracting important structural features from the predictive models which can serve as building blocks for generating virtual compounds with novel scaffolds using generative AI models.	
17	SE24plsc002	Rutvik Kulkarni	se24plsc002@mahindrauniversity.edu.in	Dr Varun Kumar	Elucidating role of rhizosphere microbes in mitigating biotic stress in plants	Plant disease outbreaks present significant challenges to global food security by causing losses worldwide of up to 40% of crop yields. The current plant protection methods rely mainly on chemical pesticides which harm the environment by degrading soil health, pose risks to the health of farmers and consumers, and often result in development of resistant pathogen strains. Emerging evidence revealed that plant-associated microbiomes are crucial for improving plant resilience against pathogen attack. Increasing the abundance of beneficial microbes can improve plant growth and control pathogen infections. My Ph.D. research focuses on how the rhizosphere microbiome changes during pathogen attack and aims to develop formulations using beneficial microbes for controlling biotic stress in crops.	
18	se24plsc003	Siddhant Dilip Mahabale	se24plsc003@mahindrauniversity.edu.in	Prof RS Chauhan	"Developing gene markers for major nutritional & Anti-nutritional metabolites for a nutraceutical food crop (Fagopyrum spp.)"	Our reserch aims to unlock the high biological value of buckwheat by studying its metabolic pathways and genetic factors. buckwheat,rich in essential amino acids,resistant starch, vitamins, minerals,and potent flavonoids like rutin and quercetin,offers therapeutic benefits for condition such as hypertension and hyperlipidemia. its proteins,notably high in lysine compared to other cereals,holds promise as a valuable nutraceutical resource. we address anti-nutritional compounds hindering growth and causing discomfort in humans and animals, like protease inhibitors and tannins impacting buckwheat protein digestibility and nutrient utilization. the overall goal of our reserch to delineate the nutritional and anti-nutritional factors in buckwheat populations,subsequently develope gene markers towards developing a defined genetic improvement strategy.	

19	SE24plsc004	B Dhruvi Suresh	se24plsc004@mahindrauniversity.edu.in	Dr. Akanksha Singh	Effect of gut microbiome in the neurodevelopment using Drosophila as a model organism	This work aims to investigate how the composition of gut microbes in fruit flies (*Drosophila*) influences neurodevelopment. By manipulating the gut microbiome and analyzing its impact on brain function, we hope to shed light on the potential role of gut bacteria in shaping neurological health. This knowledge could pave the way for future studies in more complex organisms, potentially leading to novel therapeutic strategies for human neurodevelopmental disorders.	
20	se24plsc005	Chandrika Sharma	se24plcs005@mahindrauniversity.edu.in	Dr Souradyuti Ghosh	Bio-engineering novel chemoenzymatic modalities in oligonucleotide based sensing and therapy	Current oligonucleotide therapeutics predominantly uses chemical modifications to improve in vivo stability and biodistribution efficacy. This project will look into novel bioengineering angles (those independent from chemical modifications) of therapeutic oligonucleotides and see how they regulate biodistribution, stability, and therapeutic efficacy, either individually or in tandem.