DR. B. R. AMBEDAR CENTER FOR BIOMEDICAL RESEARCH
UNIVERSITY OF DELHI, DELHI – 110 007

AREA OF RESEARCH OF RECOGNIZED SUPERVISOR'S ASSOCIATED WITH ACBR

- *Prof. K. Natarajan, Professor, ACBR, DU*

The research in the lab focuses on Host-pathogen interactions during mycobacterial infection at the cellular and molecular levels. We explore the role of innate pathogen recognition receptors along with their cell signaling pathways and their implications in directing activation of macrophages, dendritic cells and T lymphocytes. Potential interest in ion channels as second messengers and their expression and regulation by mycobacteria and their antigens are being investigated. The newly enrolled student would be expected to work on similar lines.

- *Prof. AnjuKatyal, Professor, ACBR, DU*

i)   Evaluation of Biomarkers of Alcoholic Liver Disease through OMICS
ii)   To study the Pathophysiology of cerebral malaria and devise novel therapeutic strategies
iii)   To study the epigenetic influences on the stroke pathology in experimental models .
iv)   To evaluate the moonlighting role of Heme and non heme peroxidases in cerebral pathology of cerebral ischemia /cerebral hypoxia/cerebral malaria

- *Prof. Madhu Chopra, Professor, ACBR, DU*

Our lab is working on drug design and development involving computational design which involves docking, pharmacophore development, molecular dynamics and other computational methods-based design. We are also working towards building Machine Learning and AI-based platforms for predicting activities of unknown molecules for their anticancer and antimicrobial properties against selected targets. Our lab also evaluates the screened compounds for their in vitro activities and also looks into detailed mechanisms of action of these active molecules in cell lines based models. Future work will involve using the above methods to discover new/novel inhibitors for important drug targets as well as through drug repurposing approaches.

- ***Prof. ManishaTiwari, ACBR, DU***

Students would be working on development of novel heterocyclic compounds which would be used as anxiolytics and elucidating their molecular mechanism of action. We would be developing these compounds using Bioinformatic Tools and synthesizing agonists of the GABA A receptor, Inhibitors of Serotonin Reuptake receptors and partial agonists of the 5HT1A receptor. We have two publications in this research area from our laboratory.

1. Synthesis and Pharmacological Evaluation of [(4-Arylpiperazin-1-yl)-alkyl]-carbamic Acid Ethyl Ester Derivatives as Potential Anxiolytic Agents
   ManishaKhatri, Santosh Kumar Rai, RanjitRanbhor, Krishna Kishore, ManishaTiwari*
   Archives of Pharmacal Research, 35(7), 1143-1152, 2012 impact factor 6.01   Springer Nature Publisher

2. Synthesis and pharmacological evaluation of new aryl piperazines N-{4-[4-(aryl) piperazine-1-yl]-amine derivatives: Putative role of $5HT_{1A}$ receptors
    Manisha Khatri, Santosh Kumar Rai, Sameena Alam, Anjana Vij, Manisha Tiwari*
    Bioorganic & Medicinal Chemistry 17,1890-1897 ,2009 IF 2.95 (Elsevier)

- ***Prof. Ajay Kumar Yadav, Professor, ACBR, DU***

Cancer therapeutic and its Molecular signal transduction pathway

- ***Dr. Meenakshi Sharma, Assistant Professor, ACBR, DU***

   i.   Aging and autophagy
   ii.   Antimicrobial resistance

- ***Dr. Sanjay Kumar Dey, Assistant Professor, ACBR, DU***

   i.   Protein involved in Atherosclerosis
   ii.   Viral proteins and
   iii.   Protein involved in cancer

- ***Prof. Uma Chaudhry, BhaskaracharyaCollege of Applied Sciences, DU***

Research Topic 1: Metagenomic analysis of pulmonary microbiome to understand susceptibility to SARs-CoV : Microsoft Word -
In this project, we wish to investigate the pulmonary microbiome of COVID-19 patients. Further, we would explore the effect of these changes in the pulmonary microbiome and susceptibility to other diseases. As we track changes in the pulmonary microbiome during COVID-19, we can apply this knowledge to current pandemic control measures and recovery.

Research Topic 2: Multiplex Real-Time PCR based rapid detection of Sexually Transmitted Pathogens in tribal women of aspirational districts: Nucleic Acid Amplification Tests (NAATs) kit based detection of microorganism responsible for STIs among tribal women of aspirational districts will be carried out. Networking with the local health agencies/PHCs,/CHCs/ district hospitals for disseminating information about the prevalent strains of microorganisms and ensuring use of appropriate antibiotics.

- **Prof. Urmi S. Bajpai, AcharyaNarendraDev College, DU**

1. **Research area in the 'Antimycobacterial Drug-DiscoveryLaboratory'**

    My laboratory is engaged in finding solutions to antimicrobial resistance (AMR), which occurs due to the widespread overuse/misuse of antibiotics and is declared as a major threat to the global health by WHO, CDC, ICMR. COVID-19 has further exacerbated the AMR crisis. Hence, finding alternative therapies are vital as human/animal lives, crops &agri-food and the economy are deeply impacted.

    What we do?
- Study bacteriophages and their derivatives as alternatives/adjuncts to antibiotics.

    Discover, characterize and explore the anti-mycobacterial potential of bacteriophages and the lytic proteins (Endolysins). We are developing a bank of mycobacteriophages and lysin enzymes with an aim to develop suitable candidates as potential therapeutic candidates against Tuberculosis and Non-tuberculous Mycobacterial (NTM) infections.

- Discovery of small molecule inhibitors as drug candidates

    We have developed a biochemical assay with six enzymes (Mur enzymes of the cell wall biosynthesis pathway of *Mycobacterium tuberculosis*) as the target proteins for TB Drug Discovery & Drug Repurposing. This assay has the potential to identify potential molecule(s) which could be developed for multi-target therapy.

The probability of the development of resistance to a molecule that targets multiple essential proteins in a pathogenic bacterium is very low. Similarly, bacterial resistance to the lysin enzymes is also remote. Hence, both approaches are highly promising and have the scope for translational research.

For more details about the work, please visit the link updated till 2021. https://www.andcollege.du.ac.in/uploads/departments/BMS/BMS_Urmi%20Bajpai_Proforma_%20July%2020,%202021_compressed.pdf

- ***Dr. Radhika Bakhshi, Associate Prof.ShaheedRajguru College of Applied Sciences for Women, DU***

Deciphering gene networks associated with altered mitochondrial DNA copy number foridentification of novel potential therapeutic targets in Pediatric AML.